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UNDERSTANDING AND PROMOTING RANGE MANAGEMENT BY HERDERS IN EASTERN TURKEY*

by

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*This paper is based on work carried out for FAO in connection with the Erzurum Rural Development Project; it represents an account of work in progress rather than a completed study.

Introduction

1. This paper describes the pastoral situation in Erzurum Province, north-eastern Anatolia, Turkey (see map), and gives an account of some of the existing range management practices. It emphasises the necessity of understanding existing pastoral practices, and more importantly the circumstances that give rise to them, when planning the improvement of livestock husbandry, breeding, fodder production and pasture management. Erzurum province is one of the most important areas in Turkey for the production of sheep and cattle for fattening and slaughter. Not only is it important as a source of red meat and store animals for the domestic market, but also for export to Turkey's middle-eastern neighbours. In addition the herds of cattle, and more especially the flocks of sheep, produce dairy products, mainly cheese as well as carpet wool. Livestock husbandry practices are still based almost exclusively on the seasonal use of rangelands, alpine pastures and hay meadows supplemented wherever possible by planted fodder and fodder grain crops: irrigated lucerne, dry land sainfoin and vetches, barley and rye. This feed base is however recognised as being inadequate for the numbers of stock involved, especially through the long harsh east Anatolian winter, when the resident village flocks and herds are housed in dark and primitive stables. Much of the range-land is degraded, overstocked and over-grazed. Furthermore much of the hay crop is sold out of the Province for cash, leaving many of the resident herds and flocks to survive the winter on a diet based largely on chopped straw.
2. The author returned in October 1984 from a six month assignment with the FAO to the Erzurum Rural Development Project. This is a World Bank funded multi-sectoral project aimed at aiding the development of the rural

communities within the administrative boundaries of Erzurum province. The mission was the first in a series scheduled for the next three years, to assist with the organisation, planning and training of the Province's agricultural extension services. In the predominantly pastoral economy of eastern Anatolia, the improvement of fodder production and grazing management is an important aspect of extension responsibility, that has hitherto received too little attention and which on the whole has been poorly understood. The work has included monitoring the existing pasture, meadow and fodder improvement programmes already in progress; and selecting new areas and village communities for improvements in husbandry practice, fodder production and the management of meadows, pastures and rangeland. During this first phase of his work, the author was fortunate to have had as his close working colleague, Professor Peter Boeker, grassland and pasture Professor from Bonn University.

3. Geography and climate: Erzurum province is located in high mountain country in north-eastern Turkey astride the main highway and rail links to Iran and Soviet Armenia. Over 60% of the Province lies above 2,000 metres, with altitudes ranging from 1,500 metres on the floor of the main valleys to well over 3,000 metres on many of the alpine pastures. The climate is continental with long harsh winters and comparatively warm summers. Temperatures range from between minus 30/35 o.c. to plus 34/37 o.c., with between 125 and 154 days of frost being usual; though up to 273 days have been recorded. Throughout most of the Province no more than a 4 to 5 month growing season can be expected. It will be appreciated however that topography and altitude create marked local variations in climate. Two main weather systems meet over, and influence, the area.

A cool, moist system from the Black Sea to the north and a drier warmer system blowing up from the Mesopotamian plains to the south. Precipitation ranges from 380 mm to 600 mm per annum, mainly falling as winter snow, but rain can be expected throughout the Province in any season. The southern districts tend to be somewhat drier than the northern, the result of the influence of these two systems. The mountains form a succession of parallel ranges, running east to west, and north/east to south/west, and form the headwaters of three important river systems. The Karasu, one of the main sources of the Euphrates, drains west and then south towards Mesopotamia. The Choroh and its tributaries drain north to the Black Sea through a series of narrow valleys and precipitous gorges. Lastly the Aras, which drains eastwards, eventually forms the borders between the USSR and Turkey and Iran, before flowing into the Caspian. These valley systems have for thousands of years provided the routes in as well as out of these strategically important uplands for both invading armies and migrant graziers in search of summer pastures.

