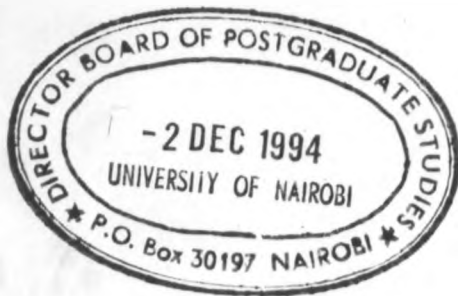


THE SOCIAL DYNAMICS OF WATER MANAGEMENT AMONG THE
EAST POKOT PASTORALISTS, NGINYANG DIVISION BARINGO
DISTRICT OF KENYA. 4

BY

BENEAH MANYURU MUTSOTSO.



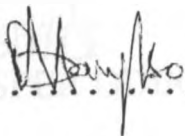
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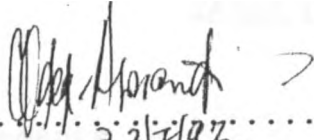
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23/7/93.

DR. CASPER ODEGI AWUONDO.

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However, I alone remain responsible for any errors in writing and interpretation of the thesis.

ABSTRACT

The East Pokot pastoralists belong to the wider Kalenjin speaking group. They are herders of cattle, sheep, goats, donkeys and camels. These animals provide for them food - milk, meat blood and also provide skins for clothing and dung for building "manyattas". The East Pokot live in two divisions - Nginyang and Tangulbei. The 1979 national population census indicated that they were 37,000.

The central concern for this thesis was to find out the social behaviour patterns that emerge around water and how these patterns are translated into management of this scarce resource. This was because of the clear understanding that water upon which the pastoral economy is dependent is scarce and therefore requires careful management.

The main objectives of this study were to find out the decision making processes around water, examine ownership patterns and how ownership is acquired and translated into rights of access and, to find out the existing rules of water use and sanctions applied in cases of non-conformity.

The efficacy of communal ownership and use of resources in the arid and semi-arid lands of Kenya and the world over has in the preceding period increasingly come under question. Early writings indicate that communal ownership and use of resources leads to waste because there is no affection involved in exploitation. The tragedy of the commons theory has been a landmark formulation that has for generations sparked off raging debate over efficacy of

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communal ownership of resources. Studies by Daniel Bromley in the period preceeding 1993 have all along defended the conveniences, efficacy and sustainability of communally owned resources. The two paradigmatic arguments constitute the backbone of this thesis.

The focus of this study was to investigate the existing indigenous water resource management techniques among the Pokot. This was in an effort to understand how pastoralists manage the scanty and fragile resources on their own. The study investigated those institutional and cultural factors with regard to water management among the pastoral Pokot. The study concentrated on those inbuilt mechanisms that stand out during drought and when water becomes critically scarce.

The study benefitted from a range of methods of data collection. The unit of analysis during the field work was individual household units (heads) and this was supplemented by key informant interviews. Given the nature of the study anthropological methods - observation, informal interviews, key informant interviews were used in collecting qualitative data. The questionnaire was the most important source of generating quantitative data though it also generated a substantive mass of qualitative data. Documentary sources were useful particularly in Chapter 2 for its present face by extensively reviewing literature on pastoralism and ownership of resources. The study employed descriptive methods of data analysis and used tables, frequencies and percentages in analysing the data in Chapter 4 . The sample size for this study was 61 households. This sample comprised of 53

and 8 male and female respondents respectively.

The study formulated three hypotheses around which data was collected and used to test them in Chapter 4. The hypotheses were: Demographic variables are crucial determinants of water utilization; division of labour affects utilization of water in the household; water use depends of the peoples perception of the environment.

Findings of this study indicated that there were cultural underpinnings which regulated and controlled exploitation of common resources. The institution of the "kokwo" was the most noticeable body with which administration of water rests. It occupies the central position in the Pokot lifestyle and it is therefore their toolkit for everybody life for its duties and responsibilities pervades all aspects of everyday life. This ranges from formulation of rules, punishment, organization of grazing timetable, deliberation on security arrangements, sanction cattle raids, arrange circumcision and 'sapana' dates etc. The study also found that with the proliferation of the Provincial Administration and the increasing power of the elected politicians the 'Kokwo' is becoming incapacitated in its duties. Unless this is checked we might be seeing the systematic collapse of indigenous institutions that have for centuries been responsible guardians of the resources on which they depend. The more the Provincial Administration extends its tentacles the faster the 'Kokwo' becomes powerless and the more the security situation deteriorates and the faster the range degradation as witnessed around Chemolingot, Chesanja,

Nginyang resulting from a shrunken resource base. Along this background the study found that the state of the range south of Nginyang is more attributed to insecurity than the nature of nomadic pastoralism.

In the study women portrayed a better understanding of the environment in which they live because all their activities were clear reflections of this understanding. The school, it was found out negatively affected water management in the household because of the withdrawal of useful labour. Consequently less water was fetched.

It is the call of this thesis that the Pokot need to be armed as before. The anti-stock theft unit at Chemolingot is powerless alone in the face of the superior Turkana raiders. The Pokot homeguards should be given guns to defend their livestock and life and in the process halt the on-going land degradation. Congestion has in this case resulted from the fact that the Pokot have been scared off most of their grazing land towards the north where the dry season pastures lie.

Given the scarcity of water it is the desired recommendation of this study that more water pans should be scooped in this area in order to reduce the long distances covered by human beings and livestock to the water sources. While a Non-Governmental Organization - Kenya Freedom from Hunger Council has for long provided water to the Pokot, its efforts should be supplemented by other bodies and means in order to diversify the water sources.

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Central governments have the world over been uncomfortable in the face of indigenous institutions. This study strongly recommends that the central government should recognize the existence and role played by the 'Kokwo' and leave as much authority with it as possible over local issues. The Provincial Administration in Kenya should not see the 'Kokwo' as a threat but a partner in development and governance. A recognition of the 'Kokwo' has strong implications for articulate resource management and improved security.

CHAPTER 1

1. PROBLEM STATEMENT

Pastoralists own and control resources communally and this is necessary because of their [resources] apparent scarcity. This system of ownership is conducive because it guarantees access to range resources at all times. They are migratory in nature as a survival strategy from predators, cattle rustlers, diseases and drought. They keep the sturdy East African short horn Zebu cattle, sheep, goats, camel and donkeys. The commonest livestock in all pastoral communities is the goat. The livestock form the base around which all aspects of life rotate. The old orthodoxy holds strong that pastoralists have excessive livestock more than they require and that this is the principal cause of the apparent overgrazing. It is this misconception about pastoralists and the dynamics of pastoralism that formed the justification for transformations in land tenure and other range resources. Allies and bond-friends with whom they exchange overtures at times of difficulties is a noticeable characteristic of pastoralists.

In Kenya, over 4/5 of the total land area is arid or semi-arid and supporting about 25% of the national human population. Kenya's drylands also carry an estimated 35% of the country's cattle population, 100% of the camel population, 69% goats, 66% sheep and 75% donkeys. With that potential arid and semi-arid land have great capacity in national livestock development endeavours programmes to feed both the local and external markets.

However, the challenge is that water resources on which the pastoral economy is dependent are dwindling with resultant death of people and livestock most likely due to famine and drought. Early researchers held that problems associated with the shrinking of resources in ASAL are 'sui generis'

Hence the philosophy has been that intervention activities have always aimed at changing them, often leading to disaster.

The focus of this study was to examine the indigenous water resource management techniques among the Pokot. An attempt was made to examine the evolution of such techniques over the years. Hence we may learn from them the strategies they employ around other than prescribing for them what is not tenable. The study hoped to deepen our understanding of pastoralism and how pastoralists manage the scanty resources on their own. This may help to improve policy approaches in other areas of Africa.

The analysis as posited by Hardin, 1968 in the "Tragedy of the Commons" held that communal ownership and utilization of resources was wasteful. Therefore the remedy, at least in his view, was privatization of common resources to instill a sense of responsibility in the herders. The analysis went that herders used common resources without regard to other users because there were no institutional norms and values that governed utilization. That this inevitably led to degradation of the common resources. However, this position is challengeable with on-going research.

This study focused on these institutions and cultural arrangements with regard to water management among the pastoral

Pokot. These arrangements form the backbone of managing water scarcity in the area in order to make it available for longer periods.

The study concentrated on those in-built mechanisms that stand out during drought when water supplies become critically scarce. The issue investigated in this study was how the Pokot have coped with recurrent water shortages over the years on their own in the absence of external interventions.

The economy of the Pokot - livestock husbandry is so dependent on water without which it would be negatively affected. Indigenous water management is the nucleus of the environment without which pastoralism cannot function as a mode of production and a way of life. It was important therefore to investigate the range and scope of norms and values that do emerge around water as a scarce resource. The study was about behavioural mechanisms which emerge in the process of conscious water conservation practices. It was the assumption of this study that such water management techniques remain dormant when there is plenty of water as in the wet season but stand out prominently in the dry season.

1.1 JUSTIFICATION OF THE STUDY

The study presented the chance to learn about the challenges of life in a nomadic pastoral community.

The study hoped to generate new information on pastoral adaptation mechanisms and contribute to the already existing data

bank on water resource ownership, utilization and management among pastoralists in general and the Pokot in particular.

" A man may be attracted to science for all sorts of reasons. Among them are the desire to be useful, the excitement of exploring new territory, the hope of finding order, and the drive to test established knowledge" (Kuhn, 1970:37).

It would also point out changes occurring in water resource ownership and management among the Pokot and whether assumptions about them in regard to water use ownership and control among other things still hold.

1.2 OBJECTIVES OF THE STUDY

The specific objectives of this study are:-

- 1- To find out how decisions regarding water use are made and by whom among the Pokot.
- 2- To investigate how water is fetched, by whom, the distance to the nearest water source and how it is used in the household. This was as part of analysis of water management at household level.
- 3- The study sought to find out how ownership and the use of water is acquired in pastoral communities. (rights of access). This is particularly critical at this time of changing property rights among pastoral communities.
- 4- To find out the existing rules of water use and sanctions

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applied in cases of non - conformity to the prevailing norms
in the use of this scarce resource.

CHAPTER 2

LITERATURE REVIEW AND THEORY2.0 A HISTORY OF THE EAST POKOT.

The name Pokot first appears in colonial records in 1929 when it was substituted for Suk which according to the Maasai means ignorant people. The East Pokot belong, according to some theory to the Nilo-Hamitic stock.

The name Pokot has various meanings. According to interviewees during the fieldwork it means highland agriculturalists, denoting the fact that they were cultivators at a time in history. Others said that it means a people with cattle and to others a person who is warlike until he remained alone. So it means a people who survive on luck and this lends support to the theory that they constitute a refugee population.

Pokot folklore strongly indicates that they came from a place called Seger, a place in the area of modern West Pokot Cherengani and Mt. Elgon. Another hypothesis holds that they came from Misri. But it is not clear where Misri is presently and whether it means present Egypt is hard to confirm and therefore open to further research. The consensus is, at Seger there was hunger and an epidemic that killed many and forced the survivors led by Arimot to the East as others settled among the Karamojong. What emerges from this narration is that Seger is likely to have been a dispersal point. Arimot promised his people glory in the East, a land full of honey, fruits and wild game.

At Hamudat, at the confluence of Turkwell and Kanyangaren rivers they were attacked by the Turkana and Arimot was killed at Chichia. It was here that Ptura and Kiwuta took over leadership to lead his battered people to Tiati hills where they first settled.

Ptura had two sons Lokudo and Lomomuk. The former became a wise chief and lived in Tiati where he died of tuberculosis in 1985. But Kiwuta only had daughters and one of his grandsons, Rokes became a famous laibon and lived at Seretion village.

There are competing explanations as to whether the Pokot were originally pastoralists or agriculturalists. One hypothesis holds that they were pastoralists and later became agriculturalists by some unknown circumstances and reverted again to pastoralism when the Samburu were driven off the eastern plains (Beech, 1911). This, he affirms, is why they seem to follow a different pattern from the Maasai and Nandi who in some cases took agriculture and stayed with it. But Elliot² insists that these people were not originally agriculturalists. Studies by Were and Akonga (1986) indicate that the East Pokot were originally agriculturalists.

Presently, the East Pokot say they are superior to those who practice agriculture and they contemptuously refer to them as "pipapagh" or "seed people". It is this unusual attitude towards cattle that Herskovits, (1926) based his "cattle complex" 3.

There is a hypothesis that the Pokot occupied the East only when the Samburu vacated it. But whether the Samburu vacated it

voluntarily or under pressure is hard to tell though Pokot informants say their ancestors drove them away. But Hobley (1906) argues that the Maasai drove out the Samburu and left land which was later occupied by the Pokot.

On cattle acquisition Beech argues that the Pokot did not have any until they moved into the plains and acquired them from the Samburu, but the Pokot insist that they brought them with them.

The Pokot belong to the Kalenjin cluster linguistically although they have borrowed more traits from the Karamojong and the Nandi. The Nandi relationship has in the past been overlooked all because the Pokot look like the Karamajong physically. The most important acquisition from the Karamojong was the initiation ceremony, "Sapana"⁴ which is accompanied by the wearing of a fine clay headdress⁵. This 'sapana' ceremony could be used to justify the few cattle raids between the Pokot and Karamojong unlike with the Turkana.

By 1945 the District Commissioner lamented that after 34 years of administration Pokot still rank as the most primitive district in Kenya (Annual Report for West Suk, 1945). This was because chiefs and the African District Council refused to accept responsibility and people could not send their children to school nor hospital. The climax with the British administration was the Kolloa massacre, 1950 when the leader of "Dini ya Msambwa" Elijah Masinde defied the District Commissioners' order to surrender while attending a "KOKWO" at Kolloa, Kerio valley. The "askaris"

fired at the "KOKWO" killing many and in the ensuing scuffle the Pokot killed the District Commissioner and four "askaris", three black, one white. The Pokot were later herded into concentration camps at Nginyang and fined 5000 cattle and all their arms confiscated. Others were prosecuted and condemned to stiff prison sentences.

