HUMAN RESPONSE TO DROUGHT AND FAMINE IN TURKANA, KENYA

BY

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A thesis submitted in fulfilment for the Degree of Doctor of Philosophy at the University of Nairobi.

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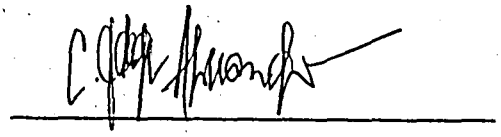

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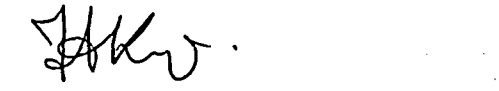

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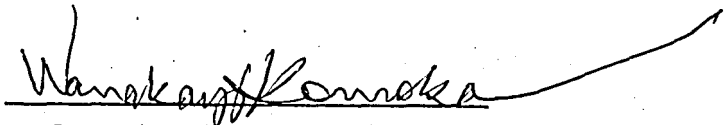

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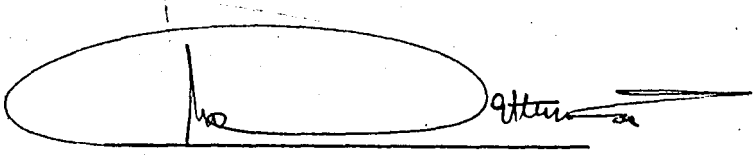

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The final responsibility for the thesis, nonetheless, remains entirely with the author.

ABSTRACT

This study sought to inquire into the indigenous modes of coping with drought and famine among the nomadic Turkana of northwestern Kenya. The study was carried out during the 1979-80 drought and famine period.

The findings were that the Turkana nomads possess a repertoire of adaptive strategies which stand out in their boldest relief in times of economic hardship. This study found that migration, splitting families and the search for allies were the dominant modes of adaptation. The allies sought out included traders, kinsmen, affines, bond-friends, neighbours and the school.

The study found out that the adaptive strategies aimed at augmenting existing domestic food supplies by looking for non-pastoral food sources. At the same time, where possible, families were split and some of the members sent away to relatives, friends or the school in order to ease the consumption pressure on available household food reserves. The process thus helped to slough off population from the pastoral sector.

The factors which seemed to have determined the scope and effectiveness of the adaptive choices were the physical, social and economic environment. The Yapakuno who inhabited a more hostile and isolated environment suffered more severely while the Ngissiger of the more richly endowed environment escaped almost unscathed.

It was further found out that the economically active part of the population (10-59 years age bracket) coped better with the drought and famine than the young (0-9 years old) and the aged (above 60 years). Thus the weak faced the greatest jeopardy.

CHAPTER 1

STATEMENT OF THE PROBLEM

Introduction

The debacle of the Sahel in the early 1970s pointed to the vulnerability of pastoral production systems to prolonged droughts. It has been estimated that at least 50 per cent of the 10-million cattle in the region before 1968 perished.[1] This resulted in a bad famine which claimed at least 100,000 human lives in the Sahel and another 100,000 in Ethiopia.[2] These disasters were a kind of eye-opener and caused an upsurge in drought management studies in the effort to make pastoralism more resilient as to stem future disasters.[3]

This need to study and find new ways of improving the nomads' adaptive capacities does not exclude Kenya. This is basically because Kenya's arid and semi-arid lands (ASAL) inhabited by some 3-million nomads incorporate as much as 81 percent of its land area and carry approximately 50 percent of its livestock.[4] They are drought and famine prone areas of the country and seem to have a regular timetable of natural disasters. They are the hardest-hit whenever there is a national drought which occasions a shortfall in food production.

Evidence suggests that Kenya nomads are just as vulnerable to droughts as the Sahel and Ethiopian ones. For instance, during the 1960-61 drought, Kajiado Maasai lost between 300,000 - 400,000 cattle. This was estimated to be between 65-80 percent

of their total herds. Many Maasai were therefore left stockless and hungry.[5] The nomadic Turkana suffered equally badly then, losing two-thirds of their livestock. According to Hopcraft, 30,000 Turkana were rendered destitute and had to be fed by government in famine relief camps.[6]

During the 1971-4 droughts, the nomads once again suffered heavy losses.[7] Stock losses and the subsequent famine were compounded by an outbreak of cholera and high incidence of malnutrition, tuberculosis, meningitis and measles. The young, the old, the sick and the weak suffered most severely. Wisner records 768 cholera cases in 1971, 45 in 1972, and 402 in 1974. He suspects that 50 percent of these reported cases could have died from the combination of famine and disease.[8]

During the 1979-80 drought, the Turkana and Kitui Kamba were among the worst-hit victims. The nomads of northern Turkana district were described in one report as having been trapped in a bush fire and "engulfed in the pangs of hunger, seemingly without precedent in the continent's gruesome diary of recurrent natural disasters."[9]

Droughts and famines are extremely costly to the affected nations. Apart from the crop failures, livestock deaths, loss of human life and relief costs, there are many other hidden costs.[10]

Social costs are probably the most devastating. Famished children are highly susceptible to disease infection. They also become victims of kwashiokor, marasmus and xerophthalmia

(acute vitamin A deficiency blindness). Malnutrition also accounts for the high infant mortality rates in Africa. There again exist fears that malnutrition causes mental impairment and poor performance in school.[11]

Anaemia is a common disease among malnourished expectant and nursing mothers. Studies further reveal that malnourished mothers endure long labour pain when delivering babies. This puts the life of the infant and the mother at great risk.[12]

The precariousness of pastoral production systems and the dangers that drought and famines pose in Africa make it necessary to urgently:

a. review Africa's food policies;[13]

b. undertake academic studies aimed at generating data which could help in the planning and restructing our food production methods, improve storage facilities, and strengthen food distribution networks; and

c. launch systematic studies of drought and famines with particular emphasis on pastoralism. This in particular should deepen our understanding of adaptation and adjustments and how best to improve them to help stem future disasters.

With regard to these three items, Kenya could be said to be ahead of many African states in having a National Food Policy drawn as a result of the nasty lessons learnt from the 1979-80 drought and famine.[14] But the document is not the final treatise

on Kenya's food security question. The time when all Kenyans will have access to adequate food intake is nowhere near.

The Problem:

The national drought and famine of 1979-80 made it quite difficult for the Kenya government to provide immediate emergency relief food for the famished Turkana nomads. For nearly a year since the drought struck and its devastating effects took their toll, these nomads had to fend for themselves. There was, indeed, very little the state could do to help them due to the national shortfall in the country's agricultural production occasioned by the drought. The national food reserves had been drained seriously and there were widespread food shortages.

It was not until large quantities of food aid were imported from the European Economic Community (EEC) and the United States of America that the situation in Turkana changed. The government sent in a large amount of famine relief food for the famished people.

But as we all know, famine relief food supplies are just a stop-gap measure in the struggle to keep the victims alive. The big question therefore was how the Turkana themselves normally adjust to drought and famine conditions.

The aim of this study was therefore to inquire into the local patterns of adjustments to drought and famine which the Turkana nomads used in coping with the 1979-80 drought and

famine before food aid reached them from outside the community. The basic question the study set out to answer was: How did the famished Turkana nomads cope on their own with the drought and famine?

The focus of the study was on those behavioural patterns which emerged in the process of adjustment as to stem the negative effects of the drought. It was assumed that such behaviours remain dormant in good times and become observable in exaggerated forms only in times of need. The adaptive responses which were the focus of the study were those which stand out in their boldest relief during periods of severe drought and famine. Thus the study was not about all types of adaptive responses; it focused only on those which emerge in response to calamities, more specifically drought and one of its consequences, famine.

Theoretically, the study sought to observe and explain two basic components of the adjustment phenomenon:

a. The types of human relationships which emerged during the drought and famine in the endeavour to survive.

b. The social and economic determinants of adaptability.

Rationale:

The rationale of this particular study was twofold. Firstly, it would enhance our theoretical and empirical

understanding of the Turkana nomads' ways of coping with drought and famine today, as a representative of what nomads would do under similar circumstances universally.

Secondly, the findings would enable us to identify key variables of local adjustment patterns which could be manipulated for developing long-range drought and famine management mechanisms. The planning of low-cost but high-benefit approaches of coping with droughts require that they are built on local patterns of adjustments.[15]

Finally, the study of behaviour patterns in time of crisis when social norms, values and beliefs are stretched to breaking point provides a good occasion for the testing of hypotheses and theories hitherto assumed to be universal or applicable only in certain circumstances. This is critical for this study for as W.I. Thomas and Florian Znaniecki would argue, it is "pure fiction" to assume that people behave uniformly whether under normal circumstances or in hardship.[16]

This is a small-scale study whose findings could add to the existing literature on human adaptation to droughts. As we expand and enrich our knowledge of adaptation, it should be possible to design new methods which would enable the nomads to cope better with droughts. This becomes even more crucial in the current situation in Africa where droughts are becoming more frequent and severer than previously, coupled with a general decline in Africa's food production.[17] The ultimate

objective is to make regional economies attain a certain measure of self-sufficiency in locally produced foodstuffs in line with Kenya's National Food Policy.

Historical Background to Drought and Famine in Turkana:

In the pre-colonial past, African pastoralism appeared relatively resilient and ecologically preservative as a mode of production. Today, however, the creeping of the desert and competing land use practices put pastoral resiliency in serious doubt. The scenario is such that pastoralists appear trapped between the advance of the desert and the onslought of the cultivators, agro-business concerns, ranchers and wildgame conservationists.[18] They are like a people sitting hopelessly in a house set ablaze with its roof curving in. But the pertinent question is: Can they really cope?

The historical processes of impoverishment and economic stagnation[19] have given rise to an interesting phenomenon where pastoralists find themselves faced with serious adjustment problems caused by recurrent droughts, diseases and famines. One could even posit here that Africa's main economic predicaments derive from the fact that its peoples continue to operate weak subsistence economies such as traditional pastoralism with very little modern technological inputs. These subsistence economies look like remnants from the past, unsuited for the modern age.

The high-point in Turkana pastoralism was in the 1880s when they were still few but occupied the same land area as they do today.[20] The human and livestock numbers had reached their optimal size if the land area and technology were to remain unchanged. Indeed, by the turn of the century, whenever there was a drought, the Turkana went outside their territorial borders in search of fresh pastures.

These attempts by the Turkana to gain access to additional dry season pastures were thwarted by the British colonial state who sent punitive patrols against them. The Turkana in response organised armed resistance and this plunged the region into one of the most protracted and costly wars of primary resistance in Africa.[21]

During this era of primary resistance, the Turkana suffered heavy losses in men and property. Many of their livestock were captured and carried away by the troops. Historical records show, for instance, that:

> Between 1916 and 1918, an estimated quarter-million livestock were confiscated from the Turkana and many more were slaughtered by the various expeditions and garrisons for their rations. This reduction of Turkana herds was carried out far more systematically and extensively than any which had occurred before. By the end of 1918, the northern sections had lost nearly all their cattle, and as late as 1933 many Turkana herds had still not been rebuilt to their former size.[22]

Thus the wars and the raids left many Turkana households relatively impoverished. By the mid-1920s officers on the spot voiced concern that large captures had led to cases of man-induced starvation and hoped that the colonial policy towards the Turkana would be reversed to avert a future economic crisis.[23]

Further reports during the same period expressed the fear that the district was faced with the problems of rapidly increasing human population and declining livestock numbers. Diseases and raids by the colonial troops were blamed for the depletion of the herds.[24]

In this century, livestock diseases such as rinderpest and pleuropneumonia, which were unknown in the past, have become a permanent scourge to the animal population. On this van Zwanenberg comments:

> Redwater, east coast fever, rinderpest, pleuropneumonia and tsetse fly have been major scourges of the animal population of most of the pastoral communities in the twentieth century. There is some evidence which suggests that these diseases have become common only fairly recently to East Africa, as a result of greater mobility and the opening up of the country by explorers. Redwater and East Coast Fever, for instance both tick-borne diseases, are said to have been imported through South Africa and Madagascar around the 1870s. Rinderpest is a virus which seems to have been introduced in Africa through North-East Africa around the 1840s; and pleuro-pneumonia, also a virus, infected African cattle from South Africa at about the same time.[25]

In Turkana there are limited veterinary services and the imposition of quarantine has become the fashionable method of responding to the outbreak of stock diseases. For instance,

Turkana district has been under a permanent cattle quarantine since independence! The writers of the 1979-83 District Development Plan lamented that:-

> For almost 15 years now, the district has been under permanent quarantine because of the existence of Contagious Bovine Pleuro-Pneumonia (CBPP). ..... Lack of free veterinary services has also made it difficult for the Turkana to reap the benefits of modern animal husbandry.[26]

This state of affairs does not only restrict cattle sales, it also encourages overstocking and therefore overgrazing.

"Overstocking" and overgrazing are serious ecological problems in Turkana. The human and livestock populations have increased greatly over the years and yet little has been done in terms of technological development or conservation of the ecology to increase theland's carrying capacity. For example, the district's human population increased from 69,000 in 1948 to 142,000 in 1979.[27] This had a corresponding increase in stock numbers. Table 1.1 below shows the stock numbers for those two years.

TABLE 1.1:- LIVESTOCK NUMBERS IN TURKANA, 1948 AND 1978[28]

	1948	1978	% Increase
Cattle	200,000	522,878	161.4
Camels	80,000	112,000	40.0
Sheep and goats	800,000	2,677,715	234.7
Donkeys	96,000	78,000	-18.75

Sources: P.H. Gulliver (1951:15); Turkana District Development Plan 1979-83, p. 17.

The dangers of concentrating such large stock numbers in an area which is largely semi-desert are not difficult to imagine. The risks to the ecology are even more serious if we consider the fact that sheep and goats which are said to be more destructive to the vegetation than the other stock species, are the more numerous.[29] Their numbers increased by 235% between 1948 and 1978. The point becomes clearer if we looked at the livestock densities for the two years. Table 1.2 shows the comparative increases in densities.

TABLE 1.2 LIVESTOCK DENSITIES PER KM^2, 1948 AND 1978

	1948	1978
Cattle	3.2	8.4
Sheep/goats	12.9	43.1
Camels	1.2	1.8
Donkeys	1.5	1.2

Results of D.L. Campbell's computations based on Standard Stock Units (SSU) proposed by M.D. Gwynne indicate that Turkana district's population carrying capacity had been exceeded at least a decade ago--1975.[30] His model is rather static, for it does not take account of the non-pastoral activities in the

district, however, it provides us with some scientific basis for our 'overpopulation and overgrazing' hypothesis.

It is interesting to note that in spite of the remarkable increase in stock numbers over the years, Turkana pastoralism remains stagnant and non-growth in the sense that the majority of the people are poor. Stock numbers have increased in absolute numbers but the size of family herds have either remained static or declined. Assuming equal distribution of herds, each of the 22,911 households in Turkana by 1978 would own 22 cattle and 116 sheep and goats.[31] This is not any better than the situation was in 1948 when a careful study by the ethnographer, Philip Gulliver, found that an average household had 25-30 cattle and 100-150 sheep and goats.[32]

The plight of the poor nomads becomes even more glaring as one analyses the emerging social stratification patterns in the district and the factors which reinforce them. Georg Henriksen's work on the ecological problems in Turkana indicates that the Turkana who are themselves non-pastoralists like civil servants, teachers, politicians, businessmen, etc. take advantage of their privileged position to accumulate large herds. They do this because pastures are communally owned and free, thus making livestock keeping the most profitable form of capital investment. They use the patron-client relationship based on traditional kinship ties to recruit cheap labour. During drought and famine, they buy off the poor and thus

perpetuate inequality. According to this line of thought, the rich, who are themselves "nonpastoralists", are the immediate cause of the overstocking and overgrazing problems.[33]

The demand for woody materials for building and fuel wood is yet another source of pressure on the land. One therefore witnesses extensive bush clearance, tree felling and charcoal burning everywhere in the district. A recent study by a team of experts shows that this demand for woody materials is on the upward trend and has to be counter-balanced by deliberate reforestation campaigns if the ecology is to be conserved.[34]

Recurrent droughts and the prevalence of livestock diseases decimate whole herds leading to widespread destitution and hunger. This happened in 1928-32, 1960-61, and 1971-74. Since 1932, one way of responding to the situation has been to rush large quantities of famine relief food into the district.[35]

It is true the government has made visible efforts to develop the district by introducing non-pastoral activities such as fishing, irrigated farming, wage employment and various types of cottage industries, but they still remain precarious and limited in scope. The mainstay of the Turkana economy still remains nomadism. By 1978, it was estimated that some 4,400 people were depending on irrigated farming, 12,000 on fishing, 4,800 on wage employment, 4,000 on retail trade, 5,000 on famine relief food and the rest 150,000 on traditional nomadism.[36]

This economic and ecological precariousness forms the background against which the impact of the 1979/80 drought and famine should be understood. The Turkana nomads under these material conditions experience major adjustment hardships which should be ameliorated through researches and action aimed at increasing the land's carrying capacity, alleviation of poverty and bolstering up indigenous adjustment mechanisms. . .

CHAPTER 2

LITERATURE REVIEW AND THEORY

The Ecology of Pastoralism:

Ecological theory is quite broad and touches on biology, geography, medicine, anthropology and sociology.[1] Though thus broad, ecologists, whatever their respective sub-disciplines of specialization, study ecosystems and focus on "the adaptation of living organisms to their environment and the mutual relations that occur in the course of that adaptation".[2] The human ecology model places man at the centre of a total physical,biological and social environment which he has to tame for survival. This theoretical approach to the understanding of adjustments to the environment makes it necessary to review literature on pastoral ecology.

The economic historian, Helge Kjekshus,[3] has argued that the East African economies had developed within an ecological control situation where there existed a relatively stable balance between man and nature.

> ...the precolonial economies developed within and ecological control situation -- relationship between man and his environment which had grown out of centuries of civilizing work of clearing the ground, introducing managed vegetation, (stock), and controlling the fauna. The relationship resulted in an agro-horticultural (and pastoral) prophylaxis, where the dangers of tsetse fly and tryponosomiasis were neutralized and Africa's bane was made a largely irrelevant consideration for economic prosperity.4

The East African pastoral economies were viewed as having developed a well-tuned balance between man and nature. Edward

Soja[5] has described precolonial East Africa as a "sea" of pastoralism surrounding a few "islands" of settled agricultural communities. Many of the nomadic communities such as the Turkana and the Somali were wealthy, well-fed and also politically powerful.[6]

Starting with Evans-Pritchard's work on the Nuer,[7] and Mary Douglas' seminal "environmental bind hypothesis",[8] ethnographers have tended to subscribe to the view that pastoral social and economic organisations spring directly from the nature of the physical environment and the level of technology. This is evident, for example, in the works of Behnke[9], Awogbade[10], Carr[11], William Torry[12] and Gudrun Dahl.[13]

Such an ecological approach to the study of pastoralism views it as a mode of production and way of life adapted to the harsh conditions of the arid environment. It is a land-use system which puts into profitable use the scanty and sparsely distributed resources of the marginal lands without doing damage to the ecology. In these areas, rain-fed agriculture is not possible. Thus pastoralists kept cattle, sheep, goats, camels and donkeys which moved around freely and foraged on the grass and browse (the Sahelian type of thorny steppe) and converted them into human food in sufficient quantities in each annual cycle. Pastoral products on which the nomads depend on a day-to-day basis are meat, milk, blood, urine, dung, etc. Pastoralism was a clever

way of converting the otherwise "useless" resources of the drylands into wealth to sustain human life.

On pastoral ecology, Randall Baker notes that:

> What was sadly misunderstood was the highly developed adjustment to the environment which the pastoralists had made to arrive at a system which offered them the minimum of risk in a very marginal physical environment and the very intimate knowledge of the physical resources which they had acquired in the process.[14]

The fragility of the ecology, scantiness of the land resources and their sparsity due to the low and erratic rainfall (250-750 mm per annum) made it imperative for the pastoralists to develop well-balanced resource utilisation regimes. They developed selective grazing and browsing patterns and flexible herd management practices which included the diversification of the domestic herds herd-splitting and a clear division of labour by age and sex.[15]

The pastoral economies were further bolstered up by the nomads' capabilities to pursue many ends. As Philip Salzman pointed out recently, pastoralists have never been single-minded "hedgehogs" who know only one big thing, livestock husbandry; rather they have always been multi-interest "foxes" who pursue many ends.[16] Dan Aronson argues that pastoralists operate multi-resource economies:

> ...throughout their history ... pastoralists have engaged in a multiplicity of economic activities, making use of a wide diversity of resources within their reach and often modifying their animal production to the demands of other pursuits. Above all they farm, but they also trade, they handcraft, they smuggle, they transport, they use to raid and make war on their own or for others, and they managed the labour of others working for them.[17]

As an adjustment mechanism, the non-pastoral pursuits gained prominence in times of hardship when pastoral yields declined to below subsistence level. For instance, in such times, the Turkana in the northern territories would engage more actively in trade with the people of the Lower Omo, Southern Sudan and Northeastern Uganda.[18] From this trade they procured an assortment of goods including maize meal, sorghum, beans and tobacco. The Lower Omo, however, was their principal source of sorghum. Turkana oral traditions record that in this trade:

> Sometimes the Turkana would drive cattle up there and sometimes the Melire would bring bags of sorghum down here. In either case, people would go to the kraals of the people they knew. If their daughters had been married by men of the other tribe, they would go to the kraals of their sons-in-law.[19]

Nomads' adjustment strategies to calamities became widely visible during the ecostress of the 1880s and 1890s caused by the series of calamities at the time -- rinderpest, pleuropneumonia, scub, drought, smallpox, malaria and cholera. There

were bad famines everywhere except among the Turkana who, due to some still unknown reasons, escaped unscathed. As it were, the ecostress caused a major ecological crisis and they had to find how to cope. Writing about the pastoral Maasai, the historian Godfrey Muriuki tells us:

> The various disasters that overtook them (Maasai)-- the cattle epidemic, smallpox and their internecine wars -- culminated in a large-scale influx of refugees into Kikuyuland. In fact, this phenomenon was not confined to the Kikuyu alone; throughout the century Maasai refugees are known to have settled among the Taveta, the Chagga, the Arusha and Luhya. Moreover, an arrangement whereby women and children could be pawned in times of misfortune existed, as it did among the Ashanti and the Dahomey of West Africa. Desperate Maasai families left their children and women in the hands of the Kikuyu in exchange for foodstuffs, hoping to ransom them in better times. No stigma was attached to the pawning and the system was commonly practised by the Kamba, the Kikuyu and other Mount Kenya peoples, but it was only practised during famine times. In any case, it fulfilled an important function by ensuring that a family did not starve. Pawnship was certainly not regarded as slavery, indeed it was a stage towards full adoption.[20]

Yet another historian, William Ochieng', records that impoverished Maasai warriors fled the land and became paid mercenaries and fought in the armies of the Kikuyu, the Kamba and the Luhyia.[21]

In his study of the Gabbra adjustments to drought and the famine of the 1890s, Paul Robinson, records farming, long distance trade, hunting and gathering as poor wata, reciprocal gifts paid employment within the community and, in extreme cases, sale of female children in exchange for food.[22]

Farming and trade are of particular interest for this study for they were low-cost but high-benefit adjustment choices for the famished Gabbra. Those who settled down to farm (temporarily) did so among the agricultural Konso of Southern Ethiopia where they settled as migrants.

The Konso live in the well-watered highlands of Southern Ethiopia. They grow sorghum, wheat, barley, maize, potatoes, vegetables, coffee and cotton. They also keep donkeys as pack animals and a few cattle, sheep and goats in the lower altitudes. Theirs is a market-oriented economy.[23]

The Konso and the Gabbra maintain friendly relationships which the Gabbra exploited during the famine of the 1890s to survive. They settled among the Konso and planted what crops they could. Meanwhile they lived off food from their relatives and friends. From their harvests, the migrants bought cattle, sheep and goats and when the pastures were restored, they returned to Gabbra country and re-entered the mainstream of pastoral life.

Trade was an interesting mode of adaptation since traditionally the Gabbra despised trade, just as they despised hunting as the occupation of the poor whom they call Wata. During the famine, the famished Gabbra stooped to hunting and trading. They hunted elephants for ivory which they then sold to the Somali traders, and from this trade in ivory they accumulated large herds. It is said that the trade was lucrative for one good pair of tusks fetched 30 head of cattle from the Somalis.[24] We are told that there still exist traces of "Elephant Cattle" among the Gabbra of today.[25]

The lasting economic effect of the ecostress on the Gabbra pastoral economy was the shift from a predominantly cattle-based economy to a camel-based economy as an adaptive strategy. The rinderpest had killed nearly 90 percent of their cattle and spared the camels. This to the Gabbra meant that cattle are weak and therefore less secure as a source of subsistence than the hardy camels.[26]

The evidence in the literature suggests that outright gift of food to the famished families was never an efficient mechanism for weathering the food crisis. Neville Dyson-Hudson, for instance, says that among the Karamojong, the poor could be fed only if they were few, but when their numbers swelled, they had to fend for themselves or perish.[27]

In the north across our borders with Somalia, Lee Cassanelli discusses the adjustment strategies of Somali nomads.[28] From the literature he reviewed, responses tend to correspond with the worsening conditions on the ground. Robert Dirks has advanced a similar hypothesis following his literature review on "social responses during severe food shortages and famine."[29]

When a period of unnaturally long drought is detected as approaching, the nomads begin by moving the herds to dry season pastures earlier than usual; and the herds remain there as long as the drought lasted. Thus the normal migration timetable was altered.

In the second phase, the family herds were divided into smaller but specialised units--those with long watering intervals were moved farther away from the wells than those requiring more frequent watering. Young men scattered in every direction with these small units in search of fresh pastures and water. Thus mobility intensified. They went to kinsmen and friends to "beg" for grazing.

As the drought persisted, extending beyond three seasons, the women, children and the aged were moved out of the homesteads and sent away to live with kinsmen and allies in towns and the farming villages. This enabled the herders to migrate farther away from home in search of forage and water. It also helped to slough off population from the pastoral sector thus saving milk for the calves. This helped to improve the survival rate of calves.

Then there would be systematic culling and sale of livestock. This reduced the grazing pressure on the land and also helped the nomads to get cash income for buying food.

Apart from depending on kinsmen and friends for food, the nomads would trade, farm and take up wage employment temporarily as they waited for the rains to restore the pastures to allow for the return to full-time pastoralism.