4. Agriculture: the Province is divided north from south by the wide and interconnected valley basins of the Karasu and Aras rivers, which account for about 60% of the Province's agricultural land. Most of the remaining arable land is found in the narrower but warmer valleys of the Choroh and its tributaries. Little cash crop farming is found outside these main valleys, and even there a mixed crop/livestock system prevails. In the surrounding hill country, livestock husbandry with sheep and cattle predominates, with cropping such as it is being primarily subsistence in character. Though agriculture in the main valleys has become increasingly mechanised in recent years, the horse and the ox are the main motive powers throughout most of

the Province, and are likely to remain so for some time to come. The main crops are cereals: wheat, barley and rye, with maize grown in the warmer valleys, as much for human as for animal food. Except on irrigated land, cereal crops are generally grown once every two to three years on the same land, with a fallow break in between. Sugar beet and sunflowers are grown as cash crops in the central valleys, but perhaps the most valuable cash crop from the Province as a whole is hay. This is cut from both wild meadows and from planted fields of irrigated lucerne (*Medicago sativa*) and dry land sainfoin (*Onobrychis viciaefolia*). Vetch (*Vicia sativa*) is often planted, usually as a mixed crop with barley.

5. Administration: the Province is divided into fourteen districts (*ilche*), The civil administration of the Province is in the hands of an appointed governor, vali with his seat in Erzurum city; district governors, kaymakam, are also appointed by the central government in each of the fourteen main district townships. Each village is represented by a head man, muhtar, and village committee *azar*, who are elected by the villagers for a term of four years, which may be renewable. Their powers of authority and control are limited, and reliant on village consensus. Rural law and order is looked after by a paramilitary force of 'gendarmes'. The sensitivity of its geographical position and a history of rural dissent in certain areas mean that there is a strong military presence in the Province. There is a provincial agricultural office in Erzurum and subsidiary offices in district towns and main village centres. Likewise there are veterinary and agricultural banking services with provincial and district offices, plus other agricultural and rural organisations for irrigation water, soil conservation, rural roads and electrification etc.

6. The people and their background: at least three quarters of the 800,000 population of the Province live in villages and small rural townships. The remaining 25% live in Erzurum city, the provincial capital and main administrative and military centre of eastern Turkey. There are approximately 80,000 farm families averaging seven persons living in some 1,070 villages, and engaged in some form of agricultural activity. Most are small-holders tilling their own land. No cadastral survey has been carried out, but it is thought that the average holding of arable land is not more than ~ hectare. Most farmers are also livestock owners and most cut their own hay meadows. Grazing land is generally used communally by each village community. There are a few large land⁴ proprietors.*

7. Life in most villages is harsh. The prolonged isolation of many communities during the winter months, the past ineffectiveness of government services, increasing population with its consequent pressure on the land, the shortness of the growing season and lack of good arable land have all combined to cause widespread poverty. Seismic activity is a constant hazard to village houses which are little more than simple constructions of boulders, roofed with timber and mud. There is a

- * Mainly in the district of Chat, and a few individuals through the central valleys. In the district of Chat a system of landlord/peasant sharecropper is not uncommon and much of the rangeland is effectively controlled by powerful family groups – known as ~ – to the exclusion of many of the resident villagers.

tendency towards migration from many overpopulated poverty-stricken communities; either whole families to settle in the main urban centres further west or as workers to north-west Europe; and, since the recession, to the oil countries of the Middle East and North Africa.

8. In addition to the settled population an unrecorded number of nomad shepherd families or Yoruk* bring their flocks into the southern districts of the province in the summer months. These nomad clans winter on the plains to the south of the Province towards the Iraqi/Syrian borders. There is also a smaller migration of transhumant shepherds from the Black Sea coast to the northern districts in the summer.

9. Erzurum Province in common with much of eastern Turkey has had a violent and often bloody history. Even now much of eastern Anatolia is effectively under military control. For much of the 19th century north east Anatolia was the scene of a series of savage wars between the decaying Ottoman Empire and Tsarist Russia then

- * They belong to two main groups, the Beritanlar and the Savatlar, and generally identify with smaller clan groups or ashyret. They winter on the plains towards Urfa and Diyarbakir, and have probably brought their sheep to summer in these uplands for many years if not centuries. They do not however possess permanent rights of pasturage here and must negotiate the lease of alpine pastures each year either with settled villagers with grazing in excess of their requirements or with individual agha who have control over large areas of range land.