The most distinctive feature among the Pokot political organization is its lack of centralized leadership. There is no case where one person has absolute authority over another. This is encouraged by the fact that there is no crowding for land hence no need for an elaborate government machinery. The only level is by the elders council, "Kokwo". Its primary function is to settle minor disputes and to establish regulations regarding such matters as grazing, women circumcision, security. Without a "KOKWO" no group action can be taken.

2.1 LITERATURE ON RESOURCE OWNERSHIP AND MANAGEMENT.

The notion of private land or water resource ownership does not exist in pastoral communities. It is the resources which the land produces that are important, but not the land itself. Hence land is owned, in general by everybody (Schneider, 1953). Hence land cannot ultimately belong to a limited group of people (Hjort and Dahl, 1976:18). What seems to exist are private rights but temporarily. However, there are certain restrictions regarding their utilization. For instance certain zones of grazing land and its accompanying resources like water and salt licks can be

private when they appear next to a homestead where one's calves graze. In certain cases regions can be set aside for use during particular times of the year as in drought.

Utilization rights of the common do not set stock limits an individual owner herds on the land. The only limitations that are seen/noticeable in this setting are controlled seasonal movements of stock in certain parts of the rangelands. But friction within communities and between individual and community interests in resource use are seen as inevitable in future. Presently, overcrowding of women around hand dug wells could in future be a cause of friction. Recent studies indicate the propensity towards privatisation as that which has happened among the Maasai (Kituyi, 1990).

Pastoralists, particularly African pastoralists have been accused on numerous occasions of having a land tenure system that is incapable of efficient or economical resource use. The "Tragedy of the Commons (Hardin, 1968)", says that the problem is the contradiction of having individual animals using communal resources e.g water. This, many have argued inevitably resulted in indiscriminate resource utilization hence degradation. This obnoxious notion has had a strong influence on planners. The alternative of privatization that this argument suggests has been widely followed (Pastoral Land Tenure in East Africa: Report of a workshop, Arusha, Tanzania, 1-3, Dec. 1988).

The results of the above policies have rendered many pastoralists, especially the weaker ones destitute because they

have been denied access to their traditional pastures and water resources. (Lane, 1990).

The basic argument in the "tragedy of the Commons " goes that communal users of a resource like water cannot work in unison for its effective and sustainable use. That the result inevitably became immediate destruction. However, recent analysis shows that individual members of a group set regulations that govern the use of resources hence the tragedy is unlikely to occur. These governing regulations are merged with existing institutions to enforce them. Such arrangements, the argument goes, have recently been shown to exist and operate successfully in many pastoral contexts.

In northern Kenya, Turkana pastoralists recognise a range of rights in natural resources including heritable rights of households to individual zones of brouse trees in riverine forests. Among the Maasai, sections or lineage groups occupy and control areas with recognized boundaries including both dry and wet season pastures. Within a lineage's area, the pasture are divided into localities, each composed of several homesteads which cooperate in using and managing water and pasture. But in times of scarcity, as in drought, lineages form alliances to allow use of each other's resources. This cooperative strategy challenges the Tragedy of the Commons. This strategy is seasonal, however, and at times regional. For instance, in areas where there are low pastoral populations the resources are unlikely to be scarce or threatened and therefore cooperative solutions are

not necessary. An increasing number of studies demonstrate the relative efficiency of pastoral production and resource use systems. (Cossins, 1985; Behnke, 1985).

In some areas, as among the Barabaig in Tanzania, central government has enacted legislation that has arrested control from traditional rules leading to a disaster (Lane, 1990). What ensued was a real "Tragedy of the Commons" created by the government. Better put, "ruleless chaos" ensued (Lane, 1990 Op.Cit.).

Central governments have in many places imposed alien types of land tenure more in tune with the prevailing orthodoxy in form of private ranches. This strategy has proved ineffective and was hotly resisted by pastoralists. A notable example is among the Maasai when grazing blocks were introduced and made compulsory. In such circumstances non-pastoralists like powerful politicians, businessmen and wealthy pastoralists have benefitted from this individualization of land resources (Cernea, 1989). Dissenting views however suggest that the Maasai embraced ranching thinking it would give them land security.

Land tenure is a critical and timely area of policy intervention, for decisions made today will determine allocation, use, rules and institutions which will in the final analysis shape the future pastoral economy. These decisions may indirectly also shape policies concerned with equity, poverty, food security, environmental conservation and productive pastoral development.

However, any search for reforms in land tenure and water

resource tenure must inevitably start with a thorough knowledge of what exists presently. This is what many have disregarded and ended up with conditions worse than it was found.

Available evidence suggests that in controlled - access arrangements, traditional rules show great dynamism. For instance there are discriminate rights to various resources on the same land, and between different products from the same species. Access to resources can change at different times in a year, showing each season with its rights. Even the duration of the use for a particular resource can change depending on the expected climatic conditions. For example in East Pokot hand dug water cannot be used by animals when there is water lying in pools. Or strategic water reserves are preserved until and when all other sources have run dry.

In the foregoing analysis Hardin seems to be raising the fact that individual herders are always interested in having huge herds since there are no set mechanisms to determine the ideal size of the herd. Implicitly, Hardin, (1968) implies that African pastoralists are always in competition over raising the biggest herd. This has never been the case. It is because of this viewpoint advanced by Hardin, (1968) that calls for land reform originated. In fact the creation of game parks encompassing huge chunks of common land found legitimacy in his writings. More recently commons are thought to be obstacles to development (Pratt and Gwyne, 1977). This factor is in line with the "cattle complex" (Herskovits, 1926) and which Hardin, (1968) was well

aware of .

As privatization of the common is forcefully injected in by outsiders who claim to understand what is best for pastoralists than pastoralists themselves customary land tenure arrangements have been increasingly unable to maintain production and wealth as previously. This has consequently put the lives of the pastoralists who are unable to adjust into jeopardy. Once this state creeps in as it has happened among the Turkana and Pokot the pastoralists become declared destitutes and become the focus of international and national aid in form of famine relief hand outs.

Given the above state, modernization projects are based on the assumption that African pastoralism is inefficient and unproductive. Resource degradation is blamed on the inefficient and outdated land tenure systems. These views are supported by the notion that African pastoralism is a remnant of a past age of agricultural evolution. That is they are behind on the evolution scale and therefore by implication closer to apes than their agricultural brethren. But the history of the East Pokot strongly refutes this conclusion (Were and Akonga, 1986).

Most conventional thinking equate sustainability with preservation or enhancement of the productive resource base, particularly for future generations. Are livelihood activities with specific reference to Arid and Semi-Arid (ASAL) lands maintaining and enhancing or depleting or degrading the local natural resource base? They may contribute to desertification,

deforestation, soil erosion, declining water tables. On the positive livelihood activities can improve productivity of renewable resources like air and river water, soil, organic soil fertility and trees but on the negative they can be destroyed (Chambers and Conway, (1992)

2.2 OPEN-ACCESS MODEL

Open-access is a rangeland tenure in which it is posited that resource depletion is an appendage to common resource ownership. Hence each livestock owner utilizes the range resources without regard of how others like him will use it. Those who support this model are often drawn to the conclusion that indiscriminate resource depletion can only be arrested by reforms privatising resources. Some argue that the state be given powers to police individual use and unleash punishment to poor custodians of common resources. As earlier noted, individual use of resources e.g water can be, and often is regulated by local institutions and informal rules to minimize depletion. In a nutshell available theories poorly model real world institutional arrangements and are at least unable to offer convincing and implementable solutions to real world grazing management problems. And open access from another angle is taken to mean a system where no property rights have been recognized by the users.

2.3 COORDINATION ACCESS

This is a more elaborate theoretical perspective on rangeland tenure on resource use in pastoral communities. It posits that pastoralists exploit resources on the common land with the knowledge that others with interests like theirs will also use it. Hence there is beneficial coordination in the use of resources without the existence of individual resource tenure systems (Cernea, 1989, Op.Cit). It is the duty of the herders therefore, to enforce informal social sanctions to punish undesirable behaviour.

Pastoral societies do exhibit some faint form of individual tenure arrangements but temporarily or seasonally. This is particularly that area next to the homestead where other herders herds cannot graze. But the individual has no powers to sell or trade it. Probably The nearest concept the Maasai have is the "aker". Among the Maasai ownership is equated to greed and selfishness. But the "aker" may be applied to a small piece of land or hill near his manyatta where his young, sick and old animals are kept. (Sena, 1988).

This arrangement is also found among the Pokot and the land or resources revert to communal use upon migration of the previous holder. But no specific local name is given to it.

2.4 BRITISH OCCUPATION AND ALIENATION OF "OWNERLESS LAND"

The colonial period marked radical changes in African tenure arrangements. The British applied to Kenya what was pertinent in

Europe. In Kenya, the concept of individual title was still foreign. Land and land resources were communally owned as it still is in pastoral communities presently. The British made a heinous mistake by labelling it idle land. Of course they were wrong. For instance they criticized communal tenure arrangements for lack of specificity (Okoth-Ogendo, 1991a). The weak point was that without some degree of specificity within communal areas, rights whether individual or communal are relatively more difficult to ascertain and clarify.

"During colonialism the British were able to exploit this communal ownership element as "ownerless", the land was considered waste and unoccupied. It was argued that since Africans could only own, or make claims to, occupied land, it therefore followed that unoccupied land reverted to the territorial sovereign" (Okoth-Ogendo, 1991b).

Consequently the British declared such "unoccupied" land "crown land". In that confusion they introduced the alien phenomenon of individual tenure while loosely tolerating the notion of common property. This is the notion being extended to the East Pokot and other pastoral communities. It has already taken root in Maasai, Laikipia and Samburu. At independence in 1963, individual ownership retained its legitimacy and found security in the laws enacted thereafter. The African elite who

assumed power and had benefitted from Western education came to accept and appreciate private ownership.

"they were the ones who had to gain most from the continuity of the economic and political colonial system. And through a variety of land related policies, there were many who not only acquired land, but with it recognized individual property rights" (Okoth-Ogendo, 1991D : 11).

The author emphatically notes,

"It was the members of this elite to whom political power was transferred at independence, a fact which gave them an enormous advantage over the other segments of society. The results of this initial coincidence of political power and the acquisition of property was the emergence of a landed oligarchy which was not only sympathetic to the principles underlying the political economy of capitalist production but which in fact held substantial investments in estate agriculture (Okoth-Ogendo, 1991, :163-164).

2.5 TYPES OF RANGELAND TENURE

Three tenure regimes are clearly identified - state, private and common. By their appearances they connote regimes in which the state, individual or groups of livestock owners have safe

expectations of use over future resources available on the range. Group ranches tend to fall into two tenure regimes - communal and private regime because they share aspects of both. In East Pokot only communal regime and state property existed but with modern interventions private regimes are being introduced on small scale.

2.6 STATE PROPERTY

That the state or the state acting in another organization has legal title to the income generated by these resources. The state has the ability and means to exercise control over use of the resource(s). This is what became known as Crown Land in colonial Kenya. Presently, such areas include game parks, game ranches, state farms, conservation areas such as forests, military reservations are good examples. Shifts from common to state property are common.

2.7 PRIVATE REGIME

Individual herders have exclusive rights to income generated by the resource. The individuals have the rights of excluding others from using his resource(s) unless with his permission. The individual is always sure of using the range resources in future and whenever he pleases. The decisions regarding use are solely dependent upon the individual. By implication non-owners do not have secure expectations of using the individuals resource(s).

2.8 COMMUNAL REGIME

Individuals and groups achieve access to use the resources, but as many theorists have argued they do not respect the wishes of others. That the absence of personal affection to part of the range is highly unlikely to be consistent over-exploitation and deterioration of the resources. However, as earlier noted in the section of coordinated access, pastoralists often coordinate mutually beneficial rangeland resources amidst common resource tenure. Hence as one scholar has put it,

" the strategy of each livestock owner depends upon the strategies of all other livestock owners sharing the same rangeland" (Bromley and Cernea, 1989).

By implication every livestock herder takes on co-operative behaviour and punishes non-cooperative behaviour through a common system of norms. This non cooperative solution is here called threat coordination access. In it individual herders and resource users support cooperative solutions through a system of threats of punishment for non cooperative activities. Therefore each herder goes along strategies that are contingent upon information regarding the past and present actions of other herders. Hence if a herder has followed coordinated strategies then subsequent users will have the willingness to also follow a coordinated strategy. That far there are functioning membership criteria and communally defined guidelines for resource use and there is an enforcement mechanism for rebuking deviant behaviour. For this

case, that user with incomplete information about each other's strategies collect information to increase real and potential gains from coordination.

With this knowledge, policy instruments will be positive in pastoral communities if they are explicitly designed to improve coordination within the range. It is possible that policy without this knowledge has little chances of success.

Pastoral nomads are not in that locked into a destructive land-livestock relationship. Nor are they romantic independents living in perfect harmony with nature. They are highly skilled and knowledgeable herdsman with a long tradition of making the best of a tough environment. Many are able to adapt quickly to changing circumstances, to take advantage of new opportunities or to save themselves in time of drought (Timberlake, 1985).

In a pastoral community property is not a purely legal or economic entity but a social institution. It is an institution that comprises of individuals who hold rights, duties and objects over which are held and duties observed (Bromley, 1991). Therefore possible individual rights include rights over possession, use, management, income, capital, security and the right to transfer (Bromley, 1991).

Water resources are culturally controlled and communally delimited as individual, family, communal, tribal or national concerns by herders who use it for sustenance to their herds. But these controls are loosely defined. With such controls the pastoral community has provided conditions for exploitation of

the stock as living factories on the hoof, founded on and made possible by the ecological symbiosis of herder, herd and environment.

In common property there appear distinct groups of individuals who own resources. The property-owning class vary in nature, size and internal structure across a broad spectrum, but they are social units with certain common interests, with at least some interactions among members, with common cultural norms and often their own endogenous authority systems.

The group's external boundary is at that point where rainfed agriculture abounds. In this case international boundaries do not constitute a boundary as such. The group moves among and within itself according to environmental dictates.