This random selection of adjustment mechanisms from the Turkana, Maasai, Gabbra and Somali brings out a number of salient features of adaptability. First, all nomads have ways of coping with drought and famines when they break out. Secondly, the adjustment choices are easier to observe during periods of hardship. Thirdly, the choices are made by the individual herders. Fourthly,the adjustments may vary from one society to the other, but they possess one common denominator--they are creative behaviours. How then can one explain them theoretically? Our starting point will be a more detailed and expanded application of the ecological model.

Symbolic Interactionist Theory and Adjustments:

Social scientists studying adjustment behaviours during periods of drought and similar calamities have in recent years expanded and modified the ecological model by extending it into the field of social psychology. This has been necessary because, as Ben Wisner has noted:

> ...man does not act directly on his surroundings but rather indirectly through a perceptual and cognitive filter composed of elements of culture, personalities, childhood experience, recent experience, and even immediate bodily states.[30]

This approach views adjustment behaviour as taking place within a social context and influenced by taboos, ideology, group values as well as individual perceptions. This is the human ecological approach to adjustments to disasters which develops psychological tests for individual perceptions and choice of adaptive strategies. It builds heavily on the symbolic interactionist theory of behaviour.

Symbolic interactionist theory is a paradigm developed from the original work of the psychologist George Herbert Mead.[31] The leading scholars of symbolism have been Alfred Schutz, Herbert Blumer, and the ethnomethodologists, Peter Berger and Thomas Luckmann.[32]

The basic tenets of the symbolic interactionist theory are that human beings act toward things on the basis of the meanings those things have for them in the course of interaction; and that definitions typically undergo revision and reconstruction in the process of interaction itself.[33] The core of the theory is that in a changing situation, behaviour is never random and purposeless but selective and purposeful. Unfamiliar environments call for

their definition by the interacting individual to shape the frame of his act. Sheldon Stryker summarises the theory in these lines:

> When one enters a situation in which his behaviour is problematic--that is, in which pure habit will not suffice--he must find some way to represent that situation to himself in symbolic terms if he is not to behave randomly, if he is not to select arbitrarily from the range of acts in his repertoire of possible actions. He must, in short, define the situation. The products of this behaviour are definitions of the situation.34

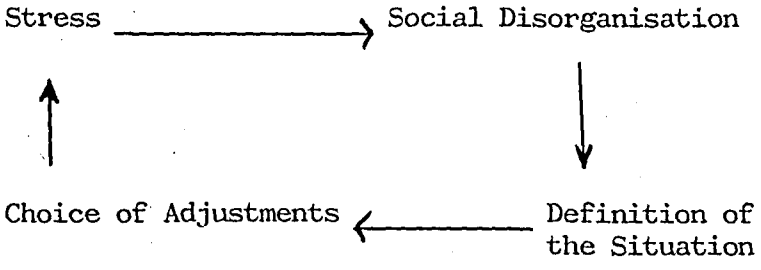
Thus man lives in a symbolic physical, biological and social world which acts as a stimulus to shape his behaviour. The concepts of "role" and "expectations" are crucial to this theory. As a man enters into an interacting system, he assumes a certain status position (role) and assigns certain other roles to members of the group and by so doing invokes role expections.[35]

For a man hungry enough, says Stryker, what may previously have been defined as inedible and cast aside, may be redefined as food and found quite nourishing.[36] This example ties in quite well with this study of response to drought and famine; men have to redefine the changing situation as a basis for the rational selection of adjustment choices.

In their detailed study of the Polish migrant families in America, William Thomas and Florian Znaniecki[37] found that for

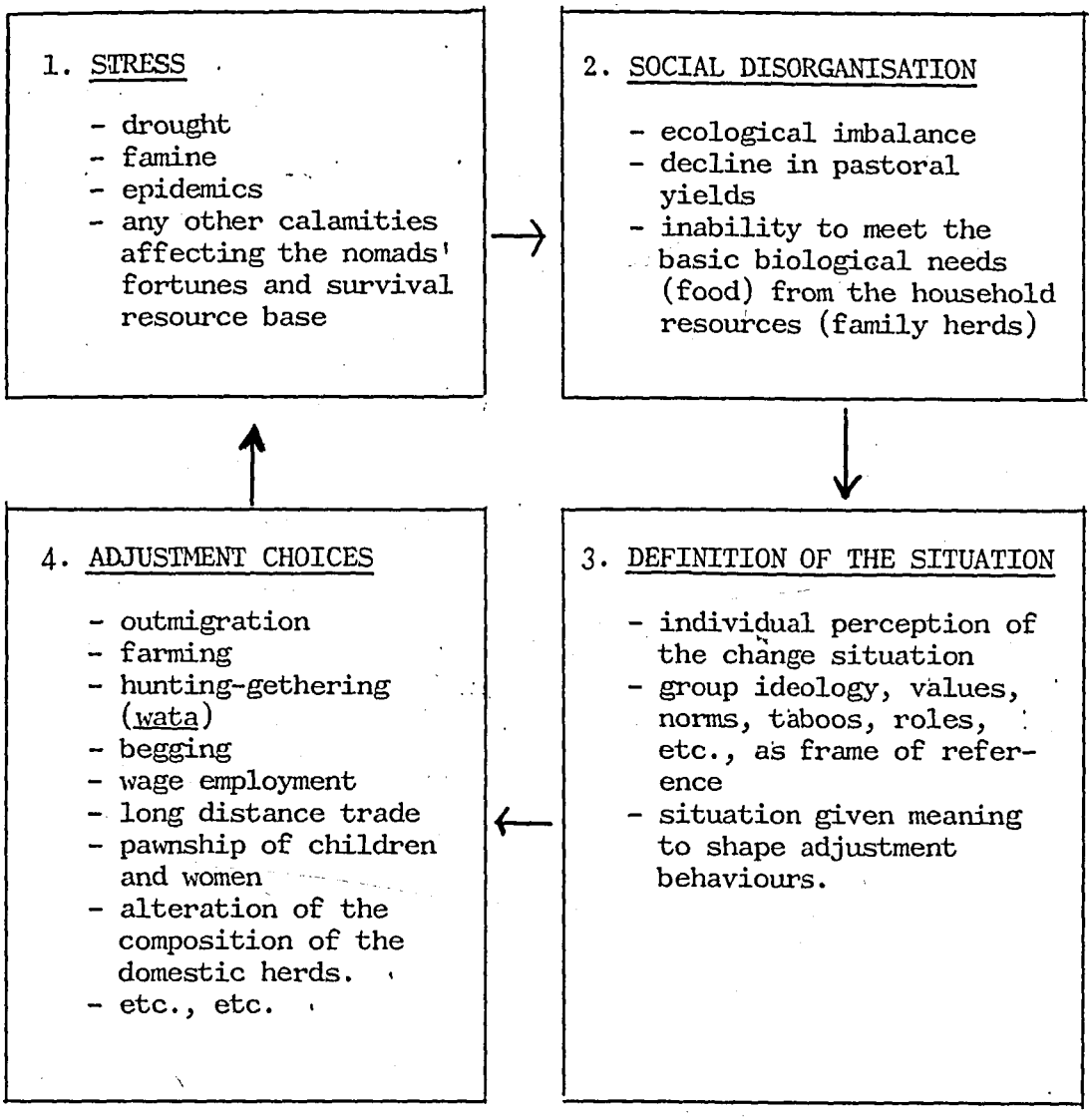
the Poles to adjust to the new environment abroad, they had to give the situation in which they found themselves a definition which in the process moulded their adaptive behaviours. For Thomas, "if men define situations as real, they are real in their consequences".[38]

Drastic changes that threaten to tear apart communities like those discussed by Cottrell in his "Death by Dieselization"[39] call for a difinition of the situation to guide adjustment behaviour. But, as the Caliente case reveals, the impact of disasters vary down to the individual level. In this particular case, those whose fortunes depended entirely on the railroad suffered most, while those who were peripheral, like the "nomads", suffered least.[40] This has a lot of bearing on the definition of the situation and responses. What men do in a crisis, then, depends on how hard-hit they are and the choices available to them.



The data from the literature could be organised into the adjustment scheme in the following way:

NOMAD'S ADJUSTMENT SCHEME 1



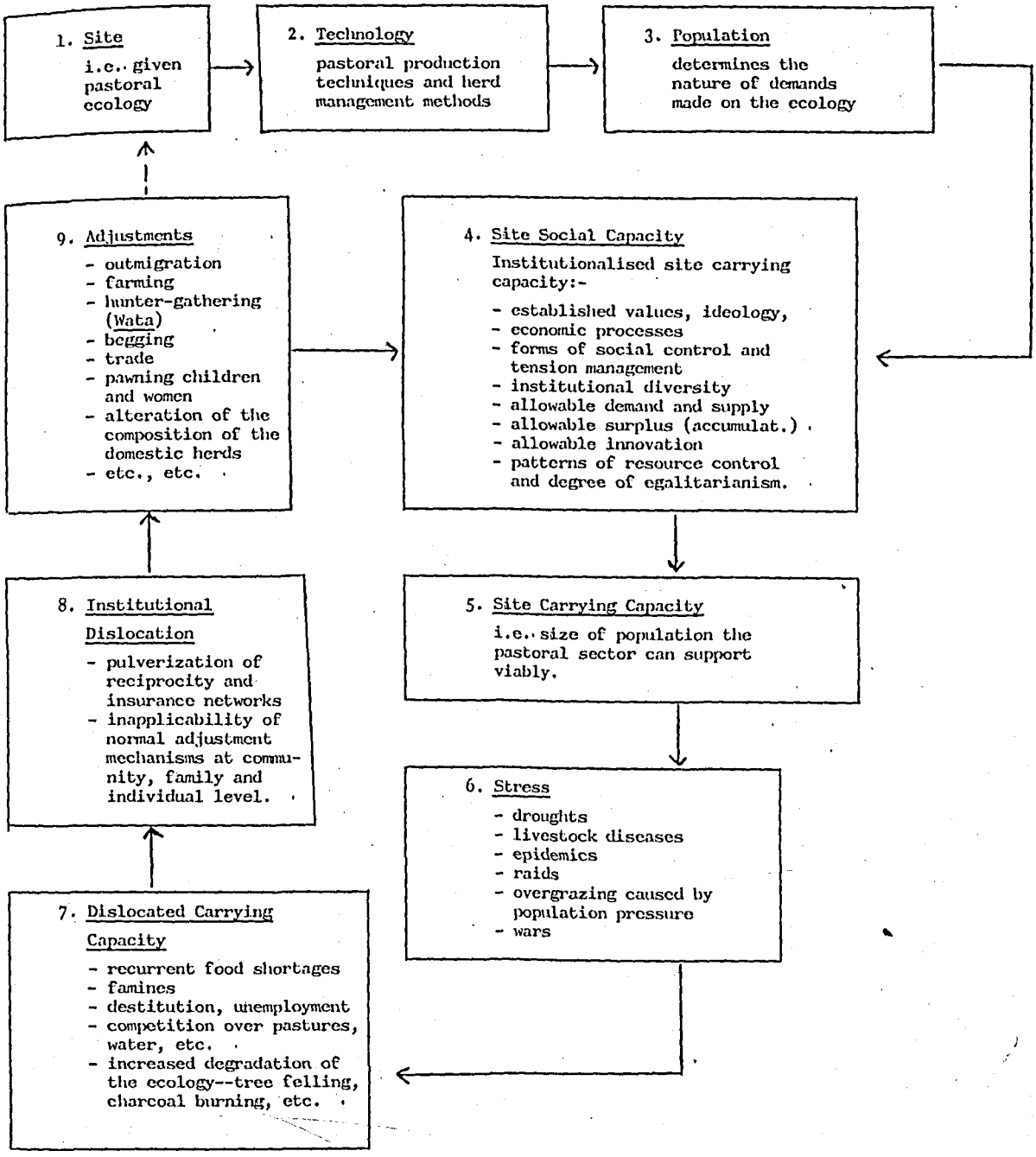
Since adjustment behaviours take place within a group context, Frank and Ruth Young shift the level of analysis from the individual to the social system.[41] This approach emphasises the collective awareness and interpretation of the change situation as the basis for innovative behaviour. The collective difinition of the situation gives a group consensus on the parameters of allowable adjustment choices.

Among the nomads, collective awareness of the economic hardship permits and even "legitimises" otherwise anti-social conduct such as stooping to hunting, farming, taking up paid (wage) employment, begging and the pawning of children and women. These are definitely non-normal behaviour which pastoral norms do not allow under normal conditions.

Young's theory of "collective awareness" and the symbolic interactionist theory of "individual perception" will be seen as complementary to each other in this study. The two together improve the analytical power of our theoretical model.

The nomads' responses to stress could further be shown theoretically by introducing into the model site technology and carrying capacity as crucial variables in the adjustment scheme by adopting Mbithi and Barnes.[42] Scheme II below is an expanded and more detailed form of Scheme I.

NOMADS' ADJUSTMENT SCHEME II



Adopted from Mbithi and Barnes (1975)

Notes: i. Positions 1 - 5 in the adjustment scheme should be read as an ecosystem interacting with the rest of the model.

ii. As in Mbithi and Barnes' original model the path analytical framework does not imply causality but a chain of inter-related and mutually reinforcing process.[43]

Reciprocity and Symbiosis:

Although the nomads' adjustment scheme we have developed above may appear to exhaust the adaptation phenomenon, it does not quite capture certain aspects like reciprocity and symbiosis. Reciprocity is perhaps best explained by the social exhange theory of George Homans and Peter Blau.[44]

Social exchange theory is a utilitarian scheme for the study of human behaviour. It assumes that people always behave rationally to maximize gain. It emphasizes the fact that men behave according to anticipated rewards, and where faced with competing choices, they will choose the option which carries the higher rewards. The rewards could be material things or they could be purely social and psychological like acceptance, prestige, sympathy, praise or esteem.

As in all situations of social interaction, ideology (shared values), beliefs, goals and expectations are the motivating factors. Motivation to act derives out of the probability that the interacting individual's goals will be realised or interests served.

In pastoral communities, reciprocity is an important insurance system. It is established and maintained by the constant exchange of livestock gifts. Lee Cassanelli has argued that pastoralists hoard stock to enable them to oil reciprocal partinerships through the distribution of livestock gifts.[45] Uri Almagor says that a married Dassanetch man builds up his own affinal and bond partnerships which make up a network within which reciprocal interests are shared.[46] Perhaps one of the most detailed accounts of reciprocity as an insurance system is that in Philip Gulliver's Turkana ethnography, Family Herds.[47]

The tilia institution among the Pokot of Kenya is one good example of pastoral insurance system. Harold Schneider says that:-

> A tilia partnership assumes many of the characteristics of clan ties. The partners support each other in disputes, exchange small gifts such as goats, beer, and ornaments, and generally assume an intimate attitude toward each other.[48]

Gudrun Dahl believes that the reciprocal gifts of batume herds from the clan to the dispossessed qollo plays a significant role in enabling the distressed to re-enter pastoral economy among the Waso Borana. An average family would receive 10 cattle as batume herds, and in addition the qollo receives gifts from kinsmen and friends depending on his previous generosity. He would also benefit from Taka Muslim tax.[49].

In her response to Robert Dirks' essay on responses to famine, Diane Kayongo-Male has stressed the need for more policy-oriented research on social networks and how they could be improved to enable drought and famine victims to cope better. For instance, she notes that "in Kenya, social networks among pastoralists help them survive drought and famine more easily than in-migrants from other ethnic groups".[50] Other scholars hold the opposite view that reciprocal networks get culturally clogged up when household food reserves get depleted. The family ceases to function as a food redistribution unit due to selfishness, forcing people into a situation of "everyone for himself". Pitirim Sorokin, for example, believes that starvation rips off man's social garments and leaves him a naked beast on a naked earth.[51].

On symbiosis, Alfred Kroeber had once argued that pastoralism emerges as a sub-culture with ties linking it to sedentary populations, and that this is one of its distinctive characteristics.[52]. For their own survival, pastoralists develop inter-

dependence relationships with neighbouring agricultural communities, he concluded. More recent studies lend supportive evidence to this pastoral-sedentary interdependence thesis.[53] So, the pastoral Maasai and the Kikuyu, the Gabbra and the Konso, need each other for their survival. These relationships benefited both parties and were most vigorously exploited in times of need.

Similarly, there exist pastoral-pastoral symbiotic relationships. The Turkana and the Dassanetch, the Samburu and the Turkana, the Gabbra and the Somali, for instance, all need each other for survival. One of the most accomplished work on this is Paul Spencer's Nomads in Alliance.[54] The study views the Rendille camel-based pastoral economy as weak and non-growth and therefore vulnerable to stress, especially rapid population growth. It periodically ejects surplus labour which is then absorbed by the buoyant and resilient cattle-based Samburu economy. In the process, an intermediate economy of the Ariaal has developed. The Ariaal are of mixed Samburu and Rendille blood, and their economy is a mixed cattle and camel one.

Elliot Fratkin, while agreeing with Spencer on the symbiotic dependency between the Samburu and the Rendille, seems, however, to suggest that it is the Samburu cattle-based economy that is weak due to pressure on hilly grassland pastures. In the event, a number of Samburu opt out of the predominantly cattle economy into

a mixed cattle and camel economy to enable them to survive on the lowlands which favour camels and some cattle. Thus it is the drought resistant Rendille camel-based economy that bolsters up the Samburu cattle based economy.[55]

However, whichever is the case, the fact still remains that the two pastoral communities are interdependent, one improving the survival of the other. It is a two-way relationship. Secondly, these diverging views about the Ariaal would further help to underscore the complexities involved in adaptation to environmental changes, which then makes it necessary to study it more carefully.

This study anticipates data on how reciprocity and symbiosis were used among the Turkana nomads in the process of adjustment to drought and the famine. This should enable us to obtain a deeper understanding of how these insurance systems work under conditions when the social and economic organizations are stretched to their limits.

Summary and Hypotheses:

Our general assumption arising from this literature review is that adaptive responses constitute institutionally atypical sort of behaviours in the sense that they stand out in exaggerated form in times of economic hardship. The review reveals that East African pastoralists possess a repertoire of adaptive strategies which they call into action during drought and famine.

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The adaptive responses are guided by a detailed knowledge of the physical and social environment and the kind of survival resources they may offer in times of need. Survival, then depends greatly on the group or individual's capacity to exploit the social and economic worlds around them.

From this literature review, this study will test three working hypotheses about the Turkana nomads' adjustment responses to drought and famine. The first hypothesis views drought and famine as stimulants to adaptive responses. The second one links the adaptive responses to the environment. The last one relates to age and the impact of famine. It states that the impact of famine varies down to the individual level. Individuals in certain age categories are assumed to be more vulnerable to the devastating effects of drought and famine than others.

HYPOTHESES

1. Drought and famine stimulate the search for potential allies.
2. The social and economic resources accessible to famished nomads determine the range and scope of adaptive responses.
3. Age is a crucial determinant of adaptability to drought and famine.

Operationalisation of Concepts:

Some of the key concepts in the hypotheses need clarification to explain their specific meaning for this study.

Hypothesis 1:

Drought: We do not have one definition of "drought" since what is drought in one place may not be a drought in another place. Even in the same region, what one farmer considers as a drought, the other farmer may view as normal. Generally, however, drought could in our case be defined as lack of normal precipitation usually lasting for three seasons in a row leading to loss of pastures and death of livestock. It is important to stress that it is loss of dry season pastures, for it is only in such conditions that animals begin to starve and die.[56]

Famine: It is not easy to tell when a famine breaks out unless there is mass starvation as happened in the Sahel (1971 - 4) or the recent Ethiopian episodes. This study adopts a general working definition of famine as a period of low food supplies affecting part of a community or the whole community resulting in persisting hunger and a considerable elevation of community death rate attributable at least in part to deaths from starvation"[57]

Potential allies: These include kinsmen, neighbours, bond-friends, the state, missionaries, traders, employers, pastoral and non-pastoral neighbours.

Hypothesis 2

Social resources: In the problem statement we indicated that the

objective of the study is to observe and record (explain) how existing social relations or newly formed relationships which emerged with the drought and famine were used to weather the disaster.

The literature reveals that in the past, several types of social relationship used to be exploited for survival in times of such economic hardship. These were kinsmen and affines within the pastoral communities themselves; reciprocal partnerships; symbiotic relationships with neighbouring agricultural or pastoral communities; and, finally, relationships with the outsiders to pastoralism like traders, the state, missionaries, employers and sedentary populations in general.

These are the kind of social resources we shall be concerned with among the Turkana during the drought and famine.

Economic resources: The ultimate purpose of the exploitation of social relationships is to gain access to economic opportunities which then enable the famished nomads to obtain additional food supplies to top up their household food reserves. Some of the variables to be considered will be trade, marketing facilities for livestock products, availability of food in the open market, employment opportunities outside the pastoral sector, etc.

Adaptive responses: This study is about adaptive responses. These could be defined generally as the whole range of beha-

viours that are regarded as atypical and which were aimed at weathering the effects of drought, particularly famine. They are rational behaviours aimed at eliciting desired results in terms of generating subsistence and survival resources, namely food.

Hypothesis 3

Age: Under this concept, the studied population was divided into under 10 years, 11-59 years and those above 60 years of age. The age bracket 11-59 years is taken to be the economically active population for the purpose of this study. The young under 10 years and the old above 60 years are taken as the dependent population. In this hypothesis, therefore, age is the independent variable.

Adaptability to drought and famine is the dependent variable. It is the individual's ability to cope or adjust effectively to the effects of drought and famine. It is the drought and famine management capability of the individual.

CHAPTER 3

METHODOLOGY

SITE DESCRIPTION:

The Turkana are Eastern Nilotic speaking peoples.[1] According to the 1979 population census there were 142,702 of them living within Turkana district and probably another 70,000 migrants.[2]

Turkana district occupies the northwestern corner of Kenya and is bounded by Uganda, Sudan, Ethiopia, Marsabit, Samburu, Baringo, and West Pokot (see map). It lies entirely in the Rift Valley between latitudes 1^{o} and 5^{o}N and longitudes 34^{o} and 36^{o} 45'E. It has a land area of 61,768 km^2. It has a population density of 2.3 persons per km^2. The most heavily populated area in the district is Ngisiger location of Lokitaung division with 8 persons per km^2.[3]

According to Pratt and Gwynne's classification of East Africa into eco-climatic zones, Turkana district has three main zones, IV, V and VI.[4] The land gets progressively drier as one approaches the central plains where the average elevation is 500m. above sea level.

The district's mean annual rainfall ranges from 50 - 800 mm. However, most of the land receives between 250 - 500mm of rain per year. Rainfall records kept at selected stations in the

district over a number of years show the following amounts for the various regions: Lodwar, 160 mm; Kalokol, 220 mm; Lokitaung; 400 mm; Todenyang, 190mm and Lokichoggio, 520 mm.[5] This means therefore that the higher grounds lying in eco-climatic zone IV and parts of zone V receive higher rainfall than the central plains which are taken up by zone VI, which are predominantly arid and semi-desert. Table 3.1 below shows the extent of the eco-climatic zones.

Table 3.1: Turkana Eco-climatic Zones

Eco-climatic Zone	Extent in ha. (000)	%	Land use Potential
III	74	1.2	agricultural
IV	613	9.4	pastoral
V	3,539	54.2	pastoral
VI	2,308	35.2	pastoral
	6,534	100	

Source: Government of Kenya, Arid and semi-arid lands Development in Kenya, Framework for Implementation, 1979, Reuben Ogendo (1983:124-6).

The higher grounds (altitude 1000-2000m.) enjoy a cooler climate with temperatures never rising to 30°C and moisture index of -10 to -30 for zone III and -30 to -40 for zone IV.

There exist pockets of good soil suitable for crop-based agriculture. The vegetation consists of evergreen forest formation and woody grasslands on the escarpments and mountain areas.

Zone V experiences a hot climate with temperatures always above 30°C with a moisture index of -40 to -50. It is covered with thorn bushes comprising commiphora woodland, acacias, soft woods, browse and succulent grasses.

The central plains, zone VI, are extremely hot, recording mean annual maximum of 38° - 36°C and mean annual minimum of 25° - 22°C. The moisture index is -50 to -60. The vegetation is predominantly annual grasses, shrubs and acacia.[6]

A part from lake Turkana which is said to be rich in fish,[7] the district has a number of seasonal rivers and water courses. The major rivers are the Turkwell, Kerio, Sugut and Tarash. The first three rise in the west and southwest and flow into Lake Turkana, while the Tarash starts from Mersuk and Loima Hills and runs north across the vast Lotikipi plains into the Ilembi Triangle on our borders with the Sudan and Ethiopia.

There are also many wells, springs, and water pans which carry water in the wet season which generally lasts from May to August.[8] The hills and mountains which dot the district are yet a further source of water found at the hillsides. Some of the

highest grounds are Loima (2,133m.), Pelekec, Labur, Lorianatom, Lokwanamur, Mogilla, Songot and Loriu. Those who have worked in Turkana district claim that it has more water resources than one would expect in an arid environment.[9]

The district appears to possess favourable climate, pastures, and water resources suited for nomadic pastoralism. In good years the land carries large livestock numbers. For instance, the Turkana regarded the years 1977/1978 as the best in recent times. The rains were normal and the pastures were good. As we have already indicated (Ch.1), Kenya Rangeland Ecological Monitoring Unit estimated that there were some 522,895 cattle, 2,677,715 sheep and goats, 78,336 donkeys, and 112,383 camels in the district in 1978. The northern part of the district (the boundary between "north" and "south" not shown) was, due to higher rainfall and better pastures, carrying approximately 70% of livestock numbers. Table 3.2 below shows the distribution of livestock in Turkana district in 1978.

Table 3.2: Livestock in Turkana in 1978

('000)

	Cattle	Sheep and goats	Donkeys	Camels
North Turkana	435.0	1,714.8	62.7	60.3
South Turkana	87.9	963.0	15.6	52.1
	522.9	2,677.8	78.3	112.4

Source: Turkana District Development Plan, 1979/83, p.32. (KREMU Estimates for 1978).

During the drought, it was the north that was the hardest hit. A number of reasons were given to explain the severity of drought and famine in the north:-

(1) cattle rustling was a serious problem in the north where due to the political insecurity following the fall of Idi Amin, deadly weapons were being used by the raiders against the Turkana in the north. They lost many livestock from these raids and were also kept away from traditional dry season pastures.[10]

(2) There are many more permanent water points in the south than in the north.

