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REPORT ON SOCIAL AND ADMINISTRATIVE ASPECTS OF RANGE MANAGEMENT DEVELOPMENT IN THE NORTHEASTERN PROVINCE OF KENYA

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The main recommendations are in paragraphs 4, 19, 36, 37, 43, 45, 50, 52 and 55-60.

Appendices

Background and Purpose

1. This report arises from the proposals of the Kenya Government, supported by the World Bank and the Swedish Government, for water and livestock development in the Northeastern Province. The intention is that water supplies shall be increased to allow cattle to remain for longer periods in the under-utilised wet season grazing areas, thereby increasing the dry season grazing by some 25 per cent. These new water supplies would allow a more controlled and systematic use of grazing and permit an increased cattle population and an increased offtake of immatures.

2. The purpose of this report is to examine and advise on social and administrative aspects of these proposals. The most obvious and central questions concern the most suitable land and social units for development and the forms and degrees of control that are feasible. These questions cannot, however, be tackled in isolation. The physical conditions of the Northeastern Province are so extreme and difficult that it is essential to examine them first. Moreover, while I was in the Province it was repeatedly pointed out to me how low and uncertain rainfall, shortage of water, the distribution of soils and vegetation, and the dictates of good animal husbandry are powerful constraints on development proposals. This report begins, therefore, by setting the scene with an examination of these factors as a preliminary to considering social and administrative questions associated with proposals for range management.

Method and Limitations

3. The survey was carried out in August and September 1969, and the writing up completed in October. I gratefully acknowledge very full assistance and cooperation from Government officers in Nairobi and in the Northeastern Province, and from the Somali people whom I met. My main source of data was a series of barazas and ensuing discussions with small groups or individual Somalis. Such meetings were held in 16 places in Garissa District, 15 in Wajir, and 8 in Mandera, and typically lasted several hours. Much of the information on soils, and most of the information on livestock, migrations, water supplies, social structure, social groups, and attitudes to range management and development proposals, are derived from such meetings. The Kenya Government archives have in addition provided material. A more detailed description of sources and their limitations is given in Appendix A.

4. In the time available the amount of cross-checking of data was bound to be inadequate. Many of the statements which follow should properly be prefaced by "In several places I was told that ...". Since the prime source was Somali informants, there was a danger of distortion

through interpreters and through misinformation designed to secure particular advantages. A special problem was the reluctance of most people to state the areas preferred or normally grazed by particular social groups. Nevertheless, I believe that most of the information which follows will prove to be accurate, and that it is adequate to support consideration of the recommendations of the report.

Rainfall, Water and Grazing (See also Appendix B)

5. In discussions of migration, livestock husbandry, water development and range management, the limiting factor most frequently mentioned by Somali elders was low and uncertain rainfall. I am indebted to Dr. H.T. Morth of the East African Meteorological Department for providing the statistical information in Appendix B. This confirms and supplements what the Somali people themselves have said.

6. Although the rains frequently fail, they are expected in two seasons: the long rains (Somali - gu) from late March until mid- or late May; and the short rains (Somali - dir) from late October until mid-December. The long rains are extensive and persistent, with simultaneous rain covering wide areas, a widespread cloud cover and low temperatures, whereas the short rains are typically localised convection storms with sharp edges. In gu it may rain at night, or it may rain persistently during the day; in dir rain is usually limited to the late morning and early afternoon. The two dry seasons are hagai and jilaal. Hagai (June to October) may be somewhat cloudy, and has strong winds. Jilaal (late December to March) has few clouds and is very hot.

7. Rainfall volume and variability are probably the most critical factors constraining the scope of population stabilisation and range management. Mean rainfall varies from over 20 inches in Ijara Division in the southeast corner of Garissa to possibly less than 10 inches in some western parts of the Province. For most of the Province, the mean rainfall since records began is a little over 10 inches (Garissa - 12.73; Wajir - 11.13; Mandera - 10.25; El Wak - 12.93; Buna - 12.68; Habbaswein - 12.35). These figures, however, give a most misleading impression of regularity. In fact, rainfall in any particular month is highly unpredictable. The greatest regularity of rainfall is in the southeast, and the rainfall at Galole (which may be taken as similar to that in Ijara) is not only higher (19.38) than in most of the Province, but also more evenly spaced throughout the year and less variable in any one month. (Caveat: Galole's records are for 1957-1969 only). Elsewhere the span of variation is startling. The tables of monthly variability in Appendix A show the probabilities of rainfall in any one month falling below half or over double the mean. They demonstrate that for most

months, even for rains months, it is more likely than not that the rainfall total will be either less than half or more than double the mean. Quite apart from the question of the volume of rainfall, this percentage variability is greater in the Northeastern Province than for the higher rainfall areas of other parts of Kenya. Annual totals, too, are very variable. Between 1937 and 1968 inclusive, the highest and lowest annual rainfalls recorded at the three stations with longest records were:

	Lowest inches	Highest inches
Garissa	2.71	36.00
Wajir	2.90	33.36
Mandera	1.65	26.85

8. It is even more serious that there can be, and have been, sequences of years well above or well below the mean. It is all too easy to be influenced into unjustified optimism by a few good years, or into fatalistic pessimism by a few bad. It is important, therefore, before any assessment of grazing and water supplies, to examine the few preceding years and compare them with the mean. The 1960s have been exceptionally rainy in the Northeastern Province. In the nine years 1960 through 1968, Garissa has had seven, Wajir seven, and Mandera eight years of rainfall above the mean. It is sobering to compare Garissa's figures for the four years 1965 - 1968 with those for the four years 1943-47:

	1943 - 46		1965 - 68	
	Total recorded rainfall	mean over 4 years	Total recorded rainfall	mean over 4 years
Garissa	16.14	4.03	78.12	19.56

1967 and 1968 have been exceptional years, and may be compared with two bad years:

	1945 - 46		1967 - 68	
	Total recorded rainfall	mean of two years	Total recorded rainfall	mean over two years
Garissa	5.92	2.96	55.33	27.67
Wajir	11.85	5.93	51.03	25.52
Mandera	12.75	6.38	43.56	21.78

9. The significance of this evidence deserves to be laboured. Sequences of high or low rainfall have a cumulative effect on grazing and on some water supplies. Although 1968 has been drier to date than the immediately preceding years, range resources and some water supplies can be expected to be in exceptionally abundant supply. In addition, during past five or six years a very substantial proportion of the livestock of the Province migrated to Somalia and some went to Ethiopia. Many camels, and to a lesser extent cattle, are reported to have died in Somalia, and others died in the Province during the Emergency.

During 1969 many of the surviving animals have been returning from Somalia. The Province is thus being restocked, probably at a lower level, after a number of years of abnormally low stocking and abnormally high rainfall. This would therefore appear to be a difficult and misleading time to assess the range potential of the Province.

10. Rainfall deserves to be studied more systematically and in more detail. Local variability of rainfall, in particular, is important since it bears upon the relationships between size of management unit and carrying capacity. Especially in dir, when rain storms are particularly localised, the chances of rain falling somewhere within an area can be expected to increase the larger the area. This means that the larger the management unit, the higher will be the safe per acre carrying capacity. It is important to try to establish the extent of this effect. Rainfall variability also bears closely upon the question of how far more controlled and systematic use of grazing is possible at all.

11. I recommend:

(i) that this rainfall information and that in Appendix B be brought to the attention of all who are concerned with administration or range management in the Northeastern Province;

(ii) that the East African Meteorological Department be encouraged (as it is willing) to install more rain-gauges in the Province. Where Government staff are not available, traders should be persuaded to keep the records;

(iii) that a study of rainfall correlations between neighbouring stations be carried out by the East African Meteorological Department in order to assess more accurately the variability of rainfall.

Soils and Livestock

12. At an early stage of discussion with Somali elders it became clear that it is in terms of soil types that they most commonly describe different ecological conditions for livestock. Vegetation corresponds surprisingly closely with soil type, and Somali graziers are unanimous that grazing on different soils affects the well-being, size and reproduction of cattle as well as camels. A soil diagram of the Province has therefore been prepared combining evidence from some geological maps and statements by elders. The map, and a more detailed description of soils, may be found in Appendix C.

13. The main soil categories are:

Adabla (Borana - Korticha): dusty soft grey soil, sometimes described as grey cotton. Fertile, with much grass.

Boji : salty black cotton soil. Infertile. Usually found within more extensive areas of adabla.

Waiyana : hard red soil on which water stands

Rana : sandy red soil, on which water does not stand

Kunya : a residual category of white and reddish sandy soils, not always clearly distinguished from rana and waiyana, but sometimes stony.