**Often the result of deliberate Ottoman policy predating the formation of the Republic

at the height of its imperial expansion. The mixed muslim/christian population and varied ethnic groupings that inhabited the region before the First World War were the victims as well as the pawns in this series of bloody imperial conflicts. These led to wholesale migrations of populations as first one people then another shifted with the fortunes of war and politics. Moslem tribesmen fleeing from the Russian conquests in the Caucasus, Armenian christians in their turn the victims of Turkish vengeance.* Frontiers shifted back and forth, and for almost forty years between 1878 and 1917 the north-eastern half of the Province was under Russian rule. This ebb and flow of frontiers and peoples culminated in the wholesale destruction and slaughter that accompanied the First World War and the subsequent fighting that re-established Turkey's eastern frontiers and rule in the area. These frontiers were effectively established in October 1921 by the treaty of Kars between the Kemalist Turks and the Bolshevik rulers of the new Russian empire. The local moslem population returned to their shattered villages, the Armenian population was replaced by both Turks and Kurds from elsewhere in Anatolia as well as turkish refugees from the Soviet states. Arising out of the region's often violent and dissentious history, which is not altogether a thing of the past, and its sensitive position near Turkey's eastern borders, the position of the forces of law and order including the army itself, is a dominant factor in the rural life of eastern Anatolia.

* In 1864, 600,000 Circassians fled from Russian conquest in the Caucasus and were given protection by the Sultan, a road that was taken by many other moslem tribesmen both turkish and non-turkish speaking. Many thousands of Christians, mainly Armenian peasants, fled in the reverse direction to seek the protection of the Tsar.

10. Ethnically and linguistically the Province still remains diverse. The central and northern districts are predominantly turkish-speaking whatever their ancestors' geographic origin, while the southern districts are linguistically less uniform, with both turkish and kurdisch being spoken. Kurdisch-speaking villages predominate in the districts of Chat, Tekman and Karayazi (see map). The nomads are in this area all kurdisch-speaking. Cutting across these linguistic distinctions are more subtle socio/religious differences. Some communities adhere to the more strictly orthodox schools of islamic jurisprudence and 'sunni' belief; others follow heterodox and usually more liberal sects on the fringes of islamic practice.* These historical, ethnic, linguistic and socio/religious factors have a profound effect on such things as the position and role of women in the community, attitudes to the outside world, to education, innovation, the use and management of common pastures and even the siting of village hay stacks, as will be described.

Livestock and animal husbandry

11. The Province has an estimated resident population of 730,000 head of cattle and some 2 million sheep (1983 official
- These tend to be loosely termed alevi (or in local Erzur parlance 'turkmen'); they are broadly speaking 'shia' in persuasion, but often follow their own sheikhs and individualistic practices, and are distinct from the main-stream 'shia' of Iran.

statistics). Cattle numbers reached a peak in 1979 (1.79 M) and sheep numbers reached a peak in 1981 (2.4 M) (see tables 1 and 2). The reasons for this decline are not clearly understood. In certain parts of the Province stock numbers increase significantly in the summer months, and possibly even double. This is caused by the seasonal migration of nomadic and transhumant flocks from the provinces to the south and north and of herds of store cattle belonging to merchant butchers, brought into these uplands for the summer grazing. The statistics, however, relate supposedly to the winter months, when animal numbers are lowest. The cattle herd remains essentially unimproved and mainly of a type known as the 'east anatolian red': a small, slow-maturing breed. There has been some attempt over recent years to upgrade the local herd, through both natural and artificial breeding programmes, using 'brown-swiss' bulls. The impact of this is still barely discernable except in a few places. Other types of cattle probably of Russian origin are found in some villages. The sheep flocks are all of the fat-tailed asiatic type. An 'improvement' programme using a type of turkish 'merino' has had virtually no impact and attracts little local enthusiasm. The flocks of the resident village population are all of a dark-woolled breed known as the mor-karaman. Those of the nomad groups from south of the Province which summer in the area are invariably of a white breed known as the ak-karaman*. In addition, the groups of transhumant shepherds from the Black Sea littoral,

- This provides an interesting historical analogy with the region's nomadic past, when the great tribal groupings of the 12th/13th centuries were dominated by the White-Sheep Ak-Koyunlu and Black-Sheep Kara-Koyunlu Turkomans.