(3) During the drought, Contagious Caprine Pleuropheumonia (CCPP) crossed the borders from southern Sudan into Kenya and killed many sheep and goats.[11]

It was difficult to estimate how much the Turkana lost from a combination of raids, drought and disease. However, observers believed the losses were heavier than those of 1960-61 or 1971-74 droughts. At least the Turkana themselves believed so. Personally I saw large numbers of dead livestock everywhere in the northern part of the district I visited: Todenyang, Kaeris, Makutano, Kakuma and Lorus. They were so thickly littered with carcasses of dead animals that gave one the impression that all was lost. By March 1980, the people of Lokichoggio said they

had not received any rain for 18 months in a row. They could see a major disaster ahead but they still hoped the year's long rains would come at least in May. It didn't come! By September 1980, deaths were being reported from famine and cholera. The Turkana Members of Parliament were the first to report publicly that:

> Famine and cholera are claiming the lives of at least ten adults and hundreds of children in the Turkana area of Kenya. The area has been hit by a terrible drought resulting in the death of nearly all the cattle, leaving the survival of the area's nomads under the mercy of famine relief which the majority hardly get. .....
>
> Mr. Ekidor (Turkana East M.P.) told the Standard that he had personally witnessed the death of nine people in the area. Mr. Ekidor who looked deeply moved said 'Four died in Kalokol last Friday, two in Lodwar on Monday and many die daily at Kakuma and Lokichoggio.' Mr. Ekidor said that the worst-hit areas were Turkana West, especially Kaling. .....
>
> An Assistant Minister for Co-operative Development, Mr. Peter Ejore confirmed the famine issue.[12]

In addition to these press reports, those government workers from the north visiting Kalokol or Lodwar would tell chilling tales of nomads in Kaling dying in the bush and being eaten up by vultures since those still struggling on were too weak to bury the dead among them.

The Turkana episode became a national issue and a presidential mission was went into the district during the first week of October, 1980 to investigate and report on the famine situation.

But while deaths from cholera were officially confirmed, those caused by outright starvation remained shrouded in mystery.[13]

SITE SELECTION

Two study sites namely Kaling and Lokitaung were selected for the questionnaire survey and key informant interviews on drought and famine in Turkana. Kaling was one of the locations reportedly hardest-hit by the drought and famine.[14] Secondly, its remoteness from any major population concentration centre (town) made it an ideal choice for making observations on how "pure" pastoralists adjust to drought and famine on their own presumably with little outside help in the first instance. The inhabitants of Kaling were the Yapakuno section of the Turkana. It is a purely rural environment with a relatively homogeneous community.

Lokitaung site was chosen mainly for comparison purposes in the hope that data collected here would bring out the difference in adjustment to drought and famine as contrasted to the Kaling case. The section of the Turkana around Lokitaung are the Ngissiger and, as their Yapakuno neighbours, are traditionally pure pastoralists as opposed to the Boicheros who are traditionally both pastoralists and fishermen. However, the methodological assumption in selecting the Ngissiger for the study was that they have been exposed more intensively to modern life styles due to their closeness to Lokitaung town and to the economic changes at the lakeshore occasioned by the introduction of

commercial fishing since the early 1960s. Lokitaung was seen as presenting a different social and economic environment from that at Kaling. Since one of the hypotheses anticipated the social and economic environment to influence adjustments to drought and famine, the choice of Likitaung environment, alongside the Kaling one, was methodologically acceptable.

Lokitaung is the second largest town in Turkana district after Lodwar the district Headquarters. It is situated on a relatively cool and wet mountain climate of the Labur Ranges (see rainfall patterns above). Apart from a more developed infrastructure of its urban environment--richly stocked stores, a big Roman Catholic Mission opened in 1928, one of the best hospitals in the district, security,[15] schools, abundance of water resources, both natural and piped, etc.--it is the centre of a communication network linking it with the wider society. It seems to possess all the trappings of an up-coming urban centre. If Kaling was ideal as a rural setting, Liktaung was an ideal choice as an urban and peri-urban environment.

Kaling has hardly any of the facilities Lokitaung enjoys. It is more or less a wilderness. At the time of the study there were four poorly stocked and almost broken-down shops. There is a primary school of up to class V and four boreholes--all, except one, were in disuse at the time. Apart from these listed facilities, there existed nothing else modern. The place was largely

occupied by the famine relief villages and food stores looked after by the Turkana Rehabilitation Project.

Moreover, while the people at Kaling were encamped in a small area of less than 5 kilometers diameter, Lokitaung was an open site extending over several miles. For instance, Kachoda village to the west of the town was situated some 35 kilometers from lowarengak at the lakeshore--both were part of the Lokitaung famine relief site. Here it was normal to find famine relief recipients just in their usual manyattas (homes) as contrasted to Kaling where everybody had been uprooted and moved to the centre for feeding.

The other rationale for the choice of the two sites for the study was because both had a large number of famished Turkana families being fed in camps by the Turkana Rehabilitation Project. Data collected from the respondents would help in the testing of our research hypotheses. At the time of the survey the feeding in the camps had been on for at least a year, the first large consignment of famine relief food having reached the district towards the end of 1980.

In short, the choice of the sites were determined by the need to find famished Turkana households whose experience would be recorded to help test our hypotheses. Additional care was taken

to include in the survey both rural and urban environments for purposes of comparison. These were quite sound methodological justifications for selecting Kaling and Lokitaung study sites.

SAMPLING:

There were two kinds of data sources which required sampling. The first were questionnaire interviews and the second were key informant interviews.

(i) Questionnaire Interviews:

All the interviews were conducted at Kaling and Lokitaung famine relief camps. The Turkana Rehabilitation Project management kept registers of the famished Turkana at each of the sites. These were the registers used to prepared a sampling frame. Multi-stage sampling method was used at each of the two sites since the people had been accommodated at the sites roughly in loose clusters.

The units of analysis were to be the individual families. Families were therefore listed and sampled. The head of each family was interviewed.

At Kaling there were approximately 1,064 families with a total population of 4,554 individuals (1,913 adults and 2,641 children). They were accommodated at the site in 6 clusters of about 160 families each.

Sampling Stage 1:

The six clusters were given numbers 1 - 6. Two of the numbers were picked at random. These were numbers 2 and 5.

Sampling Stage 2

All the families in clusters 2 and 5 which had fallen into the sample were listed as they appeared in the registers the camp managers kept for the weekly rations. A random sample of 35 families was picked.

At Lokitaung there were 2,085 families with a total population of 12,987 individuals (6,377 adults and 6,610 children). They occupied a rather wide area but there were 10 distinct clusters in and around Lokitaung town. Each cluster had some 200 families. As already mentioned, some of them were living at home and only went to centres for their rations once a week.

The sampling was done in two stages as in Kaling.

Sampling Stage 1:

The ten clusters were given numbers 1-10. Two of the numbers were picked randomly. Numbers 3 and 7 fell into the sample.

Sampling Stage 2:

From the registers kept by the managers of these two clusters, all the families were listed and a random sample of 30 respondents picked.

The total sample size for questionnaire interviews was therefore 65. It was originally designed that a sample of 200 respondents would be picked for the interview. However, for reasons which will be discussed below, the sample was made smaller to allow for intensive interviewing and cross-checking of the responses.

Key Informants:

At Kaling and Lokitaung, eight elderly men were identified to be interviewed on the cultural history of the Turkana and on traditional modes of adjustment to drought and famine. From the District Commissioner's office, Lodwar, I carried a letter of introduction to the area chief who accorded help in identifying research assistants, interpreters and the eldest surviving men at the camp for the interviews. The ones interviewed were those willing to volunteer needed information. All the key informants were men as no woman was found who was willing to volunteer such information. Of these eight key informants, five were interviewed at Kaling and three at Lokitaung.

The main criteria for selecting the key informants were their ages and assumed knowledge of the Turkana cultural practices related to drought and famine, today and in the past. They were interviewed in depth. All were men aged 65 years and above.[16]

DATA COLLECTION TECHNIQUES AND THEIR LIMITATIONS:

The approach adopted in this study views research as a process of interaction between theory and methodology. Methodology is therefore a means for generating data to be used in testing hypotheses which derive from theory. Where applicable, the testing of the hypotheses leads to recasting of theory and emergence of new theoretical paradigms. Thomas Kuhn's The Structure of Scientific Revolutions is quite emphatic on this.

David Silverman summarizes Kuhn's methodology thus:

> Kuhn rejects the view that science has advanced by the careful accumulation of data leading to an ever more refined picture of the way things are. Instead of this 'cumulative' view, Kuhn argues for the central importance in the history of science of the emergence of new 'paradigms' which define the nature of the reality being considered in original way.[17]

Similarly, Robert Merton argues for a closer relationship between empirical research (methodology) and theory.[18] In this regard, it would be a futile exercise advancing a set of hypotheses which data generated by a given methodology cannot test.

Both qualitative and quantitative data were required in order to help test the hypotheses formulated to guide this study. The process of data collection was spread over a period of two years. During this period, several data collection techniques

were used to collect the two types of data needs (qualitative and quantitative).

(1) Documentary Data:

For a meaningful analysis of the Turkana response to drought and famine, it was necessary to have some background information about the problem. This entailed collecting secondary data from published and unpublished sources. The main source of such secondary data was the archives. The colonial government kept reports on the social and economic life in the district up to the 1940s. These were at the time of the study now open to the public for reading.

There was therefore extensive study of the archival records in the Kenya National Archives in Nairobi. Of particular interest were records which pertained to drought and famine in the district and how their adverse effects were managed during the colonial days. Through these records, we found, for instance, that famine has been a persistent problem in the district through the decades. The first recorded famine was in 1932 and the government responded to it by voting money for famine relief food.

The limitations of archival records are many. First, they represented the official view of the famine problem and were largely biased. Secondly, the records tended to blame the Turkana way of life (nomadism) as the main cause of famine and that if they abandoned nomadism and settled down as cultivators, they

would never again experience recurrent food shortages and famines. Thirdly, the records say totally nothing on how the Turkana themselves managed droughts and famines as to be of help to this study.

(2) Observation and Informal Interviews:

The limitations of documentary data sources on the history of Turkana adaptation to drought and famine made it necessary to talk to the Turkana themselves and learn from them. Therefore, much of the study time prior to the questionnaire interviews was taken up by making repeated visits to selected sites in the northern section of the district for the purpose of observation and informal interviews.

Due to the fact that the north and northwestern parts of the district were operational areas, i.e. areas of insecurity due to the raids and counter-attacks staged by rustlers across the borders, it was found advisable to work in close collaboration with local leaders in terms of movement and residence.

During the reconnaissance visit, the area's District Commissioner accorded all the help possible to introduce me to the local leaders. He personally took me around the divisions and introduced me to the District Officers (DOs), chiefs and any other influencials. When he could not travel with me, he made sure someone took me round. I visited Kalokol, Lokitaung, Lowarengak, Katilu, Lokori, Kakuma and Lokichoggio. This

reconnaissance visit lasted one week.

I also had the opportunity of attending a District Development Committee (DDC) meeting and a leaders conference. Both meetings were chaired by the D.C. and he took the opportunity to introduce me to the heads of departments and local leaders (Members of Parliament and Councillors) and church leaders. He pointed out that this research was being carried out at the request of the DDC and appealed for their assistance to make it a success. A representative of the Norwegian Agency for International Development (NORAD), who sponsored the research, was also present at the leaders conference. Norad runs the giant Turkana Fishermen's Cooperative Society at Lake Turkana whose Headquarters are at Kalokol. Later, we took one day off to tour the cooperative, travelling from Kalokol and going as far north as Todenyang (see Map in Appendix). During this tour, I was introduced to the officials, workers and members of the cooperative whom we met.

Later visits were then made to locations where previous research contacts had been made. Through these earlier contacts, we visited the manyattas (villages) and I was introduced to the people as a visitor from Nairobi doing research on drought and famine and how the Turkana traditionally coped with them. The villagers seemed to have no difficulties welcoming such a person. The Turkana nomads only have difficulties with neighbours who are perceived as interested in raiding

their livestock. The rest are welcome and are only asked for tobacco.

Once I had found someone to live with for a month or so--a chief, missionary, a worker with the cooperative or some government employee-I spent much of the study time with the villagers, talking to them and making observations. The Turkana men speak a little Kiswahili and school children speak some English. This helped occasionally in communication. However, I always identified someone who could speak either good English or Kiswahili to help as interpreter for some little payment. Meanwhile I made efforts to pick a few words in the local language. This was relatively easy since the Turkana speak a version of the author's mother tongue and many words in the two languages (Kiturkana and Dholuo) are mutually intelligible.[19] After two years of repeated visits and stay with the people of Kalokol, Lowarengak, Kakuma and Lokichoggio, I had gained quite useful insights into the drought and famine problem and a good vocabulary of the language. It was now quite easy for me to tell the general drift of a discussion in Kiturkana unless it was too advance for a learner.

This period of familiarisation and observation was crucial as it was during this time that the study took shape. The issues to be investigated through future questionnaire interviews were selected from the experiences gained during this early period. I also learnt the best methods of interviewing the nomads. I had

never lived or carried out research among nomads before. I was therefore learning as I stayed and discussed various subjects with the Turkana.

But although observation and informal interviews were useful in introducing the author to pastoral life style, helped to gain extensive background information to the drought and famine problems and helped to sharpen the focus of the study, they had their demerits as data collection techniques. Firstly, the respondents were not systematically selected. We just lived and talked. Secondly, the issues discussed were never uniform. A topic came up and was discussed. Thus data generated left a lot of gaps in the subject of response to drought and famine. The data could not in themselves be used to test the hypotheses. Thirdly, observation and informal interviews generated mainly qualitative data. Yet even these qualitative data did not bring out clearly the people's cultural interpretation of drought and famine and how the Turkana traditionally coped with them. There was then a need for more systematic techniques of data collection to generate data which could help to establish linkages within the adaptation phenomenon.

(3) Key Informant Interviews

To help systematize information on the history of drought and famine, cultural interpretation of drought and famine and modes of adaptation, the eight key informants at Kaling and

Lokitaung were interviewed in depth using an Interview Guide (see: Appendix).

The questions for the key informants sought to generate data on history of drought and famine and the Turkana cultural practices related to these calamities in the past and today. Five days of intensive interviews (two days for Kaling and three for Lokitaung) generate quite an amount of interesting information on the subject. The data were recorded in the form of field notes. The field notes included the names and ages of the informants and the dates and place of the interviews. Well-trained interpreters were used for the interviews.

One of the key informants at Lokitaung, a Mzee of about 90 years old, living at his manyatta at Natoo village (see Sketch in Appendix), was a mine of cultural knowledge. We spent a whole day with him discussing and recording information about drought and famine in Turkana and the people's religious practices in response to these calamities. For the first time I had the occasion to visit a Turkana religious shrine (Akipeyare or Amurunot) where at the peak of the drought sacrifices had been made to Akuj (High God) at the instruction of the region's Emuron (High Priest or Diviner).[20]

(4) Survey (Structured) Interviews:

(a) Preparations for the Interviews:

Survey interviews were the main source of both quantitative

and qualitative data used in the testing of the hypotheses. The timing of the survey had a number of methodological justifications.

First, the drought had been on for nearly two years and had had its effects felt down to the household and individual level. It was therefore the ideal time for the people to tell of their experiences and how they had responded on their own before food aid was brought to them by government.

Secondly, the author had already gained enough experience with interviewing the Turkana pastoralists which could now be used for conducting more intensive structured interviews.

Thirdly, documentary data, observations and informal interviews had made it possible to sharpen the focus of the study and formulate testable hypotheses which helped in the designing of the questionnaires.

When I returned to the district in November, 1981 for the survey study, I obtained a letter of introduction from the D.C.'s office, Lodwar, to the chief of Kaling (see Letter in the Appendix). The chief then introduced me to local leaders and managers of the Turkana Rehabilitation Project. The chief also helped me to identify the key informants and research assistants/interpreters. I took up residence in a back room in one of the shops at the centre from where I worked for the

next two weeks before moving on to Lokitaung.

Both at Kaling and Likitaung, I identified a number of Turkana young men with 'O' Level education to hire as research assistants. However, since all of them were employed full-time as "camp" managers by the Turkana Rehabilitation Project (TRP), they were only available to assist me as interpreters. I trained one at Kaling and another at Lokitaung and used them as interpreters. We discussed the questionnaire in some detail, to explain what the data needs were, before we conducted any interviews.

(b) Pre-Testing of the Questionnaire

The questionnaires had been prepared in advance. Each questionnaire had four parts namely general information, cultural definition of drought and responses, specific questions on the 1979/80 drought and famine, and the final part, the livestock industry. Part I of the questionnaire was concerned mainly with household composition, the extended family, property ownership, and livestock losses during the 1979/80 drought. Part III of the questionnaire was concerned with adjustments, reciprocity and human losses in the community and at the household level due to the 1979/80 drought and famine. These were the two sections of the questionnaire that emphasized the collection of quantitative data while sections II and IV were to generate largely qualitative information. In all, there were 80 questions and some 250 copies of the questionnaire were prepared for the Kaling and Lokitaung interviews.

The first interview task was to pre-test the questionnaire. On my second day at Kaling, I visited one cluster of villages at the site and spaced out 14 manyattas (homesteads) at regular intervals and in four directions from the centre. The household heads of these 14 selected manyattas were interviewed. It took two days to complete the 14 interviews.

From the results of the pre-testing interviews, it became clear that the questionnaire was rather too long and had to be shortened. Secondly, some questions were never answered at all by anybody, while at the same time particular questions were popular with everybody. The questionnaire therefore needed to be streamlined by removing those questions which were ineffectual. Furthermore, the responses to the majority of the questions in Part IV of the questionnaire did not seem to link well with the rest of the answers on adaptation. The section focused on "disease control" and thus could be an entirely separate study by itself. This section was dropped from the newly designed interview schedule.

One other problem was lack of privacy when interviewing the household heads. This came about because the people were crowded in the camps and many people were always around either just listening or occasionally joining in the interviews completely uninvited. For instance, when Q.56 was asked: "Were there any human losses you know of due to starvation?", there would be

chorus answers: "Yes; many; etc.". Then everyone was eager to name those one knew died from famine. Even the women who normally remained silent most of the time as the men talked, would all of a sudden get excited and join in.

Yet, to maintain the excellent rapport which had been established between the researcher and the interviewees, you could not stop them talking for to do that would be to silence everybody. My long stay with the Turkana nomads prior to the survey had taught me that they are good talkers when properly motivated, but become completely withdrawn at the slightest suspicion that you are unhappy with the way they conduct themselves. Similarly, you could not pull someone aside to interview him privately. You will be highly suspected of being antisocial and amoit (enemy) who wants to do harm to the man you have pulled aside. You will be deserted and that will be the end of your interviews with them. So, you proceed more cautiously.

Sometimes I noticed that as I was interviewing a respondent, someone whom I had just interviewed a short while ago or the previous day, was sitting quietly close-by and occasionally making gestures as questions were asked and attempts being made by the respondents to answer them.

The sum total of the experiences gained during the pre-testing phase was that we had to find new approaches to the

interviewing exercise in order to minimize the negative effects of the above problems. Absence of privacy in particular seemed to have contributed to a large number of stereotyped responses got from the 14 interviews.

(c) Interview Schedule and Supplementary Questions:

At least 40 key questions were identified which had generated useful data from all the 14 respondents during the pre-testing of the questionnaire phase. These questions were extracted and used for designing a new Interview Schedule.

Secondly, it was necessary to scatter out the interviews in much wider area to check against the possibility of those who have been interviewed influencing future responses. I attempted to resolve this problem by reducing the sample size and by interviewing these few both intensively and extensively to help cross-check the responses on the spot. More importantly, a large number of supplementary and probe questions were used. It was therefore necessary to interview not more than three people per day. I took ten days to complete the 35 interviews at Kaling and another ten days for the 30 interviews at Lokitaung.

The core questions still focused on the impact of the 1979/80 drought at both the household and individual level and the various adjustment mechanisms which emerged in the process of attempting to cope with the calamities. The questions also

aimed at eliciting data on how the insurance systems of reciprocity and symbiosis worked during the drought and famine period. Further, information was sought on the environmental perception, cultural practices associated with drought and famine, and the role of the diviner (Emuron) in rain-making practices to avert droughts and famine. Still many of the questions touched on what the interviewees complained were personal and sensitive matters, however, it finally helped to generate the needed data for the subsequent analysis of human response to drought and famine among the famished Turkana nomads.

(5) Case Histories:

It had never been intended originally to use case studies as source of data. These later emerged naturally from the responses to the supplementary and probe questions during the survey interviews. As in the case of observation and informal interviews, data gathered through case studies were recorded in the form of field notes.

Individuals interviewed described how they survived during the drought and famine. A number of them told of their journeys to Ethiopia in search of food or about having sent out their sons or wives to fetch food. Others retold their migration histories down-country and back to the north when famine relief food was brought by government. For instance, one respondent related how the family migrated from Lokwanamur area down the vast central plains to the lake-shore. When the family was faced with serious food shortages,

he was forced to prematurely marry out one his daughters to a "rich" herdsman in exchange for food. Two of their children remained behind with the newly married sister as the custom requires, in order to keep her company. The family now had enough food which lasted many days as they travelled south. At the time of the interview the two children were still living with their sister at Lekudule, a few kilometers north of Kakuma town. The parents do visit them occasionally.

Yet another interviewee told the story of his trek from the Sudan borders, down across Turkanaland and West Pokot to Kitale to look for employment. The journey took more than two months. There were many such stories whose content analysis helped to gain a lot of insight into the adaptation phenomenon.

DATA LIMITATIONS OF THE SURVEY:

As we proceed to analyse our data and test the hypotheses using survey sources, there are two main limitations which had been imposed on this method of data collection to be put into consideration. First, the sample was small. However, as already noted above, it was necessary to have a small sample to be interviewed in depth rather than a large one which could not be handled profitably. Furthermore, this data limitation was compensated for by the fact that there were several other data sources to supplement them. Additionally, case histories which developed naturally from the survey helped to enrich the amount

of data available.

The second limitation with this survey had to do with the interview environment. I got the impression that once the people had been moved out of their natural environment into famine relief camps, their attitude towards life and the people around them tended to change. They viewed themselves as helpless and had to relate to others in a way that would not jeopardize their chances of survival. My impression was that the interviewees' responses to questions now became part and parcel of their response to the drought and famine predicament. For instance, I got quite convinced, as I carefully looked at the response about the impact of drought, that the people quite deliberately exaggerated their livestock losses as to project a seriously gloomy socio-economic statuses. My respondents, if not all, viewed this study as an exercise to determine the level of destitution for the purpose of removing the beter-off from the famine relief list. Projecting misery was erroneously thought of as a means for increasing the household's chances of getting better treatment when food is distributed. They were all complaining of being cheated out of their rightful share of food which became either too little or infrequently given.

THE QUESTION ON NUMBERS:

The responses to questions about numbers presented some difficulties because the Turkana nomads have a peculiar system of counting their livestock. For instance, if a man was asked:

"How many goats did you have before the drought?", the answer would be: arei, meaning, two. But when you sought to know where exactly the two goats used to forage, the answer was: "One was at locality "Y" with my second wife and one was at locality "Z" with my third wife". Obviously, it was going to be extremely strange that two goats belonging to one person should be kept singly at separate manyattas!

Further probes were made to elicit the actual figures. The man had 80 sheep and goats with the second wife and 150 sheep and goats with the third wife.

From this first experience, I learnt that the Turkana nomads do not normally count their animals. It is taboo to do so and may spell disaster, they believe. So, when they ever count, they would rather refer to groups instead of individual numbers.[21]

Furthermore, a number of the respondents mistook this writer for an employee of the Turkana Rehabilitation Project and therefore they thought they stood to gain by exaggerating their livestock losses. Many people in the famine relief camps, particularly at the fairly congested Kaling site, thought that this study aimed at identifying the rich among them so that they could be removed from famine relief list and expelled from the camps. So, when the question was asked: "How many of those your goats did you lose due to drought?", the answer would be:

"I LOST EVERYTHING". Nobody really wanted to volunteer information about existing livestock wealth.

The whole exercise of trying to ascertain the exact size of family herds before and after the drought thus became painstakingly tedious. One had to cajole and prod to get any quantitative data from the respondents. How reliable are the statistics then? It is difficult to tell but we use them because they are the best we have so far.

TIME OF THE STUDY:

The study was spread over a period of two years and four months. The first reconnaissance visit to Turkanaland was made at the end of August, 1979. The survey and key informant interviews at Kaling and Lokitaung sites were conducted in November and December, 1981. In between, several study visits were made to selected regions where preliminary data were collected through observation, informal interviews and discussion with the people. The first draft of this thesis was completed in March, 1983.

CHAPTER 4

CULTURAL INTERPRETATION OF DROUGHT AND FAMINE AND SOCIAL RESPONSES

This opening chapter on data analysis has three objectives. First, it will give an overview of the impact of drought and famine in the study area as to enable us to appreciate the difficult economic conditions the people went through: conditions which they were forced to grapple with on their own before food aid was sent into the district by the government. Such an overview further aims at making the interpretation and analysis of data in the rest of the thesis more meaningful.

Secondly, in this chapter, the people's environmental perception, their interpretation of their economic predicament, shall be analysed. And finally, data on social response will be analysed by way of testing research hypothesis 1.

IMPACT OF DROUGHT AND FAMINE

(i) Livestock Losses in the Household:

Computation of the survey data revealed that before the drought each of the 65 families studied owned an average of 30 cattle, 80 sheep and goats, 2 camels and 2 donkeys. This is quite close to Kenya Rangeland Ecological monitoring Unit (KREMU) estimates of family herds for the year 1978 which averaged 22 cattle, 116 sheep and goats, 5 camels and 3 donkeys (see Ch. 1). The fact that usually the north

carries more livestock numbers than the south (see Table 3.2). is reflected in higher than average of cattle per family. The sheep and goats taken together were lower per family than the district average firstly because they are usually more difficult to count and, secondly, as has already been mentioned in Ch. 3, just before the drought the number of goats had been drastically reduced by an outbreak of Contagious Caprine Pleuroneumonia (CCPP).