14. Sheep and goats do well on waiyana, rana and kunya. They do better on waiyana than on adabla.

15. Camels do best on combinations of soils. During rains they cannot graze in adabla because of flies and ticks, and they are usually herded in waiyana. During this period their salt needs are provided for either by buying salt or by transporting boji by baggage camel from places like Buna where it abounds. A month or two after the rains, camels go to browse in adabla. While there they do not need additional salt. Some camels browse in rana which has the advantage that bushes usually remain green for several months after the rains. Good camel husbandry requires movement every month or so to a new area. Even cattle owners who dislike camels infiltrating into their areas admit this.

16. Cattle develop differently on adabla on the one hand, and on waiyana, rana and kunya on the other. The principal contrasts are said to be:

	adabla	waiyana rana and kunya
Age of starting first pregnancy	1½ - 3 years	3 - 4½ years
Calving frequency	often once a year	perhaps 3 times every 5 years
Milk yield	higher	lower
Hardiness	less hardy	more hardy
Size and weight	smaller and lighter	larger and heavier

Cattle grazing on adabla do not need to move off adabla; indeed, it is bad for them to move from adabla to waiyana. But cattle grazing on waiyana, rana or kunya do better if they graze on adabla from time to time.

17. This information requires careful checking and confirming and should be treated with caution; but if it is correct then it is important to establish the relative advantages for the purposes of breeding immatures of the higher reproduction rates on adabla and the larger and tougher animals on waiyana. From a social welfare point of view there is a case for developing water supplies on adabla rather than waiyana because of the disproportionate increase in milk supplies that could be expected to result. If the differences in size and hardiness are not great, then the differences in rates of reproduction will also weigh strongly in favour of adabla development for cattle.

18. There is also some further evidence from stock population distribution that Somalis at present prefer to keep cattle in adabla rather than on the other soils. There is some correspondence between Watson's[1] stratification, derived for his aerial stock census of the Northeastern Province, and the soils diagram. There are intervening factors such as the criteria (including water point density) used by Watson for stratum identification, and the time of year of the survey, but there is a notable tendency for the strata showing high cattle populations also to contain substantial amounts of adabla, for instance Boransis (Lak Dera), Mudo-Gashe (Galana Gof) and Jara Jila (including Kolbio, Hulugho and Galma Galla) in Garissa District; Goochi (Khorof Harar), Bur Maiyo, Itailale (Didentu) Garade (Kufole), Wachidima, Dida Chamu, Erip (Boji Plain), Shinbirre, Turguda, Bun, Garati, Mereid and Jirtoi (Wajir Bor) in Wajir District; and Bur Maiyo and Mansa in Mandera District. There are also a few exceptions. In addition, although the data is much less precise, there is some confirmation from rinderpest inoculation figures which show, for instance, very high returns for Watson's Jara Jila stratum in south-east Garissa, - 175,000 out of a District total of 339,000 (as at 6th August 1969), though the 175,000 is inflated by cattle from Somalia. All this evidence must, however, be treated with caution.

19. Although these findings, taken separately, are vulnerable to obvious criticisms, taken together they suggest that there is a case, which deserves to be further examined and confirmed or refuted, for giving priority to development on adabla soils. I recommend that this question be further examined by means of a professional ecological survey which would provide harder data on soils, vegetation, cattle distribution, and livestock performance in different conditions.

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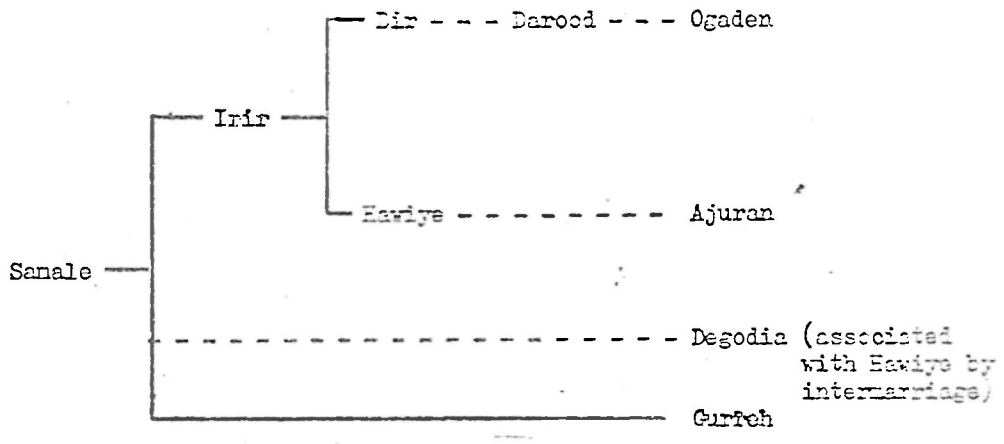
(1) R.M. Watson, "A Census of the Domestic Stock of the North Eastern Province", (typescript, but to be published), 1969

Socio-Political and Territorial Organisation (see Appendix D for map)

20. A major question is the extent to which there are political units with territorial identities which would provide a basis for administrative and range management organisation.

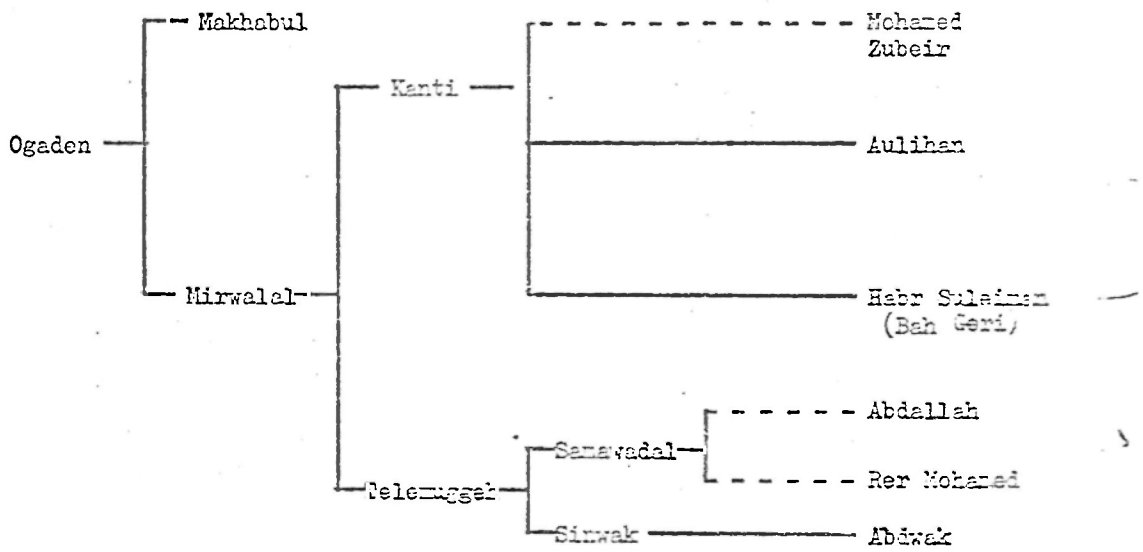
21. Somalis are patrilineal, tracing descent through the male line, and identifying themselves as co-descendants of particular ancestors. The Somalis of the Northeastern Province are mostly of the Darood and Hawiye tribes. Their descent relationships are:



——— = descent without an intervening generation

- - - - = descent with one or more intervening generations

The descendants of Ogaden can be further subdivided:



22. These descent diagrams do not indicate the current relative sizes or importance of the various descent groups in the Northeastern Province. Administrative usage is followed here in calling the larger groups (Ogaden, Ajuran, Degodia, and Gurreh in particular) "sections"

and the smaller groups (among the Ogaden: Makabul, Mohamed Zubeir, Aulihan, Habr Suleiman, Abdallah, Rer Mohamed, and Abdwak) "sub-sections". The term sub-section (roughly corresponding with the Somali rer) is also used sometimes for lower descent groups (such as Rer Ugas Nur, or Rer Ugas Guleid of Mohamed Zubeir).

23. Political friendship or hostility between groups is partly opportunistic, but also strongly associated with the closeness or distance of descent groups. The clearest cleavages are at the level of sections, with Ogaden, Ajuran, Degodia and Gurreh self-consciously competing for water, grazing and other resources. Below the level of the section, sub-sections, such as the Aulihan and Abdwak in Garissa District, may also be self-consciously competing, but in public at least Somalis of the same section usually claim that they are all brothers and share grazing and water equally.