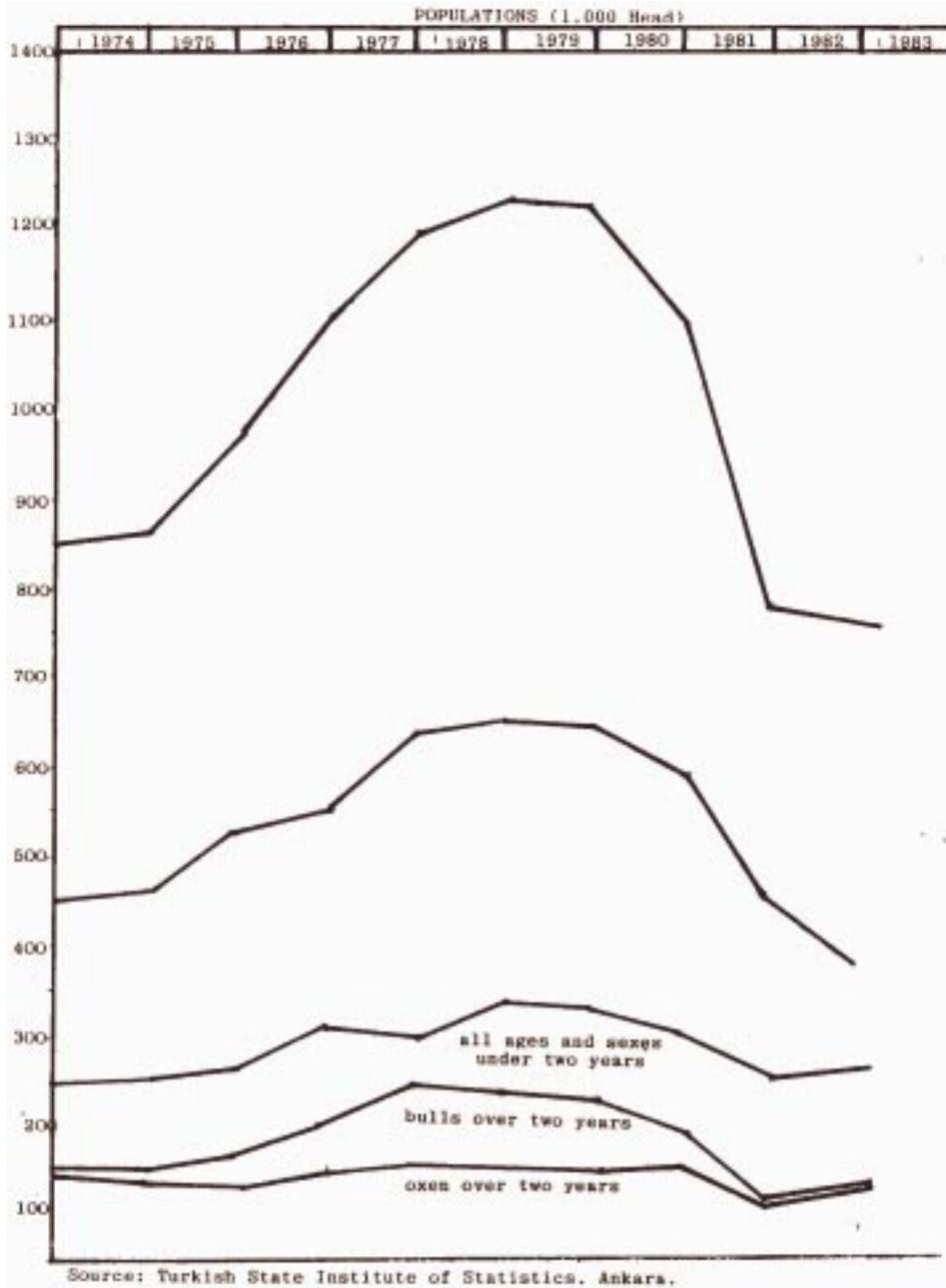
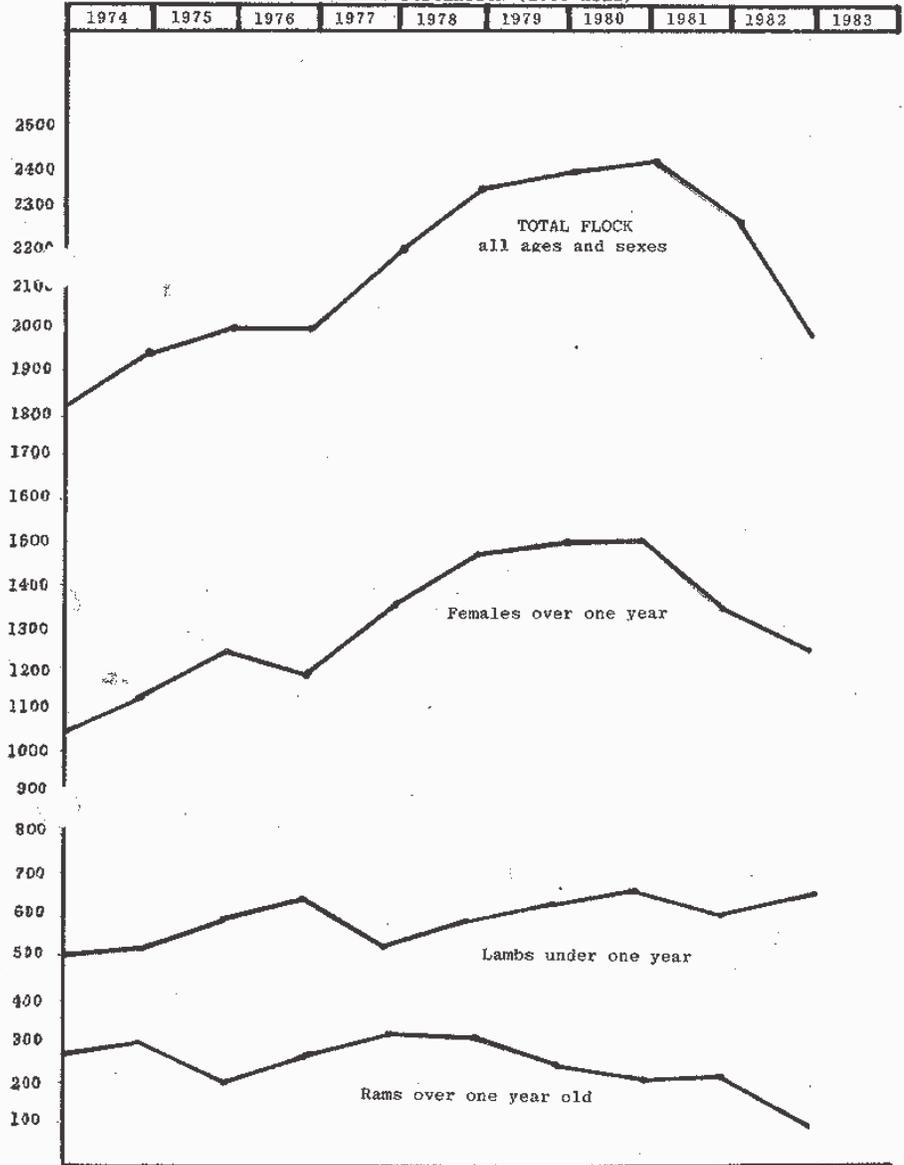