2.9 OPPORTUNISTIC AND CONSERVATIVE STRATEGIES

The rate and intensity of stocking is dependent year to year on variability in forage and rainfall. Other than make assumptions about livestock owner's motivations in stocking decisions., Sandford, (1982) argues that an opportunistic pastoral strategy is,

"one which varies the number of livestock with the current availability of forage. Such a strategy enables the extra forage available in good years to be converted into economic outputs or into productive capital"(Sandford, 1982:62).

And should livestock numbers vary with appropriate times, increase in good seasons and cut down in drought to save the delicate ecological balance, this is called an efficient and ecologically conscious opportunistic strategy.

A conservative strategy is one which keeps a population of livestock at fairly constant levels in good and bad seasons without overgrazing (Sandford, 1982). That herder who follows a conservative strategy is more interested in ecological sustainability and not immediate profit. Hence the nomadic movements of pastoralists are a constant adjustment to the changing demands of the natural habitat and the fluctuating pressure of the social environment. The Pokot similarly adjust herd levels in drought. For example the livestock market becomes active at Nginyang market on Mondays when livestock traders of Kikuyu, Tugen and Somali origin come to buy livestock for slaughter in Nakuru. In response to similar environmental difficulties they also migrate with their cattle to the highlands and to areas around Churo.

Literature about resource utilization among the Borana show that their stock numbers are subject to availability of water and labour in digging the well. This is in line with the conservative strategy.

2.10 CHOICE OF STRATEGY

Varied factors which Sandford, (1982) calls ecological, social, political, economic and attitudinal are likely to

influence a herder's choice of strategy. That the more erratic the rainfall and the smaller the area of grazing, the greater the market outlets the more opportunistic the herders strategy is bound to be. However, should herders be more concerned with environmental conservation and resource sustainability and less concerned with individual happiness they are more likely to toe the conservative line. Pastoralists who have school going children are more likely to toe the opportunistic strategy if they have to cope with fees payment and local 'harambee' contributions.

At other times choice of strategy is determined by previous shocks such as drought, disease and livestock rustling and expectations of the future. Rainfall is accepted as the most determining random factor affecting strategies. Other random processes include prices, disease, government programmes and regulation, domestic political instability, cattle rustling

Therefore risk becomes a central issue in pastoralists' choice of strategy. In fact many aspects of pastoralists' behaviour are clear reflections of this risk. Risk determines the decisions pastoralists are likely to make regarding the number and types of livestock kept. Whenever the shock claims its toll social institutions in the name of bond-friends helps those adversely affected to recoup their herds.

2.11 MOBILITY AS A RESOURCE MANAGEMENT MECHANISM

It is a strategy adopted by pastoralists to maximise

production and insure survival from droughts, predators, diseases and cattle raids. For example the Pokot employ alternate and seasonal herding regimes. In the dry season they move the animals to the highlands-Tiati, Chepanda, Paka, Amaya and trek them at least twice a week for water in the lowlands. In the wet season the animals are concentrated in the plains as the highlands are spared for the dry season. Claims indicated that the highlands are infested with cattle diseases in the wet season hence the concentration in the plains. Such alternate grazing patterns are ecologically conserving. Hence it is a risk avoidance mechanism which is unlikely to tamper with the fragile ecology of the drylands.

In Pokot mobility has of recent been necessitated more by insecurity posed by 'Ngoroko' cattle rustlers than with climatic dictates. This has disrupted the traditional grazing pattern and is responsible for the apparent overgrazing noticeable around Nginyang, Chemolingot, Seretion and to the South-West towards Yatya. Yet highlands like Paka and the area towards Kapedo are very vegetated because that is the direction the 'Ngoroko' approach from and so all the animals have either been stolen or moved further south. Similarly the Turkana migrate further from Kapedo for fear of Pokot raids for livestock. Hence a huge buffer zone has been created between these two communities and this has denied the herders access to their rightful traditional pastures.

Available literature comes to common agreement that pastoralism does not inevitably lead to a tragedy. Instead

pastoralists are quite aware of the fragility of the ecology. However, the syndrome of "absentee herd ownership" has emerged and disregards the established guidelines of coordinated access. There is evidence of increasing absentee ownership of livestock by non-pastoralists in Botswana, Kenya, Somalia, Cameroon, Mali, Niger. In the Il Chamus area of Baringo it was found that local businessmen, teachers, politicians and private farm owners are taking increasing advantage of the common (Little, 1985).

Little, 1985 argues that the blame for some of the serious overstocking and apparent overgrazing in the location may lie more with non-pastoralists and "part-time" herders than with the pastoralists themselves.

What features prominently in this review is that private ownership among pastoralists is a foreign concept. In reference to the Fulani nomads, none of the forms of social groupings had, or has, any 'de-jure' rights of ownership of pasture, water or cattle tracks enforceable either by the sanctions of pastoral Fulani society, or those of the alien political entities within which the pastoral Fulani move.

Few pastoral societies are hierarchically organized. Hence there is no overall individual who has authority to tell another member of his community on how he should handle his animals. They are mainly egalitarian in outlook and tend to be regionally organized. As in Pokot each village has its own decision making 'kokwo' quite independent from the next.

This loose organization facilitates the best use of the

variable forage and water resources of the Sahel. By the nature of the resources, they are best utilized depending on how far the livestock disperse. For this to be possible people are relatively independent in decision-making in order to take their own risks.

2.12 DIVISION OF LABOUR

Writings on pastoralism strongly suggest that demographic variables are crucial to its functioning. That with adequate labour, traditional livestock husbandry techniques make pastoralism prosperous. In cases where labour has been withdrawn due to introduction of schools, inter-district migration, wage labour and the fall of altruistic motives pastoralism has tended to perform poorly.

Anthropologists have taken great pains to explain the rationale behind the social organization and structure of pastoral societies and the requirements for raising domestic animals in terms of labour and ecology.

In a pastoral setting a household is the minimum independent societal unit which has sufficient personnel and an internal division of labour that enables it perform the duties of looking after a herd and fetch water, firewood for domestic consumption. Thus the household I refer to in this thesis is the minimum management unit.

Table 1. WORK ALLOCATION IN A PASTORAL POKOT HOUSE HOLD

Boys / men	'Girls / Women
4 - 6 Yrs - Herding of calves and goats kids	4 - 6 Years - Herding of calves and goats kids
6 - 12 Yrs - Herding of goats and camels near the homestead	6 - 12 Years - Herding of goats and camels near the homestead. Starts to help mother in domestic work e.g cleaning calabashes, milking etc.
12 - 20 Yrs - Herding the foraging herd - Begins to attend the 'Kokwo'	12 - 18 years - Herding goats and camels; in proportion the girls are now more involved in domestic work, carrying water, firewood, going to trading centres to sell milk, buy posho, grind.
20 -60 Yrs - Management of household herd. - After marrying he actively gets involved in managing his herd. He becomes the sole decision-maker. - Gives instructions on how livestock are to graze and to be watered.	18 - 60 Years - After marriage she has to manage her own household i.e cook, fetch water, firewood, general domestic duties. - She continues to graze especially if she has only children below 18 yrs - Build 'Manyatta'.

Source: Adapted from Michael Bollig (1989)

The fragile ecology, the scanty but prized resources and the erratic rainfall (250-750mm) per year require that pastoralists need to evolve a resource use regime. To get to this they work out a clear division of labour based on age and sex. As the above table shows and as other scholars indicate there are no known idlers in a pastoral household (Awuondo, 1990:34).

The male are most productive in their youthful stages when they can move far as herders and warriors. The women, young boys and girls take care of small stock, camels, donkeys and the sick and young animals. The women particularly water animals, milk, fetch water, firewood, clean the house, clean pots and other utensils, cook, prepare calabashes, make necklaces among others. They also build 'manyatta'. Hence they remain actively productive much longer than men and like women in agricultural zones are relatively overburdened with domestic duties. (Ndagala, 1974).

Issues like divination, rain making, medicine were a preserve for the elders. They had the knowledge to foretell impending calamities like drought, disease, floods or raids.

But modernity in its various forms has negatively affected the productivity of pastoralism. The introduction of schools, has for instance interfered with traditional division of labour and this partly explains why pastoralist's resource base is low. Most of the domestic and livestock duties have consequently returned to the weak and old men and women whose productivity is next to nil.

Yet migration is another factor that has continued to impinge negatively on the Pokot pastoralists of the needed labour for production. Interestingly, most migrants are those in their prime ages of production 15 - 35 years. Although statistics are not here available to back up the argument but it is common knowledge that there is exodus from pastoral communities to urban centres to work as shamba boys, watchmen and groundsmen. In

Nairobi Maasai young men dominate while in Western Kenya a good proportion of employed herdsmen are Turkana.

For example the school negatively affects the amount of water fetched in Pokot households where girls attend school thereby overburdening women. The school is increasingly becoming the springboard for continued erosion of pastoral values and dislocation of the traditional role allocation in the family.

The opening of European farms in Trans-zoia district had a negative effect on the availability of labour among the Pokot pastoralists as many people were attracted to wage labour.

However, in pastoral societies division of labour is not a rigid exercise. There is great overlap particularly in male specified activities such as herding where women continue to play a leading role. But it appears rigid only in domestic chores such as cooking, fetching water, firewood and milking or washing calabashes.

Schneider (1953) reports that women must also herd livestock for if they do not they will be considered poor. And that a woman who refuses to herd may be divorced thus bringing down on her head the wrath of the members of her clan.

Women in pastoral communities do the lion's share of work and it is not surprising that they have occasionally become independent. When the husbands die or migrate to look for payable jobs elsewhere they carry on the functions of the family save security concerns with the help of the children.

It is important to note that the main duties of men cannot

be so easily defined as those of women.

2.13 THEORETICAL PERSPECTIVES

In order to understand the relationship between utilization of common resources, humans, livestock and ecology a number of models explain the nature of this relationship in terms of co-existence.

2.14 SOCIAL DIMENSIONS THEORY

To foster our understanding of the situation the theory of social dimensions has its own contributions. That individual behaviour is determined by expectation about other people's behaviour. It is that assurance that others will not misuse the resource that makes the individual user to demonstrate care and respect for when utilizing them. Hence there is a strong interdependence between individual herders and they do not utilize communal resources as individuals but do so as conscious members of a group. Therefore the behaviour towards common resources is solely based on what the individual user expects of others. This expectation on the part of other users gives security to the individual user. Given that conservation of resources to the benefit of all, individuals respond in the way they know others are likely to reciprocate. This assumption and expectation of other users strategy assumes a coordinated strategy by the use of informal rules and institutions that guide utilization to the benefit of all.

The above argument puts Hardin's theory "The tragedy of the commons" onto new test as it was formulated based on access to open free common property but researchers discovered that natural range resources are controlled by customs, conventions and institutional rules. Hardin assumed that all commons are free access. This is not the case.

But the stability of the common can be upset if these controlling mechanisms are altered and not enforced. Most often this comes from external interventions (Runge, 1985, 1986). For instance land reform in Western Rajasthan (India) which privatized the common formerly controlled by feudal landlords created a true "tragedy" in which the commons were denuded (Jodha, 1987).

In agreement with Jodha (1987), Runge, (1986) argues that it is external factors that are held responsible for the collapse of the commons but not an inherent weakness in the common property arrangements.

Social scientists maintain that economic theory is deficient in explaining human behaviour. The truth is that cultural factors are in the forefront in modelling human behaviour. Therefore failure to consider this bold fact and concentrating solely on economic and materialistic variables in interpretation of common land tenure, theorists end up with wrong conclusions upon which policies of pastoral development are often based. This explains why many programmes directed at pastoralism have ended up in disaster.

Economy of affection (Hyden, 1980) is the basis of what happens in pastoral communities in utilization of common resources. That individual and mutual security are the basis of actions in pastoral communities. That reciprocity is the real cornerstone for cooperative behaviour and through it there is individual propensity to act for group benefit at most times.

The herder is both a satisfier and maximiser. That is, he is intend on satisfying others but cleverly also maximising his gains but not at the expense of the group.

2.15 PROPERTY RIGHTS THEORY

This is an economic theory in nature. That the value of property determines the nature and rights that govern it.

Demetz (1967) argues that common property regimes exist in cases where resources are of low value while the costs of control would be fairly high.

But when a resource becomes more valuable or scarce there is the propensity for individual users to over-exploit it maximumly. But when this stage is reached institutional mechanisms are enacted to govern it to contain the threat of extinction to the extent that non-conformers to the enacted group rules of use risk exclusion.

A good example is given here. The evolution of fishing territories in the late 1900's from non-exclusive to exclusiveness lends hand to this theory. For instance it is true that before 1900 fishing in the world's oceans was free because

there was plenty of fish and the activity was not popular. But as many people, nations and multi-national companies realized the economic potential in fishing many parties took to the activity as a way of life and economic development. To the extent that there was a threat of extinction of what was once known as an infinite resource. Consequently, as the need for fish rose nations began portioning off certain areas adjacent to its mainland in the name of "territorial waters". Laws were consequently enacted to keep off non-nationals and licences from central governments were introduced. The point is that fish became a valued resource hence required guarding. And as the demand for fish increased worldwide so did the economic rewards of controlling access to fishing areas.

It must be noted, however, that changes from common to private rights tend to occur only where the costs of control are exceeded by the benefits accruing from that control.

Demetz maintains that the persistence of Indian common hunting grounds on the North American plains was because the costs of taming the bison were higher than the eventual benefits. Therefore the greater the economic value of pasture land the higher the likelihood that private control will eventually take over (Behnke, 1985).

Similar situations are reported by Behnke, (1985) in southern Darfur, Sudan. That pastures near Nyala town were fenced off from roaming nomads because it was found more profitable to sell the fodder periodically than to let it be grazed and be

paid. And this explains why fencing was done because the costs of that work could be easily settled by payment after selling fodder.

And in Somalia, Behnke (1968) reports that as new wells were sunk herders began apportioning to themselves pastures near the wells and there was also apparent competition between agriculture and nomadic pastoralism. The issue is provision of water (scarce) stimulated the search for private rights by creating individual enclosures.