24. Members of sections appear communally to identify themselves more closely with territories than do members of sub-sections. The colonial policy of tribal separation and the imposition of exclusive boundaries between sections was partly making de jure what had earlier been de facto. It attempted to freeze a situation which had earlier been fluid, a situation in which water and grazing "rights" were based largely on force and liable to change according to the relative power of the different groups. Now that the boundaries are not being enforced, the more aggressive (and predominantly camel-owning) sections - Gurreh and Degodia - are opposed to their reintroduction, whereas the less aggressive (and predominantly cattle-owning) sections - Ajuran and Ogaden - are in favour of a return to the former boundaries (shown on the map with Appendix D).

25. The state of affairs with sub-sections is much more difficult to assess. Informants were often either reluctant to discuss relationships between sub-sections and grazing and water use, or willing only to give misleading information. (In one case we all ended up laughing when lies became too blatant). However, there is no question but that most individual manyattas have preferred wet and dry season grazing areas, and that sub-sections can be identified as being more common in some areas than others. This does not mean that the members of a sub-section will always use that area, nor even that at any time the particular sub-section will necessarily prove to be a majority in those areas. Sub-sections are normally highly intermingled. In Garissa District, there are relatively small areas where Aulihan, Abdwak and Abdallah are "pure" and large areas where they are "mixed". In south and southeastern Wajir, the four Ogaden sub-sections of Mohamed Zubeir, Habr Suleiman, Geri

and Makhabul live together, and say that any of them may be found anywhere, although in some areas some sub-sections probably predominate. Much the same is true of Ajuran sub-sections and Degodia sub-sections further north.

26. From a social point of view, various compositions and various sizes of range management unit are possible. The fact that the Ajuran requesting a group ranch near Giriftu all come from the same sub-section - Gelberis - suggests that sub-sections might in time provide cores or solidarity upon which management units might be built. But the Somalis are highly pragmatic, and units might well develop with mixed sub-sections or even mixed sections composed of those people who were customary users of land or who were prepared for range management. For the present there are no clear lines of social-territorial separateness. Those opposed to any exclusive boundaries are: in Mandera District, all groups; in Wajir, Degodia and those Gurreh who have moved in; and in Garissa, Aulihan and Abdallah. Those in favour of exclusive boundaries are, in decreasing order of strength of feeling: Ajuran in Wajir; Ogaden in Wajir (against Degodia rather than against Ajuran); and some Abdwak in Garissa. If exclusive boundaries are considered important for administration of range management, then from a socio-political point of view, the areas most commonly grazed by the Wajir Ajuran, Wajir Ogaden and Garissa Abdwak should provide the least difficult starting points.

Group and Individual Ownership of Land and Water

27. Apart from the degree of identity between sections (and in Garissa sub-sections) and land described above, I was unable to find evidence in the Northeastern Province, with the possible exception of Ijara Division, of customary exclusive rights of grazing. The colonial grazing boundaries established areas for sections which over time, by virtue of use, could then be said to be customarily grazed by those sections; but that "customary" exclusiveness is no longer in operation, and most areas in the Province are now being used by more than one section (or in Garissa, sub-section). At this stage it would be difficult, again with the possible exception of Ijara Division, to establish adequate customary rights to land to allow land adjudication to groups smaller than sections; and even at the section level adjudication would be complicated by past sharing arrangements.

28. Ownership and rights of use are clearer with water. There are many variations and nuances, but the following are generally true:

Natural pan water (hiya daxan) (warr)	is communal
Government pan or dam water (warr)	is communal
River water (webi, with access at malkas)	is communal

Wells in sand luggas (khot khot)	are owned for the season by those who dig them
Permanent wells (el)	are owned by those who dig them. or who have them dug, or who buy them
Pans dug by individuals	are owned by them and they have exclusive rights to use the water
Borehole water	Much probably depends on the borehole operator and pressures brought to bear on him. I was unable to obtain reliable information about practices in allocating borehole water.

Water from a source which is owned can be sold, although this is generally disapproved of. It is only sold for stock; water for human consumption is given and not sold. There has been a shift from group towards individual ownership of wells, for instance at El Wak, and this has been associated with the growing practice of selling wells.

29. Individual or family ownership of a water source or of land may be established through the application of labour. A well which a man has dug to a depth above his knee is owned by that man, and no one else can continue to dig it without his permission. Similarly, rights to cultivate land are established by clearing land, placing marks on trees, and fencing with thorn. Cleared land can now be sold. Adjudication of cleared land would be possible, and might in the very long term be desirable. In the short term, however, it does not seem an urgent matter since land disputes are not prominent; users of land (except on the banks of the Tana) do not feel their usage threatened; there is as far as I know no question of credit being issued on the security of land title; and there is no shortage of land to cultivate, only of rainfall to make crops grow.

Migration and Settlement

30. For any range management or population stabilisation planning it is vital to appreciate how extreme and how necessary is the nomadic opportunism of individual Somali manyattas. Their movements are, to be sure, influenced by social factors; but the most powerful factor is where it happens to have rained, and where the best combinations of water and grazing can be found. In matters of migration, the unit is normally an individual manyatta, and the decision rests with the head of the manyatta. He sends out scouts (jahan) to look for grass and water. When they report he consults the other men in the manyatta, and then decides whether and where to move. Movements are usually kept secret from neighbours. An exception is where there is a Koranic teacher around whose instruction are grouped a number of manyattas. In this case one man, an abaula, is appointed to decide for the group, which then moves as a unit so that the teaching can continue.

31. A distinction can be made between camels and cattle. Where a man owns both camels and cattle, he normally prefers to have them together, but in the interests of good husbandry they have to be separate for much of the year. For several reasons, camels move far, often, and irregularly: they can water at intervals of up to at least twenty days; they can carry water for people; they can give continuous supplies of milk; they are fast walkers; and they require to move frequently to new types of browse. Camels are thus adapted to and associated with way of life which is mobile, tough, and independent.

32. In contrast with camels, there are several reasons why cattle herds move somewhat less far, less often, and less irregularly: they have to be watered much more frequently, and do best if watered every day; they are only very rarely used for carrying water for people; they give less continuous supplies of milk, making the people more dependent on other sources of food; they are slower walkers than camels; and they do not to the same extent benefit from changes in grazing (particularly if they are on adabla). The fact that cattle are, despite these factors, highly nomadic indicates the degree to which movement is necessary for good management and survival. There is a difference here between the milk stock (irman) and the dry stock (Somali - bile; Borana - fora). Cattle-owning Somalis do not like moving, but with present water supplies most of them find it difficult to conceive circumstances in which they would not have to continue to be nomadic. They commonly compromise by leaving their milk stock, together with the old men and women and children, near permanent or semi-permanent water, and moving the dry stock, together with the young men and sometimes young women, over extensive areas. Information obtained from cattle-owners in Garissa and Wajir Districts about the movements of their dry stock over the previous eight months showed cattle moving hundreds of miles, following the water and grazing, and migrating freely between countries, districts, and former section or sub-section areas. The nomadism may have been exaggerated by the distances covered by cattle returning from Somalia after the Emergency, but other evidence supports the conclusion that, except in the high rainfall areas of Ijara, dry stock normally cover considerable distances during and after the rains. When the rains come, they move away from permanent water to good grazing where there is little water. Then, as the dry season sets in and temporary water supplies dry up, they move away to the more permanent supplies, usually associated with less good grazing. Sometimes cattle are cut off (as happened in 1961 when Abdallah cattle were stranded in Wajir District, and this year when Makhabul cattle were caught at Jaraka in Habbeswein Division) when the staging water needed to reach the water of last resort dries out before they have moved. In such an event they may have to travel far from the places they know - the Makhabul cattle in

this case having a six-day trek without water moving south to the Tana. This example should make it clear that the migration lines drawn on the map in Appendix E cannot be taken as more than broadly indicative, describing possible tendencies. Cattle movements may be less unpredictable than those of camels; but they are still highly variable.

33. I cannot emphasise too strongly that given the low and unreliable rainfall, and in present conditions of water supply, this system of competitive opportunism is a most able adaptation to a harsh and unpredictable environment. Its flexibility, and the incentives it provides for vigorous exploitation of transient resources, make for more effective use of water and grazing than with a more rigid and more administered system. With present water supplies, nomadism is necessary. The rain falls differently each year. As Somalis say: "We follow the rain. We have to."

34. At the same time, and in conflict with this nomadism, many Somalis express a strong desire to be settled, to cultivate, and to enjoy facilities such as schools and health centres. Although the villagisation during the Emergency was resented at the time, its advantages were quickly appreciated, and small centres like Bura, Dadaab, Mudo Gashe, Habbaswein, Giriftu, Buna, Gurar and Takabba have been growing, and will probably continue to grow, particularly those which are or which become divisional centres. The most extensive settlement taking place is along the Daua and Tana rivers where the forest is being cut down and farms started. It is remarkable, too, that unirrigated farming is being tried at places as dry as Giriftu and El Wak.