Table 2
ERZURUM PROVINCE
SHEEP POPULATION (1000 head)



Source: Turkish State Institute of Statistics, Ankara.

who summer in the northern districts of the Province, also possess a distinct type of sheep: usually mixed flocks of white, grey, and black animals. There is a very strong opinion, borne of experience, among these groups that their own particular type of sheep is best suited for their own particular environment and life style. In consequence there is little cross purchase of breeding sheep between the settled and the nomadic populations.

12. Though the nomads and Black Sea shepherds are primarily sheep owners, possessing few cattle, the resident stock owners and villagers are for the most part owners both of cattle and sheep. Sheep are admitted to be relatively more productive and profitable, but the sedentary farmers need cattle in order to sell young animals, to breed plough oxen, to produce a little milk through the winter, and to produce dung for fuel. In addition most small farmers find it advantageous to keep both sheep and cattle to maximise the use of available pastures and crop residues.

13. Yields and offtakes are low, especially from the cattle herd. This is the result not only of poor nutrition and disease, but also of inherited qualities, which are offset to some extent by their ability to survive the unfavourable conditions in which they live. The indigenous cattle in Erzurum Province, under average village conditions, seldom produce their first calf until between three and four years old, and in most circumstances probably do not successfully raise a calf more than once in

two years. Bulls are kept until nearly three years old before being sold to professional stock merchants and butchers to fatten for slaughter. Unless required as plough oxen they are seldom castrated. Plough oxen are usually castrated sometime in their third or fourth year and seldom worked until a year afterwards. If well cared for they may have a working life of eight years or more, but the average is probably nearer to five. Their importance to the livelihood of the small farmers ensures that they get the best care; often better than the care given to the breeding cows. Calving may take place at any time of year, but the majority of cows drop their calves between February and the end of May. Most cows are served whilst running out on the hill with the village bull(s) in the summer, and usually do not come into heat with any regularity until after they have recovered from the winter 'famine', on the spring grazing. Lactations are generally short, probably no longer than between 120 and 150 days coinciding with the peak grazing period. Milk is shared between the calf and the owner and most herdsmen and stock owners spoken to do not reckon to obtain more than an average over this period of 1 litre per day into the pail.