Behnke, op.cit says that privatisation of common property is inevitable where resources attain high value or where the danger of future scarcity is imminent. What seems to abound in this argument is that when scarcity is foreseen and the costs of private enclosures higher than the benefits, and when there is social and political stability then a tragedy will definitely occur. The gist of the matter is that this theory somehow suggests some universal linear historical evolution from common to private. (It adopts the Marxian model of societal evolution, historical materialism). And that private is modern and common primitive. It appears clear that it is population growth and greater demands that creates the necessity for enclosures (privatism).

However, more research is needed to explain individual cases where the threat of scarcity is imminent yet common property rights still persist. For example, the Maasai have fought to retain communal access to the Ngorongoro pastures in the face of

growing land scarcity (Parkipuny, 1983).

It would be erroneous to conclude that the threat of scarcity alone causes enclosures of land. Politics is another factor. Hogg, (1987) argues that the Borana of northern Kenya enclosed their pastures when the Somalia pastoralists threatened to deprive them.

Technological changes in land use, as usually induced by outsiders could be another factor that can lead to creation of enclosures and not necessarily resources becoming scarce. For instance, the creation of ranches in Maasai is a case in point but not that Maasailand resources were getting scarce.

In East Pokot enclosures have been introduced by a Non-Governmental Organization (Kenya Freedom from Hunger Council) not because resources were getting valued but it was the organization's policy to encourage creation of individual enclosures in the name of pasture development. And even so water in East Pokot is a valued resource, but where water pans have been scooped no traces of enclosures are seen. The case disapproves the property rights theory. And it may be applied to only particular situations.

2.16 HYPOTHESES

2.17 WORKING HYPOTHESIS

Common use of resources by pastoral communities contributes to dwindling of the resource base, periodic food shortages, livestock deaths and the fall of pastoralism. In order to

alleviate these problems, contemporary literature holds that there is urgent need to privatize resources among pastoral communities if a tragedy is to be avoided.

2.18 SPECIFIC HYPOTHESES

1. Demographic variables are crucial determinants of water utilization.
2. Division of labour affects utilization of water in the household.
3. Water use depends on the people's perception of the environment.

2.19 OPERATIONALIZATION OF VARIABLES

1. demographic variables.

Is the independent variable in this hypothesis. It will focus on the household and be measured in terms of age of members, household sex structure, size of the household, number of wives per household, number of dependents etc. For this study dependants will be those below 10 years and over 60 years.

water utilization

This is the dependent variable and will be measured in terms of activities in which water is used, how much is used, how often and whether there are some activities not undertaken because there is no water or it is less in the household.

2. division of labour.

It is the independent variable. It will be measured in terms of how work is organized and shared out, who fetches water, who assigns the responsibility of fetching water. What percentage of the population in that household is organized around water use. For this study, only the active group (12-55 years) will be of interest. How many people fetch water, how many use that water.

3. perception of the environment.

This is the independent variable. It will be measured in terms of how the Pokot respond to the use of water available. For this study the people's culture particularly around water, their upbringing in that environment, the process and pattern of response will be investigated with the understanding that water in their environment is scarce. How they have learnt to live in this environment, the activities they undertake in response to the stimuli which in this case is the harsh semi-arid environment. These perceptions will also be measured in terms of water classification into good or contaminated, human and livestock water, and how they view drought.

CHAPTER 3

3.0

3.1 METHODOLOGY

This was a case of study of the pastoral pokot who live in Nginyang Division, Baringo District. The study involved staying with the people in their "Manyatta" and sharing with them their day to day experiences as related to water resource management.

3.2 Site Selection.

The study was based in Nginyang Division. Nginyang was found to be the most suitable because it was the nucleus of the East Pokot pastoralists, at least in their traditional setting. More to that they are heavily concentrated in this division compared to divisions like Tangulbei, Kabartonjo and Marigat.

Secondly, Nginyang was selected because of the nature of the topic. The study was about pastoralists and therefore it was only logical to base it in a truly nomadic setting.

3.3 Site Description.

The East Pokot live in two divisions - Nginyang and Tangulbei. Chemolingot is the divisional headquarters for Nginyang division. As per the 1979 population census the two divisions had an estimate of 37,000 people (Kenya National Population Census, 1979). However, no updated statistics for Nginyang exist yet. But what is as a general statement is that Nginyang Division has denser population settlements than Tangulbei and is larger in its physical extent. The two divisions combined cover a total land area of 4441KM².

Nginyang division occupies the northern most part of Baringo district. It neighbours Kabartonjo division to the south, Elgeyo-Marakwet district to the west, Pokot district to the north-west, Turkana district to the entire north and Tangelbei division to the East.

The division is topped by the Tiati hills (2351m), to the north, Chepanda hills to the South-West and Kerio valley dominates the Western part of the division. The land is on average 900m above sea level. The division is dominated by rock outcrops which makes one aptly describe it as stone country. Any visitor will be greeted by stones everywhere.

The area is drained by two rivers. To the East of the division is Nginyang river which rises from the Tugen hills to the South west. Though seasonal it is the source of human livestock water requirements. What one sees in the dry season is its dry bed, littered with "black and thinly structured" human beings with herds of livestock wandering about as their owners dig wells to scoop water for domestic and livestock consumption. One will also see small girls and women waiting with jerricans to get water. This picture gives one the tacit impression that the water situation is pathetic.

To the far West is the Kerio river which forms the boundary with Elgeyo-Marakwet district. Hence its water only serves Tirioko location.

The nature of road transport in the division is in bad shape. There only exist motorable tracks and which are in most

cases impassable. There are only two bridges in the whole division which is drained by hundreds of seasonal but dangerous rivers. These rivers cause havoc to human life, livestock and soil. The drive to the West of the division is too steep and stony where only powerful 4-wheel drive vehicles can ply. The area is simultaneously littered with many dangerous looking gorges along which the roads meander. In a word the greater part of the division is still inaccessible.

Rainfall is erratic and can best be described as unpredictable. There are generally three rain seasons, April to May, July-August and November. But these are mere generalizations because rain may fail for a series of years. Average rainfall received is between 250-750mm. The temperatures are always high with minimum above 25oC and maximum rising to 40oC and above.

The Pokot can best be described as livestock husbandmen. They keep goats, cattle, donkeys, sheep and camels. These herds are mainly for subsistence and social purposes. At least there are no cases of commercial livestock keeping. "They are kept for household needs, provision against emergencies and increase in social status" (S.A.L.T. L.I.C.K. Baseline Data Survey, Nginyang, Baringo).

The division is inhabited by the Pokot ethnic community who form the majority. Other ethnic communities residing here are the Luo, Kikuyu, Luyia, Somali, Kamba, Kisii and the Nandi. Most of the non-Pokot are traders and Government workers. Some of them work for Non-Governmental Organizations. There are also white

missionaries running the Parpelo and Kositei Catholic missions and dispensaries.

In terms of vegetation the division is dominated by Acacia species. They shed leaves in the dry season (deciduous) and bloom with green leaves in the rainy season. They flower in the second rain season which coincides with honey harvests. Perennial grasses and shrubs have been overgrazed to bare stone and sand. The various Acacia species include, Acacia tortilis, Acacia Mellifera, Sanseviera SPP, Commiphora SPP and Acacia reficiens (S.A.L.T. L.I.C.K, 1991).

By national education standards, Nginyang division can be described as uneducated. For instance in the whole division there is only one secondary school, Chemolingot where enrolment is low. There are no indication either that most people prefer educating their children outside the division.

3.4 SAMPLING

Nginyang division has three locations. These are Tirioko, Ribkwo and Loiyamorok. Two locations Ribkwo and Loiyamorok were picked at random and names of sublocations in them listed down. One sublocation was picked randomly from each location. Then a sampling frame for all households in each of the two sublocations listed down. The listed households were then sampled and 61 households were picked randomly. The first sub-location Maron had 39 households and the other Kechii had 22 households. Then those households which fell in the sample were later traced and their

heads interviewed in their homestead.

Sampling was done in various stages in order to arrive at specific households. This was necessary because it would have been difficult given the time constraint to get a frame of all the Pokot. Therefore sampling in various stages helped to prepare adequate sampling frames from which a representative sample was taken.

The household head (man) was interviewed and in some cases alongside his wife or one of his wives. The household head was interviewed first in all cases. And in cases where the household head was absent his wife was interviewed instead.

3.5 TYPES OF DATA COLLECTED

Qualitative and quantitative data was collected. The data focused on various aspects of water-water use, frequency of use, who fetches water, livestock watering, water storage, distance from the homestead to the nearest water source. Other areas of interest included water management techniques, water quality, its relative availability in different seasons of the year, potential conflicts and ownership of water sources.

The questionnaire was the principal method of data collection. The questionnaire had two sets of questions, open-ended and closed questions. The former mainly generated qualitative data and the latter quantitative data. To ensure consistency in the respondents answers the questionnaire also had cross-check questions. In cases that required further probing

45/...

supplementary questions were asked and their responses recorded in a Field Note Book. The questionnaire had three principal parts, division of labour, perception of the environment, water use and ownership.

The sample size for questionnaire interviews was 61 though originally it was supposed to be 100 households I deliberately narrowed down because of the general insecurity in the area posed by 'Ngoroko' raids. But the 61 households were then interviewed in depth.

The research also benefitted from key informant interviews. They were mainly interviewed on the Pokot settlement history and their views on water availability in various phases of their lifetime.

All the key informants were men because they looked more willing to discuss with the "stranger." Women looked afraid. Key informants were Six in number, two at Seretion village, one at Kositei Mission, two at Chemolingot and one at Amaya. They were chosen solely based on their age and also based on the knowledge of my research assistants about them.

The key informants were not sampled but were directly interviewed on identification. For this study they were men of about 70 years and over. The data obtained from their interviews was recorded in a Field Note Book. All the details about them were recorded such as their ages, names, number of wives, number of children, number of livestock, their village name, place interviewed and the date and time of the interview.

One problem I found with key informant interviews was undue interruptions from other people who came discussing the rumour and at times real activities of the 'Ngoroko' raids. At the time of the fieldwork there were about three major livestock raids and therefore the danger of insecurity was real.

Observation method was also used to generate data. My research assistants and with the help of a Non-Governmental Organizations in the area enabled me to travel far and wide in the division and through that familiarized myself with the people and the environment. During these familiarization tours I had occasion to attend 'Kokwo' sessions where I observed their conduct, the attendants, their sex and approximate ages. I was introduced to the elders by my research assistants as a person from Nairobi who had come to study the water problem in East Pokot. I personally paid visits to nearby water points (hand dug wells) and saw for myself how cattle were watered, how women drew water, how the wells were dug or scooped. Later I put on paper my day's experiences from where I was staying at Chemolingot.

Documentary sources were also an important source of data collection. This involved collecting secondary data from written works. The major source of that data was project evaluation reports from the Kenya Freedom from Hunger Council. I also made use of their library which was well stocked with materials on water in East Pokot.

The National Archives was also of great help. Their records were rich with information about the Pokot and the British

administration (colonialism). These records also pointed out that water problem has been known to exist in Pokot for long. For instance it was reported that the first borehole in the division was drilled at Chemolingot in 1967.

The study was in two phases. The first phase was between July-September, 1992. The second phase was from November-December, 1992. The study used various descriptive methods for data analysis. The study particularly used tables, frequencies and percentages throughout Chapter 4. This was because the data collected did not require highly statistical applications for analysis.

CHAPTER 4

4.1 DATA PRESENTATION AND ANALYSIS

This chapter gives an impression of how the Pokot pastoralists survive in an environment of water scarcity. Particularly so, this will highlight the difficulties they undergo in drought in an effort to eke out a living. Then data on division of labour and water use techniques will be analyzed and used to test hypothesis 1 and 2. The people's perception of the water situation and their interpretation will be analyzed by testing hypothesis 3. The presentation is based on the assumption that water management is a rigorous activity among the Pokot pastoralists. As pointed out in the methodology chapter, all the interviewees were household heads.

The introductory remarks below give the make - up of Pokot households in various forms, at least in their original form.

Table 2 Showing family size distribution

Number of children per household	Frequency No. of households	%
0-4	36	59.02
5-9	17	27.87
10-14	4	6.56
15-19	3	4.92
20+	1	1.63
	n = 61	100

The average family size for the sampled population is 5.1 members. By Kenyan standards a household is taken to have an average of 6 members. But for a pastoral community like the Pokot they require larger families in order to manage labour. Consequently the average household size for the sampled population is 7.1 members.

TABLE 3. RESPONDENTS IN TERMS OF SEX

Sex	Frequency	%
Male	53	86.9
Female	8	13.1
	n = 61	100

Of the sampled population 86.9% were male and 13.1% were female.

A further attempt was made to find out the number of monogamists and polygamists in the sample. This is presented in the table below.

Table 4. Incidence of Monogamy And Polygamy

No. of wives per household head	Frequency (No. of household heads)	%
1	26	49.06
2	14	26.41
3	8	15.1
4	5	9.43
	n = 53	100

As the above table shows 8 cases are not included because they comprised of women who in this case were not taken as household heads.

Of the 53 male respondents contained in the sample of 61, 49.06% were monogamists and 50.94% have more than one wife (polygamists). Further computations indicate the average number of wives per one household head is 2.3. Some respondents explained the phenomenon of multiple wives in the sense that if a man wants peace of mind he should have many wives so that in the event of disagreement with one he can comfortably rest elsewhere.

Table 5. Showing Total Number Of Children Per Sex.

Sex	Number
Boys	171
Girls	213
Total	384

In all the 61 households there were 171 boys and 213 girls. Hence there was a total of 384 children.

On average there was 2.8 and 3.5 boys and girls respectively per household. The 1979 population census figures (Op. cit) indicate a total of 17,826 and 18,602 males and females respectively and therefore positively tallies with the above average per household in terms of sex. While two households reported no boy five households reported no girls in its composition.

4.2 Pokot Economy

The centrepiece of the East Pokot economy is nomadic pastoralism. They keep herds of cattle, sheep, goats, camels and donkeys. The herds referred to above is the unit under the authority of one household head. The herd consists of those livestock managed by one household head or those available to the family irrespective of ownership.

There are variations in terms of number of livestock species per household. But the largest herds at least in all the stocks are goats, cattle, sheep, donkeys and camels in that order. Rich households like that of a respondent at Kositei, a subchief (Charles Sarich) had about 105 cattle, 231 sheep and goats, 15 camels and 6 donkeys.