35. Settlement has obvious advantages. It makes the provision of schools and medical services easier; it simplifies administration; insofar as food is grown where there was none before, it has direct economic benefits. It also has two particular disadvantages. In the first place, even with new seed varieties, a high proportion of crops will fail, and should any poor people try to depend entirely or largely on crops (unless irrigation is used) they will quite often be dependent on famine relief. Secondly, and more importantly, to the extent that the people living in settlements or along the rivers abandon nomadism while retaining stock, there will be a danger of overgrazing. This is no new phenomenon, but it is serious. The area around Mudo Gashe is already a dustbowl, despite the exceptional rains of recent years, and by September this year much of the grazing along the Tana and Daua had been exhausted.

36. The danger is that increasing numbers of milk stock near permanent water will be needed to supply milk to increasing populations, and that this will deplete the reserve grazing of very much larger

numbers of cattle. While Administrative Officers are mainly committed to establishing administrative centres, there is an opportunity to tackle this problem by regulating the numbers of cattle near centres and rotating their grazing. It is also desirable that townspeople should be encouraged to change their diet gradually to include more purchased food.

37. The problem of grazing and cultivation near the two rivers is more difficult, and should be approached with an open mind. It is arguable that the forage near the rivers is so critically scarce that it is more important to preserve it for stock for the height of the dry season than to eliminate it by allowing cultivation. Alternatively cultivation may prove the most desirable land use if accompanied by stock limitation and seasonal evacuation of stock to allow grazing to recover. I recommend that the question of land use along the two rivers should be the subject of a land use and economic survey with the proviso that any recommendations emerging from such a survey are critically examined for administrative feasibility.

38. The key fact in this discussion is that the forage near permanent water is scarce resource. To maximise stock carrying capacity it should only be used towards the end of the dry season when no other forage is accessible. If, however, it is used before then, it reduces the number of stock that can safely be grazed elsewhere since it uses up the grazing on which they must rely later. Every animal near the Tana or Daua or other permanent water during or soon after the rains thus reduces the safe carrying capacity of the Province as a whole. The provision of more water that was permanent would ease the situation, but the problem would persist; and insofar as water development produces only temporary water which does not significantly defer the return to permanent water, to that extent the pressure on the forage near permanent water will be even greater because of the increased numbers of stock made possible by the new temporary water.

Customary Authority and Controls

39. The next question is the extent to which there are customary authorities or controls which could be adapted to and assist range management.

40. In Somali society in the Northeastern Province there are no formal traditional authorities with a political jurisdiction. Religious leaders (sheikhs) are respected and rich men are influential through their wealth and the number of their dependants, but they do not exercise the comprehensive powers usually associated with traditional rulers. Chiefs and Sub-chiefs are appointed Government servants and not traditional leaders, and any slight traditional element in their previous authority has been reduced with the policy of giving chiefs responsibility

for territorial areas rather than tribal groups. The segalis who were in the past paid a retainer by Government and who represented group interests in dealings with Government no longer have the same official status or backing, though they are still respected. The most widely recognised authority, (apart from force) is the ad hoc meeting of elders, but this also carries less weight than in the past. An indication of the decline of authority is given the lower frequency with which maradha (Borana - Karamata), a customary fine of one or more animals to be slaughtered and eaten by the community, is now said to be used. I often asked elders when the most recent maradha had been awarded, and with very few exceptions was given examples from before the Emergency, together with an expression of hope that the practice would be revived.

41. The authority of groups of elders, and the frequency of the imposition of maradha have declined for several reasons. In the first place, customary sanctions were artificially sustained by the colonial administration, and, to take one example, payments of blood-money (dia) were insisted on by Government. Second, the policy of applying only one law, the law of Kenya, to crimes such as murder, and not supporting traditional sanctions, has left elders uncertain whether to continue using them, and uncertain what they can do in case of default. Third, the Shifta emergency involved a return to force as a source of authority between Somalis. Fourth, the abandonment of inter-section boundaries means that in any particular place, a group of elders is less likely to be tribally homogeneous. Because these reasons for the decline of traditional sanctions are so powerful, it is unlikely that without Government support, maradha will again become widely practised.

42. The decline of these controls is most noticeable in connection with water discipline. The Borana-speaking Ajuran and Gurreh, like the Borana themselves, have a traditional system by which one man, an abaharega, is chosen during each season of use to organise and control watering at a particular water source. In ideal theory the abaharega schedules watering times, supervises sanitary measures, organises the demarcation of watering areas and the fencing of pans and wells, allocates water to passing strangers, and reports infringements of water discipline to the elders who use the water. Before the Emergency this system was backed up by Government, presumably under the Native Authority Ordinance, and the local authority employed overseers who moved around with baggage camels supervising the abahareegas. I have no way of knowing how effective these controls were, but Ajuran and Gurreh are unanimous in stating that the system has disintegrated. What were previously offences - watering diseased stock in the same place as healthy stock, failing to remove cattle dung and pile it for burning, washing clothes in pans, bathing,

allowing cattle right into the water instead of building a thorn barrier in the water so that only their forelegs could enter - are now widely practised with impunity.

43. The breakdown of Ajuran and Gurreh water discipline has led to much pollution and dirtying of water, and has aggravated inter-group tensions. The breakdown appears to result mainly from the interpenetration of other groups, notably Degodia, and from the impossibility of official backing for sanctions during the Emergency. In the interests of health and well-being I recommend that:

(i) abaharegas, where they exist, receive official support under the Chiefs' Authority Act[1], or whatever other legislation is appropriate;

(ii) that the peripatetic supervisors with their baggage camels be reinstated where this has not already been done;

(iii) that all District Officers and Chiefs be encouraged to visit important water holes regularly, and be fully informed of their legal powers in connection with water discipline and instructed to use them;

(iv) the system of abaharegas should be encouraged to spread into other sections, the Ogaden of Wajir District appearing initially to be the most receptive.

44. Although I often asked about customary controls over grazing I was unable to establish any case of the imposition of a sanction for any improper use of grazing, although it was said that a naraaha might in the past have been awarded to a stock-owner with sick animals who refused to keep them segregated. The closest example, apart from that, is that when water begins to get short at a water source, the elders may jointly agree to send away their dry stock. Any man failing to comply would be subjected to strong social pressure until he did comply; but I was told that non-compliance was most unlikely. The control exercised in this example is, however, primarily over water and not grazing. Again, movement away from permanent water when the rains come is a matter of personal preference and is not subject to any customary sanction. There is no custom of closing grazing.

45. In conclusion, therefore, the only two institutions upon which water usage and range management controls might be built are the abaharegas of Boran-speaking Somalis, and the influence of a "committee" of elders. Both these have been weakened in recent years and would require official support if they were to exercise effective controls over water and grazing

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(1) Cap.128, sections 10(b) and 10(c) appear to apply.

use. These and other institutions of the Somalis of the Northeastern Province deserve further study, and such study would be of benefit in planning for the future. I recommend that a full-time sociologist be encouraged to carry out a more detailed and more prolonged survey.

Attitudes to Range Management and Boundaries

46. Any statements about attitudes must be treated with caution, and may quickly become dated. The observations about range management which follow apply only to Garissa and Wajir Districts, since I did not enquire about attitudes to range management in Mandera. However, all the people in Mandera appeared firmly opposed to any reimposition of boundaries, and to any restriction on freedom of movement.

47. Current attitudes to range management and boundaries are conditioned by past experience. The colonial intertribal boundaries, considered essential at the time for the maintenance of peace, were enforced by fines, usually one tenth of the stock involved, levied on trespassers. Those Somalis at present opposed to boundaries state that far from maintaining peace, the fines aggravated inter-section hostility. Those at present in favour of boundaries state the opposite. (There is probably some truth in both). The groups most frequently fined were Aulihan (Garissa) for trespass across the Aulihan line to the southeast, and Degodia (Wajir) for trespass, mainly with camels, into the Ajuran adabla and boji areas to the west. In the case of the Garissa-Wajir boundary, with Ogaden (though of different sub-sections) on either side, separation was felt important by the Administration but not by the people who had amicable arrangements for sharing grazing when in need.