14. The sheep on the other hand are relatively productive in both saleable animals and milk, and in addition produce a wool clip, which though of poor quality, commands a local market for carpet weaving. Ewes are tupped in late October and early November. Lambing starts in early April shortly before the weather clears sufficiently to allow the flocks to be taken out to graze, and is largely over by the middle of May. Young ewes, sheeshek, are tupped for the first time in their second autumn. In prevailing conditions most

shepherds spoken to reckon on achieving 80/85% live births with a further 5% to 10% of lambs dying before they are weaned. Epidemics and unseasonable weather can cause considerable losses on occasions. As many hired shepherds are paid in a percentage of lambs successfully raised, they have some incentive to keep losses to the minimum. The lambs receive all their mother's milk for the first 70/80 days, after which they are weaned. Thereafter the ewes are milked for the remainder of their lactation, possibly a further 70 to 90 days depending on the state of the grazing and the health of the flock. The ewes' milk is processed into cheese and yoghurt, either sold or consumed by the owners themselves, of which more will be said later. During this period a yield of between 40 and 45 litres of milk can reasonably be expected from a healthy ewe grazing reasonably good alpine pastures. This compares very favourably with the yields expected from the cows under similar conditions. Most ram lambs and cull sheep not required for breeding are sold to stock merchant and butchers in the autumn before the stock are housed for the winter, and while still in good condition. Only as many as can be fed through the winter will be kept to be sold the following spring when prices tend to be higher. In the case of the nomads most ram lambs and any sheep excess to breeding requirements are sold prior to their return migration to the plains round Urf a and Diyarbakir, in late September.

15. Some goats are kept, and most sheep flocks include a few as flock leaders. More goats were previously kept in the forested areas, but have been actively 'discouraged' in recent years by the Forestry Department. A few water buffalo are also kept in villages along the central river

valleys. Large numbers of equines – horses and donkeys – are still kept, especially in the southern districts, and some villages take a pride in their horsemanship in addition to their more utilitarian use. Competitive games (e.g. jirit, with its origin in the training of nomadic light cavalry) still take place between certain, usually Turkish-speaking villages; while spring horse races are a feature of the Kurdish-speaking districts such as Tekman.

16. Villagers: most village families own both sheep and cattle; it is usual custom for livestock to be housed by individual families, but herded communally. Cattle are usually grazed separately from sheep, and it is common practice to herd different categories of stock by age, sex and purpose i.e. all milking cows together and all milking ewes together, with dry stock, young bulls/oxen, calves, rams and lambs in separate herds and flocks. This varies somewhat with stock numbers and grazing conditions. Herdsmen and shepherds may be members of the village community; or they may be hired from outside the community for the season. Individual graziers and flock masters may own sizable herds and flocks themselves and employ professional herdsmen. Herdsmen and shepherds are remunerated in a number of different ways by the actual owners of the stock. It may be in the form of cash, or grain, or a percentage of the lamb crop (eg. one lamb in fifteen or twenty successfully weaned); or it may be a combination of these methods of payment. Though many herdsmen are at the bottom of the economic scale, there are those who have acquired a reputation in the locality and who command a comparatively high wage. These hire themselves out by the season to wealthy merchant, butchers

who rent grazing on which to run their store animals during the summer. Such herdsmen can command a cash wage of between 60 and 100 thousand Turkish lira (aprox. 120 - £200) a month but the work is seasonal, covering at the most six months out of the twelve. They may also have to pay for any extra help out of this wage. Two herdsmen will look after between 500 and 600 sheep in one flock (suru), usually split for grazing purposes into groups of between 250 and 300 animals (baluk) they are assisted by several large and usually savage dogs as a protection against thieves and wolves. Cattle are usually herded in groups of between 30 and 80, depending on age and sex. Lambs and calves are normally looked after by children. Generally speaking women do not herd stock, though this is not an absolute rule*. On the other hand women invariably do the milking and often appear to be responsible for many delicate tasks, for example giving antibiotic injections. The importance of women's role in many aspects of livestock care, and in their responsibility for the small children who herd the very young animals, poses special problems for extension staff. Vets and livestock extension officers are almost invariably men, barred by custom from directly addressing the village women in this largely conservative part of Turkey.** The problem is particularly acute in

* In the valleys of the upper Choroh towards Ispir for instance it is not uncommon to see women herding stock on the mountain-sides. This is an area where many villagers have left to settle further west, or to work as migrant workers.