After the drought, the surveyed families had an average of 0.3 cattle, 2.4 sheep and goats, 0.0 camels and 0.1 donkeys each. These figures suggest that only 1% of the pre-drought family cattle, 3% of the sheep and goats, 0% of the camels and 5% of the donkeys survived. This information could be summarized as follows:

TABLE 4.1: LIVESTOCK SURVIVAL RATES:

	Cattle	Sheep and Goats	Camels	Donkeys
t_1	30	80	2	2
t_2	0.3	2.4	0.0	0.1
sr (%)	1	3	0	5

Notes:

t_1 Means pre-drought family herds

t_2 Means after-drought family herds

Sr Means survival rate--t_2 expressed as percentage of t_1.

These findings, therefore, would suggest that the Turkana lost between 90-95% of their livestock from the drought. This highly drastic level of loss needs to be qualified to present a more realistic picture.

First, as we have already discussed in the "Methodology" chapter, there existed problems with "numbers" as the respondents seemed to have been in the habit of exaggerating their losses from the drought in the hope of receiving larger and more frequent relief rations. Secondly, the Turkana nomads never count their stock for "To count stock would be to challenge Fate".[1] It was as a result of careful probing that the figures came forth. They can therefore be quite deceptive unless cautiously interpreted. However, they give some rough idea as to the magnitude of the drought especially its impact on the poorer and more vulnerable nomadic households.

Secondly, as in similar disaster situations the world over, the Turkana case demonstrated the apparent existence of what Robert Dirks (1980) has termed "extraordinary contradiction" where there exist wealth amidst human misery.[2] The drought had varied degrees of stress down to the household level: some households were struck more severely than others. Apart from the varied responses to the survey questions which recorded both "total" loss and "some" loss, a visitor to Kaling would have wondered why it had been found necessary to feed all the Yapakuno

on famine relief food. Between 7 a.m. - 3 p.m. daily, large herds were watered in turns at Kaling traditional water point. Similarly, in the vicinity of Lokitaung, it was baffling to find a herd of anything up to a hundred healthy donkeys roaming the countryside as if this was one of the best years in the history of Turkana pastoralism. Since the contraditions were so obvious, all the 65 interviewees had been asked who owned these herds--those being watered at Kaling daily and the donkeys in the countryside. They gave varied answers which fitted three different explanations.

The first explanation was the argument that those stock belonged to the destitutes in the famine relief camps. They said that the stock which had survived the drought had been brought together by the owners who formed small corporate groups. As the owners moved to the famine relief camps, the livestock was left in the hands of a few specialised herders to whom payments in the form of relief food is sent from time to time.

The second claim was that those stock belonged to the nomads who had only mildly been affected by the drought. The respondents argued that these were the nomads who had been lucky to occupy hilly pastures during the drought and used them selfishly at the exclusion of others. They did not find it necessary to move into the famine relief camps and continued to live in the countryside even at the time of the study.

On this defence of pastures during periods of prolonged droughts, the anthropologist Philip Gulliver had once written:

> Some years ago when rainfall had been unusually poor for two years consecutively, dry-season grasslands on Pelekec Mountain failed before the dry season ended, and most cattle had to be moved. Some went west to parts of Muruapolon, some north-west to Thungut, Mogila and the Dodoth Escarpment, and some north, to Lokwanamur. In most cases men were to go to areas where they had bond-friends or kinsmen. One group, however, attempted to move en bloc to Naitamajong. Following early brawling, a serious fight occured, and some serious injuries were incurred on both sides. The "invaders" retired, split up and separately found entrance elsewhere. Naitamajong, the nearest mount to stricken Pelekec, had suffered almost equally badly, and the men there were genuinely afraid of the grave consequences if more stock came to graze there.[3]

From this historical observation, it could be possible that some Turkana nomads had access to better pastures than their less fortunate colleagues and thus saved quite a large portion of their pre-drought family herds. One, however, needs more substantive evidence before making authoritative conclusion on this claim about the selfish defence of pastures as a survival strategy. The literature on pastoralism is silent on this mode of adaptation.

The more vocal claim was that the stock one saw being watered at 'Kaling and the donkeys in the countryside belonged to

the rich salariat, those who are firmly integrated into the modern sector of the economy and thus use their salaries and various forms of non-pastoral sources of income to accumulate livestock. This claim supports Georg Henriksen's findings that the rich livestock owners in Turkana district are the teachers, politicians, businessmen and civil servants who rely marginally on their herds for subsistence.[4] Paul Devitt (1980) makes similar observations with regard to drought in Botswana.[5] Those who like a class analysis of drought and famine could in this respect view the phenomenon among the Turkana as a class famine where the poor suffer while the rich remain largely unscathed.[6]

(ii) Human Losses in the Household:

If we adopt our earlier definition of famine borrowed from Bennett (1968) as severe food shortage which results in raising a community's death rate, then one method of determining the magnitude of drought and famine is to use recorded deaths as tools of measurement. In the questionnaires, the 65 respondents had been asked to name all the members of the household (if any) who died from hunger or famine-related diseases such as cholera. The sex, age and status in the family of the dead were recorded in each case.

TABLE 4.2: MORTALITY IN THE SURVEYED HOUSEHOLDS [7]

	Households	%
Deaths recorded	36	55.4
No deaths recorded	29	44.6
TOTAL	65	100.0

Out of the 65 households survey, 36 of them (55.4%) recorded at least one death claimed to have been caused by starvation or famine related diseases. The total number of deaths recorded was 90, which gave an average of 1.38 deaths per family.

Crude computation of the data gives a mortality rate of 17.96 deaths per 100 head of population. This works out to approximately 180 deaths per 1,000 head of population. Although these are mere estimates made from the statistics, they would appear to portray quite a high death rate possibly caused by the drought and famine effects. However, the death statistics ought to be read against the background that:

(i) Even in the absence of drought and famine, the infant mortality rate is estimated to be 133 deaths per 1,000 live births.[8] These are the children who die before attaining the age of two years.

(ii) Deaths from natural causes throughout the population have to be read into these death statistics.

However, there is still some evidence which would suggest that a number of the deaths were caused directly by famine or famine-related diseases. For instance, two cases were deaths from cholera; and in the others, the parents and relatives of the famine victims provided what seemed to be valid diagnostic explanations as to the cause of the deaths: starvation. Thus starvation significantly increased the community's death rate; and essentially this is what Bennett defines as "famine".[9]

ENVIRONMENTAL PERCEPTION:

The symbolic interactionist theory which this study adopted to analyse the adjustment phenomenon among the Turkana nomads states that such adjustments are made through cultural filters of taboos, values, personality, etc. This approach, therefore, develops psychological tests which use verbal responses to pre-determined questions as a basis for analysis. The people's cognitive map of reality, their cultural values and individual personalities are all taken as crucial factors determining their choices of adjustments to drought and famine in this case.

The crucial sociological question to answer then is: What is the Turkanas' interpretation of drought and famine? Secondly, how would their interpretation of the change situation determine their choice of adjustments to drought and famine?

The elders interviewed[10] offered three broad but complementary explanations for the frequency and severity of droughts and famine today. They are cultural as well as historical. They all suggest that the people are aware of the social and economic changes which have swept through the community in the last century.

The first explantion is that the Turkana broke an important cultural taboo regarding warfare. They declared tribal war on their elder brother, the Ngijie of Uganda.[11] They said:

> Tradition handed down to us from our ancestors told us that we never (and do not) fight or kill a Ngijie. It is taboo. All our roots are found there. Stock marks are to be found there. But now they fight. No one knows who started the feud, but it is now bloody war fought with guns. It is stock that have been brought with tears and blood of our kin that have brought a curse on us. It has "burnt" all our stock wealth.[12]

The elders believe strongly that it is the curse from their elder brother, Ngijie, that accounts for the recurrent scourges. They think these calamities are not due purely to climatological changes; there are good pastures all along the borders but they cannot use them due to warfare and poor relations even with their own kin: Ngijie.

To illustrate their claim, the elders pointed out that after any bloody encounters with the Ngijie resulting in the

death of a Turkana, the Ngijie would always return home (Uganda), kill a bull and perform a "mock" burial ceremony as if the dead Turkana were a Ngijie. The significance of this in their religious practices is that they look on the Turkana not as "enemy" but as "kinsmen" who must be buried according to custom. The Turkana, on the other hand, do not observe a corresponding burial ceremony when they kill a Ngijie in such bloody encounters. The elders believe that this phenomenon has had the cultural effect of transferring "blood guilt" on to the Turkana: an evil spell which has caused their doom.

The elders thought that in order to be prosperous again, the Turkana must make peace with the Ngijie and plead with them to lift the curse. They concluded:

> We have to live in peace with the Ngijie if we are to survive as a people. It is only when there is peace that we can regain our economic prosperity of the past.[13]

Another group of elders[14] explained that the drought and famine predicament has been caused by a curse of Turkana elders due to intergenerational conflict in the community. They told a long story which cannot be retold here in full. I shall summarize its basics. It sounds partly factual and partly myth; but myths are part of a culture and therefore cultural data subject to analysis and interpretation.

The traditional rule by the elders (gerontocracy)[15] had the unchallenged powers of moderating cattle raids so as to make it a kind of sport rather than war. Thus raids and counter-raids had to be blessed and sanctioned by the elders.

It happened, about three generations ago, that the elders refused to bless or sanction anticipated raid because the people to be raided lived in a distant land and it was to the elders a risky exercise. The warriors, however, defied the orders of the elders not to undertake the raid. The elders tried to follow them to restrain them but the warriors rebuked them and told them to return home. They felt insulted and cursed themselves and the rebellious warriors and their generation-set.

The curse was that they would live at war with their neighbours. Their neighbours would not allow them to gain access to better watered pastures in their northern and western borders. Many Turkana would be killed in their attempts to force their way into these pasturelands.

The elders therefore said that the land has to be cleansed of that curse if they were to regain their lost economic prosperity. They suggested this could be done by organising a community-wide ceremony where the generation set representing the rebellious warriors would collectively present offerings in the form of livestock to the elders representing the offended

generation set. The latter would then be asked to lift the curse for it would be in the interest of all including themselves.

Finally, the drought and famine predicament is blamed partially on the declining powers of the emuron (diviner). Since this study was concerned with drought (absence of rain), it sought to enquire into the present status of the rain-maker. In the past, the most reputed emurons were also the rain-makers. The Emuron Akuj (Chief Priest) possessed the mystic powers of healing, communicating with God (Akuj) and inducing rain. These were the power bases of men like Koletiang and Lowalel which enabled them to wield tremendous amount of religious and political influence that transcended community borders.[16]

Responses from key informants and survey interviewees on the role of the emuron (rain-maker) seemed to suggest that his mystical powers are on the decline. The respondents viewed themselves as a people without a strong spiritual leader, unlike their grandfathers whose spiritual leaders like Lokerio spear-headed the occupation of the land and the acquisition of the camel. They lamented that the whiteman destroyed the spiritual foundation of the society by hunting down and killing powerful emurons and then introducing new religious practices. Thus the office of the emuron had since lost its customary mystic aura

that made it so formidable in pre-literate times. The office of the emuron remains legendry but of little practical use. Many people today, especially the youth and the educated do not take emurons seriously in their deliberations. The educated, for instance, campaign against the emurons calling them desperate opportunists interested only in making money out of a dying trade.

There was, however, some evidence that in times of crisis, the emuron is still consulted by those who still believe in his mystic powers. The emuron also still claims to be able to predict the coming crises and advises on measures to avert them. Prayers and sacrifices to Akuj (God) are still made at emurons' instructions. The dilemma facing the people is that in the majority of the cases their prayers are never answered.

Approximately 30% of the survey interviewees stated that they had been alerted of the coming 1979/80 drought and famine by an emuron by name Akiyobok, a Nkwatella of Lokwanamur. The majority of the respondents (70%) said, however, that they did not hear of the warning from Akiyobok. At the time there was no emuron among the Yapakuno or among the Ngissiger Turkana--a fact which may partly help to explain why not many people heard of his warning and religious advice.

The few who heard of the warning went through the required

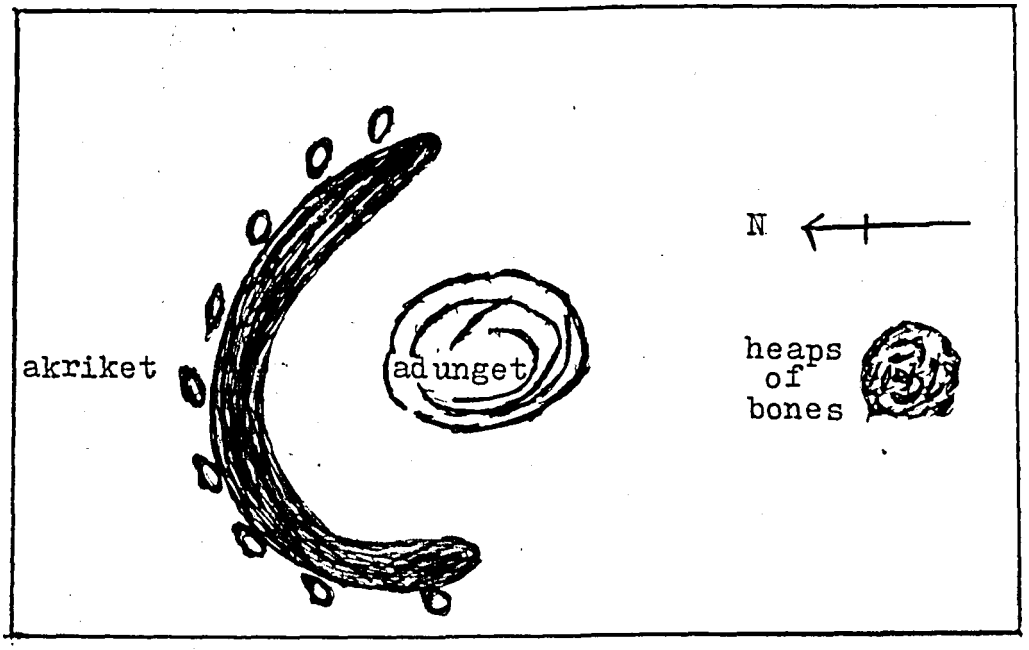
religious rituals individually like painting oneself with mud or performing community rites to induce rain and avert the crisis.

At Natoo village, about 10 kilometers south of Lokitaung town, a key informant, a mzee of nearly 90 years old,[17] led the author to a religious shrine in the mountains where prayers had been conducted and sacrifices made to Akuj (God) when the local people heard of Akiyobok's warning and instructions. Two camels had been slaughtered and offered as sacrifices; and heaps of their bones were still at the site at the time of the visit. The shrine is sketched in Fig. 4.1 below:

This particular prayer function was led by the eldest man in the village at the time named Lomoria Kilatar aged approximately 80 years. Lomoria since died during the drought when he went out of his home area to look for food. Like Lomoria, the emuron Akiyobok also died during the drought. To the people, their deaths meant that the mystic powers of the emuron had seriously declined. It was bad omen to the people.

When further enquiries were made to hear from the people why they think prayers are ineffectual today, the key informant at Natoo who is now in charge of the shrine explained:

Fig. 4.1: AKIPEYARE or AMURONOT



Notes:

- Akipeyare or Amuronot is the shrine or prayer site.
- Adunget is the altar on which the sacrificial beast is slaughtered and its meat is later placed after roasting ready for the eating.
- Akriket is the semi-circular formation of stones on which the wazees (elders) sit during the ceremony.

> One reason which makes these ceremonies fail to be effective today is because of the change of things from true meditation and submission to God to the situation of hypocrisy. These days people who come to the ceremonies are motivated more by the desire to eat the slaughter rather than serious prayer, hence the slaughter of camels instead of goats. But still many people go home angry that they did not eat enough. So it is not prayer, it is feasting. It is all hypocrisy. And the gods refuse to be fooled as the people do not humble themselves before them. Moreover, after the prayers, many people return to their manyattas and commit various sins, for example wife beating, which anger the gods. That discipline that would make prayers effective is sadly not forthcoming.[18]

IDENTITY CRISIS:

The magnitude of the drought and famine which we have discussed in the preceding pages seemed to have had serious psychological effects on the people. The heavy livestock losses were emotionally disturbing. The psychic stress became more intense due to starvation and loss of human life particularly children.

What distressed the people most gravely is the fact that over the years they have witnessed a systematic erosion of pastoral values, ideology and life style. They see a society caught in a crisis as it drifts into the unknown future. Even their religious and cultural practices for averting droughts and famine have become increasingly obsolete due to the declining powers of their spiritual leaders.

The people saw themselves as having lost control over their

destiny and were drifting into the gloomy future. They were caught up in a serious identity crisis. Key informants at Kaling put their predicament forth in the following poetic words:

> We are not Turkana.
> (PAUSE)
> We A - R - E not Turkana.
> The people you see here in the famine
> camp are not Turkana.
> The Turkana are up in the mountains
> tending their stock.
> Those who are here are destitutes--
> MAA-SIKINI, people who have lost their
> Turkana identity.
> To be Turkana means:
> To own livestock;
> To be well fed in milk, meat and blood;
> To have wives and children who bathe
> in milk and ghee;
> To be held in high regard as manager of
> livestock;
> Today we are not men, we are animals.
> We are now fed on MCHANGA - meaning soil,
> filth, sand - by government, and,
> We diarrhoea, and our children develop
> over-grown bellies.
> WE ARE NOT TURKANA.[19]

I found this portrait of the changing Turkana pastoral life important for this study because it kept recurring in subsequent interviews. It represented a consensus view about the economic problems facing the people. For instance, weeks later, at Kachoda village in Lokitaung, another key informant projected the same image of a changing pastoral life using slightly different words. He said:

> A Turkana has three legs:
> Two human legs; and one, the third,
> is social -- his livestock.

> The third leg is the most important in human relations.
> Remove his livestock and he is a cripple.
> Without livestock, you cannot mix freely with other colleagues and peers.
> You cannot ask for food and be given with a clean heart.
> You cannot ask for a wife and be given.
> You cannot entertain friends and relatives.
> YOU ARE NOTHING.[20]

SOCIAL RESPONSES:

The economic disaster which faced the Turkana nomads as a result of the drought and famine made it imperative for them to seek out for ways of topping up their household food reserves. This they did through a number of adjustment mechanisms whose analysis is the subject of this part of the thesis. The research hypothesis to be tested here stated that drought and famine stimulate the search for potential allies. The analysis is based on the interpretation of questionnaire interview responses primarily.

Trade Ties and Symbiosis:

During the drought and famine, previous ties with the traders and businessmen in the district and symbiotic relations with the Merille of Ethiopia were revitalized and exploited to the full as survival strategies adopted by the famished nomads. The respondents said that without these two allies (the traders and Merille) it would have been much more difficult for them to cope with these hardships.

There was increased dependence on the Oria (Somali) traders who travelled with their merchandise in large trucks to the countryside and bartered them for goats, hides and skins. Similarly, the nomads forged greater ties with the various market and rural centres[21] where they sold their hides and skins to traders for cash. The cash income was then used for precuring essential commodities from the local commercial stores. From these transactions, the Turkana nomads were able to maintain a fairly steady supply of maize-meal, sugar, salt, tobacco, soda, tea leaves and other essential commodities. The peak period of this business was between September, 1979 - June 1980. After that period, things became much more difficult since there were now no more hides and skins to sell as most of the stock had long died. Moreover, the people had run out of cash previously earned from the trade in skins.[22]

Symbiotic relations have existed between the Turkana and the Merille for as long as the two pastoral communities have existed as neighbours. We have seen in the literature chapter how the Turkana used to cope with droughts and famine by exploiting these kind of relations for survival. The Turkana traded with the Merille and sometimes settled among them during such periods of hardship.

The data reveal that such symbiotic relationships still exist between the two communities and were used extensively to cope with the drought and famine. Many famished Turkana households went

across river Omo into Ethiopia either to trade or beg food from affines. Those who went to trade used dry skins, ornaments or cash to buy food. They bought sorghum, maize and maize-meal.

The practice has been for the household heads to send their sons or wives to look for the food. However, in one instance there was mass emigration of famished nomads who wanted to settle temporarily in Merilleland to take advantage of the better food situation across the borders. The Ethiopian government was reportedly airlifting food from Addis Ababa into the area twice a week. Kenya's security men at Numurupus border post refused to allow such mass emigration for reasons which the respondents were unaware of. Movement in small groups for the purpose of trade was, however, permitted and through it, it would seem the Ethiopian government, by default rather than design, helped to feed the drought and famine-stricken Kenya nomads.

Migration:

From the case histories compiled during survey interviews, migration was found to have been yet another important mode of adaptation to drought and famine. Further evidence was obtained from the responses to a specific survey question which sought to elicit information on migration.

At first there were mass wanderings in search of food as it became clear that a famine was approaching. Then there were selective migrations of individuals from the northern pasture-lands in the Ilembi Tiangle southwards to the market and rural

centres, to the lakeshore, and down-country.

Migrations were determined by the individual's environmental perception, a good geographical knowledge of the territories ahead and most important, the existence of friends, kinsmen or affines at the receiving end. Those who so migrated said that it was not just a plunge into the unknown wilderness; they knew where they were going and they believed before setting off that they would find someone to welcome and give them hospitality.

One respondent said he walked from the Kenya-Sudan borders to Kitale in search of employment. But it took him nearly one month to reach Kitale because the journey was made in stages. He walked to Kakuma, then to Lodwar, later to Katilu, and finally through West Pokot to Kitale. At these named stopping places, he stayed a couple of days with a friend, a kinsman or affine before proceeding farther.

From what came out of the interviews, it would seem that in certain instances the migrants merely exploited fictive kinship ties to find a place to stay while looking for a job or waiting to move to the next stopping place. For instance, the respondent who walked to Kitale said:

> I used to hear that a distant cousin had settled in Kitale with his family after the drought and famine of 1974. I had hoped to trace him and ask for his help in getting a job.[23]

This respondent had hoped to settle at Kipsongo, a Turkana slum in Kitale. The village is estimated to have a population of 2,000 poor Turkana who over the years have been driven out of Turkanaland when they lost their livestock due to raids, drought or epidemics.[24]

Another migrant had walked down the Lotikipi plains to Kakuma, through Lokitaung and Kokuselei down to Kalokol. This respondent appeared to have experienced a more difficult time than many of the migrants for he was trekking with the whole family. The household ran out of food before reaching Kakuma at a place called Lekudule. He was therefore forced to prematurely marry out his eldest daughter (or was it pawning?) to a rich man in exchange for food. Two other younger sisters remained behind with the newly married daughter as the rest of the family continued south subsisting on the bridewealth.[25]

It is evident that outmigration from Turkana district increases during drought and famine. The respondents who had migrated said that many migrants joined up and walked in small groups to Kitale and Maralal in Samburu. Some of them returned when famine relief food was brought but many they knew never returned.

This outmigration trend might help to explain why according to the 1979 population census, as many as 34% of the Turkana were listed as migrants. The leading receiving districts were

found to be Samburu (13,444), Trans-Nzoia (12,660), Laikipia (9,568), Uasin Gishu (4,705), Nakuru (6,002) and Isiolo (4,533).[26]

In the urban centres in the district, the migrants from the countryside engaged themselves in all sorts of odd jobs. A number of them settled down and took to basket making, rope making, charcoal burning, chang'aa brewing, and various types of what Ander Hjort has termed the "10 cent trade".[27] This they did in the attempt to eke out a meagre living.

Splitting Families:

In pastoral communities, the practice of splitting families to better manage the family herds is a dominant feature of their life. However, the kind of splitting families which emerged with the drought and famine among the famished Turkana nomads is entirely new. It was done specifically to ease pressure on existing household food resources and to save life in a manner comparable to the Somali case described by Lee Cassanelli.[28] The data were particularly rich in cases of children who had been sent off either to kinsmen, friends or to school as a survival mechanism. It was in a way a mechanism for sloughing off population from the pastoral sector. One respondent said:

> Before the drought I had 12 cattle, 150 sheep and goats and 2 donkeys. After the drought I remained with only 32 sheep and goats. Therefore my second wife and her four children went to Kalokol to look for work. She works for a Jaluo trader there.

> I stay here at Lokitaung with my first wife. She has five children in all; four are with us here and one we sent to a boarding school at Lodwar. Unless the family is so split, it would be difficult for us to survive.[29]

Of particular interest for this study is the practice during the drought of sending off idle children to school due to lack of pastoral duties and the shortage of food. The school is popular at such times because nearly all the primary schools in the district have boarding facilities where the children are fed by the government or the missionaries. The school enrollment rises during the drought and probably decreases in good times. For instance, the total primary school enrollment in the district rose to over 9,000 pupils in 1980 from 4,430 in 1978. As we have discussed in Ch.1, 1978 was a prosperous year while 1980 the drought had stretched the pastoral economy to its limits. The ten government aided primary schools were full to nearly three tiems their authorised capacity.[30]

We could demostrate this point by examining the enrollment trend at Kaling primary school during the period. The annual statistical returns obtained from the headmaster showed that the school's enrollment rose from 78 pupils in 1978 to 181 in October 1981. Table 4.3 below illustrates the trend.

TABLE 4.3:· KALING SCHOOL ENROLLMENT DURING 1978 - 1981

	Classes					
Years	1	II	III	IV	V	Total
1978	58	10	10	-	-	78
1979	22	25	15	15	-	77
1980	81	21	4	3	4	113
1981	114	40	19	5	3	181

Source: Kaling Primary School, Annual Returns, Kaling, November, 1981.

The figures in the table indicate that the school enrollment in 1981 was more than twice that of 1978. This,however,. reflects the general trend in the district where the total enrollment in 1980 was already more than twice that of 1978.

For Kaling, the lower classes, particularly Class 1, attracted more pupils than any of the other classes. Kaling was in 1981 forced to run three streams of class I due to this sharp rise in enrollment. The Kaling statistics further revealed that parents in that area appear to send more of their daughters to school in good times; in periods of economic hardship when there are few herding duties for the boys, they would then be sent off to school. This can be seen from Table 4.4.