48. In addition to section boundaries, control was exercised over overgrazed areas near permanent water. After the Second World War grazing guards were recruited, and these areas were closed during the rains, normally for the months of April, May, June, November and December, with variable dates for starting and finishing set by the District Commissioner each season according to when the rain came. Patrols were used to catch trespassers, and fines were levied on those who were caught. Orders of this sort were made for various zones, including the area between the Tana and Mahony's Road; for part of the Lorian swamp; for five miles on either side of the Uaso Nyiru between Tumtu and Meri; for the area within five miles of the Galana Gof; for the vicinities of Wajir, and El Wak; and for the area to the south of the Daua river. (This list may not be complete). Somalis' attitudes to these controls are ambivalent. On the one hand they resented the loss of freedom of movement and the occasional fines. On the other hand, several stock-owners, in different parts of the Province, told me that they hoped these controls could be reintroduced in order to improve and conserve the grazing near their water of last resort.

49. Attitudes to current range management and administrative proposals are evolving, as are the proposals themselves. There is strong, unresolved tension in many Somalis' attitudes: they do not wish to miss any benefits which may be going, whether these are group or individual ranches, or water supplies; but at the same time they cannot conceive sound animal husbandry under conditions of individual or group ranching unless those taking part were in exceptionally (and improbably) highly privileged positions in relation to grazing and water. The badia (reserve) Somalis generally oppose boundaries and proposals to rest areas; the townsmen are warily in favour of making the right noises to secure maximum benefits for themselves. The more influential men, representing town and not badia opinion, realise that if they agree to group ranches, or whatever else it is that Government appears to want, they will improve their chances of getting new water supplies. At the time when I left the Province (the end of September 1969) a competition was developing between groups to obtain the first favours.

50. This means that requests for group and individual ranches and agreements to hypothetical forms of range management should be treated with care, if not scepticism. The experience in some other parts of Kenya has been that people will agree to controls up to the time when the water is irreversibly installed, and then reject the controls later. I recommend that if any individual or group ranch is introduced in the Province, it should be treated as strictly experimental, and there should be no question of a rapid spread of the system until several years' experience of operation have been gained.

51. Although individual attitudes appear to be changing rapidly, sectional attitudes are quite likely to remain in the same relative positions. In order of readiness to accept and cooperate with range management, the sections of Wajir and Garissa Districts can be graded as follows:

High	Wajir Ajuran
	Wajir Ogaden
	Garissa Abdwak (El Lein)
	Garissa Abdallah (Ijara, Kolbio, Bulugho)
	Garissa Aulihan
	Wajir Degodia
Low	Garissa Ogaden along the banks of the Tana

The attitudes grade between a strong desire for exclusive boundaries coupled with a readiness in principle to cooperate with Range Management staff (Ajuran) to a readiness to cooperate only on condition that there are no boundaries (Degodia) and a refusal even to state where new water would be desirable (general tendency among Garissa Ogaden along the banks of the Tana).

52. Attitudes to Divisional boundaries as exclusive grazing units are unformed. There is, however, a widespread fear of the land being divided into small units which would prevent cattle from following the rain. In my view this fear is rational. It is obviously important to avoid development policies which would complicate administration without commensurate benefits. Were Divisional boundaries enforced to make Divisions exclusive grazing areas there would be widespread resistance. The most sensible policy would appear to be the one being followed, namely to treated Divisional boundaries as subject to review and in the meantime for Divisional officers to administer those people who for the time being are within the boundaries without restricting their freedom of movement. In the longer term, administrative convenience will lie in the direction of allowing Divisional boundaries to coincide with emergent range management units. This will simplify the work of range management staff and also allow Administrative Officers to make a full contribution to range development. I therefore recommend that in the meantime Divisions should not be treated as exclusive units, and that their boundaries be considered flexible and subject to review.

53. The development of Divisional headquarters and of Divisions relates to many factors, not merely social and administrative convenience. Road communications, water supplies, population densities, development proposals and political priorities all have to be taken into account. Without full information and in the absence of the census results. I do not feel that it would be useful for me to make suggestions at this stage about future Divisional units.

Managerial Problems and Resources

54. Managerial problems vary with the scope of what is attempted. If the whole list of possible measures associated with closer range administration were implemented - land adjudication, stock limitation, individual or group ranches, grazing rotation, disease protection, better marketing facilities, improved breeds, reseeding, strict water discipline, and so forth - the problems would be formidable indeed, even if only a small part of the Province were taken. They would also be more formidable than elsewhere in Kenya for the many reasons which make administration in the Northeastern Province peculiarly difficult: huge distances; a thin scattered nomadic population; bad roads giving access to only a small proportion of the Province; heat; low and unpredictable rainfall; problems of supply of spare parts and of access to servicing facilities; difficulties of maintaining the morale of non-Somali staff without frequent visits outside the Province; the many obstacles to effective staff supervision; and the high proportion of staff time spent travelling, among others. At the time of writing the aftermath of the Emergency aggravates these

obstacles to effective administration through the many minor roads which have been disused for some years and which may be mined, and through the surviving sense of some staff that it is imprudent to sleep out in the bush and uncongenial to carry out walking safaris. In any case, Divisional-level Administration staff are at present occupied with building up Divisional centres, and range management staff are being posted in gradually and necessarily taking time to find their feet. In these circumstances it is unrealistic at present to think in terms of administrative measures for range management and population stabilisation which require close controls any distance away from Divisional centres.

55. I have already concluded (para 45) that apart from the committee of representative and responsible elders, and the abaharega of the Ajuran and Gurrah, there are no traditional social institutions which could be developed or adapted for range management purposes. If the essence of intermediate levels of range management is the periodical closure of areas in which there is both water and grass, then it is difficult to imagine Somali elders being able, even if willing, to keep out trespassers without Government support. This means that if this sort of control was to be implemented, a mobile and energetic Provincial Administration and Range Management Division, motivated for hard travel and living in the bush, would be required, together with improved road communications. Those best adapted to such a life are Somalis themselves, and the commendable extent to which the Range Management Division is training Somali range assistants will pay off in time. In the short run, I recommend:

(i) the clearing of minor roads;

(ii) additional roads for areas which are to be developed;

(iii) the regular use of herio camels, purchase of baramils and the training of Administration Police where necessary in camel management;

(iv) the issue of safari kit to all officers in any way associated with range management;

(v) an induction course for District Officers to teach them to walk and to be able to live in the bush without discomfort;

(vi) a requirement that District Officers and Range Management staff submit regular safari reports to their superior officers;

(vii) careful selection of staff for service in the North-eastern Province to ensure that they are interested in the area and motivated to serve it diligently. The recruitment or secondment of some Army Officers might be considered.

56. Even with these measures, however, and even if they were successful, the inherent difficulties of the Northeastern Province would still mean that the ratio between staff effort and effective output would be much lower than in other parts of Kenya. Staff work output would therefore have to be regarded as a scarce resource to be carefully rationed. If measures requiring intensive administration were adopted, then staff effort would concentrate on them to the detriment of others. In my view, the possibilities of land adjudication and group ranches should be seen in this light. It may be argued that they are desirable, but the indirect cost in terms of the other tasks that would not be performed would be high. The approach to range management and administration which I recommend is to maximise staff resources and effectiveness and at the same time to use staff output carefully in order to obtain maximum benefit. This can be done by covering large areas with development policies which are relatively sparing in their demands on staff performance.

Water Development and Range Management

57. A very committing set of decisions which cannot be long delayed is where to provide new water, and what sort of water to provide. I recommend that in the light of the preceding discussion and the economic purposes of water development, the following principles be applied to these decisions. New water should be placed:

(i) to give access to under-utilised grazing for cattle.
This is axiomatic, accepted, and requires no comment

(ii) where, in conditions of possibly heavy grazing without controls, minimum irreversible deterioration to the vegetation will result.
This is a technical question. The answer may well be that adabla is to be preferred to waivona, pans, or kunya

(iii) where it will lead to the most beneficial output of immatures.
This is a technical question, but on the sketchy information available it would seem that adabla has the edge over other soils. (see para 16)

(iv) so that it forms part of very large management units.
This is because: (i) large units spread the risks of rainfall failure, and (ii) large units require less administration per unit area than small ones

(v) so that it is somewhat isolated or in clusters.
This is for ease of control, if grazing in the area is to be closed. Closing the water will then effectively mean closing the area.

(vi) so that it lies deep within management units, and not on boundaries.

This is to minimise the temptations of trespass and to avoid the problems of joint use allocations

(vii) in tribally pure areas, as part of a draw-off policy (to draw off groups from sectionally mixed areas) to make the establishment of manageable units easier later.

This policy should, however, be subject to continual review as experience is gained.

(viii) so that priority is given to predominatly cattle areas, but camel-owning groups should be compensated through access to adequate adabla and boni grazing, and by the cleaning and deepening of existing improved pans in their areas.

This compensation is politically desirable as well as in the interests of justice and peace.