** Exceptions to this rule can be found however especially in alevi communities where the normally strict islamic conventions do not apply.

Kurdish communities where the women often do not speak or understand Turkish even if their menfolk do (having had to learn it in the army if not before). Extension and advice in such important things as mastitis control should be given directly to the women who do the milking. In practice, if it is given to women at all, it is given indirectly, through their husbands and fathers; the message thus loses any direct impact. Women are also responsible for the manufacturing of dairy products (see below). In addition, both cows' and sheep's milk is sold fresh or skimmed to professional cheesemakers: these professionals are almost invariably men.

17. Nomads and transhumants: in the case of the nomads and also of the transhumant Black Sea shepherds, herding is a family group enterprise. The whole family move with their flocks, though individual members of the group will be allocated different duties, such as shepherding, moving and setting up camp, milking and so on. There is constant pressure on the nomads to settle. The government has been building housing for them near to Diyarbakir, though reports indicate that these are hardly suited to herdsmen. Deprived as they are of education and many of the facilities of that kind offered by the state, there are strong inducements for them to cease their migratory life. Undoubtedly their way of life is changing, but they need not cease to be herdsmen and stock owners. It is suggested that the way in which they make seasonal use of pastures is a better way of managing the alpine grazing than is often practiced by the resident population and should not necessarily be discouraged. The Black Sea Shepherds, fewer in number than the Kurdish nomads, live through the summer season in tented encampments, in family groups. In the autumn

they return to established villages on the forested mountains overlooking the coastal towns where they spend the winter. The nomad and transhumant groups arrive on their yayla about the middle of June onwards, usually a little after the resident herds and flocks. They depart for their kishla⁴ on the plains or their villages on the sea coast in early September.

Range, landuse and pastoral rights

18. Some 60% of the Province's 25,000 square kilometres are classified as meadow, pasture and rangeland. In former times the mountain ranges to the north of the central valleys were heavily forested to as high as 3,000 metres, mainly with scots pine (*Pinus silvestris*), but mixed with hard woods in places : *Quercus*, *Acer*, *Populus* species and others. *Juniperus* species are found on many drier slopes. Centuries of indiscriminate felling, and the wholesale destruction of forests that accompanied the Turco/Russian wars culminating in the First World War have left only a remnant, now under the control of the Forestry Department. Where forest once stood is now mainly open alpine pasture. But where the slope allows, and the need for grain has compelled, a growing population has ploughed even the most unpromising mountainsides to plant crops of wheat and barley that hardly repay the time and effort.

19. To the south of the central valleys the mountains have probably always been more open. For many centuries they have been much as they are now, a treeless upland of rounded mountains and high plateau. Bleak, snow-covered and wind-swept in winter, green and flowerstrewn in spring and early summer, but increasingly brown and parched from

August onwards. Snow usually starts to fall on the high ground by mid October and there can be complete snow cover even on the lower ground by mid-November. Above 2,500 metres the snow can lie well into May and above 3,000 metres into June. For many centuries these uplands have been the traditional summer pastures for Turkish and Kurdish herdsmen – a relief from the hot plains of Mesopotamia. In previous centuries the settled population was undoubtedly smaller and nomadism much more extensively practised.

Over the past hundred years many villages have been settled with refugees from further east or people who previously lead a more migratory life. Village populations have themselves grown, never more so than in the present generation; and pressure on the land and grazing has increased enormously as a result.

20. Where not overgrazed however these uplands and alpine pastures are often still in an optimum condition, though one has to get away from the immediate vicinity of the villages and main centres of population. These mountain pastures are home to a rich botanical community that still requires systematic classification, and includes many valuable grazing plants. Legumes: including many species of Trifolium, Medicago, Vicia, Astragalus, Onobrychis, Coronilla and others. Grasses: including many species of Dactylis, Agropyron, Festuca, Bromus, Poa, Hordeum and others, as well as a multitude of herbaceous, alpine plants, both perennial and annual.