Most recent statistics indicate that the Pokot have 50,000 cattle, 100,000 goats, 20,000 sheep, 3,500 camels and 7,000 donkeys. (SALT LICK, 1991). According to a study by Armbruster and Odegi, (1991) rich households have 80-120 cattle, but the poor ones 10-15 and the biggest were goat flocks. It is possible that today, 1993 would indicate lower herd levels per household because of increased cattle rustling, drought and animal diseases. On average a recent study, (Awuondo, 1992) put that each household has 8.3 cattle, 16.7 goats, 3.3 sheep, 1.2 donkeys and 0.6 camels. The commonest species are goats and cattle.

Some households reported having no livestock of any kind. This was a common phenomenon to the North of Nginyang and Chemolingot, areas that are prone to raids and had just been raided at the time

of the fieldwork. It was interesting to find that herd ownership followed certain patterns and functional prerequisites. It is common to find households with camels having more cattle, goats and donkeys and rare or unlikely to get a household with camels alone and the more the camels the richer the household. They are the most expensive currency in this environment and are still very productive. Other households reported having had donkeys sometimes but presently they have wandered away to join the flocks that roam the countryside unused. It is along this background that women have remained burdened with domestic chores of fetching water, a job that could be easily done by donkeys.

The cattle are herded by boys above 12 years but girls and boys below 12 years herd camels, sheep and goats and others herd calves. Donkeys accompany cattle.

Watering of the herds differ from one geographical location to another and its complexities will be discussed later in the area of division of labour. Initially it should be clear that men are mere supervisors of how their herds are grazed and watered.

Given the nature of the environment the water situation is grave. As it will be shown later in the text women and girls still scoop the river bed for water and tens of thousands more trek daily for over 7Km in search of water.

The story is different when it comes to watering livestock. In some cases domestic water is fetched where livestock are watered. As reserves get depleted the livestock move further. For example cattle and donkeys cover a distance of between 20-30Km to the

nearest water point in the dry season because as the pastures dry up in the lowlands the cattle are moved to the highlands. It is from the highlands where they trek to the lowlands twice a week for water. The story is different in the wet season.

4.3 SOURCES OF WATER

Water development by national standards is still deplorable in East Pokot. The people still use traditional sources of water. For instance the sources include wells scooped in the dry river beds, springs, boreholes and permanent rivers. However, the latest source include artificial water pans scooped by a Non-Governmental Organization in the area.

In the area of 4441Km² there are only two permanent rivers, Amaya and Kerio. Unfortunately they are accessible to by very few people hence out of reach of many hence they do not make an important source of water for people and livestock. Of all the people interviewed (n=61) only 5% said they are accessible to the permanent rivers, 6.5% artificial water pans, 6.5% boreholes (Chemolingot and Chesirimioni), 13% springs at Churo and Papello catholic mission and 69% use hand dug wells in the dry river beds that dominate Nginyang division. The main rivers that provide water for majority Pokot include Nginyang, Kositei, Kiliieleu, Chepanda, Mukur, Kechii, Cheptopokwa among others.

The river beds are not scooped haphazardly but there are particular places where water percolates into the sand and rock. It is these special places that are scooped to provide water. At the

dawn of the dry season particular places are dug but as the reserves get exhausted the 'Kokwo' is consulted and other places that never run out of water are earmarked and dug up. Pokot elders confirmed that particular places are dug first and others later as long as the dry season is on. As pointed out in the introduction water management becomes a rigorous activity during this trying moment.

4.4 PERCEPTION OF THE ENVIRONMENT

Water is the base of Pokot livestock industry. It is the availability of water that makes life meaningful to them because human beings and livestock are dependent on it. It is therefore important that water should be available and accessible to by all. In cases when water shortages becomes acute the Pokot simply but skilfully adjust their food habits in order to live. In such circumstances they resort to foodstuffs that do not require water for preparation such as milk and / or roast meat. And in more critical circumstance they may not use mud on their manyattas save cowdung. Activities like brewing "busaa", washing milk gourds and refining honey are completely or partially forsaken without water. This adaptation is presently mandatory because the size and productivity of the herds have gone far below historical herd accounts. This has been due to harsher and longer dry seasons which claim a heavy toll of Pokot livestock but lately and more importantly, the perpetual 'Ngoroko' livestock raids. Hence the people have resorted to shop foodstuffs like maize flour, rice,

beans, sugar, cooking fat, tea which require water for preparation.

The above assertion shows that unlike before water has become mandatory in the domestic life of the Pokot. They now require it in reasonable quantities if they have to prepare food to eat. It is along this background that people have learnt to store water.

The Pokot have a number of alternatives or strategies they employ to ensure a year round access to water.

In the wet season they make use of running water in streams, rivers and pools that litter the place. It is only in the dry season that they dig or scoop the river bed. So they only dig the river bed when surface water is not available. But this scooping is systematized.

At the dawn of the dry season they dig the river bed in places where the water table is high and as the dry season becomes ferocious they then dig the river bed in places where the water table is low. The reason for this careful alternation or strategy is that leaving the area with high water table exposed to the vagaries of heat, a huge quantity of water is likely to be lost through evaporation. Being astute water managers, the Pokot do not accept to loose any minute quantity of water because it is scarce and they are in dire need of it.

Some respondents confirmed they use donkeys to fetch water as far as 20km away or beyond as the water becomes scarce. Those who live at Loiwat and its environs drive donkeys to Kerio river, about 15Km away. Those at Nakoko drive donkeys to Nginyang river, about 10Km away when the dry season is not severe but as the reserves at

Nginyang dwindle a number of households reported migrating to the West of the division.

Donkeys, it was confirmed are a wasted resource in this community. Although pockets of the Pokot milk them and eat their meat they remain unused till the dry season. One wonders why women burden themselves with carrying water when they can conveniently use donkeys. In all the households (n=61) visited during the study only 21% confirmed they use donkeys to fetch water.

Migration is yet another response that is employed by the Pokot when water gets scarce. About 64% responded they migrate with their livestock and entire households to places where water is available. In some cases women and children were left behind as the boys migrate with cattle. But this is only in places where the household is well established. For example all the key informants confirmed they do not change their homesteads but only their livestock are moved but return as the rains begin. Those who live in Tirioko and Kolloa and those in Western part of Ribkwo location and Kapedo West sublocation reported they migrate towards Kerio river, over 20Km away.

Therefore migration is an adaptive strategy among the Pokot pastoralists. They migrate from areas of scarcity to areas of plenty. A respondent at Kadingding in Loiyamorok location, Todongura Molo narrated there are usually two alternatives to him as the dry season begins. Either he migrates to where water is in plenty and he recalled how in 1990 he migrated past Kolloa and further towards Kerio river, a distance of about 50Km across rough

and mountainous terrain. When the rains came he returned to his original home to rejoin his family. Initially he uses donkeys to fetch water for domestic use and calves from Nginyang river 7Km away before he migrates.

Migration in search of water is not haphazard but directional. It is directed towards rivers in which wells can be dug. The crux of the matter is that not every stream or river bed has the rocks and soil texture that allow water percolation. And those that have special properties only particular places are scooped. It is common that a river course with many stones and gravel has water. A good illustration is the water point besides Kositei mission, at the crossing to Seretion. It is therefore common in the dry season to see groups of hungry and lean women with containers at such points waiting for water.

Once dug the wells are used diligently till the rains come and premature digging is punishable by the 'Kokwo'. These strict rules of use and strategies such as migration are clear indications that the Pokot understand their environment. Their perception of the environment in which they live makes them employ careful strategies of water utilization. This is strong evidence to prove right the hypothesis that water use depends on the people's perception of the environment.

In areas around Churo, Amaya and Kerio river there is not much difference between wet and dry seasons because they enjoy higher rainfall and have permanent rivers and springs.

Some places with boreholes as at Chemolingot and Chesirimioni in Ribkwo and Loiyaromok locations respectively, water scarcity is not acute because boreholes are evergreen. In fact the one at Chemolingot is fitted with a diesel generator and supplies water to many people at the market and even to those people neighbouring the centre. However, it is common to see haggard-looking women denied water at the time they need it most.

Parpello Catholic mission could be classified as having the best water system in the whole of East Pokot. Respondents at that site said that when the water table goes low in the borehole they deepen it and continue having enough water. The story at Kositei is different. The place has many iron sheet houses and all the roof run off is harvested into huge concrete tanks. These reserves are open for use only in the dry season when the wells in the nearby Kositei river are left to livestock.

To ascertain whether the Pokot, given their environment have concepts of water classification a question was asked to all respondents, " Is there water you call contaminated? " Of all, 74% answered positively and 26% answered negatively. This was to find their perception of the environment in which they live and how that understanding shapes their utilization strategies. One respondent said,

"You, in Pokot there is nothing like good or bad water. Water is water ". (Interview with Domokwiang Kamukuny, Chesanja village, 20-8-92.)

Similar responses emanated from respondents in villages like

seretion and Yatya which are far removed from sources of water. As indicated above majority people said bad water indeed exists. They all agreed that for water to be contaminated it must have been stagnant (turor in local language) for a long time and been overused by animals and humans. And that it can only be called contaminated long after the rains and when it is found in a depression that holds water for short periods. Then a probe question was asked; " In such cases what do you do ?"

Diverse answers were given. Some 30% of the respondents confirmed that they dig a well besides the contaminated water so that it filters to get clean water. And 26% said there was no alternative because the issue of quality was irrelevant. Yet 20% said they pour the contaminated water into containers and use the roots of a local shrub *Maerua edulis* (Chepluswo {singular}, cheplus {plural} in local language). They use its roots to stir the dirty water for about two minutes and leave it to settle. After about 10 minutes the water becomes sparkling clean and it can now be used. "Chepluswo" has a chlorine-related effect on water. But 11% said they boil the water before use though it is not a popular alternative. It is possible that they may have been narrated to by their children who attend schools. And 13% of the respondents, although they come from areas well endowed with water they, were aware of these devices their counter parts employ.

The nature of the above responses prove right the hypothesis that water use depends on the people's perception of the environment. The above discussion is summarized in the frequency

table below.

Table 6 SHOWING CHOICE OF STRATEGY

Strategy / adoption	Frequency (no. of people who use)	%
Dig well besides	18	30
Use "Chepluswo"	12	20
Boil	7	11
Water clean always	8	13
No alternative	16	26
	n = 61	100

4.5 THE 'KOKWO' AS A RESOURCE MANAGEMENT INSTITUTION

An institution is a distinctive complex of social action (Berger, 1973). It is a regulatory agency channelling human actions. And it provides procedures through which human conduct is patterned and compelled to go in grooves deemed desirable to society. And these grooves are performed by making them appear to the individual as the only alternative. And to protect its goal(s) the institution has impressive systems of controls that guard the limits.

The 'Kokwo' as a management institution therefore has the prime duty to carry out, execute, implement policy decisions in order to accomplish a common purpose which in this case is resource sustainability. The 'kokwo' has to manage because the resource

(water) is scarce, priced and therefore it need be used optimally and sustainably to reduce waste and get the maximum out of it. Those who cherish social and economic analysis of management see water as a scarce resource that need to be used efficiently.

But management of water goes beyond the 'kokwo'. For instance domestic water management is in the hands of women. The 'kokwo' is only concerned with water outside the homestead and principally for livestock. Therefore domestic water management is a big burden to the managers (women) who work under difficult conditions of hunger, malnutrition and poverty.

The 'Kokwo' is a council of elders. It is the highest and only political and management institution vested with the powers to deliberate on matters ranging from punishment to decision making. Even the colonial and independent Kenya government worked or works through it. Historical records indicate that it was an effective instrument used by British colonialists in pacifying and punishing the Pokot from 1950. The Kolloa massacre of 1950 (op.cit) and its aftermath clearly indicate the position the 'Kokwo' holds.

Membership is open to males only but contribution in its deliberations is reserved for married men only. It is the institution that gives the grazing time table and deliberates on security arrangements. It is at the 'kokwo' where certain portions of the grazeland are agreed to and set aside for future use.

Its meetings are held besides a water source. The main reason is to oversee its use, get news from other people because all people and even travellers come to the water place to drink water

or to give and get information. Hence it is easier to announce an issue here and be sure it will get to all corners in the shortest time possible. One whose animals are lost can easily trace them from the 'Kokwo' because all animals in the neighbourhood or a series of neighbourhoods are watered in one place.

A rather peripheral but environmental reason why the 'kokwo' is located near a water source is that tall trees which provide shade are found here hence an ideal site for people to protect themselves from the scorching sun.

'Kokwo' has two meanings; one it refers to the members who deliberate on issues and secondly to the place where the members meet. It is important to note that its powers around water are clearly marked and understood. There is an appointed standing committee of about six members plus its chairman who eventually chairs all meetings and reports to the 'Kokwo' regularly. The decisions the committee makes are followed without question and implemented by all and any signs of non-conformity are brought to the 'Kokwo' and discussed without fear or favour. To be a member of the committee one must be respected by all the people before he can be seconded. Wealth is not an indicator as such but a diagnosis of several 'Kokwo' committee members revealed they were relatively rich (in livestock) but it is their general conduct that elevates them to the position of leadership.

Women are not members of the 'kokwo' but issues affecting them e.g women circumcision and young male-female dances in preparation for marriage are discussed here and dates fixed. Though in some

areas where agriculture based activities are taking root as in Loiwat, Kapunyany, Kakapul and Kolloa it has become fashionable to see women attending 'kokwo' sessions. In the many cases where the author had chance to observe no woman contributed in the proceedings as they sat far removed from men. And even the proceeds from offenders (roast meat) is not given to them.

The 'Kokwo' teaches Pokot children (boys) traditional norms, values around grazing and based on proper utilization of scarce resources for the community's collective good. Communal ownership and use of resources is inculcated into them to grow up with it.

From my own understanding of the significance of the 'kokwo' in Pokot livelihoods, any outside interference or intervention however well intentioned that disregards it is unlikely to take off. But once it is captured the chances of success are great. The success of programmes such as Food for Work and Famine Relief Food succeeded because they were channelled through it.