(ix) so that as far as possible its volume and degree of permanence will, even without any further controls, lead to more systematic use of grazing.

58. The next measures to be taken by staff concerned with administration and range management should be:

(i) further surveys. Staff must for themselves find out about:

soils
vegetation
water supplies
livestock husbandry practices
migration patterns and social groups.

Staff should be encouraged to check, and amend and add to the information presented in this report and in the appendices and maps. A short course in techniques of data collection and organisation is desirable.

(ii) becoming more familiar with the badia people and with the land. This cannot be done only from administrative centres, nor only from Landrovers.

(iii) carrying out prolonged and patient extension work, initially listening and learning rather than seeking to instruct.

(iv) developing responsible committees representative of possible large management units.

59. On the basis of the evidence presented in this report, I recommend the following policy for range management for any areas developed:

(i) the identification of areas for development (see para 60)

(ii) the identification of users of the areas, their migration patterns and social and spatial groupings

(iii) the establishment of an acceptable committee representing badia people as well as townspeople

(iv) participation by the committee in the choice of sites for water. This may seem a complication to water engineers, but is very important for gaining a sense of participation and responsibility, and ultimately perhaps of ownership of the water. Local people also often have local knowledge which is invaluable for siting water.

(v) the establishment with official support of water discipline, with abaharegas where this is customarily acceptable, in the use of the new water

(vi) Government support for measures desired by the committees and considered in the interests of good range management. These might at first be limited to water discipline, but might later extend to deferring use of water and grazing and even to complete closure of areas for whole seasons. The degree to which use of the water and grazing should be exclusive to those represented on a committee is a question which should be approached with care and without dogmatism. The obvious advantages of excluding non-participants may be offset by the dangers of participants being refused access to outside grazing in time of need. The guiding principle should be to maintain a middle course between the wishes of a committee and the dictates of ideal range management, should these two diverge.

Areas for Development

60. Subject to survey findings, I suggest the following possibilities for water development and range management:

Wajir District

Western Ajuran:

For : (i) Ajuran favourably inclined to range management

(ii) very extensive underutilised adabla, and probably good grazing for cattle (It is vital that this should be checked before any decision is taken).

(iii) very limited water supplies at present

(iv) draw-off from Degodia pressure to the east

(v) Ajuran predominantly cattle people

(vi) Ajuran have relatively good water discipline

Against: (i) new roads would have to be built in

(ii) infiltration from outside the District might have to be watched

(iii) Degodia might have to be held off

Eastern Ogaden

For : (i) extensive adabla, only grazed during and immediately after the rains at present
(ii) would relieve pressure on Wajir, Habbaswein and Daaaab
(iii) Ogaden fairly open-minded about range management

Against : (i) road communications would have to be opened up.
(ii) it would be desirable to move the Divisional Centre from Habbaswein
(iii) Somalia Somalis might benefit

Garissa District

The three main alternatives (from northwest to southeast), all having substantial adabla, and being fairly pure tribally are:

Northwest Lak Dera:

For : (i) could provide water for both Wajir and Garissa Ogaden

Against : (i) uncooperative attitudes of Mudo Gashe cattle owners (confirmed in a revisit on 1.10.69)
(ii) problems of the district boundary running through the centre of the area, probably requiring two range management units and inter-district coordination.

El Lein and Fafi, the Abdwak heartland:

For : (i) favourable attitudes of Abdwak leaders, anxious to exclude Aulihan intruders
(ii) a possible natural cattle boundary in Rama Guda to the east, and perhaps in the bush (unknown to me) to the south

Against : (i) perhaps subject to Aulihan pressures from the north, and Abdallah pressures (less serious) to the south.

Ijara Division:

For : (i) higher and more regular rainfall
(ii) the densest cattle populations in the District
(iii) moderately favourable attitudes on the part of elders

Against : (i) grazing rotation would be harder to incorporate because poor rainfall does not compel people to move to the same extent as in lower rainfall areas

(ii) more intensive administration would be called for

Ijara is the only part of the Province in which I consider it might be desirable to experiment with individual or group ranches - perhaps a few individual ranches in the fly areas to the south should any stock owner be prepared to use them under inoculation, and perhaps a group ranch should any group come forward with reasonable grounds for acquiring title to land.

Mandera District and Wajir Degodia

Existing pans should be cleaned out towards the end of each sustained dry season. Cattle will benefit in the deferred moves to water of last resort, relieving pressure on Wajir, El Wak, and the Daua in particular.

R.J.H. CHAMBERS
31st October 1969

APPENDIX A : SOURCES, RELIABILITY AND DISPOSAL OF DATA

The information on which this report has been based was collected with the assistance of Government officers in Nairobi and in the North-eastern Province, and particularly the Provincial Administration and the Range Management Division of the Ministry of Agriculture. For hospitality, help with safari arrangements, and useful information I wish especially to thank Mr. John Newbould, the Provincial Range Officer, and Mr. Abdullahi Aboud, the District Range Officer, Wajir. Outstanding work was done by the Range Assistants who accompanied me in collecting and collating data. Mr. Ali Guleid, at present training at AHITI, was skilful in gaining the confidence of informants, and found out much about migration and sub-section areas. Mr. Abdirahman Abdinoor, who was with me throughout, worked conscientiously and hard in difficult conditions. Without his contribution, the soils, migration and water supplies maps could not have been compiled. Finally, Mr. Abdi Osman, besides contributing in many thoughtful and intelligent ways to the success of the safari, was the safest and most competent Landrover driver I have ever come across. Quite apart from their work towards this report, my wife and I would like to thank those who were with us for their considerateness and companionship.

In addition to the Kenya Government Archives, which contain much relevant information, the most important written sources consulted were:

F. Dixey, "Hydrographical Survey of the Northern Frontier District of Kenya", (the Dixey Report), (mimeo), 1944

D.C. Edwards, "Report on the Grazing Areas of the Northern Frontier District", (mimeo), undated but c.1944.

International Bank for Reconstruction and Development and the International Development Association, Livestock Development Project in Kenya. August 1, 1969.

I.M. Lewis, A Pastoral Democracy, a study of pasteralism and politics among the northern Somali of the Horn of Africa, Oxford University Press, 1961

Ministry of Agriculture and Animal Husbandry, Range Management Division, "Development Plan 1968/69 - 1972/73", (mimeo).

D.J. Pratt, "The Grazing Areas of the Lower Uaso Nyiro Basin, A report of a survey conducted during May 1960", (mimeo), Ministry of Agriculture, July 1960.

R.M. Watson, "A Census of the Domestic Stock of the North Eastern Province", (typescript, but to be published), 1969.

The main source of information was however, a series of barazas followed by informal discussions. Barazas and meetings in the Northeastern Province were as follows:

Garissa District, Barazas and Meetings

August	
7	Mbalambala
8	Mbalambala
9	Benane
10	Mudo Gashe
11	Mudo Gashe
11	Dugup
12	(Saka) (no one turned up)
13	Provincial Agricultural Board
13	Garissa District County Councillors
15	Bura
16	Bura
16	Ngababa
17	Masalani
18	Ijara
19	Kolbio
20	Hulugho
21	Members of Parliament, Garissa
23	Alinjugul
24	Amuma
24	El Lein
25	Dadaab
September	
30	Garissa elders (water supplies and migrations)
31	Mudo Gashe

Wajir District, Barazas and Meetings

September	
6	Habbaswein
7	Gormale
8	Wajir - Chiefs and Sub-chiefs
8	Wajir Bor
9	Mansa Guda
9	(Sengu - people too busy watering camels)
9	Tarbaj
10	Wajir - prominent citizens and cattle-owners
11	Wajir - Ogaden elders
12	Wajir - Ajuran elders
12	Wajir - Degodia elders
13	Giriftu
14	Giriftu-Ajuran
14	Giriftu - Degodia

15	(Mado - no people)
15	El Das
16	Buna
17	Butelu
17	Ajao
18	Korondille (held in my absence by DRO Wajir)
19	Gurar (held in my absence by DRO Wajir)
19	Provincial Leaders' Meeting, Garissa (end only)
	Members of Parliament, Garissa
20	Karadusi
20	Adadijola
28	Wajir elders (water supplies and migrations)

Mandera District, Barazas and Meetings

September

21	Kufole
21	Dandu
22	Takabba
23	Mado
24	Malka Maris
25	Rhamu
26	Mandera
28	El Wak

There was an obvious danger of seeing only the people who live in trading and administrative centres, and who have different attitudes and interests to the badia people. The townspeople are undoubtedly influential, but they have rather specialised interests compared with the bulk of the population: they are richer, they do not have to be so mobile, they prefer cattle to camels, and they have a strong interest in good relations with Government in order to secure further services. Badia people, in contrast, are forced by their environment to be nomadic, often tend to regard camels as more important (for milk, for transport, for mobility), and benefit less from services based at administrative centres. I met some badia people at the centres, and at meetings held away from the centres. I was challenged in a friendly way with remarks such as: "Have you been off the main road?", and "People in offices do not know where the tick bites."