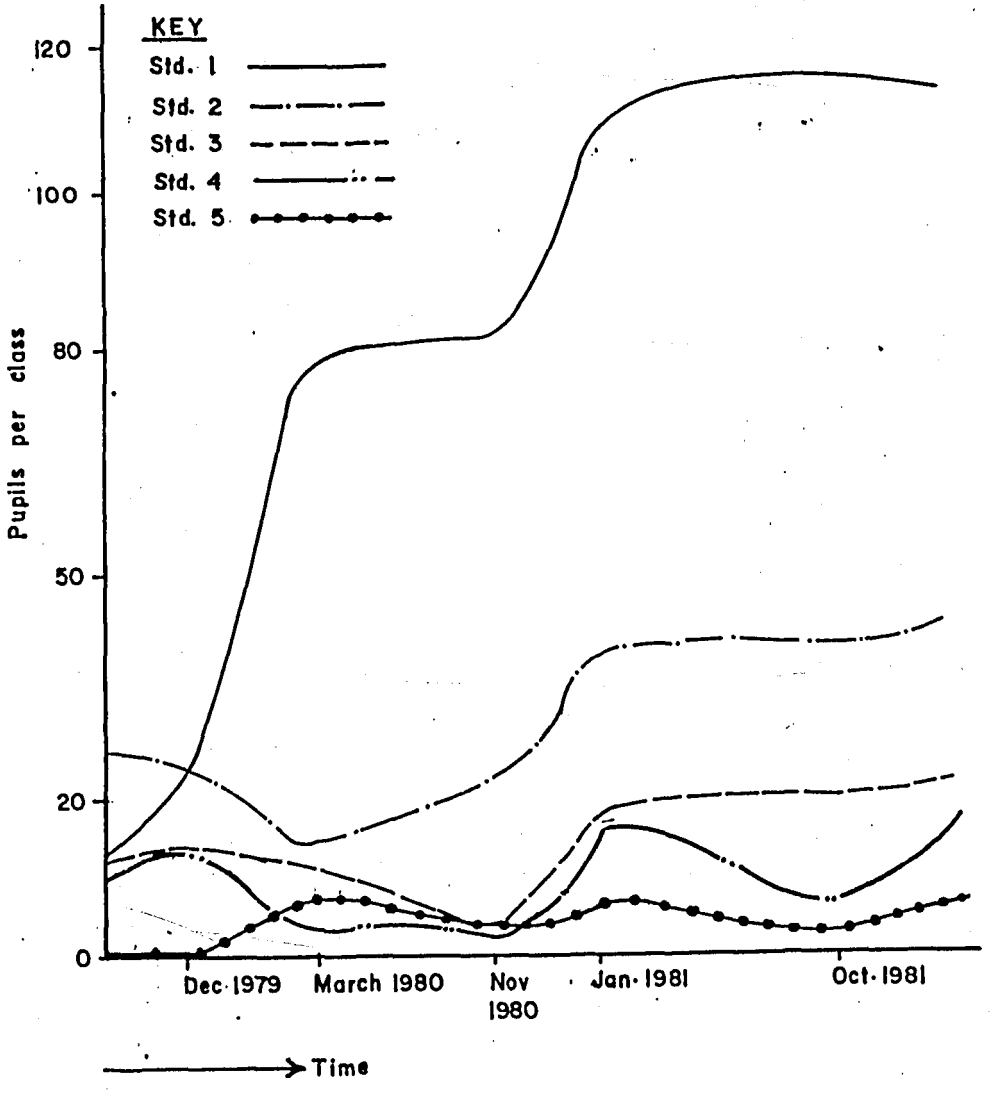
TABLE 4.4: PRIMARY SCHOOL ENROLLMENT AT KALING BY SEX, 1978 AND 1981

Years		Classes I	II	III	IV	V	Total	%
1978	Boys:	16	17	4	-	-	27	34.6
	Girls:	42	3	6	-	-	51	65.4
1981	Boys:	89	28	14	4	3	138	76.2
	Girls:	25	12	5	1	-	43	23.8

Source: Kaling Primary School, Annual Returns, 1978 and 1981, Kaling, November, 1981

The rush for Class I places at Kaling in order to ease the consumption strain on the household resources could further be depicted on a graph

Fig.4.2 : School enrolment at Kaleng as drought and famine intensified, 1979-81



Pooling Resources

There was evidence which suggested that after the drought, herders joined together in corporate groups and pooled their surviving stock in order to exploit economies of scale. The respondents at the famine relief camps said that once the livestock had been so pooled, they were left in the hands of a few selected men or families in the pasturelands as the rest moved into the camps. Migrants had similarly left their families and livestock with kinsmen, neighbours or friends as they went out in search of wage employment.

The respondents went on to explain that this mechanism of pooling resources after a drought or loss of livestock from catastrophes is customary. Historically, the able-bodied dispossessed nomads would leave behind whatever had remained of their stock and "disappear" into distant lands to settle and work there temporarily. Most of them would emigrate to Merilleland. There exists written evidence to this effect.[31]

The dispossessed would live among the Merille for as long as the economic hardships lasted; it could be even two years. When good times returned, they would collect their 'pay' and gifts in livestock and return to Turkanaland to re-enter the mainstream of pastoral life. This was quite similar to what other nomads such as the Gabbra and the Maasai did in response to drought and famine.

On their return, these migrants would receive their share of the built-up livestock from the pooling system. Bridewealth was yet another source of stock wealth. The Turkana marriage customs help in the distribution of the bridewealth in the extended family.[32]

Reciprocity:

On reciprocity, all the 65 (100%) respondents interviewed said that during the drought and famine they received no gifts in the form of livestock from bond-friends. Similarly, they indicated that they could not remember having given away much. But they hastened to add that small food gifts were received through the traditional hospitality system. Yet even these were seriously limited by the depletion of household food resources due to drought. Moreover, the mass wandering and dispersals due to drought tended to separate bond-friends making immediate contact difficult.

Quite a number of respondents stated that they looked after their friends' families or children in the case of those who had to migrate in search of food or employment. They further explained that reciprocity involving the exchange of livestock gifts works best in building up the herds after a drought rather than as a source of subsistence during famine. They said that there were already positive indications that the exchange of livestock had begun among kinsmen, affines and trusted bond-friends on a limited scale in anticipation for a return to pastoral life.

When the respondents were asked if it is true that the pulverization of reciprocity forces the poor to fall off the exchange network,[33] they noted that with respect to the 1979-80 drought and famine there was no such thing as "falling off" for the majority of the people were almost equally hard-hit. Turkana culture prohibits asking for help from a neighbour, kinsman or friend who is himself a victim of a disaster; you console him, you do not beg from him. To do so is culturally viewed as anti-social and an insult.

The responses discussed in this final section of the chapter show that during the drought and famine under study, the famished nomads sought out allies as a way of coping with the stressor. These allies included traders, businessmen, kinsmen, friends, affines and the school. The evidence supports the hypothesis that drought and famine stimulate the search for potential allies.

Summary:

This chapter reveals that the Turkana pastoral economy has become highly vulnerable to droughts. During the 1979-80 drought period, the Turkana lost many of their livestock and many of the people were rendered destitute. The people saw themselves as caught up in a crisis.

There is evidence that the drought led to deaths from starvation judged from the high death rates during the period. The evidence available also indicates that the famished Turkana had applied various ways of weathering the food crisis. Thus

they did not just wait passively but creatively ventured out to find ways and means of survival. It was not a cul de sac -- a dead end -- for them.

CHAPTER 5

IMPEDIMENTS TO ADAPTABILITY

In the previous chapter, a number of responses were discussed as brought out in the data. These included dependence of traders and businessmen in the district, symbiotic relationship with the Merille of Ethiopia, migration, family splitting and the corporate pooling of resources to take advantage of the economies of scale.

However, since response to drought and family (adaptability) does not take place in a vacuum, a critical analysis of some of the response impediments would help deepen our understanding of the adaptive phenomenon. Secondly, we can only discuss the policy issues emanating from this study more meaningfully if we could address ourselves not only to responses per se but also to factors which promote or impede them. It is only with such knowledge that one could make suggestions about how to improve the adaptive capacity of the nomads, more so the Turkana.

In the methodology chapter it was spelt out that two localities, Kaling and Lokitaung, with different ecological setting, were selected to help in assessing the impact of the environment on adaptability. To guide the study, a hypothesis had been advanced that the social and economic resources accessible to famished nomads determine the range and scope of adaptive responses. This hypothesis will be tested using available qualitative and quantitative evidence gathered during the fieldwork.

The purpose of the test will be to find out if there existed any statistically and qualitatively demonstrable differences in the impact of famine on the sample populations at Kaling and Lokitaung taken separately. Should there be such differences, we shall seek to analyse the responsible factors. We shall use the X^2 (Chi-Square) test for the comparative analysis. It will be necessary for purposes of comparison to carry out the test in two stages. First, we would like to test if the impact of drought was different at the two sites. This impact will be measured in terms of livestock losses. It is true there could be other ways of determining the impact of drought scientifically, but for this study "livestock losses" were used as the measuring tool. Secondly, a similar comparative analysis of the impact of famine in terms of human losses will be carried out. On the basis of the results of the two tests, we shall then proceed to discuss the factors which impinge on adaptability.

Table 5.1: Livestock Losses at Kaling and Lokitaung

(per household)

	"Total" Losses (more than 75%)	Partial Losses (up to 75%)	Total
Kaling	14	21	35
Lokitaung	18	12	30
	32	33	65

Ho: Livestock Losses at the two localities were similar

H_1: Livestock Losses at the two localities were different.

d.f = 1.

The dicision criterion at 5 percent level $X_{0.05}^2 = 3.841$

The calculated X^2 is 2.5839, which is not significant at 5 percent level.[1] We therefore retain our null hypothesis that livestock losses from drought were similar for the two sites: Kaling and Lokitaung. The next step in our test will be to find out the impact of famine at the two localities.

Table 5.2: Human Losses at Kaling and Lokitaung (per household)

	Households recording deaths	Households recording no deaths	Total
Kaling	26	9	35
Lokitaung	10	20	30
	36	29	65

Ho: Deaths from famine were independent of locality

H_1: Deaths from famine were dependent on locality

d.f. = 1.

The decision criterion at 5 percent level $X_{0.05}^2 = 3.814$.

The calculated X^2 is 10.9192, which is highly significant at 5 percent level.[2] We therefore reject the null hypothesis and accept the alternative hypothesis that deaths from famine were associated with locality.

To help improve the precision of our conclusion concerning the relationship between death from starvation and the ecology, more categories were introduced into the contingency table and a further test done. The test yielded the same results as the previous one causing the null hypothesis to be rejected and the alternative hypothesis to be accepted.(3)

These findings were important for our analysis for they show that while the impact of drought had similar effects in terms of livestock losses at Kaling and Lokitaung, famine was severer at one of the sites than at the other. Table 5.2 shows that Kaling was struck more severely by famine than Lokitaung. Table 5.3 below shows the distribution of deaths per household for the two sites.

Table 5.3: Human Losses in the household at Kaling and Lokitaung

Deaths per Household	0	1	2	3	4	5	Total
Kaling	9	5	7	5	5	4	35
Lokitaung	20	6	3	0	1	0	30
Total	29	11	10	5	6	4	65

Computation of the distribution of the deaths in Table 5.3 indicates that there were a total of 90 deaths recorded at both sites. Out of the 90 deaths, 74 of them (82%) occured at Kaling as compared to 16 (18%) for Lokitaung. In addition, most of the

households at Kaling who recorded deaths lost between 3-5 members each as compared to 1-2 for the corresponding Lokitaung households. It could even be argued here that the deaths at Lokitaung were due to natural causes rather than from famine. They were comparatively too few.

Kaling had 26 households suffering deaths as compared to 10 households for Lokitaung. And on average Kaling lost 2.11 persons per household while the average for Lokitaung was as low as 0.53 deaths per family. Thus the Kaling average was far above the average for the whole sample which was 1.38 deaths. The average for Lokitaung was on the other hand much lower than that for the sample population.

These statistics empirically demonstrate that it was Kaling locality which was more severely hit by famine. It now remains for us to discuss the causal variables. The question to be answered is: Why did the people of Kaling suffer so severely from famine while the people of Lokitaung escaped almost unscathed? The respondents provided the answers in the attempt to explain the differences.

Firstly, Kaling is isolated and far removed from any major population concentration centre such as towns or markets. In a word, it is remote. The nomads who live around Lokitaung are on the other hand blessed in having a more favourable environment. They live near to Lokitaung town, the lake where there is industrial fishing, and other market centres like Kokuselei, Namuruputh,

Lowarengak and Nachukwi. These are areas of diversified economies as opposed to almost pure pastoral economy of the Kaling ecosystem.

Therefore, because the Ngissiger are more exposed to the modern sector of the economy than the Yapakuno, they seemed to have coped better with drought and famine. The men of Lokitaung environment were better placed to pursue many ends to top up their domestic food reserves than the people of Kaling whose social and economic infrastructure are poorly developed.

Secondly, the inter-tribal feuds between the Nyangatom of the Southern Sudan and the Turkana, especially the Yapakuno, precluded symbiotic interaction.[4] Consequently, the only symbiotic interaction during the drought and famine under study was between the Turkana and the Dassanetch (Marille) of Ethiopia through the Namuruputh gateway (see map in Appendix). Yet ironically the Turkana share much wider territorial borders with the Sudan than they do with Ethiopia. Thus, on account of their living farther to the north, the Yapakuno became greater victims of the forays from across the Sudan borders than the Ngissiger. In this regard we can argue that their social environment is hostile and militates against adaptability.

Thirdly, when the respondents were asked to list their sources of non-pastoral food during the drought and famine, the impact of the ecology on adaptation became quite marked. While the Yapakuno listed wild fruit, berries and nuts as major sources, the Ngissiger

listed these at the bottom of the scale. Incidentally, the Ngissiger included rice and fish in their list! The differences were indeed remarkable.

Table 5.4: Sources of Food during drought and Famine (Kaling and Lokitaung compared)**

KALING	LOKITAUNG
Chief Sources:	
. Bought food from Oria . Bought food from Ethiopia . Ate wild fruit, berries and nuts	. Bought food from Oria . Bought food from Ethiopia
Other sources:	
. Sent away some of the children to feed in school . Got help from Kinsmen/ friends . Migrated down country to look for wage employment	. Bought food from the shops . Went to the lakeshore to look for fish. . Sent away some of the children to feed in school. . Got help from missionaries . Migrated down country to look for wage employment. . Worked for others as paid labour locally. . Ate wild fruit, berries and nuts.

** Notes:

(1) The responses were scored and given in the Table in a descending order. The Yapakuno had limited adjustment choices. The Ngissiger had several openings.

(2) Nobody named Sudan as his source of food. This was due to lack of symbiosis between the Turkana nomads studied and the Nyangatom who are their northern neighbours.

The assortment of wild fruit, berries and nuts named by all the 35 Yapakuno interviewees included edapal, ebei, and eng'omo.[5] Edapal was the most dominant in the diet: Even in the famine relief camps at Kaling, it was still part of the diet at the time of the study. Edapal is a semi-poisonous wild fruit which is gathered in bags, brought home and processed by the women for consumption. It is boiled and pounded several times to remove the poison. The recovered and processed beans are then cooked and eaten. In the famine relief camps, the edapal beans were mixed with maize and cooked together as the destitutes' equivalent of githeri or nyoyo.

But while the story of hunter-gathering was popular at Kaling, the drought and famine situation at Lokitaung had a marked contrast. The people had many openings. One respondent at Punipuni in Lokitaung narrated how his family survived; and from a content analysis of his story, one sees a people responding to a much more socially and economically dynamic environment. He told the author:-

> I migrated from Kokuro via Lokitaung to Lowarengak. I survived on posho (maize meal) bought from Oria traders with skins. Earlier, my wife and some of the children had left via a different route and travelled to Namuruputh border post. She crossed the border into Ethiopia and bought grain using skins and some of her ornaments. They lived on the food they bought until we re-united months later at Lowarengak.
>
> Before famine relief food was brought, I used to go to the fishermen to beg for fish. Some of the children went to the market centre to beg for money. When I got fish and they got a shilling, we could buy posho (maize meal) with the money and cook ourselves a meal.
>
> Later we heard that famine relief food had been brought to Lokitaung. We moved there and entered the camp. We found when the Catholic priests there had been giving free rice and cooking fat to mothers with hungry children. We got some. I had five children and they all survived the famine.[6]

Our argument, therefore, is that this wide range of opportunities at Lokitaung locality saved the people. They survived unscathed. The Yapakuno were not equally lucky: they suffered.

We want to argue further that the Yapakuno's heavy dependence on wild fruit, berries and nuts as a result of the severe drought of the period under study (1979-80), had contributed to the high death rates recorded at Kaling. It is true one cannot make a conclusive statement on this without a laboratory test of their food value. But, even in the absence of such tests, the food value of wild fruit, berries and nuts cannot match that of livestock products such as milk, blood and meat to which the pastoralists are accustomed.

Age as a factor in adaptability:

One other social variables which this study sought to examine in relation to adaptability was age. The literature review showed that in times of famine in many societies, the children and the aged are more vulnerable to the stress than the economically active section of the population. This means that the active population respond better to the drought and famine stress than the children and the old. For instance, Passmore writes:

> Statistics gathered in Punjab during famine in 1939 show drastic increases in the total death rates for those under 10 and 60 years; at the same time, deaths for those between 10 and 60 declined.[7]

Our understanding of famine is that its impact varies down to the individual level: some sections of the population suffer more than others. All this has implications both for theory and policy. For instance, Mbithi and Wisner have pointed out in an earlier study of this kind in Eastern Kenya that:

> ...the formation of a famine relief policy which does not address itself to the various target groups is likely to be a deficient exercise. These target groups include...children, pregnant mothers, invalids and the aged.[8]

Thus the purpose of the analysis in this section of the chapter is to try to find out if the Turkana situation demonstrated this seemingly universal trend in adaptability where age is a crucial factor when it comes to coping with famine stress. The question to be asked and answered was: Did age affect adaptability or

did it not make a difference? If age influenced the degree of adaptability, what are its implications for theory and policy?

In the Methodology chapter, we explained that for the purpose of this analysis, the sample population would be divided into two broad categories along age: the dependent population (0-9 and 60 and over) and the economically active population (10-59). This categorization follows very closely to what the literature has on the division of labour in pastoral communities in East Africa.[9]

Traditionally pastoralism was a full-time occupation for all. Everyone from the ages of 5-8 years was actively engaged in production. The division of labour was along age and sex. For the males they were most economically productive when they were still youthful, energetic, agile and could move fast and far over the difficult terrain as herders, scouts and warriors.

The women, assisted by boys and girls, looked after small stock (goats and sheep), camels, donkeys and sick animals. They were also responsible for watering the family herds, did all the milking, prepared food for the family and built the manyattas (make shift dwellings). They remained productive longer than the men. Like their counterparts in the agricultural communities, the nomadic woman tended to be overburdened with agricultural duties.

Our categorization of the population into "dependent" and

"economically active" is based on this understanding of the traditional division of labour. It is, however, not a rigid categorization for pastoral societies are dynamic and rapidly changing, with new patterns of division of labour emerging. Ours is a mere guide for analytical purposes; the reality on the ground may deviate quite a bit from the "pure" types sketched here.

While a more detailed record of mortality rates per household and per age groups could be found elsewhere, Table 5.5 below shows deaths for the two age categories.

Table 5.5: Mortality by Age Categories

Age Category (Yrs)	Deaths Recorded	%
0 - 9	49	54
10 - 59	34	38
60 and over	7	8
Total Deaths Recorded	90	100

The above table shows that out of the 90 deaths recorded, 49 of them, representing 54% of all the deaths, were of those between 0-9 years of age. The rather wide class interval, 10-59 age bracket, recorded 34 deaths, representing 38% of the deaths.

The last age group, 60 and above years, recorded 7 deaths, representing 8% of the all the deaths. These figures, therefore, show that the dependent population (0-9 and 60 and above) suffered 56 deaths all together. This was 62% of the deaths. The economically active on the other hand suffered only 34 deaths, which is 38%. Thus the great jeopardy of the children below 10 years and the aged of 60 and above years seems to be clearly demonstrated by these findings. They are in agreement with what is in the literature, particularly those of Passmore (1950) already cited.

It is, however, not true that deaths are associated with age simply because 62% of the deaths came from the dependent population while 38% came from the economically active part of the population. Our conclusion may be deceptive if based merely on frequency distribution and percentages without further tests of proportional differences and of association using regression and correlation analysis. We would like to strengthen our test of hypothesis by the help of these latter tools of statistical analysis. The reasons being:

1. We have to demonstrate empirically that the death rates for the two age categories are significantly different. For instance, one has to show how 62% is different from 38%. The mere fact that one is larger than the other is not sufficient reason for making a valid conclusion to that effect. In this case, the deaths will have to be expressed in proportions and then a statistical test of differences using

z-distribution will be applied.

2. For association between death and age, we shall make use of regression and correlation analysis. This will entail the use of bivariate linear and curvilinear correlation analysis - where age will be the independent variable and death is the dependent variable. Here again, I do not know how I can make a conclusive statement regarding association without making such tests.

The important point for our analysis is to use every available tool, but not all, to convince ourselves that there exists a real and not fake association between the two variables:death and age. It is only then that the hypothesis which anticipated association between death and age can be conclusively tested. Since this analysis has not benefited from the services of a computer, tables on death rates will be presented and the statistical computations done manually with the help of a desk calculator. From the results of the computations, conclusions regarding association shall be derived for the analysis.

During the interviews, the ages of all the household members for all the 65 families studied were recorded. Secondly, the ages of the family members who died during the drought and famine were recorded, including the year of the death. We recorded their ages or approximate ages when they died. These two sets of information enabled us to:

(a) determine the original size of each of the 65 families, how many of their members were lost and their ages.

(b) prepare a frequency distribution of the deaths per age group and ultimately to compute the respective death proportions.

Table 5.6: Mortality by Age Groups

Age Groups (Yrs)	t_1	t_2	Deaths in Absolute Numbers	Deaths as Proportions
0 - 9	161	112	49	.304347
10 - 19	79	67	12	.151898
20 - 29	141	125	16	.113475
30 - 39	52	50	2	.038461
40 - 49	33	32	1	.030303
50 - 59	17	14	3	.176470
60 and above	18	11	7	.388888
	501	411	90	.1796

For the purposes of computing the statistical differences between the deaths in the dependent population and those in the economically active population, the data in Table 5.6 above were re-arranged as below.

Dependent Population	179	123	56	0.312849
Economicaly Active	322	288	34	0.105590
	501	411	90	0.1796

Ho: Death rates are the same for the two age categories.

H_1: Death rates are different for the two age categories.

α = 0.05; and the critical limits of z under the null hypothesis are ± 1.96

Using the formula for the testing the differences in the case of proportions, we get:

$$\sigma_{p_1-p_2} = \sqrt{\left[\pi(1-\pi)\left(\frac{1}{n_1}+\frac{1}{n_2}\right)\right]}$$

where $p_1 = 0.3128$; $p_2 = 0.1056$; $\pi = 0.1796$; $n_1 = 179$; $n_2 = 322$;

$$z(\text{calculated}) = \frac{p_1 - p_2}{\sqrt{\left[\pi(1-\pi)\left(\frac{1}{n_1}+\frac{1}{n_2}\right)\right]}}$$

$$= \frac{.312849 - .105590}{\sqrt{\left[(0.1796)(0.8204)\left(\frac{1}{179}+\frac{1}{322}\right)\right]}}$$

$$= \frac{0.207259}{\sqrt{(0.001281)}}$$

$$= \frac{0.207259}{0.03581}$$

$$= \underline{5.78774}$$

Z(calculated) is more than 1.96 which set the critical limits for the acceptance region of the null hypothesis. We therefore reject the null hypothesis at 5 percent level. In fact the differences are significant even at 1 percent level. We accept the alternative hypothesis that death rates are different for the two age categories.

Up to this point, however, we have only proved that the dependent population suffered more severely from the devastations of drought and famine than the economically active part of the studied population. It would, however, be necessary to test for a bivariate correlation between death and age. We would like to do this before we move on to discuss the results. We shall regress death rates on age and compute Pearson's product - moment correlation (r), and the coefficient of determination (r^2). From Table 5.6 above, the following regression table was drawn up.

Table 5.7: Regression of deaths on age

x	y	x^2	xy	y^2
4.5	.30	20.25	1.35	.09
14.5	.15	219.25	2.175	.0225
24.5	.11	600.25	2.695	.0121
34.5	.04	1190.25	1.38	.0016
44.5	.03	1980.25	1.335	.0009
54.5	.18	2970.25	9.81	.0324
70.0	.39	4900.0	27.3	.1521
247	1.2	11871.5	46.045	.3116

$$r = \frac{n\sum xy - \sum x \sum y}{\sqrt{\left[n\sum x^2 - (\sum x)^2\right]\left[n\sum y^2 - (\sum y)^2\right]}}$$

$$= \frac{(7)\ (46.045) - (247)\ (1.2)}{\sqrt{\left[(7)\ (11871.5) - (247)^2\right]\left[(7)\ (.3116) - (1.2)^2\right]}}$$

$$= \frac{25.915}{\sqrt{(16374.2198)}} = \frac{25.915}{127.96}$$

$r = 0.2026$

Therefore the coefficient of determination, r^2, is 0.041. The results indicate that the coefficient of linear correlation between death rates and age is quite low; it is trivial.(10) The subsequent test of hypothesis for r further showed that the low value for r did not occur by chance or through sampling error. It is representative of the state of affairs in the parent population from which the sample had been selected.(11) This therefore made it necessary to test for curvilinear or non-linear association between the two variables. This entailed the introduction into Table 5.6, columns for x^3, x^4 and x^2y; the solution of three normal equations:

$$na + b\sum x + c\sum x^2 = \sum y \quad \ldots\ldots\ldots \text{(i)}$$

$$a\sum x + b\sum x^2 + c\sum x^3 = \sum xy \quad \ldots\ldots\ldots \text{(ii)}$$

$$a\sum x^2 + b\sum x^3 + c\sum x^4 = \sum x^2 y \quad \ldots\ldots\ldots \text{(iii)};$$

and, finally, the use of the computed values of the constants a, b and c to establish the line of best fit:

$$Y' = a + bx + cx^2.$$

The coefficient of determination for the non-linear association between death rate and age was then found by the use of the formula:

$$r_{y.x.x^2}^2 = \frac{a\sum y + b\sum xy + c\sum x^2y - \frac{(\sum y)^2}{n}}{\sum y^2 - \frac{(\sum y)^2}{n}}$$

From the table in Appendix 2(f), and the computations therein, we found that $Y' = .38462 - 0.095x + 0.00028^2$ and the coefficient of non-linear correlation $r = 0.9796$ and $r^2 = 0.9598$.