Every society has norms of conduct. Each member is expected to strictly follow the rules in order that order may prevail. In cases where such rules are not applied then society is likely to degenerate into disorder. Hence each society, primitive or civilized and every mode of production whether nomadic pastoralism or modern capitalist enterprises have rules and expectations and guidelines within which they work. Therefore such a synopsis puts the tragedy of the commons on to new test.

Deviant activities around water include bathing or urinating in human and livestock water. Or even letting ones animals destroy

the communal fence that protects the water source on which everybody depends. In such cases the 'kokwo' is summoned to discuss and eventually met punishment to the offender. Punitive punishment is given. The commonest being fined a goat to slaughter for elders at the 'kokwo'. Depending on the gravity of the offence one may be fined a bull. In certain cases beer is included. It is found to be most painful though appropriate because nobody can just give away his animal without cause. For fear of punishment people cooperate. In cases where the offender has no livestock nor the means of getting one to pay the fine he may be publicly flogged and let to go. In more serious circumstances one may be punished in various ways. At least expulsion of members as a punishment strategy was not mentioned. Money does not constitute a fine because according to Pokot traditional it has no luck. Most conventional thinking has it that money may not be enough to everybody at the 'kokwo'. These punishments are not myths. It is common sight to see mounds of ash indicating roasting of meat from offenders.

These indigenous or cultural underpinnings are strong evidence to call for revision of the tragedy of the commons. The point is that nobody as long as he is a Pokot has the express right of using resources on which all depend without regard to others. In fact in this light, the theory of maximization as posited by Sandford (1982) fails to hold. Therefore the 'kokwo' ensures that the users of a resource coordinate for its sustainable use. Hence non-cooperative behaviour is punishable through a common system of norms agreeable to all. For fear of punishment herders cooperate.

A handful of respondents expressed the view that there is no misuse of water in Pokot land. That every Pokot clearly understands the water situation. Therefore each user has in mind that others with needs similar to his will use it. Pastoralists do not therefore misuse resources. From one vantage point it is a free-for-all game but rife with rules which all read, understand and follow them.

The 'Kokwo' also regulates the grazing pattern in the year. In the wet season the 'Kokwo' passes a decree that highlands be secluded for the dry season and grazing concentrated in the lowlands. As the dry season begins all the cattle are driven up the highlands and the lowlands reserved for the wet season. This careful alteration in exploiting resources ensures stability and sustainability of the range.

The 'Kokwo' works like the "Olokeri" system among the IL Chamus of Baringo district, Little (1985). Presently the "Olokeri" is only practised in a few remote areas but the 'kokwo' is still active. 'Kokwo' control of resources is on neighbourhood basis because each neighbourhood or a coalition of two or three villages may have one 'kokwo'. What is predominant however, is that each 'kokwo' is independent of another but on issues such as security and grazing all agree mutually.

Unlike the 'Kokwo', the 'Olokeri' system had a definite manpower of 18-30 years (IL murrans) generation to enforce its policies. They patrolled the grazing grounds in the wet and dry reserved area. Such policing is not reported in Pokot though they

have a clever mechanism of detecting offenders. Hence the 'kokwo' is still a strong factor in resource management and therefore resources in East Pokot are not "free-for-all" in the way described in sections of Botswana (Lawry, 1983) and the middle East by Sandford, (1983).

The 'Kokwo' also sanctions use of water and other resources by someone who is not a resident of the community of users on condition that he does not become detrimental to the interests of the owners (Behnke, 1984).

The future survival of the 'Kokwo' as an authoritative institution presently hangs in the balance given the growing empowerment of sub-chiefs, chiefs and Divisional officers and the entire provincial administration. For instance presently when discussing issues related to security an overall 'Kokwo' is mooted and is attended by the area Member of Parliament, chiefs, sub-chiefs, Divisional officers, councillors who assume the powers of the traditional arbitrators. Increasingly issues to do with security are handled by the District Security Committee. Hence the 'Kokwo' has been stripped off its powers. For years the Pokot had their own indigenous ways of protection which proved quite effective. But with the District Security Committee gaining an upper hand the Pokot have been left defenceless because non-indigenous security arrangements are not effective and that is why many cattle raids by the Turkana are successful.

And the growing power and relative supremacy of politics in decision making has eventually made members of parliament appear

fundamental because they must endorse anything discussed. Previously, the 'Kokwo' discussed and endorsed and things went smooth.

At this rate we are seeing the systematic collapse of powerful and effective traditional rule mechanisms which may eventually lead to a true tragedy unless the local decision-making institutions are empowered and left to act independently.

4.6 THE WATER SITUATION

The Pokot are quite aware that water is scarce. The same notion is held strong by outsiders who visit or stay in the area. Consequently, 85% of the respondents said that water is scarce and 15% who in most cases live in areas like Churo, Amaya, Kerio, Parpello said that water is enough. When asked to suggest ways of how water in the area can be increased in this range they were quick to mention. Solutions ranged from drilling of boreholes, scooping of pans, diverting streams, building a dam wall across a river course. Other suggestions included piping from Kerio river, developing natural springs and fixation of hand pumps and such solutions like 'God knows' also featured. The point is some respondents are so isolated that they cannot figure out any solution but rather resign to fate. The responses are tabulated below.

Table 7 SHOWING WATER SOLUTIONS

Solution	Frequency (no. that suggestion)	%
Piping	6	9.8
Water pans	20	32.8
Diversion of streams	1	1.6
Developing streams	3	4.9
Damming	2	3.3
Armitage tanks	2	3.3
Boreholes	16	26.2
No suggestion	11	18
	n = 61	100

The above table indicates that scooping of water pans (32.8%) is the most feasible strategy. The likely explanation for this is that a Non-Governmental Organization in the area provides water by scooping water pans and therefore people have been led to believe that it is the only solution to water problem.

Diversion of streams (1.6%) was the least feasible solution to the water problem. Those who did not suggest were those from areas well endowed with water. Most of them were respondents at Amaya, Churo, Parpello and Kerio where at least sizeable rivers and springs provide water the year round.

4.7 WATER CONSUMPTION

To examine the rate of water consumption in Pokot households the researcher set to unearth the number or frequency with which water is drunk in a normal day.

Table 8 SHOWING RATE OF DRINKING WATER

Number of times	No. of people frequency	%
1	5	8.2
2	14	23
3	21	34.4
4	9	14.7
5	7	11.5
6	3	4.9
7	-	-
8	2	3.3
	n = 61	100

The above responses positively correlated with geographical locality in which the respondent lives, the very place where he was interviewed. Only 8.2% of the respondents drink water once in a day, 23% two times, 34.4% three times, 14.7% four times, 11.5% five times, 4.9% six times and 3.3 eight times.

Majority of those who drink water three-four times were found at Chemolingot, Parpello and Kositei, places where temperatures are always well above 40° and there is either a water hole, hand dug

well or armitage tanks. The issue is that water is readily available and therefore people drink at will.

Many of those who indicated they drink water once, twice or eight times live at Churo and Amaya - places that are cool but with permanent sources of water. Though water is available but the weather does not compel them to drink water frequently. Those two respondents who indicated to drink water eight times a day live between Churo and Tangulbei, about 8Kms from the Churo springs where temperatures begin rising steadily. So the relatively high temperatures and availability of water at Churo compel them to drink water as many times as possible.

The point is that where water is readily available it positively corresponds with the number of times water is drunk. Therefore it is true to conclude that the climate (temperatures) determines the frequency with which water is drunk in a typical Pokot family. Hence this supports the hypothesis that water use depends on the people's perception of the environment. Hence pastoral resource use is very much an adaptation to the natural environment. See tables 8 below and 9 above.

In line with the above argument many respondents indicated they do not drink water regularly. That it is availability that determines consumption in terms of frequency and quantity. And that many times they go without water for even a series of days. However, many factors determine availability of water, frequency and quantity of drinking. They include whether one has gone to the water source, market centre, times of the year, state of security

in the area and principally weather. These shape utilization of water and this proves right the hypothesis that water use depends on the people's perception of the environment.

Analysis of the quantity (in litres) an individual uses on a normal day showed variation based on geographical location on which the respondent lives. These variations came in due to differences in the standard of living. Relatively higher living standards are found along or around water courses or sources and there tends to be higher consumption per individual. High living standards in this case was determined by the number of people dressed in modern clothes relative to those in skins.

Therefore only through a detailed understanding of the environment on which they depend for livestock production can their water management techniques be appreciated.

The responses in the foregoing analysis are presented in the table below.

Table 9 TABLE SHOWING INDIVIDUAL AVERAGE WATER CONSUMPTION PER DAY

Av. No. of Litres	Frequency	%	Geographical location
0 - 1	13	21.3	Chemolingot, Chesanja, Nginyang, Maron, Yatya, Seretion, Tangulbei, Chepkalacha.
2 - 3	25	41	
4 - 5	14	23	
6 - 7	5	8.2	Kerio river, Kakapul, Loiwat, Churo, Amaya, Parpelo
8 - 9	3	5	
Over 10	1	1.6	
	n = 61	100	

The above statistics indicate that 21.3% of the respondents consume 0-1 litres of water in a day, 41% 2-3 litres a day, 23% 4-5 litres, 8.2% 6-7 litres, 5% 8-9 litres and 1.6% over 10 litres of water on a normal day.

This shows that water consumption among the Pokot is much lower than the World Health Organization (WHO) recommendation of 6 litres minimum to sustain basic needs. About 85% of the surveyed consume less than 5 litres a day and only 15% consume at least 6 litres or above in a day. This evidence strongly proves right the hypothesis that the people's perception of the environment strongly determines their water utilization practices. The above table strongly shows that availability of water at all times and amount

of consumption are positively related. For instance, where water is readily available in areas like Churo, Kerio, Amaya and Kositei water consumption is higher per individual unlike in areas where water is scarce and yet hot like Chemolingot, Kadingding, Nakoko, Seretion, Yatya and Maron.

The Pokot require water in reasonable quantities just like everybody in order to prepare food. In cases where water is scarce or not available it constitutes a problem. When water is unavailable, some Pokot households reported that they go without food till they find water. Some female respondents preferred borrowing from a close neighbour. Others confirmed they set off donkeys to wander looking for water however far it may be. So donkeys as mentioned earlier in this text are here used as emergency stock.

Other respondents indicated they resort to foodstuffs that do not need water during preparation like milk and roast meat. As the situation is presently they go without food because milk and meat are scarcities. The Pokot have been deprived of their livestock and forced to lead a precarious life. Even in households where there is milk the yield is too low because of continued drought and withering of vegetation.

The introduction of foodstuffs like maize flour, sugar and tea, rice, cooking fat and more recently famine relief hand outs and food for work where maize, cooking fat and beans are dished out have made it mandatory than ever before to have water always for their preparation.

Male respondents showed open male chauvinism by vowing to beat or quarrel their wives for abdicating their responsibility. However, respondents in well watered places like Amaya, Kerio and Churo could not imagine water missing because for them the sources of water are evergreen and so they cook food always whenever it is available.

As part of the strategy to find out if the Pokot are astute water managers given the nature of their environment a question was asked to all: Do you store water for different activities separately?

Computations showed that 41% store water separately. They argued that one is not expected to give to livestock to drink the same water he drinks. It is however, interesting to note that the responses were polarized in terms of water availability and water deficient areas. Such answers were found in well watered areas like Amaya. And even in Kositei at the time of the fieldwork water from the hand dug wells was only fetched by small girls to take to calves while human water was being collected from armitage tanks at the mission. So classification of water in this case exists because there are alternatives.

Yet 59% argued that they do not store water for different activities separately. That all water, if they are lucky to get excess is stored in one container from which it will be used for any work.

Secondly, water is scarce and that that which is fetched is always used and finished particularly in households short of labour

but with many dependents. So the issue of storage does not arise. One female respondent narrated how she treks nearly 10Kms daily to the nearest water point and that the 20 litres of water she fetches daily at times gets finished before all work is done. And even if there was enough she highly doubted whether she could store separately for different activities.

These tribulations strongly support the hypothesis that water use depends on the people's perception of the environment.

In order to buttress the above argument a deliberate attempt was made to find out if the Pokot store water in their house. At least 91.8% (both men and women) confirmed that they keep some but they gave various reasons, environmental and social.

Female respondents, who in this text are portrayed as environmental managers said that they keep water in the house so that when the herdsboy comes home thirsty he should get some to drink. And that keeping water in the house is good because her children will drink when she has gone to fetch more. It is important to have some water in the house always to wash hands with before milking which is sometimes done at midnight. Others said that they always do it as security against atrocities of the husband who must be given water on demand. This is the same reason male respondents gave for their wives storing water in the house.

Some women also said they keep water in the house for emergencies like visitors coming in who may want water and for taking drugs given at the local dispensary. Only 8.2% said they do not store water in their houses because it is finished too early.

As people who understand the environment around them, Pokot women from personal observation are fond of carrying small plastic containers wherever they go. Various claims for that were advanced but all boiled down to one big thing - women show a sound understanding of the environment in which they live. Those containers, it was pointed out, carry water to quench their thirst with. Or that she uses that container to fetch water in it wherever she passes and gets water. According to male respondents women are as thirsty as children that is why they carry water with them always.

The art of carrying water containers by women does not exist in well watered areas like Amaya and Kerio but should they visit drier areas like Chemlingot they are forced to carry them. This helps drive home the point that women best understand the environment in which they live and respond accordingly. In cases where no choice variable exists the people live with what nature has bestowed to them. As much as it would be unheard of for livestock and humans beings to share the same water in the same situation this relationship has been shaped and nurtured by the environment. Hence livestock and human beings drink side by side from the same source.

About 85% of the respondents confirmed that humans and livestock drink from the same source while 15% said livestock drink separately. What that implied is that the concept of water classification does not exist. For if such concepts existed yet the water itself is scarce then either people or livestock would go

without water. But because both have to co-exist side by side classification of water into human or livestock becomes irrelevant.