The procedure at meetings in Garissa and Wajir Districts was usually as follows. The meeting was called by the District Officer or, more commonly in the absence of the District Officer, by the Chief or Sub-Chief. In administrative centres an attempt was made to ensure that prominent cattle owners were present. I usually spoke in Swahili, though occasionally in English, and my interpreter was almost always a Range

Assistant. I explained my task and outlined Government proposals, stating that no stock limitation was intended, that water in the Province would be increased, that the aim was an increased offtake by voluntary sale of immatures, and that the capital spent on water development would not have to be repaid. I appealed for information, and started by asking people to name the places where they felt new water could most usefully be placed. With the exceptions of Mbalambala and Masalani, where people were suspicious that new water might be a device for moving them back from the Tana, good responses to this question were received. We then divided informally into groups. Some Range Assistants plotted on a 1:250,000 map the places where water was requested, and recorded existing water supplies at those points. Others enquired about sub-section areas and migrations, normally asking individual cattle-owners where their stock had moved during the preceding eight months and recording these movements on a 1:1 million map. I held discussions, sometimes in Swahili where there were a number of, Swahili speakers, about many matters including soils, rainfall regimes, livestock performance and husbandry, the relative advantages of camels and cattle, social organisation, water discipline and social controls, boundaries, and attitudes of range management. I covered different ground in different places, but attempted to cover all the topics several times over in each district in order to obtain cross-checking information.

In Mandera District the procedure was similar except that more general migration data was obtained and I did not ask about range management since at that time there was no District Range Officer and there had not been any earlier opportunity to broach range management questions in the District.

This procedure was, of course, full of imperfections. Those who responded in meetings were dominant individuals who sometimes tried to shut up others with contrary views. Chiefs and Sub-chiefs often took a strong pro-range management line which was not generally supported. A few times well-meaning efforts were made before meetings to try to ensure that the responses given took a certain form. There were also dangers of distortion by interpreters. To some extent, unquestionably, I was told what it was thought I wanted to hear. In addition there was a marked reluctance to discuss the extent to which sub-sections do or do not have areas in which they predominate. Nevertheless, approaching the evidence with caution, and cross-checking with information given to the Range Assistants, I feel reasonably confident that the bulk of the data used and presented in this report is accurate. But contrary evidence should not be rejected but checked and investigated since it might well modify what has been presented here.

The main sources of data has been as follows:

1. Rainfall
   - descriptions of rainfall regimes by elders
   - annual and monthly rainfall records supplied by the East African Meteorological Department
   - an analysis of rainfall variability by Dr. Hans T. Morth of the East African Meteorological Department with comparative data for other parts of Kenya
2. Soils

   See Appendix C
3. Water Supplies
   - existing records of water points as shown on 1:250,000 maps
   - existing records of improved water shown on Water Development Department 1:1 million drawing No. B 1171 of 1965
   - statements by elders of existing water supplies at places where improved water was requested
   - statements by elders about important water sources and how long they normally last after the end of an average long rains

Not all this data has been processed or included on the map of water supplies..

4. Section and Sub-section Distribution
   - information of generally low reliability given by elders
   - indirect evidence from statements by elders about which sections use which water, collected together with water requests
5. Pre-Independence Boundaries and Grazing Controls
   - information given by elders of different Sections
   - records in the Kenya Government archives
6. Cattle Migration Tendencies
   - direct questions to elders
   - information given by individual owners about their own stock's movements over the previous eight months
   - statements by elders about the sequence in which water supplies are used as the dry seasons progress.

These sources have been supplemented and checked to a necessarily very limited extent by personal observation.

I am disposing of the data collected as follows:

ater requests	Provincial Range Officer
1:125,000 maps with water request and soils data recorded on them	"
Geological maps and reports	"
water durations and migration	"
Garissa water durations collected by DRO, Garissa	District Range Officer, Garissa
Old Garissa District Records	Kenya Government Archives
Baraza notes	I am retaining

APPENDIX B RAINFALL STATISTICS (see also paragraphs 5-11 of the report)

These tables have been prepared under the supervision of Dr. H.T. Morth of the East African Meteorological Department.

ANNUAL RAINFALL TOTALS 1937 - 1968

Figures in inches

	Galole	Garissa	Habbaswein	Wajir	Buna	El Wak	Mandera
1937		11.63		10.56			13.57
38		9.40		4.06			3.49
39		9.28		7.09			
1940		19.38					
41		14.29					
42		12.04		8.99			6.98
43		2.71		4.68			1.65
44		7.51		7.22			13.88
45		3.10		5.87			6.67
46		2.82		5.98			6.08
47		11.62		4.47			7.20
48		12.22		13.95			
49		6.67		2.90		6.50	6.67
1950		5.75		6.97			
51		24.02		20.23		13.10	16.75
52		10.88		9.44		13.21	3.92
53		8.60		14.02		12.54	7.55
54		6.94	2.65	7.87		10.32	8.27
55		5.40	2.76	4.43			7.40
56		13.24	5.22	13.95		7.55	6.35
57		20.02	5.32	20.15		14.53	17.45
58	7.56	7.81	12.21	10.29		3.33	6.64
59	15.40	9.10	5.87	3.64	8.07	10.03	8.19
1960	17.67	25.92	13.10	13.53	10.07	19.39	11.72
61	37.50	29.79	17.10	33.36	21.41	23.71	14.68
62	16.87	13.78	19.43	15.63	8.49	12.29	11.49
63	19.74	18.17	15.73	9.70	9.11	15.78	15.37
64	18.28	12.97		16.40		14.60	14.74
65	17.91	12.09		13.84	6.82	11.29	11.81
66	19.42	10.70		8.60	9.34	7.87	8.54
67	29.51	19.33	6.62	18.43	14.04	9.95	16.71
1968		36.00	48.00	32.60	26.58	28.40	26.85

In the following tables are given the number of occasions when monthly rainfall was

a ... less than half of the long-period mean

b ... between half and double the long-period mean

c ... more than double the long-period mean

Also given are

d ... the total number of months on record

e ... the long-period mean in inches

Records from Konza are included to give a comparative perspective from another ranching area. Records from Nyeri are included (in a slightly different form) as an example of a higher rainfall area.

Galole		J	F	M	A	M	J	J	A	S	O	N	D
	a)	4	4	5	2	3	3	5	3	8	5	2	3
	b)	6	6	6	10	9	8	5	7	3	4	8	8
1°30'S, 40°02'E	c)	2	3	2	1	1	2	2	2	1	3	1	1
400 ft. a.m.s.l.	d)	12	13	13	13	13	13	12	12	12	12	11	12
1957 - 1969	e)	1.18	0.68	1.55	2.82	1.58	1.09	0.85	0.51	1.66	1.37	3.83	2.26

Garissa													
	a)	22	21	21	16	20	18	21	20	20	20	13	12
	b)	8	10	12	15	10	13	10	12	12	11	19	20
0°29'S, 39°38'E	c)	8	7	5	7	8	7	7	6	5	6	5	5
600 ft. a.m.s.l.	d)	38	38	38	38	38	38	38	38	37	37	37	37
1932 - 1969	e)	0.37	0.22	1.34	2.57	0.64	0.21	0.08	0.24	0.25	0.93	3.35	2.55

Habbaswein													
	a)	8	9	8	7	8	12	12	12	11	7	6	8
	b)	4	3	3	7	4	2	0	0	1	3	4	3
1°02'N, 39°30'E	c)	3	3	4	1	3	1	3	3	2	3	2	2
650 ft. a.m.s.l.	d)	15	15	15	15	15	15	15	15	14	13	12	13
1953/64,1967/69	e)	0.17	0.20	0.82	5.59	0.25	0.02	0.03	0.01	0.09	0.80	3.19	1.18

Wajir													
	a)	27	26	22	14	22	28	33	30	35	18	18	23
	b)	12	11	19	27	18	11	7	9	5	7	22	16
1°45'N, 40°4'E	c)	7	9	5	5	6	6	5	6	5	10	5	6
800 ft. a.m.s.l.	d)	46	46	46	46	46	45	45	45	45	45	45	45
1917/23,1928/69	e)	0.26	0.19	1.26	2.99	1.26	0.08	0.12	0.07	0.26	1.01	2.69	0.94