The test therefore shows a very strong bivariate curvilinear association between death rates (mortality) and age; where 95 percent of the variation in death is explained by age. We have therefore demonstrated empirically that death during the drought and famine under study was associated with age. Secondly, we have also demonstrated that the young under 10 years and the aged of 60 years and above suffered more severely than those in the 10-59 age bracket. It now remains for us to discuss some of the causal variables as brought out in our data.

The pertinent question we would now like to answer is: In the study area, what accounted for the great jeopardy of the children and the aged during the drought and famine? Why did the economically active part of the population seem to have coped relatively well?

Pathology of Starvation: (12)

Now that we have demonstrated empirically that age is a determinant of adaptability, we find it appropriate at this point in the analysis to present a flashback of the earlier impressions about the impact of the drought and famine on children's health and that of the aged, before discussing the causal variables. These impressions emanated from the data gathered through observation during the exploratory phase of the study. They were important for they helped to focus the study, with specific concern for the plight of infants and the aged. We shall illustrate with case studies.

Lorus: (13)

Lorus is a water point some 20 km. from Lokichoggio town on the Kenya-Sudan border. It is located on the eastern foothills of Mt. Mogilla. Here there was water at the time of the visit in March 1980-- which was the peak of the drought and the famine was just about to break out for the rains had failed to come for at least 18 months according to the residents of the area. Although the residents of Lorus had water, they had no pastures--only rocks andthorn bushes stretching out to the

Lotikipi plains. There were no manyattas and the residents slept in the open under the thorn bushes, more or less like refugees in their own land. This was occasioned by their having been driven off their traditional dry season pasture-lands to the west of the mountain by the Toposa riflemen.(14)

At first, the people settled at Mogilla water point to the north of Lorus, but as the security situation deteriorated due to pressure from the Toposa raiders, they moved farther south to Lorus in a desperate attempt to save the situation. They found themselves caught up between two evils: the drought and the Toposa riflemen. Thousands of their livestock died and many more were collapsing and dying at the time of the visit. For a stretch of about 5 km. north and southward from the water point carcasses of dead animals were piled on each other or just scattered all over the place. At one point it was impossible to drive through as the track was closed by the remains of dead donkeys.

The health conditions of the children at Lorus was pathetic. Some 50 or so children between the ages of 6 months and 4 years had overgrown bellies and heads, flat buttocks, thin legs and sunken eyes bulging in their sockets. And the adults were thin, hungry and sickly. The local chief, who kept records of the drought victims in the location, said that according to his records, there were at least 860 destitutes at Lorus alone. A perusal of the records at his office showed the following break-down of destitutes in the location per sublocation.

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Table 5.8: Destitutes in Lokichoggio Location by March, 1980:

Sub-Location	Number of Destitutes
Lokichoggio	1,800
Mogilla	1,200
Lorus	860
Nanaam	1,900
Songut	1,307
TOTAL	7,067

Source: Records at the Chief's Office, Lokichoggio, 19.3.80. The total population for the Location (1979 census) was shown in the same records as 18,291.

Kakuma:

Kakuma town is located on the cooler and better watered higher grounds that rise onto Karamoja in Uganda. It is located on a fairly flat land that communicates easily with the neighbouring territories. To the east are the Pelekech ranges and it lies just on the eastern banks of the Tarash river. There are a number of shops at the town selling commercial products including maize-meal, tobacco, sodas, sugar, and other assortment of industrial goods. It also houses one or two tea rooms. To the north of the shopping centre is Kakuma Catholic Mission Hospital--one of the four hospitals in the district. Others are Lodwar, Likitaung and Lokori in the south. About 1 km. to the east are the district

offices; while the local chief's office is at the market. The main Kitale-Lodwar-Lokichoggio-Sudan road passes here. Economically, it is said that Kakuma Division (whose HQ is Kakuma town) is the hub of the Turkana livestock industry due to the abundance of good pastures in normal years. But by September 1980, the economic life of the pastoralists in the area had been completely disrupted by the drought which left thousands of the nomads destitute. They fled from the countryside and flocked into Kakuma town in search of food, hopefully famine relief food from the Kenya Government. The hungry included the Teuso community from the Uganda side of the borders. It was the peak of one of the worst famine in the history of the region.

At the time of the field visit in September 1980, Kakuma ressembled an international refugee camp. Four categories of drought and famine victims had invaded the town from March that year. The victims were:-

(1) 'intensive care' cases, both children and adults;
(2) 'sturdy beggars' (women); and,
(3) Teuso refugees from Uganda.

The 'intensive care' children were found at Kakuma Mission Hospital. They were suffering from acute food deficiency malnutrition and associated diseases such as marasmus and Kwashiokor. Ten of the children were suffering acute physical impairement. The predominant health problem in the case of the children famine victims in the hospital was diarrhoea. The

nurses at the hospital said that all those helpless children were famine victims, many of whom had died in the bush before reaching the hospital. They,however, declined to confirm or deny any deaths at the hospital from famine.

The 'intensive care' adults were mainly old women who were found living at the more or less deserted famine relief camp next to the Chief's office. Owing to the national famine, the Kenya government did not have much food to send into the district, so the famine relief camp was left as a home for the dying ones who had nowhere else to go. Most of these famine victims were mere 'skeletons', weakened and living under unacceptable health conditions. As there was no other food for them, many of them soaked ox-skins in water, cut them into pieces and cooked them for a meal!

The 'sturdy beggars' were also women living at the same famine relief camp. They were old but still relatively 'able-bodied' and could go out fetching food. Their staple food was at that time wild fruit and berries which they gathered from the bushes in and around Kakuma town. At the time of the visit to the camp, these 'sturdy beggars' were in the bush gathering, and those left behind were preparing the previous day's collection for the next meal. Thus these dispossessed women folk had been reduced from pastoralists to hunter-gatherers where they had to compete with birds over wild fruit and berries for survival.

Teuso are the people Colin Turnbull calls the Ik or the

Mountain People.[15] They are Ugandans who live in the mountains near Kidepo National Park. They were traditionally hunter-gatherers but due to modern changes their main economic pre-occupation is agriculture. Because of the prolonged drought, they had missed a series of harvests in a row. Their condition was made worse by the political climate in Uganda following the fall of Id Amin and the escalation of armed conflicts perpetrated by riflemen. They had either to flee to seek alternative means of survival or perish as a people. From their homeland, they scattered in all directions and a section of them invaded Kakuma en masse.

The Kenya authorities sympathised with the Teuso refugees and allowed them to encamp at Kakuma town. They were accommodated in one huge refugee camp where they were allowed to put up their makeshift shelters. The Catholic Missionaries undertook to feed their starving children under tight guard to stop their parents from 'robbing' them of their rations. A large enclosure was constructed as a "soup kitchen" for the children. It was fortunately feeding time when the camp was visited. Approximately 800 famine stricken children, naked and dirty were being fed on donated milk. The feeding was done in shifts as the children were too many to be in the "soup kitchen" all at once.

A short distance from the "soup kitchen" was a makeshift health clinic where real bad cases of acute malnutrition were then taken for further medical treatment after the meals. Here

again, as in the Mission hospital, a number of children suffering from acute malnutrition were noticed; and four among the many were already victims of acute physical impairment.

So, whether the drought and famine victims were Turkana nomads or the Teuso hunter-gatherers-cum-agriculturalists, the children and the aged seemed to have been struck more severely than the economically active part of the population. These earlier impressions of the health conditions of the children and the aged aroused my concern for their plight and also helped to sharpen the focus of the study. This concern for the young and the old was further aroused by the literature which portrayed them as the most vulnerable part of the population to the devastations of drought and famine.(16) Similarly, press reports about the drought and famine situation in the district, together with eye-witness accounts told of the serious plight of the children and the aged in the northern parts of the region.(17) As the study entered its second phase of survey and key informant interviews, one of the hypotheses formulated for testing was to elicit data on age as a factor in the management of drought and famine locally. Secondly, during the interviews, supplementary questions were used to find out from the respondents themselves what they had to say about age and adaptability.

There was a probe question which all the respondents had been asked and whose answer presented a dilemma to the researcher. All the 65 survey respondents were asked the question: Whenever

this household had food during the drought and famine, who were fed first? Practically 100% of the respondents answered: "the children". The next question asked was: Why then did this child die from hunger in that case? The responses to this last question provided the reasons why the children, and the aged, suffered most severely during the drought and famine while the economically active population escaped almost unscathed.

According to the respondents at Kaling, the impact of the drought and famine varied down to the individual level due to three principal reasons:

First, the trek from the mountains had the greatest adverse effect on the children, the sick and the aged due to the long distances they had been forced to cover in the hot sun and most of the time on empty stomach. The trek was in response to the Kenya government's demand that those famished Turkana who wanted famine relief food had to come out of the pasturelands and be accommodated at the two camps set up for them: Kaling and Lokitaung. Quite a number of the Yapakuno nomads of Kaling had to march south from the Kenya-Sudan borders down to camp--a distance of some 100 km. This long journey across the rocky mountains, rugged valleys and barren plains, was physically exhausting for the hungry children, the sick and the aged. The respondents at Kaling said that during the long march, a number of people died en route from hunger and exhaustion and were left behind in the bush unburied.

Secondly, during the long march southward to Kaling famine relief camp, the nomads' diet consisted predominantly of assortment of wild fruit, berries and nuts. We have touched on this in the earlier part of this chapter. As we know from the health and biological sciences, children's bodies have a high demand for energy and body-building foods such as proteins and vitamins for normal growth. Consequently, too much intake of wild fruit, berries and nuts, presumably with little protein supplements, is definitely a health hazard resulting in diarrhoea and diarrhoeal diseases. This stunts growth, weakens the body and makes it susceptible to disease infection. Such health conditions in children increases morbidity and infant mortality rate.

Finally, normally it is the economically active population which go out to look for food as the young and the elderly wait at home. The respondents and key informants stated that one reason which accounts for the difference in adaptability in the age categories is the Turkana cultural practice where hosts are always quite willing to entertain a visitor with any available food but not equally willing to spare anything to be carried home. This is their traditional practice of hospitality. When you find your host eating, the respondents said, he will tell you: "karibu" (welcome to the table), so you will eat. But the chances are that this host will not give you food to carry home to the children, the sick and the aged.

Yet, the respondents noted, that even in the rare occasion

where a guest is given food to carry home (after he has already been fed), once he reaches home, he will again have his share of what he has brought home. Thus in this case he will be having his second share of food for the day while those who had been left at home (the children, the sick and the aged) will be having their first meal of the day. Therefore, the active population become better competitors than the dependent population because"they hold the food basket."

So, according to this last explanation, if one can move around in search of food, one stands a better chance of survival; if not, then one's life is in danger. Children and the aged do not venture out from home that much; mostly they stay around, but at their peril.

The evidence we have, therefore, confirms the hypothesis which regarded age as a major determinant of adaptability. The active population are evidently more resistant to the devastations of drought and famine than the young and the old.

Summary:

This chapter has brought out two important facts concerning our understanding of adaptability. First, drought per se does not necessarily cause a famine (human deaths from starvation). Other social and economic factors must come into play to determine the ultimate outcome. Secondly, in those circumstances where drought leads to a famine, the children under 10 years

and the aged of 60 and over suffer most severely. They are less resistant to the devastations of drought and famine than those in the 10-59 years age bracket. All these findings have implications both for theory and policy as we shall discuss in the next chapter.

CHAPTER 6

SUMMARY AND CONCLUSION

The aim of this study was to find out how the famished Turkana nomads of northwestern Kenya coped with the drought and famine of the 1979-80 period. The study sought to investigate into the indigenous modes of adaptation in the absence of outside food aid, particularly famine relief food.

The core theory used in the study was that of human ecology which views man as living in a dynamic and changing environment which he must control in order to survive.(1) This core theory was improved by the introduction into it the symbolic interactionist model developed by Alfred Schutz, Herbert Blumer and the ethnomethodologists Peter Berger and Thomas Luckmann.(2) The model further benefitted from the innovative theory of Frank and Ruth Young as discussed by Mbithi and Carolyn Barnes.(3) The scope of the theory was again broadened by introducing into it the social exchange theory of George Homans and Peter Blau,(4) to help deepen our theoretical understanding of the dynamics of reciprocity and symbiosis as an insurance mechanism among pastoral nomads.

From these theoretical formulations, a "nomads' adjustment model" was erected and the various adjustment choices deriving from the literature review were fitted into it. Subsequently, three hypotheses were formulated to guide the study and to be tested at the data analysis stage.

It was hypothesized that drought and famine stimulate the search for potential allies in the effort to weather the negative effects of the food shortages. This first hypothesis was linked with a second one which stated that the social and economic resources accessible to the famished Turkana nomads would determinate the range and scope of adaptive responses. The third hypothesis anticipated data which when analysed would demonstrate an association between age and adaptability. All the three hypotheses were conclusively tested at the stage of data analysis---chapters 4 & 5.

This was an exploratory study and therefore it benefitted from both anthropological data collection techniques such as observation, informal and key informant interviews and survey method. These were supplemented by documentary material such as records kept by the colonial government in the national archives pertaining to drought and famine in the Turkana region.

With regard to the survey method, a number of methodological problems were encountered, which called for a more cautious manner in the way questions were put and answers recorded. For instance, there was the puzzling problem with numbers. This had to do with the way the Turkana count their livestock and the possibility of exaggerating losses ostensibly to gain sympathy from the interviewer(s). To counter this and improve the reliability of the data, it was necessary to reduce the original size of the sample population, limit the number of questions and finally to use a large number of probe questions as a cross-check mechanism.

The testing of the first hypothesis revealed that the Turkana nomads sought help from quite a large number of "allies" during the drought and famine period. For instance, the evidence suggests that they were compelled by sheer necessity for survival to maintain trade ties with businessmen and traders in the district and symbiotic relations with pastoral neighbours principally the Dassenetch of Ethiopia. Secondly, families were split and as a survival strategy, children were made to take refuge with friends, kinsmen and affines as the domestic food reserves dwindled. The evidence further indicated that in the family-splitting mechanism for weathering the drought and famine, the school emerged as perhaps the most dependable ally. The sharp rise of the primary school enrollment in the study area as well as in the district as a whole was probably because of the increasingly large number of hungry children who were sent away to school principally to be fed rather than to be educated as the case should otherwise be under normal circumstances. From the year 1978 Kenya adopted a national policy of free primary education and a school feeding programme. This policy could have contributed to the increase in primary school enrollment between 1978-1981. Yet we are arguing that it appears that the drought and famine must have acted as a further stimulant to change making the district's primary school enrollment go up two-fold in three years.

Thirdly, outmigration became yet another mode of adaptation. During the sojourn, the migrants exploited friendship, kinship and affinal ties to get food and shelter. Fourthly, the famished nomads used reciprocity as an insurance mechanism to counter the

devastations of the drought and famine, then and in the future. More significantly, the drought victims formed small corporate groups of cohorts, pooled their surviving livestock and left them in the care of a few among them as the rest dispersed to Ethiopia, the lakeshore, and down to the towns in the district and downcountry in search of alternative means of livelihood. This pooling of resources had an added economic advantage for it enabled the herders to exploit economies of scale. It would hasten the future return to the mainstream of pastoral life.

Regarding the second hypothesis, the data showed that adaptability is a function of the physical, social and economic environment. For instance, the people of Kaling, because they inhabited a hostile environment, suffered more severely than the people of Lokitaung whose environment is more favourable to adaptability. Our statistical testing of hypothesis showed significant differences in human deaths at the two sites thus being indicative of variations in adaptability. So we concluded that a hostile environment impedes adaptability and contributes to human vulnerability to the devastations of drought and famine.

Our testing of the third hypothesis was done even more rigorously than the first two for the earlier impressions got were that the children and the aged were the most vulnerable victims of drought and famine. Quantitative data had been collected which enable us to test this hypothesis slightly more conclusively so that there would be no doubts about the conclusions and policy implications drawn from them. The three

statistical tests done - z-test, linear correlation analysis and the test for nonlinear association--yielded results which confirmed the hypothesis that age is a crucial determinant of adaptability. For instance, the association between death and age was found to be quite strong with a coefficient of non-linear correlation ($r_{y.x.x^2}$) whose value is 0.97. The dependent population (the young under 10 and the old of 60 years and above) is highly vulnerable to drought and famine while the active population (10-59 years age bracket) cope considerably well.

CONCLUSION

The findings of this study have important implications both for theory and policy towards nomadic pastoralism in general and the Turkana in particular. Academically, they show that an improved ecological model is a viable theoretical framework for the study and analysis of adaptation among famished nomads. The model has been of tremendous use to this study as it helped to formulate testable hypotheses which guided the study.

The findings have helped to improve our theoretical understanding of adaptability for they have revealed that the Turkana nomads, like nomads everywhere in the East African region, possess a repertoire of adaptive mechanisms which they call into action in times of economic hardship. They are not passive recipients of famine relief food from outside the district. They actively manipulate the immediate environment to maximize gain which

helps them to weather the negative effects of drought and famine. Thus the findings of this study help to enrich the literature on the nomads' social responses to severe food shortages and famine. They are particularly useful findings for until now we had not had such empirical data on their indigenous mechanisms for managing economic problems of such magnitude.

The findings further suggest that drought per se does not necessarily lead to famine: death from starvation and hunger-related diseases. Other intervening variables like the socio-economic environment are crucial. Those who inhabit hostile environments suffer while those who live in better resource endowed environment generally survive. Similarly, the weak suffer while the economically active population cope much better. All these would have implications for policy.

POLICY IMPLICATIONS

A number of policy implications could be derived from the findings of this study to help improve the nomads' local capacities for managing future droughts and famine. We shall highlight some of the issues which need particular attention by the policy-makers.

First, the fact that the nomads who have ready access to non-pastoral economic opportunities seem to manage drought and famine better than those who remain isolated in the countryside means that there is urgent need to diversify the pastoral economy.

This should help the nomads to have viable alternatives to pastoral products when their livestock die from droughts. This is why the nomads who lived near to Lokitaung and the lakeshore where there is a fishing industry survived while those who lived in distant rural areas in the pasturelands suffered most severely. This shows that when peasants are left at the mercy of the vagaries of nature operating precarious subsistence economies like pastoralism, they become easy victims of climatic changes.

Secondly, apart from diversifying the pastoral economy, policy-makers should pursue development policies aimed at penetrating the rural areas where the majority of the nomads live. For now there is a tendency to concentrate development efforts in a few selected urban centres while leaving the rural areas with a poorly developed infrastructure. Services should be taken to the people where they live.

Thirdly, the traditional adaptive strategy of symbiosis between the Turkana nomads and their neighbours need to be improved. During the drought and famine under study, the only source of food was Ethiopia and not the Sudan. Yet Turkana shares much wider territorial borders with the Sudan than with Ethiopia. The Turkana got food from the Dassenetch (Merille) of Ethiopia while inter-ethnic hostilities between them and the Nyangatom of Southern Sudan precluded any peaceful interaction and symbiosis. It would be in the interest of the nomads if they would be encouraged to live peacefully.

Fourthly, local insurance mechanisms like reciprocal networks should be identified and strengthened by chanelling food aid and other relief assistance through them. The present tendency of dishing out food aid to everybody in famine relief camps whenever famines break out might not be the best approach for building up local adaptive capacity.(5)

Finally, because the weak, children and the aged, appear more vulnerable to the devastations of drought and famine than the economically active section of the population, they need emergency assistance more than anybody else. Therefore, if relief measures are to be high yielding, their administration should take cognisance of the vulnerability of the young and the aged and have them as the priority target groups. Their status should be constantly monitored in advance of an impending famine.

In conclusion, we want to reiterate here that drought and famine are national problems in Kenya and should be the subject of more serious thinking and action than the case has traditionally been. To reduce the cost of drought and famine, there would be a need for Kenya to seriously consider setting up a "Drought and Famine Monitoring Institute". This is precisely because in many instances the nation is usually caught unawares by droughts and famine, thus inflating costs, and making it a lot more difficult to bring the situation under control than the case would have been with such a research institute.

FOOTNOTES

Chapter 1

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2. Ben Wisner(1977), The Human Ecology of Drought in Eastern Kenya, Ph D Thesis, Clark University, pp. 72-3

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6. Hopcraft, A. (1968), Born to Hunger, London: Pan Books, p. 42

7. Ben Wisner, op. cit. pp. 72-88

8. Ibid., p.73; see footnote 1

9. Africa, 108, August 1980

10. Since 1960 Kenya has experienced a major famine every 10 years: 1960-61; 1971-74 and 1979-80. Estimates show massive financial, production and social cost. Mbithi and Wisner(1972), Drought and Famine in Kenya, I.D.S., University of Nairobi, DP. No. 144 and their "Drought in Eastern Kenya", in G.F. White,op. cit. pp. 87-97; as well as Ben Wisner, op. cit give details of these costs. They show, for instance, that Kenya spent Kshs. 21 million on relief food in 1961, and a further Kshs. 20 million in 1970-71 period. The authors put the production losses at Kshs. 210 million and Kshs. 200 million for the years 1960-61 and 1970-71 respectively.

11. Ben Wisner and Mbithi (1974), "Drought in Eastern Kenya" in G.F. White, op. cit. p. 90

12. Marshall Newman (1962), "Ecology and Nutritional stress in man", American Anthropologist , 64:22-33
_____ (1975), "Nutritional Adaptation in man", Physiological Anthropology, Albert Damon (ed), NY: O.U.P. pp. 210-59

Robert Dirks(1980), "Social responses during severe food shortages and famine", Current Anthropology, vol. 21 No. 1, p. 24

13. What Kind of Africa by the Year 2000? by the Monrovia Symposium(1979) registers the concern of economists that Africa is incapable of feeding its peoples despite its vast natural resources and the praise-worthy efforts of its governments and people; and has to depend on food aid even in the absence of droughts and similar calamities(pp. 1-14)

14. Republic of Kenya(1981), Sessional Paper Number 4, "National Food Policy", Nairobi, Govt. Printers

15. Ben Wisner and P.M. Mbithi(1974), op. cit. p. 19

16. W.I. Thomas and Florian Znaniecki(1974), The Polish Peasant in Europe and America, NY: Octagon Books, p. 1127

17. See for example, Rene Dumont and Nicolas Cohen(1980), The Growth of Hunger: A new Politics of Agriculture, London: Marion Boyars; and Lloyd Timberlake(1985), Africa in Crisis, London

18. One is not here echoing the sarcasm of Elspeth Huxley, rather we are addressing ourselves to hard facts. To Huxley, the pastoral Maasai were doomed. She said of them:

"The road dropped down to cross a tongue of Masai steppe that lies between Kilimanjaro and Mt. Meru. Big herds of tiny cattle were to be seen on pastures usually biscuit-coloured but now drenched in the living green of new growth after rain, and once or twice the lone, red, anachronistic figure of a Masai herdsman leaning on his thin spear, his hair plaited with fat and ochre into the traditional peruque, his proud, ancient-Egyptian features so strange a blend of male arrogance and female plasticity.

"In this modern African world of blackboards, committees and demagogues, these obstinately conservative nomads, wandering with their enormous herds from pasture to pasture, seen like dinosaurs or pterodactyles, survivors from a past age with a dying set of values--aristocratic, manly, free and doomed. Like everything else in nature that will not or cannot conform to a changed environment,

they must perish or merge; only the shield of British administration stands to-day between them and the historical fate of the nomad caught by the relentless and mounting pressure of the teeming cultivators".

-Elspeth Huxley(1948), The Sorcerer's Apprentice, London: Chatto & Windus, p. 89

On the impact of wildlife conservation practices on pastoralism in Kenya, see, C. Odegi Awuondo, (1982),"Wildlife Conservation and Decline of Pastoralism in Kenya", African Journal of Sociology, vol. II, No. 2 November, pp. 74-83

19. See, for example, R.M.A. van Zwanenberg, with Anne King(1975), An Economic History of Kenya and Uganda, Chapter 5, pp.79-109; Mahmood Mamdani(1981), Karamoja: Colonial Roots of the Famine, Makerere University; Peter Rigby(1968), Pastoralism and Prejudice: Ideology and Rural Development in E.A., I.D.S. Paper, University of Nairobi; Walter Goldschmidt(1981),"The Failure of Pastoral Economic Development Programs in Africa", in John Galaty et al op. cit. pp. 101-118; and David Campbell and George H. Axinn (1980), Pastoralism in Kenya, American Universities Field Staff, Report No. 30 (Africa)

20. Turkanaland occupies an area of 64,048 km^2. The predominant vegetation is the Sahelian-type thorny steppe.

21. John Lamphear(1976), "Aspects of Turkana leadership during the era of primary resistance", Journal of African History, vol. 17, pp. 225-43

22. Ibid., pp. 241-2

23. Turkana District Political Records, Miscellaneous, 1921-45, Kenya National Archives, Nairobi, p. 45

24. Ibid., p.170

25. Zwanenberg, op. cit. p. 85

26. Turkana District Development Plan, 1979-83, Lodwar, 1979, p. 34

27. According to the report on the East African Natives census, 1948, there were 69,400 Turkana in the district. These figures are quoted in Philip Gulliver (1955), Family Herds, p. 5 (see, footnote 1 on that page). In the same year there were 200,000 cattle, 800,000 sheep/goats, 80,000 camels and 96,000 donkeys in the district according to his: A Preliminary Survey of the Turkana, Cape Town, 1951, p. 15

28. The 1979 human population figure are taken from the national census data for that year. Livestock numbers are those of the Kenya Rangeland Ecological Monitoring Unit(KREMU) for 1978 as recorded in Turkana District Development Plan, 1979-83, op. cit. p. 17

29. Dahl and Hjort, op. cit. pp. 251-3

30. D.L. Campbell(1979), "Population Growth, Land Use and Land Resources in Selected Districts of Kenya's Arid and Semi-Arid Lands", in Government of Kenya, Arid and Semi Arid Lands Development in Kenya: The Framework for Implementation, Programme Planning and Evaluation, Nairobi, Appendix TEn, p. 9, Table 8

31. See, the 1979 Kenya Population Census Report, Nairobi

32. Gulliver (1955), op. cit. p. 39

33. Georg Henriksen(1974), Economic Growth and Ecological Balance: Problems of Development in Turkana, Occasional Paper Number 11, Institutt for sosialanthropologi, Universittet I Bergen

34. Norwegian Agency for International Development(NORAD) (1979), Report on Reforestation in the Turkana Area, Nairobi.

35. See, for example, C. Odegi Awuondo(1981), Patronage and Misery in Turkana, Department of Sociology, University of Nairobi, Staff Seminar Paper Number 45.