However, there are differences from season to season. In the wet season when there are pools of water and running streams people draw water from the very place livestock drink. Once the dry season jets in and hand dug wells prepared then people and livestock drink from the same point but in different situations. Many respondents said they draw water from deep into the well and pour it on what the local people call "ateker" from which livestock drink. In some places, I could see half-drums being used as drinking vessels for livestock. This is what one is likely to find around Chemolingot, Nginyang river, Nakoko and in some parts of Kerio valley.

In places like Parpello, Chesirimioni, Churo and Kositei the situation is fairly different and that is why people do not drink from the same point with livestock. At the Chesirimion and Parpello boreholes troughs have been built from where livestock drink. But in places with flowing rivers like Kerio and Amaya human beings and livestock drink from the same point.

A probe question was asked: Don't you have fear of getting affected by livestock diseases ?

A majority of the respondents affirmed that there was no fear where there is no alternative. One respondent said,

"Where is good water ?". The truth is, they would say, such a transmission has never happened neither does it exist. If you have such feelings then you will die of thirst".

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(Interview with a respondent at Kadingding, Lonyan'galuka Amase, 19-8-92).

Another respondent said,

"All along since I was born we have been sharing water with our 'mali' (livestock) and at no time has any diseases been reported at all. Even my father was doing that till his death. Water is water". (Kapul Arumoi, a villager at Seretion, 24-6-92).

The point being emphasized here is that the Pokot know there is nothing like livestock transmitting diseases to humans. This attitude has been implanted in them because of the nature of the environment.

Respondents at parpello, Kositei and Chesirimion did not express any fear because there are separate facilities for humans and livestock.

Therefore a people's understanding of the environment in which they live dictates the way they choose to act. And that in situations with no alternative the choice element does not exist. Hence this explains the water situation in East Pokot and consequently supports the hypothesis that water use depends on the people's perception of the environment.

In Pokot there are certain activities that are done or not done and some less frequently done because of a clear understanding of the situation. Many people expressed the sentiment that they normally bathe. But it is the frequency that is a matter of concern

for this thesis.

Personal observation of the people in areas like Chemolingot, Seretion, Chemsik, Chepanda, Nakoko, Yatya among others strongly suggest that a majority of the Pokot rarely bathe. The frequency at best could be anything between once in two months or none. In the dry season particularly, bathing is unheard of or unspeakable given the grave scarcity of water. On the whole, bathing to a typical Pokot becomes luxury. There is a strong element of doubt if some Pokot men and women have ever had a bath because from physical appearance one is likely not to doubt this assertion.

And those male respondents who confirmed to bathe at least frequently only do that on the day they take livestock for watering but this is quite rare. It is possible, however, that the confirmation that they bathe at least weekly is an outright exaggeration.

In terms of washing clothes the situation is not very different either though the general consensus lay that they wash them quite frequently.

About 97% of the respondents (n=61) confirmed they had clothes and 3% had none. Those who have clothes insisted that they do wash them at least weekly. But from personal observation they looked like clothes never washed at all. It is true that washing clothes is not an issue among typical Pokot. It is a culture rooted in them though its origin may have largely been environmental. The point is that they positively respond to environmental dictates and this supports the hypothesis that water use depends on the people's

perception of the environment.

4.8 DIVISION OF LABOUR AROUND WATER

At the household level all the chores around water are a female preserve. All the respondents attested to the fact it is a woman's duty to fetch water for domestic chores and for young and sick stock. In households where there are girls above 12 years they accompany their mothers to fetch water. When asked why it was that women fetch water alone unaided all respondents, male and female said almost uniformly that Pokot tradition allocates that duty to women.

However, the apparently more enlightened male respondents said that at times they fetch water when their wives are sick although this was rare. This assertion is in line with the findings of a previous study (Busch, 1991). All in all division of labour in a typical Pokot family is gender specific.

Table 10 SHOWING WATER FETCHING BASED ON AGE AND SEX

Category	Frequency	%
Girls	0	-
Boys	0	-
Men and Boys	0	-
Women	0	-
Women	42	69
Women and Girls	19	31
	n = 61	100

Regardless of the size of the household and its composition it is the responsibility of the woman to ensure that there is enough water for everybody at all times. This boils down to water utilization being linked to household composition. For instance it was found that where there are few male water use is low because they tend to require little water. In households where the male are many water use still remains low because they spend most of the day outside the household.

In households with many female water use is high. The reason is they stay in the household for a greater part of the day. Compared to the male, female water requirements are greater. This discussion tends to support the hypothesis that demographic variables are critical determinants of water utilization in the household. However, it is important to note, non-demographic factors also determine water utilization practices. The number of young and sick stock, distance to the nearest water point and size of water containers also influence water utilization and determine the range and scope of activities undertaken.

The shown gender division of labour around water is in conformity with Michael Bollig's findings in "The Family Herds".

Further probing around water and with the help of observation showed that all women who were interviewed or whose husbands were interviewed use plastic containers (jerricans) to carry water. And they are of various sizes. The relatively young and strong women use the big ones while small girls and old women use small ones. The water is carried on their back with a headstrand but others

swing the water in their hands. Only a few carry the water on their heads. The volume carried depends on the distance to the water point, age and health status of the carrier and size of the container. Though the commonest were the five and ten litre ones.

Household division of labour, its size and composition determines the frequency with which water is fetched. In big households the likelihood that many trips will be made to the water point is greater than in small households. The information is contained in the frequency table below.

It is important to note that average household size of 7.1 members per family may conceal isolated but important cases for this argument. Approximate distances covered by women from the homestead to the nearest water point was not uniform. It differed from locality to locality and even households in the same locality were not located at similar points from the water point. Therefore mere approximations will be used for the purpose of this presentation. However, the issue is that the nearest household to the water point was less than 1Km away and those far placed trek over 8Km away daily.

However far the water point is, it is the size of the household and the number of young and sick stock that determine the frequency with which water is fetched.

Table 11. SHOWING FREQUENCY OF FETCHING WATER

No. of trips to water point	Frequency	%	Average size of household	AV. No. of Young stock
1	14	22.9	0-4	0-8
2	33	54.1	4-8	9-15
3	12	19.7	9-15	16-20
4+	2	3.3	15+	Over 20
	n = 61	100		

Of all the respondent 54.1% said water is fetched twice a day in their household. Others go once 22.9%, 3 times 19.7% and four times and above 3.3%.

However, it is distance of the water point from the homestead that is the principal factor that determines the number of trips made in a day. Other factors that may determine the frequency as earlier noted are size of the household and its gender composition, number of young stock and security in the area.

The number of people engaged in fetching water also determines the number of trips made. For, in households where more than three people fetch water it was found that fewer trips were made to the water point unlike in households where one person fetches water. The table below illustrates this train of argument.

Table 12. NUMBER OF PEOPLE FETCHING WATER PER HOUSEHOLD

Number of trips to water point	No. of people who responent	%
1	14	23
2	19	31.15
3	19	31.15
4	4	6.5
5+	5	8.2
	n = 61	100

The frequency table above shows that in households where between 1-3 people fetch water more trips are made than in households where over 4 people fetch water. For instance about 85% of the trips made to the water point fall within households in which 1-3 people are engaged in fetching water.

4.9 THE DIFFICULTIES OF FETCHING WATER

The objective of this section was to hint that water is a scarce resource in this environment and to find out problems women encounter when performing this arduous task. About 84% (n=61) of all the people interviewed confirmed strongly that there were problems and 16% claimed there weren't any. When asked further why they thought there were no problems yet their counterparts in the same environment are complaining they were unanimous in their answer. That the water point from which they fetch water is located

less than a kilometre from their homesteads.

The common problems mentioned were long distances, heavy duty of scooping the well and carrying water on their heads. This was particularly detrimental to the health status of pregnant women who afterwards complain of backaches and chest pains. And that these problems were exacerbated by the hot sun. Other respondents mentioned long queues resulting in congestion particularly during severe drought. And that some wells are too deep and steep and therefore pose a risk to the lives of women and girls. These arguments are not presented here for cosmetic purposes but to buttress the argument that water accessibility in Pokot is still primitive.

4.10 DOMESTIC WATER MANAGEMENT

As indicated earlier there is a rigid gender division of labour around water. For example of all the people covered in this survey (n=61), 93% said that it is the duty of the woman to control water use in the house, 5% said men while 2% said children.

But further probing indicated that it is the ultimate responsibility of the man to control everything in the house by virtue of his being the head of the homestead. But this overall control is loose and spread around domestic water.

To determine who controls water at the point where livestock drink, a question was asked, "Who controls water at the point where livestock drink?"

Most responds, 97% affirmed that control rests in men. This probably explains why men hold 'Kokwo' sessions next to a water point.

Based on interviews, division of labour around scooping of the wells in the river bed is fairly loose. Although 74% of the respondents (n=61) said it is men who dig, 21% said women and 5% boys, further probing indicated great overlap. That it is a combined effort of men and women because the men scoop the soil and women deposit it away. But where there is a clear-cut division is between water for livestock and that for domestic use. That men dig the wells from which livestock are watered while women scoop wells from which they fetch water for domestic use.

Some respondents indicated that women scoop wells when the water table is high and men in turn do it when the watertable is low because the work involved is both heavy and dangerous for women. When the watertable is low as in the dry season that is when the boys come in handy but they do so under the supervision of men because they are not specialized well-diggers.

In an effort to find out that individual or group of individuals who consume more water fetched in a typical Pokot household a question was asked: Who uses more water than others in your household ? ".

Various responses were recorded. For example 48% of the respondents (n=61) said children because they need to drink water at short intervals and that water is used to bathe them. This is because they do not stay outside the homestead and therefore use

that water fetched more frequently hence become principal consumers.

And 43% of the respondents indicated women and girls use more water because in case of girls they frequently wash their school uniforms and tend to bathe more frequently in order to meet school standards. They also stay in the homestead most of the day and therefore consume water fetched more frequently.

Only 11% said men and boys consume more water. In comparison men and boys consume far less water because they spend the whole day grazing and therefore drink, bathe and wash at the source of water. It is common to see men and boys bathing and drinking water at the 'kokwo', which incidentally holds its meetings around water sources. Hence their water needs in the house are quite low.

This argument helps to confirm the second hypothesis right. That division of labour affects utilization of water in the household. Its because of division of labour that those whose duty is outside the homestead utilize very little domestic water.

Division of labour around livestock is one area where there is a fairly rigid as well as diffuse role specification. In many respects it is gender and age specific but at times it looses its specificity.

Table 13 SHOWING DIVISION OF LABOUR AROUND LIVESTOCK WATERING

Sex and age	who waters livestock frequently	%
Boys	22	36
Girls	-	-
Boys and Girls	19	31
Men	11	18
Men and Boys	8	13
Women	1	2
	n = 61	100

Of the 61 people covered in this survey (53 men and 8 women), 36% said it is boys who drive livestock to water, 31% girls and boys, 18% men, 13% men and boys and 2% women.

When asked further why boys are charged with that responsibility it was affirmed that they are strong and therefore can drive livestock (mainly cattle) to distant watering points and water them. It is a hard task that cannot be done by girls or women alone.

However, girls alone do not graze but they have to be in company of young boys of about 6-12 years. They are only assigned goats and camels which do not require frequent watering. This classification or division of labour is in concomitant with Bollig's work allocation in a pastoral Pokot household referred to

earlier.

In the few instances where men were said to water animals that meant they still have young children who are not yet of age to graze. However, in most cases men only accompany the boys or girls to supervise the watering. More often they go ahead of the livestock and sit at the 'Kokwo' from where they oversee how their livestock are watered and give direction of how they are to be grazed.

Some dissenting views put it that all people did the work as each herd is watered separately by a different group but under the supervision of the homestead head in each case. Hence it is unfair or uncondusive to draw a clear-cut distinction that watering is done by a particular group and not the other. Therefore there is some kind of diffusion in the execution of roles.

Of the households covered in this survey (n=61) at least 64% reported a child (girl) staying outside it, either in school, town or relatives. To ascertain whether their stay out of the home had implications for shortage of labour a question was asked: Does their stay out affect labour supply and amount of water in the household?". Mixed reactions were found. About 33% confirmed that by virtue of them staying away spells labour shortage and therefore less water fetched particularly when schools open. This was most pinching in households where more than one girl stays out. But a majority 67% said they do not experience shortage of labour at any time.

4.11 WOMEN AND ENVIRONMENT

Women, at least in the light of this work can be rightly called the environmental conscious group. All their activities around water are dictated by the environment.

Perception of the environment and human adaptability based on age was investigated as part of the strategy to study water management among the Pokot. To determine who the women thought of first when they brought water to the household, all respondents were asked; "When water gets to the house at the time of great scarcity, who is likely to be given first to drink ? " Why them first ?

Table 14. SHOWING LIKELIHOOD OF DRINKING WATER FIRST

Category	Frequency	%
Men	18	29.5
Women	1	1.6
Girls	-	-
Boys	-	-
Children	42	68.9
	n = 61	100

Various explanations were given by different respondents. Some 29.5% said men drink first because Pokot tradition demands that if anything is done man comes first and others later. It is also a strategy women employ to protect themselves lest they are flogged by the men.

Yet 68.9% of the respondents said children drunk first. That by their age, they cannot fend for themselves and are there only as passive recipients from their mothers with whom they interact most. They are dependants who do not ask to get but are given whenever it is available.

Thirdly, that children cannot go to the source unlike mature people. For example boys can drink water outside as they go herding, women and girls can drink as they go to fetch it and men drink while at the 'Kokwo'. It is only children who remain in the homestead and therefore are likely to be given first because they tend to get thirsty fast.

Fourth, children have a tendency of running to meet their mothers when they come home carrying water. That their mothers mistake that to mean they want water hence the likelihood that they drink first before others.

CHAPTER 5

SUMMARY AND CONCLUSIONS

The study was exploratory in nature and it benefitted from a combination of research methods. The questionnaire was the most important data collection method and it generated quantitative data mainly. Anthropological methods such as Key informant interviews, observation and informal interviews were also used. These methods were the main source of qualitative data. Both types of data were merged and used to test the research hypotheses. The study also made use of written materials (documentary) like project evaluation reports of the Kenya Freedom from Hunger Council at their Chemolingot office. The national archives was beneficial mainly in providing information concerning British occupation and how the Pokot reacted to various elements of pacification. Most literature concerning the current debate on common resources in pastoral communities was found at the African Centre for Technology studies.