Buna													
	a)	7	6	2	3	6	9	6	8	8	4	4	5
	b)	1	1	6	6	3	0	2	0	0	3	4	3
2°50'N, 39°30'E	c)	2	3	2	1	1	1	2	2	1	2	1	1
1000 ft. a.m.s.l.	d)	10	10	10	10	10	10	10	10	9	9	9	9
1959/63,1965/69	e)	0.03	0.41	1.16	4.06	1.21	0.02	0.07	0.04	0.03	1.97	2.90	0.78

El Wak		J	F	M	A	M	J	J	A	S	O	N	D
	a)	16	18	9	5	7	18	14	17	18	7	7	14
	b)	1	0	8	15	10	0	2	2	0	9	12	4
2°47'N, 40°57'E	c)	4	3	3	1	3	3	4	2	2	4	1	3
1200 ft. a.m.s.l.	d)	21	21	20	21	20	21	20	21	20	20	20	21
1948 - 1969	e)	0.01	0.01	1.18	3.98	0.83	0.00	0.17	0.13	0.10	1.74	3.56	1.12

Mandera													
	a)	27	28	16	8	17	24	24	21	25	10	12	21
	b)	3	1	12	23	11	6	3	4	2	13	14	6
3°57'N, 31°52'E	c)	3	3	5	2	5	2	5	5	3	7	4	4
1085 ft a.m.s.l.	d)	33	32	33	33	33	32	32	30	30	30	30	31
1936 - 1969	e)	0.05	0.33	0.77	3.98	1.09	0.02	0.04	0.02	0.08	1.59	1.92	0.36

Konza													
	a)	27	28	18	17	23	36	46	46	37	27	12	21
	b)	16	6	25	32	19	8	0	0	5	14	35	23
1°44'S, 37°08'E	c)	8	17	8	2	8	7	5	5	9	10	4	7
1916 - 1966	e)	1.05	1.16	2.54	4.74	2.26	0.31	0.03	0.05	0.23	0.84	3.01	1.90

Nyeri												
a)	13	10	9	8	7	13	8	8	11	9	4	2
b) between 50% and 175% of long period mean	15	18	25	25	25	19	25	21	14	24	29	32
c) above 175% of long period mean	7	7	1	2	3	3	2	6	10	2	2	1
d)	35	35	35	35	35	35	35	35	35	35	35	35
e)	1.83	1.74	2.66	7.31	6.70	1.25	1.44	1.52	1.21	3.64	4.50	3.02

N.B. When comparing Nyeri figures with those for the other stations it must be noted that b) makes Nyeri appear comparatively less reliable than it probably is.

APPENDIX C SOILS IN THE NORTHEASTERN PROVINCE

The data on soils have been collected without professional knowledge or advice and should be treated with caution. As presented they include some guesswork. For areas (1), (2) and (3) on the reliability diagram, a map of greater precision could be produced from the sources. The soils diagram will certainly have to be modified.

Especially in Wajir District there appears to be a close correspondence between vegetation and soil type, and this is recognised by Somalis. However, adabla soils may carry anything from open grassland to quite thick bush, and there may be similar variations with other soils. The soils diagram is no substitute for a vegetation map.

The soil and topography types identified most commonly by Somalis are:

ADABLA (Borana - Korticha) a dusty grey soft soil, sometimes described as grey cotton. Vehicles stick in it during the rains. The soil is somewhat salty. The vegetation is grass and acacia, but mainly grass. Adabla areas are flat and there is little erosion. The term adabla is used to describe soils in all three districts.

ARAHAN A term used to describe land on which animals do badly.

BAI (also SHAWAI) Hilly, stony land. The term is most commonly used in Mandera District.

BOJI Used by Degodia to describe adabla as above. Used by Ajuran and others variably, but usually to mean black cotton soil, especially where it has a high salt content. In this sense boji is infertile compared with adabla, and except along luggas does not carry big trees. A hole dug in boji will fill up with more soil during the rains. Boji is whitish under the surface, which is black. It cracks when it dries. It is an alluvial soil. Although opinions differ, boji probably most commonly occurs within more extensive areas of adabla

BOKOLA The limestone soil in the neighbourhood of El Wak

KUNYA A residual category of white and reddish sandy soils, not always clearly distinguished from rama and waiyana. Described only for Garissa and southern Wajir. Similar soils may be included in what is described as rama in Mandera.

APPENDIX D TRIBAL DISTRIBUTION AND FORMER BOUNDARIES

Former Boundaries

The former boundaries are accurate to the best of my knowledge except where there are question marks on the maps. Information is incomplete about Mandera District where there was probably a southern boundary to the Degodia together with a corridor through to the Wajir Degodia. In Wajir District the six areas were laid down in 1945, but the shared Ajuran/Degodia area was extended in about 1952 as shown on the map. The arrangements around Wajir itself are unknown, except that each section had its own wells, as they presumably still have. In Garissa District the Aulihan Line originally (about 40 years ago) ran through Dujis, but more recently followed, roughly, the Garissa - Liboi road. Abdwak were allowed to graze north and west of it, but Aulihan were not allowed to graze east and south of it. District boundaries were formerly enforced as exclusive boundaries. At present (1969) none of these boundaries is being enforced.

Areas Grazed by Sections and Sub-sections

The Section names in large capitals refer to the areas of the Sections before 1963 and are related to the boundaries shown. In Garissa District, Aulihan, Abdwak and Abdallah are Sub-sections of Ogaden and therefore shown with smaller lettering. The smaller sub-divisions in Garissa District, and the sub-sections in Wajir District, are written in on the map only in a very broadly tentative way. Many sub-sections have been omitted for lack of information or because of questionable information. Data for Mandera have not been processed partly because they are unconfirmed. I cannot emphasise too strongly that in all districts Sections and Sub-sections are intricately intermingled, and cannot be separated out into any tidy patterns. Writing anything on a map immediately distorts by appearing to simplify what is in fact a flexible and variable situation. All that the sub-section names on the map mean is that I have seen no good reason to reject evidence that the people of the sub-sections concerned are sometimes, and perhaps commonly, to be found (though with other people) in the general areas indicated. It would be dangerously misleading to suppose that there are exclusive sub-section territories. Moreover, the people themselves are frequently on the move, and, for instance, the whole southeast of Wajir District is seasonally virtually uninhabited. The map is best treated as a tentative sketch to be amended and added to.

RAMA	Sandy, porous red soil, usually deep. Trees on rama do not dry out quickly. Water running off rama is not red.
WAIYAMA	Hard red soil, not porous. Water running off it is red.

Usage varies between sections and between Districts. The difference between Ajuran and Degodia meanings of boji is particularly important.

The soils diagram has been prepared from information given by elders and from geological maps and drawings. Elders in the three districts were given lists of place names and asked to state what the soil type of the surrounding area was. In most cases the response was so quick that there can have been no question of distortion. In all cases the response was given in public, and occasionally a discussion would ensue where the soil types were mixed. Possible sources of distortion are inaccurate plotting of place names on the map (particularly in Garissa), and confusions of usage, e.g. between kunya and rama in Garissa.

The geological maps used were those accompanying:

Geological Report No.	40	Takabba-Wergudud
	43	Derkali-Melka Murri
	44	El Wak-Aus Mandula
	47	Bur Mayo-Tarbaj
	48	Mandera-Damassa
	57	Wajir-Wajir Bor

In addition, use was made of:

Geological map of the Moyale area, to accompany Report No. 89

Geological map of the Buna area, to accompany Report No. 95

Geological map of the Kora wells area, to accompany Report No. 91

Geological map of the Garba Tulla area, to accompany Report No. 88.

These maps are all at 1:125,000, except for the Moyale and Buna maps, which are at the more convenient scale of 1:250,000. These two latter maps are excellent sources for soils which are marked clearly in categories which coincide with those (adabla. waiyama) used by the Somalis. All these maps, with the exception of Buna which has not yet (October 1959) been published are available from the Geological Department.

Southern and eastern Garissa soils are recorded on field sheets of a Shell/BP survey which are held by the Geological Department and available through the Librarian. The soils of that area are very mixed, and it is rare for any one type to be extensive without patches of another or other types.

It must be emphasised, despite these reputable sources, that the soils diagram should not be treated as authoritative but as provisional.

It is to be hoped that in time a more professional map will be made. At that time it may be possible and useful to adopt more refined categories than those used here.

The fit between the categories used on the geological maps and those adopted in the soils diagram is not always the same because the conventions of both Somalis and geologists vary between areas. The reconciliations made to the geologists' categories are evident when the geological maps and the diagram are compared.