36. These were estimates based on the 1969 census figure of 165,000 people. It was projected that there would be 180,000 people in the district by the year 1978. The actual census figures for 1979 registered a growth rate of -1.5%. The only district in the whole republic with a negative population growth rate between 1969 and 1979. It is interesting to note that lathough 1978 was a prosperous year in the history of Turkana pastoralism judging by the large herd numbers for that year, still some estimated 5,000 Turkana were on the famine relief list.
(See, Turkana District Development Plan, 1979-83, p. 16).

Chapter 2

1. The concept "ecology" was coined by the German biologist, Ernst Haeckle in 1866. It is derived from the Greek word "oikos" (house); and by extension scientists use it to mean "habitat"(Broom & Selznick(1977), Sociology, p. 535).

   In the field of medicine the idea of "human ecology" gained popularity from the pioneer works of Drs Harold G. Wolff and Lawrence E. Hinkle Jr., who discovered that health problems may result not only from disease infection but also from environmental disruptions and disorientaion(Alvin Toffler(1970), Future Shock, p. 298).

   When anthropologists talk of socio-cultural ecology, they generally refer to the bearing of the physical environment (ecology) on the cultural behaviour of a people.

2. Broom & Selznick, op. cit. p. 535

3. Helge Kjekshus(1977), Ecology Control and Economic Development in East African History, London: Heinemann

4. Ibid., p. 181 --parentheses mine.

5. Edward W. Soja(1968), The Geography of Modernisation in Kenya: A Spatial Analysis, Syracuse IUniversity Press

6. R.M.A. van Zwanenberg, with Anne King(1975), An Economic History of Kenya and Uganda, Chapter 5, pp. 79-109

7. E.E. Evans-Pritchard(1940), The Nuer, Oxford:O.U.P.

8. Mary Douglas(1962),"Lele economy compared with the Bushong: A study of economic Backwardness", in Paul Bohannan and George Dalton(eds), Markets in Africa, Evanston, Illinois:Northwestern University Press, Chapter 8, pp. 211-233

9. R.H. Benke(1975), Ecology, economy and kinship among the Bedouin of Cyrenaica, Lybia, Ph D. Thesis, University of California, Los Angeles

10. M.A. Awogbade(1977), Ecology, cattle-rearing and formof organisation among the Fulani Pastoralists of B/P State, Nigeria, Ph D Thesis, University of Toronto, Toronto, Ontarion,

11. C.J. Carr(1977), Pastoralism in Crisis:Dassanetch and their Ethiopian Lands, University of Chicago, Dept. of Geography, Research Paper No. 180, Univ. of Chicago Press

12. Willian Torry(1973), Subsistence Ecology among the Gabra: Nomads of the Kenya/Ethiopia Frontier, Unpublished Ph D. Thesis, Columbia University (microfilm library, University of Nairobi)

13. Gudrun Dahl(1979), "Ecology and Equality: The Boran case", L'quipe ecologie et anthropologie de societe pastorale(ed), Pastoral Production and Society, Cambridge University Press, pp. 261-82

14. Randall Baker(1975), "Development and Pastoral People of Karamoja, Northeastern Uganda; an example of the treatment of symptoms", Theodore Monod (ed), Pastoralism in Tropical Africa, London:O.U.P. p. 187

15. One elaborate discussion of the division of labour among pastoral communities is in D.K. Ndagala(1974), Social and Economic Change among the pastoral Wakwavi and its impact on rural development, Unpublished M.A. Thesis, University of Dar-es-Salaam

16. P.C. Salzman(1981), "Some remarks on the role of advisers and advocates," in John Galaty et al(eds), The Future of Pastoral Peoples, IDRC:Ottawa, pp. 32-8

17. Dan Aronson(1980), "Must Nomads Settle? Some notes toward policy on the future of pastoralism", in Philip C. Salzman (ed), When Nomads Settle, NY: Praeger, pp. 173-184

18. See, for instance, Philip Gulliver(1951) A Preliminary Survey of the Turkana, Cape Town

19. John Lamphear(1982), The territorial expansion of the Turkana: Belligerent Aggrandisement or Peaceful Interaction?
Paper prepared for the African Studies Association Annual Meeting, Washington, D.C. November 6, p. 18

20. Godfrey Muriuki (1974), A History of the Kikuyu, 1500-1900, O.U.P. p.85

21. Willian R. Ochieng'(1985), A History of Kenya, Nairobi:Macmillan Kenya, p.98

22. Paul Robinson (1980), Disaster and Response among the Gabbra of Northern Kenya: an historical perspective, Discussion Paper for the conference on Ecological stress in East Africa,
Sponsored by Northwestern University and the National Museums of Kenya, Nairobi, 15th - 17th June.

23. Richard Kluckhohn(1962), "The Konso Economy of Southern Ethiopia", in Bohannan and Dalton (eds), op. cit. pp. 409-28

24. Robinson, op. cit. p. 22

25. David Stiles(1981), "What happened to the big-game in Northern Kenya? A survey in Gabbra country", Africana, vol. 8, No. 1, Nairobi, pp. 21-3

26. Robinson, op. cit. pp. 16-17

27. Neville Dyson-Hudson(1966), Karamojong Politics, London: O.U.P. p. 50

28. Lee V. Cassanelli(1981), Drought and Famine in Somalia: Pastoral strategies through the twentieth century, Paper presented to the seminar on Food Production systems and environmental rehabilitationiin Somalia, The National Academy of Science, Washington, D.C. 4th - 5th June.

29. Robert Dirks(1980), "Social responses during severe food shortages and famine", Current Anthropology, vol. 21, No. 1. pp. 21-44

30. Ben Wisner(1977), The Human Ecology of Drought in Eastern Kenya, Unpublished Ph D. Thesis, Clark University, Massachusetts, p. 119

31. George Herbert Mead(1964), Mind, Self and Society, Chicago: University of Chicago Press

32. Alfred Schutz(1970), On Phenomenology and Social Relations, Wagner (ed), Chicago:University of Chicago Press

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33. S.N. Eisenstadt, with M. Curelaru (1976), The Forms of Sociology: Paradigms and Crises, NY: John Wiley & Sons, pp. 119-20;

Sheldon Stryker(1973),"Fundamental Principles of Social Interaction", in Neil Smelser(ed) Sociology: an introduction, pp. 515-16

34. Stryker, op. cit. pp. 515-16

34. Stryker, op. cit. pp. 515-16

35. Ibid., p. 542

36. Ibid., p. 504

37. Willian I. Thomas and Florian Znaniecki(1974), The Polish Peasant in Europe and America, NY: Octagon Books, vols. 1&2

38. William I. Thomas and D.S. Thomas (1928), The Child in America, NY: Knopf p. 572

    Neil Smelser(ed), op. cit. p. 496

39. W.F. Cottrell(1951),"Death by Diesellization: A case in the reaction to technological change", American Sociological Review, vol. 16, June, pp. 358-65

40. Ibid., p. 361

41. This approach borrows from P.M. Mbithi and Carolyn Barnes's interpretation of Frank and Ruth Young(1966, 1970). See their The Spontaneous Settlement Problem in Kenya, Nairobi: EALB, 1975, especially pp. 24-5

42. Ibid., "Framework for Understanding Spontaneous Settlement", p.26

42. Ibid., p. 26

43. Ibid., p. 26

44. George Homans (1961), Social Behaviour: Its Elementary Forms, NY: Harcourt, Brace & World

    Peter Blau(1964), Exchange and Power in Social Life, NY: Wiley

45. Cassanelli, op. cit. pp. 6-7

46. Uri Almagor(1979),"Raiders and Elders: A Confrontation of Generations among the Dassanetch", Fukui and Turton(eds), Warfare among East African Herders, Senri Ethnological Studies, Osaka, pp. 121-2

47. Philip H. Gulliver(1955), The Family Herds: A Study of two pastoral Tribes in East Africa:The Jie and Turkana, London: Routledge & Kegan Paul ; see particularly chapter 7 on "Stock Associates", pp. 196-222

48. Harold Schneider(1957), "The Subsistence role of cattle among the Pokot of East Africa", American Anthropologist, vol. 59, No. 2, April, p. 284

49. Gudrun Dahl(1979), Suffering Grass: Subsistence and Society of Waso Borana, Stockholm Studies in Social Anthropology, University of Stockholm, pp. 172-6

50. See, Current Anthropology, vol. 21, No. 1 1980 p. 37

51. Piritim Sorokin(1975), Hunger as a factor in Human Affairs, Gainesville: University of Florida Press, p. 137;

Robert Dirks op. cit. p. 31

52. Alred Kroeber(1948), Anthropology, NY:Harcourt, Bruce & Co. p. 277

53. For instance, Cynthia Nelson (ed)(1973), The Desert and the Sown:Nomads in a wider Society, Inst. of International Studies, University of California, Berkeley; Stephen Pastner(1980), "Desert and Coast: Population flux between Pastoral and Maratime adaptations in the old world arid zone", in Nomadic Peoples, Number 6 (June), pp. 13-22; Philip C. alzman(1971), "Multi-Resource Nomadism in Iranian Baluchistan", in W. Irons and Dyson-Hudson (eds), Perspectives on Nomadism, Leiden, E.J. Brill, pp. 60-68

54. Paul Spencer(1973), Nomads in Alliance: Symbiosis and Growth among the Rendille and Samburu of Kenya, London: O.U.P.

55. Elliot Fratkin(1979), "A Comparison of the role of prophets in Samburu and Maasai Warfare", in Fukui and Turton op. cit. pp. 64-5; see particularly footnotes 3 and 4.

56. For variations in the definition of "drought", see, for example S. Sandford (1979), "Towards a Definition of Drought", in Madalon T. Hinchey(ed) Proceedings of the symposium on Drought in Botswana, pp. 33-41 ; while

K. Hewitt(1971) defines drought as:
"a period in which moisture availability falls below the current requirements of some or all the living communities in an area and below their ability to sustain the deficit without damage, disruption or excessive costs."
(K. Hewitt(1971), "Probabilistic Approaches to Discrete Natural Events", Natural Hazard Research Paper No. 8 Toronto: University of Toronto, p. 2)

See also Wisner op. cit. p. 100

57. M.K. Bennett(1968), "Famine", in David L. Sills (ed), International Encyclopedia of the Social Science, NY: Macmillan/Free Press, vol. 5, p. 322

Chapter 3

1. Bernd Heine(1980), The Non-Bantu Languages of Kenya, Dietrich Reimer Verlag: Berlin, p. 32

2. Compiled from vol.I of the 1979 Kenya population census report, Nairobi.

3. Government of Kenya, Population Census report for 1979, vol. 1, Table 1, pp. 117-18

4. D.J. Pratt and M.D. Gwynne (1977), Rangeland Management and Ecology in East Africa, London: Hodder & Stoughton

5. Georg Henriksen(1974), Economic Growth and Ecological Balance: Problems of Development in Turkana, Occasional Paper No. 11, Institutt for Sosialanthropologi, Universitet I Bergen, p. 10
Figure have been converted accordinglt by multiplying each ofthem by 25.4mm(corr. to the nearest 10)

6. For a more detailed classification of the Turkana vegetation, see, Norad report on reforestation in the Turkana Area, October/November 1979, Lodwar

7. See, for instance, Kenya's Fourth National Development Plan, 1979-83, p. 301, Table 6.30 which shows that fish output from Lake Turkana in 1976 was 17,044 metric tons. This was approximately 46% of Kenya's inland fish output for that year.

8. The Turkana divide a year into two seasons: the wet season, which they call agiporo, lasts from April-August; and the dry season, which they call akamu, from September-March

9. Philip Gulliver(1955), The Family Herds, p. 26;
Norad report on reforestation in the Turkana Area, 1979, p.11

10. See, for instance, Africa Magazine, No. 108, August, 1980, "Hunger"

11. Government officers at Lodwar gave these as the major reasons accounting for the severity of drought and famine in the northern parts of the district.

12. The Standard, Nairobi, September 24, 1980 p. 1

13. The Standard, Nairobi, October 8, 1980, p.3

14. Ibid.

15. Lokitaung, rather than Lodwar the district Headquarters, houses the Divisional Police Headquarters. Officer Commanding Police Division (OCPD) lives here with several hundreds of police officers to watch over the northern borders. Some police officers are stationed at the Kokuro, Lokomarinyang and Kibish outposts(See map in the Appendix)

16. I have listed their names, ages and dates of interview in the Interview Guide for Key Informants in the Appendix.

17. David Silverman(1970), The Theory of Organisations:a sociological framework, London: Heinemann, p. 4

    The citation refers to Thomas S. Kuhn(1962), The Structure of Scientific Revolutions, Chicago: University of Chicago Press

18. Robert K. Merton(1957), Social Theory and Social Structure, The Free Press

    May Brodbeck(ed)(1968), Readings in the Philosophy of the Social Sciences, University of Minnesota, chapters 26 & 27

19. The Turkana are Eastern Nilotic speaking peoples. The author, a Luo, is a Nilotic speaker. There are many mutually intelligible words in the two languages. See, for example, the following pairs of words in Kiturkana and Dholuo:-

Kiturkana	Dholuo	English
agulu	agulu	pot
akuru	akuru	dove
apoo	apuoyo	rabbit(hare)
akinyang'	nyang'	crocodile
akipi	pii	water
akiring'	ring'o	meat
etich	tich	work
arei	ariyo	two
ng'omon	ang'wen	four
kwee	bwe	jackal
ing'ok	guok	dog
edit	matin	small(little)
apethe	apisi	nice girl

Source: My own compilation during fieldwork.

20. Ile Natong, interviewed on 30/11/81. He was the oldest surviving man in Natoo Village and by the virtue of his age was therefore the religious leader.

    The name of the emuron was Akiyabok, a Nkwatella of Lokwanamur, Ile said. There was no emuron of Akiyabok's status among the Ngissigar or the Yapakuno. Akiyabok was the religious lord of the entire northern region.

21. We are reminded that the Turkana never count their cattle. "To count stock would be to challenge Fate"

    Gudrun Dahl and Anders Hjort(1976), Having Herds, University of Stockholm, p. 132

Chapter 4

1. Gudrun Dahl and Anders Hjort(1976), Having Herds, University of Stockholm, p. 132

2. Robert Dirks(1980),Social responses during severe food shortages and famine", Current Anthropology, vol. 21, No. 1, p. 25

3. Philip Gulliver(1955), The Family Herds, Routledge and Kegan Paul, London, p. 35

4. Georg Henriksen(1974), Economic Growth and Ecological Balance: Problems of Development in Turkana, Bergen

5. Paul Devitt(1979), "Drought and Poverty", in Madalon T. Hinchey (ed), Drought in Botswana, pp. 121-7

6. Dirks, op. cit.

7. See Appendix for the table "Pathology of Starvation".

8. IFAD/WHO/UNICEF, 1983 report, Nairobi

9. M.K. Bennett(1968),"Famine", Sills (ed), International Encyclopedia of the Social Science, NY:Macmillan/Free Press, pp. 322-6

10. Key informants listed in the Interview Guide. See Appendix.

11. The Ngijie and the Turkana have one historical origin. See, for instance, Philip Gulliver(1956), "The Teso and Karamojong Cluster", Uganda Journal, vol. 20, No. 2

12. Lokusudo Etukoit and Lobwin Kamurunyang,
Kaling, 16/11/81

13. Lokusudo Etukoit and Lobwin Kamurunyang,
Kaling, 16/11/81

14. Egron, Edong' and Eleny
Kaling, 20/11/81

15. One good study of the rule by the elders is Paul Spencer(1965), The Samburu: A study of gerontocracy in a nomadic tribe,
London: Routledge and Kegan Paul

16. John Lamphear(1976),"Aspects of Turkana Leadership during the era of primary resistance",
Journal of African History, vol. 17, pp.225-43

17. Ile Natong,
Natoo, Lokitaung, 30/11/81

18. Lie
18. Ile Natong
Natoo, Lokitaung, 30/11/81

19. Egron, Edong' and Eleny
Kaling, 20/11/81

20. Mariko Echoto
Kachoda, Lokitaung, 1/12/81

21. In the study area, the market and rural centres (and towns) were Kaling, Kaeris, Todenyang', Lowarengak, Namuruputh, Kokselei, Nachukwi and Lokitaung.

22. During the early period (September 1979-March 1980), ox skins fetched Kshs. 15 a piece and sheep and goat skins Kshs. 8 each. Later the prices plummeted to Kshs 7 for ox skin and Kshs. 3 for sheep and goat skins.

23. John Ekitela
Lokitaung, 1/12/81

24. This particular migrant did not trace his relative. He said that before he could reach the Turkana settlement, he came into trouble with the police for allegedly loitering without gainful employment. He was jailed for two weeks and on his release was ordered to return home. On his return he entered the famine relief camp.

25. Mariko Echoto
Kachoda, Lokitaung, 1/12/81

26. See Appendix on "The Turkana in Kenya per district 1979"

27. Anders Hjort(1979), Savanna Town: Rural Ties and Urban Opportunities in Northern Kenya, Stockholm, p. 117

28. Lee V. Cassanelli(1981), Drought and Famine in Somalia: Pastoral strategies through the 20th century.

29. John Ekitela
Lokitaung, 1/12/81

30. Turkana District Development Plan, 1979-83, Lodwar,

31. Turkana District Political Records, 1921-45 (Miscell)
Kenya National Archives, Nairobi
See especially the autobiography of Chief Lonyamon compiled by the District Officer, Lokitaung, in 1932

32. Philip Gulliver(1955), The Family Herds,

33. Gudrun Dahl and Anders Hjort(1979), Pastoral Change and the Role of Drought,
Sarec Report No. 2, Stockholm, p. 25

Chapter 5

1. See Appendix 2b for the computations

2. See Appendix 2c for the computations

3. See Appendix 2d for the computations

4. Serge Tornay(1979),"Armed Conflicts in the Lower Omo Valley, 1970-1976: An analysis from within Nyangatom Society",
Fukui and Turton(eds), Warfare among East African Herders, Osaka, pp. 97-117

5. Their botanical names not familiar to author.

6. Amukui Loree
Lokitaung, 27/11/81

7. R. Passmore(1951), "Famine in India: an historical survey", Lancet, 2, pp. 303-7

8. P.M. Mbithi and Ben Wisner(1972), Drought and Famine in Kenya: Magnitude and Attempted Solutions,
I.D.S., University of Nairobi, DP No. 144, p. 36

9. See, for example, D.K. Ndagala(1974), Social and Economic Change among the Pastoral Wakwavi and its impact on rural development, Unpublished M.A. Thesis, University of Dar-es-Salaam;

   Alan Jacobs(1965), The Traditional Political System of the Pastoral Maasai, Ph D Thesis, Oxford;

   Philip H. Gulliver(1955), The Family Herds Routledge & Kegan Paul

10. In a bivariate regression and correlation analysis, r should be equal to or more than 0.7 to give r^2 which is equal to or more than 0.5 for there to be a strong association between the two measured variables.

11. See Appendix 2e

12. Pathology is the science of bodily diseases. The word is derived from the Greek word "pathos" which means "suffering", "disease", or "passion". We talk of "pathology of starvation" here because of the suffering and physiological damage consequent upon hunger. It does to the body similar damage just as diseases do: tear and wear, emaciation, stress and loss of life. (See Sunday Nation, Nairobi, November 4, 1984 p.22)

13. See, C. Odegi Awuondo(1983), "Drought and Famine in Turkana: Some Human Problems and Suggested Solutions", The Kenyan Geographer, vol. 5, Nos 1&2, Nairobi, pp. 175-82

14. When Idi Amin fell, his fleeing soldiers stormed Moroto armoury and opened a Pandora's box of destructive weapons which threw the entire region into a state of chaos and insecurity. It became common to find villages along Kenya's common bordres with Uganda deserted as the inhabitants fled from the gun-trotting rustlers. (See, Africa Magazine, No. 108, August, 1980)

15. Colin Turnbull(1972), The Mountain People, NY: Simon & Schuster

16. Ibid.;
    See also Mbithi and Wisner, op. cit.;
    Robert Dirks(1980),"Social responses during severe food shortages and famine", Current Anthropology, vol. 21, No. 1 pp. 21-43

17. Africa Magazine, No. 108, August 1980; The Standard, Nairobi, September 24, 1980 p.1

Chapter 6

1. Broom and Selznick(1977), Sociology, NY: Harper & Row;

   Helge Kjekshus(1977), Ecology control and economic development in East African History, London: Heinemann;

   Ben Wisner(1977), The Human Ecology of Drought in Eastern Kenya, Ph D Thesis, Clark University

2. Alfred Schutz(1970), On Phenomenology and Social Relations, Wagner(ed), Chicago;

   Herbert Blumer(1969), Symbolic Interactionism: Perspective and Method, Englewood Cliffs, NY: Prentice-Hall;

   Peter Berger and Thomas Luckmann(1967), The Social Construction of Reality, London: Penguin

3. P.M. Mbithi and Carolyn Barnes(1975), Spontaneous Settlement Problem in Kenya, Nairobi:EALB

4. George Homans(1961), Social Behaviour: Its Elementary Forms, NY: Harcourt, Brace & World

   Peter Blau(1964), Exchange and Power in Social Life, NY: Wiley

5. For a discussion of some of the negative effects of the careless administration of famine relief food, see: C. Odegi Awuondo(1983),"Drought and Famine in Turkana: Some Human Problems and Suggested Solutions", The Kenyan Geographer, vol. 5, Nos 1&2, Nairobi, pp. 175-82;

   The Weekly Review, Nairobi, February 10, 1984 p. 19 -"Food Crisis Could be most Explosive".

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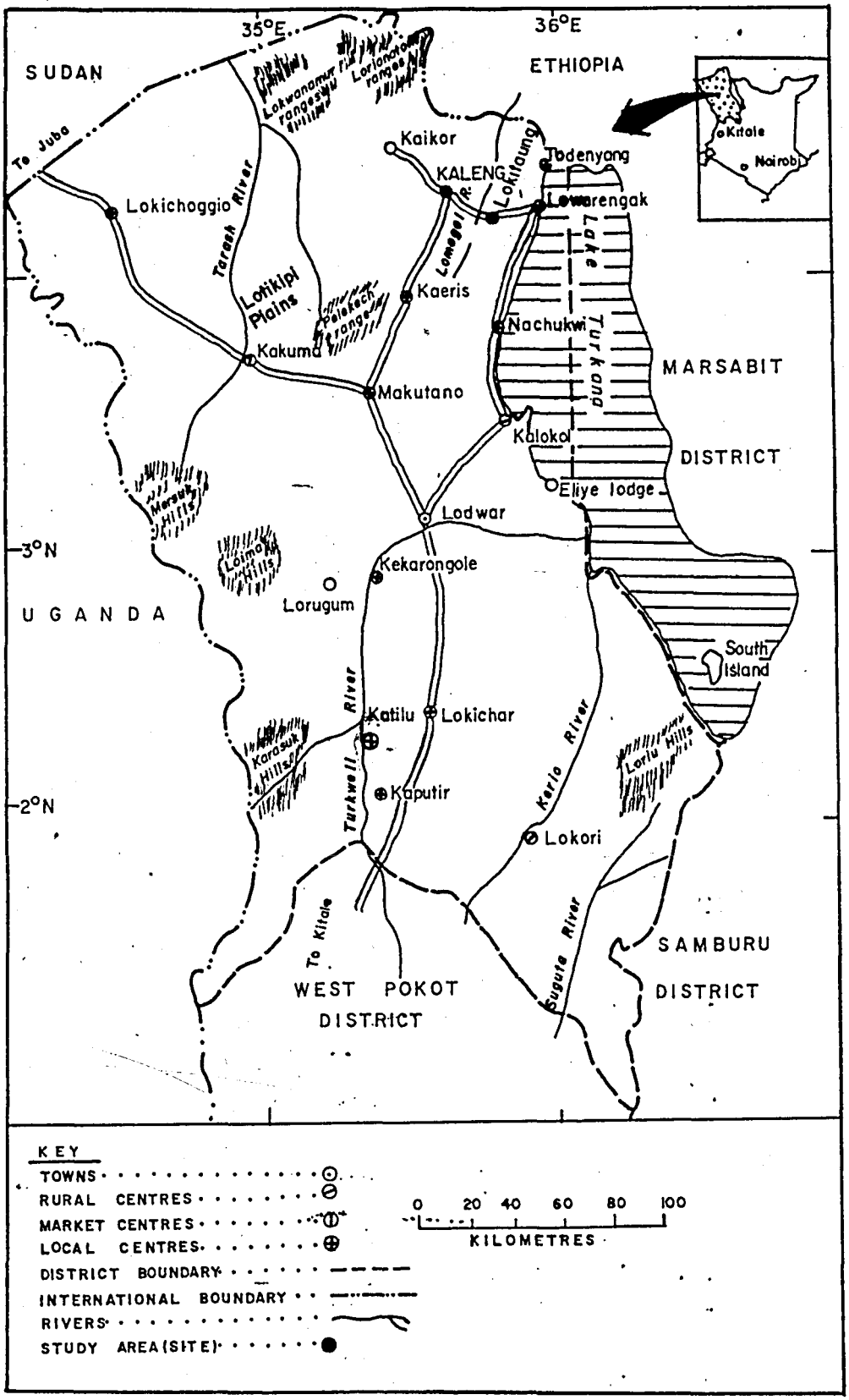
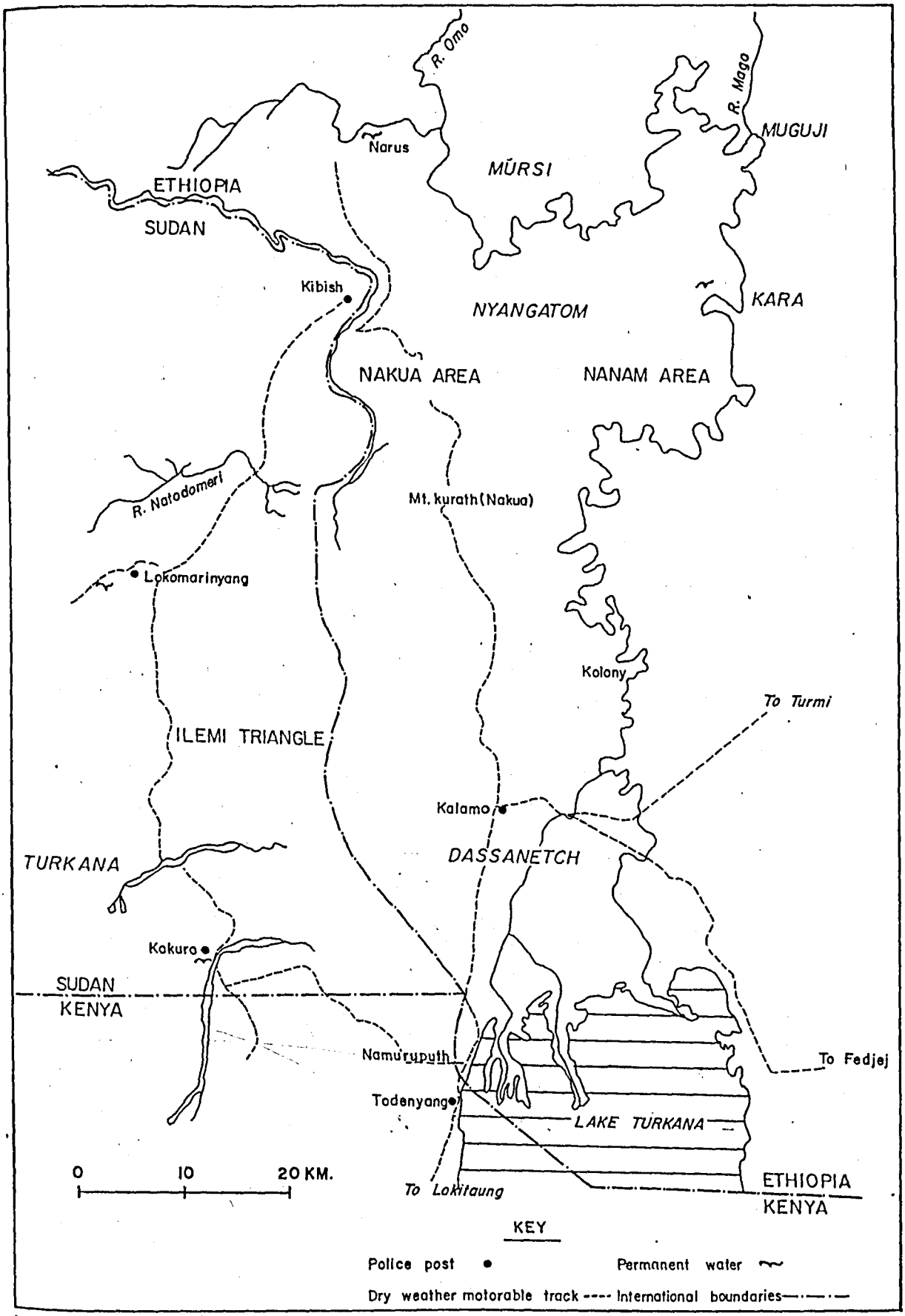
APPENDIX 1:

MAPS & SKETCHES



Map 1. TURKANA DISTRICT



Map 2 ILEMI TRIANGLE: TURKANA DRY SEASON GRAZING AREAS

(Source: Adopted from S. TORNAY, 1979 Page 102)

Fig 1: SKETCH OF KALENG STUDY SITE

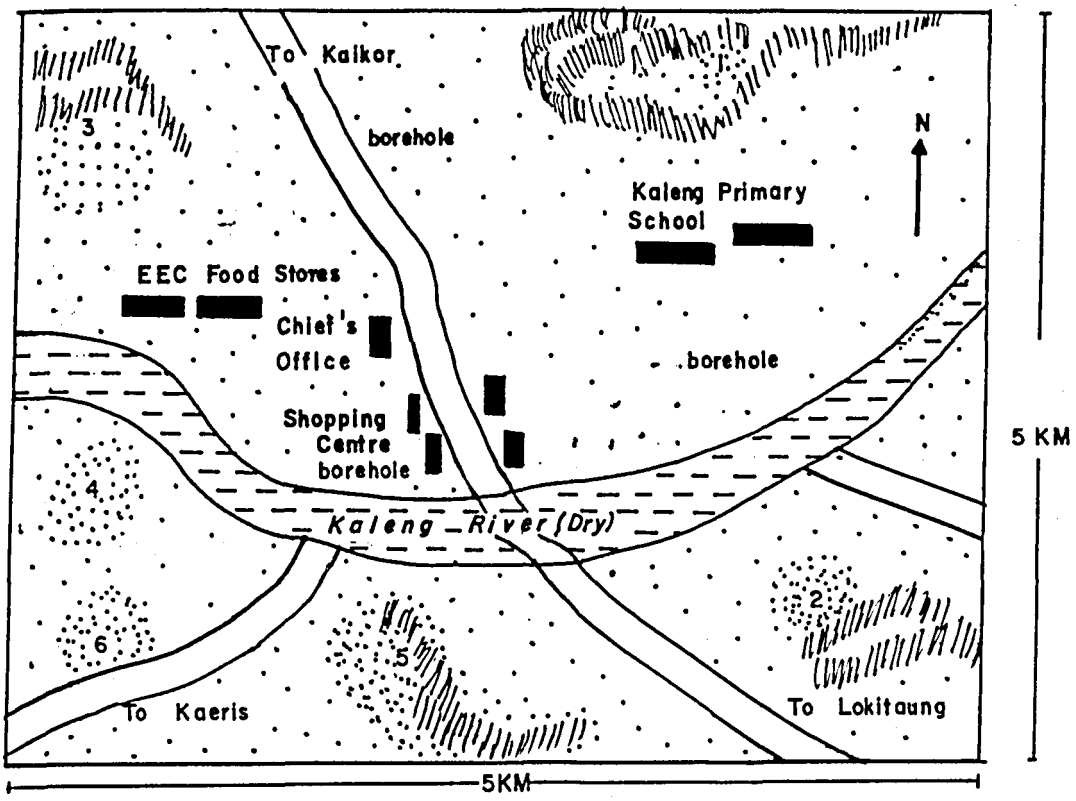
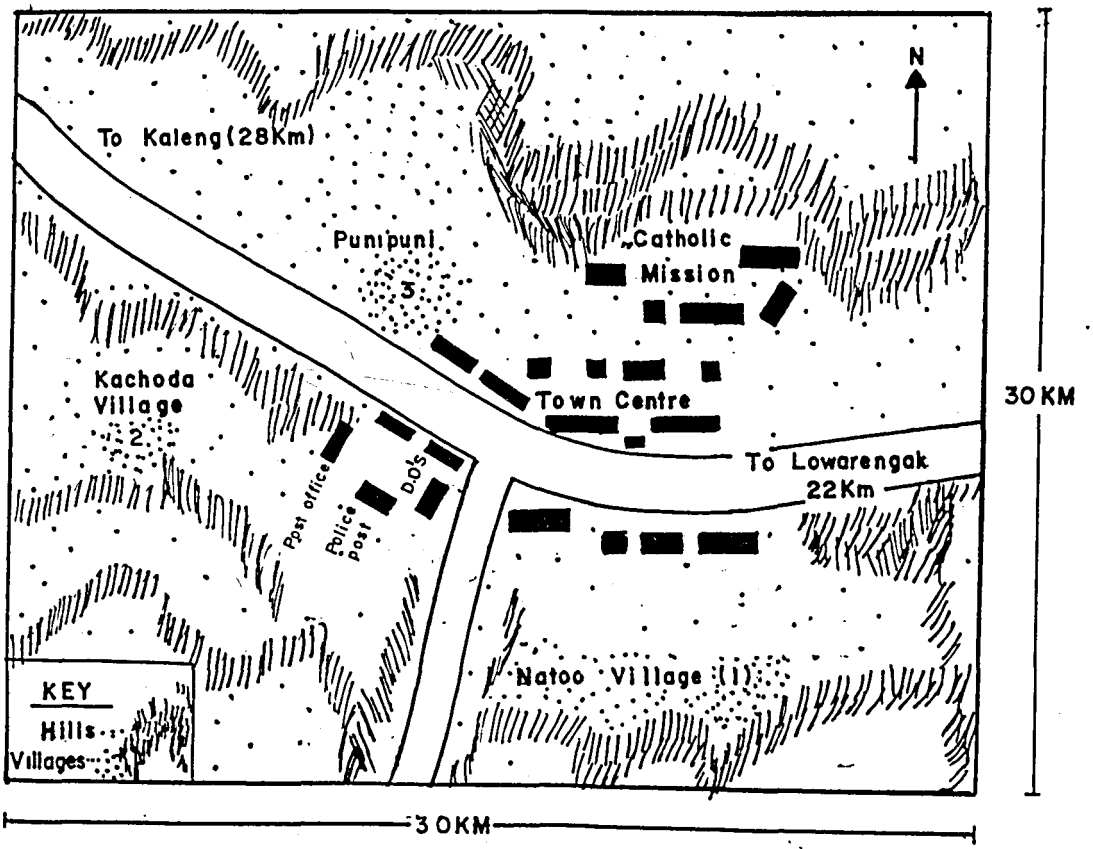


Fig 2: SKETCH OF LOKITAUNG STUDY SITE



APPENDIX 2A:

PATHOLOGY OF STARVATION

(family size and mortality)

Respondent	family size		mortality	Respondent	family size		mortality
	t_1	t_2			t_1	t_2	
1	15	12	3	36	3	3	0
2	10	10	0	37	19	19	0
3	10	10	0	38	4	4	0
4	17	13	4	39	7	6	1
5	11	10	1	40	8	8	0
6	16	12	4	41	10	10	0
7	10	8	2	42	11	11	0
8	6	5	1	43	5	5	0
9	11	9	2	44	5	4	1
10	7	5	2	45	5	5	0
11	8	4	4	46	6	4	2
12	10	9	1	47	5	4	1
13	22	20	2	48	5	5	0
14	7	7	0	49	11	7	4
15	11	10	1	50	8	8	0
16	9	6	3	51	4	4	0
17	6	2	4	52	8	8	0
18	7	4	3	53	2	2	0
19	6	3	3	54	4	4	0
20	11	6	5	55	10	8	2
21	2	2	0	56	7	7	0
22	2	2	0	57	8	8	0
23	2	2	0	58	5	5	0
24	7	2	5	59	5	4	1
25	10	6	4	60	11	10	1
26	1	1	0	61	10	10	0
27	6	3	3	62	4	3	1
28	1	1	0	63	18	16	2
29	6	5	1	64	4	4	0
30	6	6	0	65	4	4	0
31	4	1	3				
32	9	4	5				
33	5	1	4		501	411	90
34	6	4	2				
35	8	6	2				

APPENDIX 2B

CHI-SQUARE TEST OF DIFFERENCES IN LIVESTOCK LOSSES AT KALING AND LOKITAUNG

$$X(\text{calculated})^2 = \sum \frac{(O-E)^2}{E}$$

where $E = \frac{(\text{Row Total})(\text{Column Total})}{N}$*

	"Total Losses"	Partial Losses	Total
Kaling	14(17.23)	21(17.77)	35
Lokitaung	18(14.77)	12(15.23)	30
Total	32	33	65

$(-3.23)^2/17.23 = 0.6055$

$(3.23)^2/14.77 = 0.7064$

$(3.23)^2/17.77 = 0.5871$

$(-3.23)^2/15.23 = 0.6850$

$X(\text{Calc.})^2 \cong 2.5840$

degrees of freedom (d.f.) No. of rows -1)(No. Col.-1)

$(2-1)(2-1) = 1$

*Mathematical Notes:

The layout in Appendices 2B-D shows the expected frequency (E) in the brackets in the contingency table. The rest of the computations are then done under the table and the Chi-Square found by addition as usual.

APPENDIX 2C

CHI-SQUARE TEST OF DIFFERENCES IN HUMAN LOSSES AT KALING AND LOKITAUNG

	Households Recording Deaths	Households Recording No Deaths	Total
Kaling	26(19.38)	9(15.62)	35
Lokitaung	10(16.62)	20(13.38)	30
Total	36	29	65

d.f. 1

$(6.62)^2/19.38 = 2.2613$

$(-6.62)^2/16.62 = 2.6368$

$(-6.62)^2/15.62 = 2.8057$

$(6.62)^2/13.38 = 3.2754$

$X(\text{calculated})^2 \cong 10.9792$

APPENDIX 2D:

CHI-SQUARE TESTING OF DIFFERNCES IN HUMAN LOSSES AT KALING AND LOKITAUNG USING 3 d.f.

	Deaths Per Household				
Locality	0	1	2	3 and more	Total
Kaling	9(15.62)	5(5.92)	7(5.38)	14(8.08)	35
Lokitaung	20(13.38)	6(5.08)	3(4.62)	1(6.92)	30
Total	29	11	10	15	65

d.f. 3

$(-6.62)^2/15.62 = 2.8057$

$(6.62)^2/13.38 = 3.2754$

$(-0.92)^2/5.92 = 0.1430$

$(0.92)^2/5.08 = 0.1666$

$(1.62)^2/5.38 = 0.4878$

$(-1.62)^2/4.62 = 0.5680$

$(5.92)^2/8.08 = 4.3374$

$(-5.92)^2/6.92 = 5.0645$

$X(\text{calculated})^2 \simeq 16.8485$

Decision criterion at 5 percent level $X_{0.05}^2 = 7.815$

$X(\text{calculated})^2$ is more than 7.815. This is highly significant. Reject the null hypothesis.

The contingency coefficient(C):

Using the appropriate test for the degree of association between locality and human losses, we find that for a 2 x 2 table C = 0.38 while for 2 x 4 table C=0.454; where the contingency coefficient C is given by the formula:

$$C = \sqrt{\left(\frac{X^2}{N + X^2}\right)}$$

The results indicate moderately strong association since in a 2 x 2 table the maximum value of C is 0.707

APPENDIX 2E:

TESTING THE HYPOTHESIS FOR r

$H_o: p = 0$

$H_1: p \neq 0$

$\alpha = 0.05$

This is a two-tail test since we have no idea whether the association between the variables is positive or negative. Therefore $z_{0.05} = \pm 1.96$

The theoretical distribution of the sampling error for large samples is given by the formula:

$$\sigma_r = \frac{1}{\sqrt{(n-1)}}$$

$$z(\text{calculated}) = \frac{r-p}{\frac{1}{\sqrt{(n-1)}}}$$

$$= (0.2026-0)(\sqrt{64})$$

$$= (0.2026)(8)$$

$$= 1.6208$$

z(cal.) is 1.6208. This is less than 1.96 which set the limits for accepting the null hypothesis at 5 percent level. We therefore retain our null hypothesis that $p = 0$, i.e. the linear association between death rates and age in the parent population is 0 or trivial. So, $r = 0.2026$ is representative of the level of linear association between the two measured variables. The low level of linearity did not occur by chance or through sampling error. It is representative of the parent population from which the sample had been picked.

Mathematical Notes:

See, Yeomans, K. (1968), Statistics for the Social Scientist, vol. 2, pp. 209-212 for the testing of the hypothesis for r.

APPENDIX 2F:

COMPUTATIONS FOR CURVILINEAR REGRESSION AND CORRELATION ANALYSIS

x	y	x^2	x^3	x^4	xy	x^2y	y^2
4.5	.3	20.25	91.125	410.06	1.35	6.075	.09
14.5	.15	210.25	3048.625	44205.06	2.175	31.5375	.0225
24.5	.11	600.25	14706.125	360300.06	2.695	66.0275	.0121
34.5	.04	1190.25	41063.625	1416695.0	1.38	47.61	.0016
44.5	.03	1980.25	88121.125	3921390.0	1.335	59.4075	.0009
54.5	.18	2970.25	161878.62	8822384.7	9.81	534.645	.0324
70.0	.39	4900.0	343000.0	24010000.0	27.3	1911.0	.1521
247	1.2	11872	651909	38575385	46.05	2656.3	.3116

Normal Equations:

$$7a + 247b + 118720c = 1.2 \quad \ldots\ldots\ldots(i)$$
$$247a + 11872b + 651909c = 46.05 \quad \ldots\ldots\ldots(ii)$$
$$11872a + 651909b + 38575385c = 2656.3 \quad \ldots\ldots(iii)$$

Equation Transformation and solution:

Multiply (i) by $\frac{\Sigma x}{n} = \frac{247}{7}$ and subtract it from equation (ii) to form a new equation (iv):

$$247a + 8716b + 418912c = 42.34$$
$$247a + 11872b + 651909c = 46.05 \quad \ldots\ldots(ii)$$
$$3156b + 232997c = 3.71 \quad \ldots\ldots(iv)$$

Multiply (i) by $\frac{\Sigma x^2}{n} = \frac{11872}{7}$ and subtract it from equation (iii) to form a new equation (v):

$$11872a + 418912b + 20134912c = 2035.2$$
$$11872a + 651909b + 38575385c = 2656.3 \quad \ldots\ldots\ldots(iii)$$
$$232997b + 18440473c = 621.1 \quad \ldots\ldots\ldots(v)$$

We can now solve for c by multiplying equation (iv) by $\frac{232997}{3156}$ to eliminate b.

$$232997a + 17201394c = 273.9$$
$$232997a + 18440473c = 621.1 \quad \ldots\ldots(v)$$
$$1239079c = 347.2$$
$$c = .0002802$$

Now by substituting for c in equation (iv), we find that b= -0.0195; and when we substitute for b and c in equation (i), we find that a = .38462.

Therefore the regression of death rates on age is expressed here by the equation:-

$Y' = .38462 - 0.0195x + .00028x^2$; and,

$$r_{y.x.x^2}^2 = \frac{a\Sigma y + b\Sigma xy + c\Sigma x^2 y - \frac{(\Sigma y)^2}{n}}{\Sigma y^2 - \frac{(\Sigma y)^2}{n}}$$

$$= \frac{(.38462)(1.2) - (0.0195)(46.05) + (.00028)(2656.3) - .2057142}{.461544 - .2057142}$$

$$= \frac{.1016188}{.1058858} = \underline{0.9597}$$

Therefore the coefficient of determination ($r_{y.x.x^2}^2$) is 0.9597, with a coefficient of correlation which is 0.9796.

Telegrams: "DISTRICTER", Lodwar
When replying please quote
Ref. No. ADM.17/[illegible]/334
and date

OFFICE OF THE PRESIDENT

OFFICE OF
THE DISTRICT COMMISSIONER
TURKANA DISTRICT
P.O. LODWAR
VIA KITALE

13th November, 1981

The Chief,
Lokichoggio,
Kakuma,
Kenya.

MR. ODEGI AWUONDO

The bearer is carrying out a research in the district. Please accord him any possible assistance.

for: (J.E.M. OTTICHA)
DISTRICT COMMISSIONER
TURKANA

JEMO/j[illegible]

THE TURKANA IN KENYA PER DISTRICT, 1979

District	Male	Female	Total
Kiambu	767	559	1,326
Kirinyaga	52	32	84
Muranga	81	54	135
Nyandarua	646	486	1,132
Nyeri	486	351	837
Kilifi	59	72	131
Kwale	39	33	72
Lamu	10	6	16
Mombasa	89	68	157
Taita/Taveta	117	98	215
Tana River	23	23	46
Embu	21	8	29
Isiolo	2,161	2,372	4,533
Kitui	21	13	34
Machakos	163	71	234
Marsabit	1,520	1,409	2,929
Meru	928	720	1,648
Garissa	18	11	29
Mandera	20	2	22
Wajir	18	11	29
Kisii	30	11	41
Kisumu	147	104	251
Siaya	57	29	86
South Nyanza	99	84	183
Baringo	621	534	1,155
Elgeyo/Marakwet	157	110	267
Kajiado	117	91	208
Kericho	235	147	382
Samburu	6,184	7,260	13,444
Trans Nzoia	6,983	5,677	12,660
Nandi	494	318	812
Narok	87	61	148
Laikipia	4,984	4,584	9,568
Nakuru	3,251	2,751	6,002
Uasin Gishu	2,755	1,950	4,705
West Pokot	1,999	1,856	3,855
Bungoma	480	210	690
Busia	67	34	101
Kakamega	529	294	823
Nairobi	626	336	962
Total(migrants)	37,141	32,840	69,981
Turkana Dist.	68,868	68,400	137,268
Turkana in Kenya: Total	106,009	101,240	207,249

Source: Compiled from Kenya Population Census 1979, Vol.1, Nairobi: Government Printer, 1981.

Interview Schedule

I:GENERAL :

(1) Name of Interviewee ..... (2) Sex.... (3) Age ....
(4) Status .... (5) Location..... (6) Site .....
(7) Date of Interview..... (8) Numerical No. .....
(9)Family size and composition (Wives Only)

Name of Wife	Parents Home	Age	No. of Children
1.			
2.			
3.			
4.			

(10)Family size (Siblings Only) by Wives:

Wife 1

Name of Child	Sex	Age	Residence
1.			
2.			
3.			
4.			
5.			
6.			

Wife 2

1.			
2.			
3.			
4.			
5.			
6.			

Wife 3

1.			
2.			
3.			
4.			
5.			
6.			

(etc,etc)

(11) Close Relatives (Man's Side)

Name	Sex	Age	Relationship	Residence
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				

(12) Close Relatives (Wife's Side)

Wife 1

1.			
2.			
3.			
4.			

Q12 (continued)

Wife 2 (Close Relatives)

Name	Sex	Age	Relationship	Residence
1.				
2.				
3.				
4.				
5.				

Wife 3

1.				
2.				
3.				
4.				
5.				

(13) Men with whom reciprocal exchange relationships are maintained:

Name	Age	Economic Status	Location	Intimacy
1.				
2.				
3.				
4.				
5.				
6.				

(14) Livestock wealth kept away with the bond friends:

Name of Bond friend	Stock kept with him	Since When?
1.		
2.		
3.		
4.		
5.		
6.		

(15) Livestock Wealth kept by the respondent for his bond friends:

Name of Bond Friend	Stock Kept For Him	Since When?
1.		
2.		
3.		
4.		
5.		
6.		

(16) Property (Livestock) owned by the family before and after the drought and famine.

Stock Species	Before the Disaster	After the Disaster
Cattle		
sheep and Goats		
Camels		
Donkeys		
Others		

(17) Was your livestock wealth enough to see you through the drought and famine period without asking for additional assistance from anybody? YES/NO

Reasons for the answer.....

.....

II: RESPONSES:

(18) During the 1979/80 drought and famine, how were the Turkana of this locality alerted of their coming?

---

(19) Did the people here take the warnings seriously? YES/NO
Reasons ---
---

(20) What strategies did the people use for fighting the problems of drought and famine?
Enumerate: 1. ---
2. ---
3. ---
4. ---
(etc., etc.)

(21) How effective were these strategies in weathering the disaster?

---

(22) In your case when did you first learn that you were going to face acute food shortages?

---

(23) What did you personally do to weather the drought and famine problems?
(Enumerate, starting with the one which came first):
1. ---
2. ---
3. ---
4. ---
(etc., etc.)

(24) How effective were these adjustments in your case?

---

(25) What help did you get from outside the family circles?
1. ---
2. ---
3. ---
(etc., etc.)

(26) What help did your family get from the bond friends enumerated in Q. 13 above?

Name of bond friend	Help Received	How frequently?
1.		
2.		
3.		
4.		
5.		

(etc., etc.)

(27) What help did you give out to your bond friends?

	Name of Bond Friend	How much Given	How often help given
1.			
2.			
3.			
4.			
5.			

(etc., etc)

(28) Were there any human losses you know of due to drought and famine in the neighbourhood outside your family? YES/NO.
If YES, give the following details.

	Name	age	sex	locality	cause of death
1.					
2.					
3.					
4.					

(etc. etc.)

(29) Were there any human losses in your family from drought and famine? YES/NO.
If YES, give the following details:

	Name	age	sex	mother(if child)	date lost	cause
1.						
2.						
3.						
4.						
5.						

(etc., etc.)

(30) Did you send any of your family members away to stay with relatives, friends or neighbours to ease the strain on domestic food resources? YES/NO.
If YES, give details as to whom, when and for how long.

---

(31) Did any member of the family migrate to town, irrigation scheme or the lakeshore in search of food or employment? YES/NO.
If YES, give the following details:

	Name of Migrant	age	sex	Where migrated to	When Returned
1.					
2.					
3.					
4.					
5.					

(32) Give details of what help the migrants in Q31 above got from where they had gone.

	What help Found	How much sent back home
1.		
2.		
3.		
4.		
5.		

(33) When did you enter the famine relief camp?

---

(34) Which of your family members remained in the countryside as you moved to the camp for feeding by government?

---

(35) Who is now in charge of your surviving livestock in the pasturelands?

---

(36) What form of non-pastoral food aid did your family receive from anywhere/anybody before the Kenya government brought food to this locality/famine relief camp?

Thank you very much for your assistance. Stay well.
Ejok.

Kaling,
Turkana District,
16th November, 1981.

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KEY INFORMANTS

Interview Guide

The following are the questions and topics about which the eight key informants at Kaling and Lokitaung were interviewed.

(1) Oral history and cultural interpretation of drought and famine by the Turkana elders.

(2) In the past, who used to warn the people of the impending outbreak of drought and famine?

(3) In the past were there any rituals or ceremonies related to drought and famine? Are they still observed today by the Turkana?

(4) How effective were traditional means for wading off famines?

(5) How effective are the cultural means for weathering droughts and famine today among the pastoral Turkana? What accounts for the prevailing situation?

(6) How best would the Turkana themselves like drought and famine to be managed by government?

(7) Are the Turkana pastoralists more vulnerable to the devastating effects of drought and famine today than in the past? Explain fully what factors are perceived to account for the changes in adaptive capacity if any.

(8) Do you think the dispossessed Turkana fall off the reciprocal network during drought and famine as the recent/present one? Elaborate.

(9) How does one re-enter pastoral life after a major disaster like this one, today and in the past?

(10) In your view, would you say famine relief food as distributed in this famine relief camp reaches the needy? How are the people using their famine relief rations?

****

RESPONDENTS:

NAME	APPROXIMATE AGE (in years)	PLACE INTERVIEWED	DATE INTERVIEWED
(1) Lokusudo Etukoit	90	Kaling	16/11/81
(2) Lobwin Kamurunyang	88	,,	16/11/81
(3) Egron	75	,,	20/11/81
(4) Edong	65	,,	20/11/81
(5) Eleny	65	,,	20/11/81
(6) Ile Natong	90	Lokitaung	30/11/81
(7) John Ekitela	60	,,	1/12/81
(8) Mariko Echoto	60	,,	1/12/81

RECORDING THE INFORMATION: This was done in the form of field notes.