The testing of the first hypothesis indicated that the way the Pokot use water is based on their perception of the environment. The second hypothesis indicated that division of labour around water affects the way it is used and the testing of the third hypothesis showed that demographic determinants are critical to the way water is used in a typical Pokot setting.

As it was discussed in the data presentation and analysis chapter, migration from areas hard hit to areas with water and manipulation of local vegetation (*Maerua edulis*) were adaptive

strategies the Pokot employ in order to ensure access to water.

The findings of the study have important implications for theory and policy towards use of resources in nomadic pastoral societies. They show that an improved theoretical framework is an important tool within which to study ownership, use and management of water resources among pastoralists in general and the Pokot in particular.

These findings have evolved a better theoretical grasp of management of common resources and clearly indicated that the Pokot, like other pastoralists the world over, manage their resources using indigenous management techniques. The point is pastoralists have evolved indigenous or local authority systems that govern and regulate the use of resources to the benefit of all. The institution of the "Kokwo" among the Pokot is one such effective organ that oversees the orderly use of range resources. These findings therefore dispute, with irrefutable evidence that African pastoralists use resources carelessly and without knowledge that others with needs similar to theirs will also use them. Therefore the postulation that a tragedy is the end result becomes null and void. This study, therefore, plays its part in voicing that nomads are astute resource managers and therefore has strong implications for policy.

The findings indicate further that scarcity of water as it often becomes in the dry season does not alone lead to migration of pastoralists to areas with water. Presently factors like cattle rustling are more serious and contribute more to causes of

migration than mere unavailability of water. As earlier discussed in Chapter 4, insecurity in East Pokot has contributed more to the problems of apparent overgrazing in some areas than it being an appendage to nomadic pastoralism.

Various policy options could be derived from the findings of this study to help strengthen the pastoralists capacity for managing scarce resources effectively. That intervention policies, as it is often common with Non-Governmental Organizations of simply coming in between to change a peoples way of life without regard or knowledge of what they have is likely not to work. Hence a detailed and patient understanding of their life is needed in order to pin interventions on local knowledge. That is any development or change project must operate within the confines of the local environment and social landscape and local enterprise and management capacity are crucial in the provision of the needed human resource to development initiatives.

Conclusively the water problem is a serious national issue that should be accorded serious thought. There is urgent need to diversify water provision in this range if the Pokot are to benefit from the central government. At least more boreholes should be drilled at central places and more water pans scooped in areas far isolated in order to reduce the distance covered by livestock and women to water points. The Ministry of Water Development should once and for all pay attention to East Pokot and cease the notoriety of concentrating water development activities in urban centres alone.

This study also found out that women bear the burden of domestic water management. They have to withstand the scorching sun and the long distances across rough terrain yet this is a job that could easily be done by donkeys that roam the countryside unused. Hence the Pokot should be encouraged to make productive use of the donkey instead of keeping them merely for prestige.

An important theme that underlies these findings and one which runs throughout this thesis is the search for an understanding of common resource management among pastoral societies .

The school, it was discovered negatively affects water management in the house. The withdrawal of useful labour (girls) has consequently led to less water fetched in the house. Consequently this has overburdened women who have been condemned to face the work of carrying water alone. This has implications for the present low productivity of pastoralism and therefore calls for re-division of labour to be in tune with the present realities.

This study found that women portray a better understanding of the physical environment in which they live. Their activities around water and its use reflect this.

In terms of security the Pokot need to be armed as before. The Anti-Stock theft unit at Chemolingot is powerless alone in the face of superior marauding Turkana. The Pokot homeguards should be given back their guns in order to defend their lifeline-livestock. Insecurity has to be solved if ecological degradation in some parts of Baringo East has to be checked.

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Given that the Pokot herds have kept dwindling there is urgent need to sent in food to all trading centres in large quantities for them to purchase it close by. Presently, many of them walk over 20Kms looking for food at Nginyang and / or Chemolingot only to miss it. This depicts them as a helpless people.

ENDNOTES

1. Sui generis- A notion held by early anthropologists, planners that problems in ASAL areas are a natural state, internally created.
2. See Schneider, 1953
3. Advanced by an anthropologist, Herskovits (1926) in reference to the East African pastoralists. It refers to the intensity of values built and rotating around livestock. It posits that pastoralists only know one big thing - livestock. For this factor they think and act only in terms of livestock. For instance this theory assumes that East African pastoralists who include the Turkana, Pokot, Boran, Somali, Rendille and Maasai etc, only keep livestock but do nothing else. That all the activities related to food, dance, rituals, marriage, celebrations and deaths among others are related in at least all ways to livestock. This theory was later disapproved by subsequent researchers like Awuondo (1990), who reports that pastoralists (Turkana) also trade, farm, buy foodstuffs and make homecrafts. The theory assumed that pastoralists only eat meat, blood and milk. This is no longer the case. For a more detailed reading see Schneider (1953), a PhD Thesis.
4. Sapana - A Pokot ceremony borrowed from the Karamojong. It is an age mate ceremony before boys are allowed to marry and accompanied by a graduate killing and ox (goat for poor ones) for his age mates and the community. And accompanied by wearing of a fine clay head cap. Usually it is accompanied by dance, singing and massive feasting.
5. Interview with elders at Tangulbei, Nyinyang division. The author also visited a Sapana ceremony and witnessed all that went on. This was on 19-11-1992.
- 6 Sandford (1982), - Theory of Maximization - that pastoralists take advantage of situations and individually capitalize on it based on the fact that resources are owned by all. In other words there is lack of personal affection involved in resource use therefore no sustainability and security of the common is guaranteed. Hyden (1980), argues that traditional economies (pastoralism falls here) are satisfiers, not maximizers. The administration of resources by the "Kokwo" contradicts Sandford's theory in the case of the East Pokot.

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APPENDICES

QUESTIONNAIRE

The Social Dynamics of Water Management Among The East Pokot
Pastoralists, Nginyang Division, Baringo District.

Dear respondent,

I am a student at the University of Nairobi pursuing post-graduate studies in Sociology. As part of my degree work I am required to under-take research of this kind. I therefore ask you to answer these few questions in this questionnaire. Your responses and cooperate will enable me to complete my work.

Thank you.

Male respondents only:

Name:

Sub location.....Asst.Chief.....

Age.....Chief.....

- 1. Are you married ? yes / No
- 2. How many wives do you have ?.....
- 3. How many children does each wife have ?.....
 - Ist wife.....
 - 2nd wife.....
 - 3rd wife.....
 - 4the wife.....
 - Others.....

Total number of children:.....

How many are boys.....

How many are girls.....

Female Respondents Only

Name.....Age.....

Number of children.....Wife No.....

(If man is polygamous)

MALE AND FEMALE RESPONDENTS

4. Who fetches water for household use ?

- 1) Girls 2) Boys 3) Men 4) Women
- 5) Women Girls 6) Men and Boys.

5. How many times do they go for water in a day?.....

6. How many people in your household go to fetch water ?....

7. Do they (you) get any problems when fetching water ?

- 1) Yes 2) No.

If Yes, which problems ?.....

8. Who controls water use in the house ?.....

- 1} When 2} Women 3} Girls 4} Boys 5} Children 6} None

9. Enumerate the uses of water fetched:.....

10. Apart from the domestic work, where else does the water fetched go to ?.....

11. Who scoops a well in the river bed ?.....

1} Men 2} Women 3} Girls 4} Boys 5} Women and girls.

12. Where do you get water from ?

13. In your view as a water manager, who uses more water than others in the household ?

1} Girls 2} Boys 3} Men 4} Children 5} Women

QUESTIONS 14 BE ASKED FEMALE RESPONDENTS ONLY

14. Given that it is you who collects water for all people in the household, are you consulted whenever decisions about water are made ? 1} Yes 2} No

15. Who drives livestock to watering points ?

1} Girls 2} Boys 3} Girls & Boys 4} Men 5} Men & Boys
6} Women

16. Who assigns duties of fetching water in the house ?.....

17. How many people use water fetched ?.....

18. Are there activities foregone or not done where water is limited or not available ? 1} Yes 2} No

If Yes, names some.....

19. Do some of your children stay with relatives, town or in school ? 1} Yes 2} No

If yes, does their stay out mean that there is lack of labour and therefore less water fetched in the house ?

1} Yes 2} No.

20. How do you ensure that there is constant water supply in all seasons ?.....

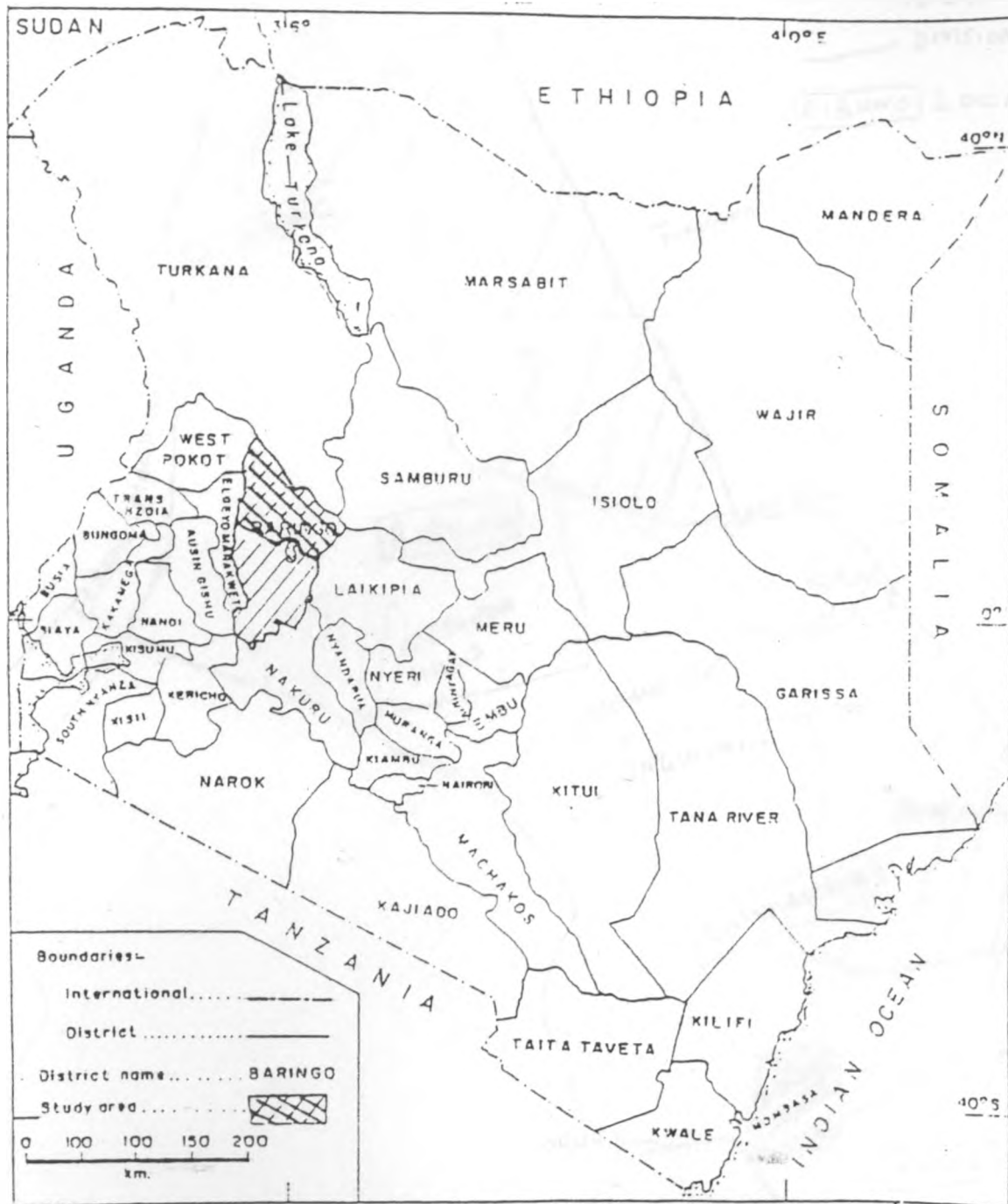
21. Is there water you call contaminated ? 1} Yes 2} No.

- If yes, this is what kind of water ?.....
22. In such cases what do you do ?.....
23. Is there a way you think water in this area can be increased or made available always ? 1} Yes 2} No. Which ways do you have in mind ?.....
24. How many times do you drink water in a day ?.....
25. Is it every day ? 1} Yes 2} No
26. Approximately how much water do you use in a day in litres.....
27. What do you do when there is no water yet there is food to be cooked ?.....
28. Do you store water for cooking, drinking and that for other activities separately ? 1} Yes 2} No
29. Who controls water at the point where livestock drink ?
1} Men 2} Women 3} Boys 4} Girls 5} None 6} Others specify.
30. When water gets to the house at the time of great scarcity, who is likely to be given to drink first ?
1} Men 2} Women 3} Boys 4} Girls 5} Children ▶
Why them first ?
31. Is the point where you fetch water for human consumption the same point where your livestock drink ? 1} Yes 2} No
32. Don't you have fear of getting diseases from such water ?
.....
33. Do you or does your wife store water in the house ?
1} yes 2} No

34. Why do you store it ?.....
35. How many times are your livestock watered in a day ?.....
In a week
36. Why do Pokot women always walk with plastic containers?...
37. Do you often have a bathe ? 1} YES 2} NO
If yes, how many times in a week ?.....
If no, why ?.....
38. Do you have any clothes ? 1} YES 2} NO
Do you ever wash them ? 1} YES 2} NO
If no, why ?.....
if yes, how often ?.....
39. Do any people misuse water ? 1} YES 2} NO
What do you do to such people ?.....
What do you call misuse ?.....
Why that punishment and not any other ?.....
Who gives that punishment ?.....
From where is it given ?.....

Thank you very much for your assistance.

Stay well.



LOCATION OF STUDY AREA

MAP OF BARINGO DISTRICT SHOWING NGINYANG DIVISION



MAP SHOWING NGINYANG DIVISION