21. In many places however unremitting grazing pressure has lead to severe degradation of the pasture and the incursion of unpalatable species such as spiny Astragalus, Verbascum, Ruta, Cirsium, Onopordum and other species. This is mainly

in the immediate vicinity of villages and watering places and has undoubtedly increased considerably over the last twenty years. Where upland slopes of marginal agricultural value have been ploughed, much of the top soil has already been eroded and the scars are likely to remain for many years after exhaustion, or the emigration of impoverished communities, has led to the abandonment of these fields. This is already happening in certain communities where migration to western Turkey is now actually leading to a decline in village population. But it could be generations before the natural vegetation will reestablish itself in such places without human aid.

22. Hay: along the rivers and mountain streams, in fact wherever water can be diverted onto land not required or suitable for arable crops, a hay crop is taken, either from the natural herbage or from planted crops of lucerne. Lighter hay crops may be taken from dry hill slopes not required for grazing. In some places sainfoin is grown on drier, tilled land. These wild hay meadows vary considerably in quality. Some are rich in natural populations of legumes and fodder grasses. Other meadows are in poor condition especially where bad drainage and over-watering have led to incursions of sedges (*Carex* spp) rushes (*Juncus* spp), Phragmites and mare's tail (*Equisetum* spp). Heavy grazing in the early spring undoubtedly has a detrimental effect on many hay meadows, as does heavy stocking on lucerne and sainfoin aftermaths after the last cut of hay in the autumn.

23. Lucerne and sainfoin have been grown in this part of Turkey for many centuries - possibly even millenia. The indigenous ecotypes, which are still planted in many villages, are generally long lived. Ten to fifteen year stands are common, stands of over twenty years are not uncommon. They tend also to be comparatively drought-resistant and able to survive heavy grazing pressure. In recent years there has been a shortage of local indigenous seed, and the only seed readily available from government sources has been of a type originating further west in Turkey from the region of Kayseri. This can be high-yielding, but tends to be more steny, shorter-lived - four to five years - and less drought and grazing resistant. Sainfoin is generally planted on land that cannot be irrigated and commonly provides a hay crop for four to five years before exhaustion. Ten years old stands still in good production have however been observed by the author.
24. Generally only one hay crop per season is obtained from the wild meadows, though two cuts are obtained from parts of the warmer northern valleys, Throughout most of the Province lucerne yields two crops, but between three and four crops are obtained in favourable places. Sainfoin seldom provides more than one crop per season. Vetches are sometimes planted as a single crop, but more often as a mixed crop with barley, and may be cut as a hay or a grain crop.

25. Hay meadows (chayir): the different parts of the chayir are almost invariably controlled by individual families as far as the right to the hay crop is concerned.

There are times of the year however when the chayir is open to be grazed by all the village stock, and not exclusively by those who have the rights of cutting hay. This applies to the early spring, when the stock are first brought out of their stables, usually April until mid-May. The date will vary somewhat between places and seasons, but is usually respected by village custom, confirmed by the muhtar and his azar. After this date the chayir is declared out of bounds, korokh^f, to grazing stock. Again in the autumn, after the hay crop has been carted and stacked and the stock have returned from the hill, the chayir is opened to communal grazing on the aftermaths.

26. Stubble (aniz) and fallow land (nadas): the same custom applies to both stubble and fallow land. In

fact all crop residues are usually open to communal grazing even though the actual rights of cropping are invariably exclusive to individual families. The same usually also applies to the grazing of lucerne aftermaths after the last cut of hay, and subsequent to the last irrigation, though this may vary between villages. The reason for this custom undoubtedly arises from the fact that in most instances village stock are herded communally, though

- * The term korokh is used for any area of meadow or range- land from which grazing animals are excluded for whatever reason. On the open' range where boundary ditches or walls seldom exist an area designated as korokh is marked off by placing cairns at intervals around the perimeter.

they are housed by their individual owners*.

27. Grazing land (mer'a): sometime between May 5th and 15th, according to location and village custom, the stock will leave the chayir for the village mer'a: grazing land open to communal use by all the village stock. For those villages with no access to alpine pastures there is no alternative to their flocks and herds continuing to graze the mer'a in the immediate vicinity to the village all through the summer. There is a tendency to graze outwards from the centre as the season progresses.** In most places the pastures are exhausted long before the stubbles and aftermaths corr available in September, to give a brief respite before the winter.***

28. However, in the village of Hizir Ilyas in Horasan district the custom exists of grazing the perimeter of the mer'a at the beginning of the season. Thereafter the stock graze gradually inwards as the season progresses, leaving the range land nearest to the village ungrazed until the

* The case for an ~ is rather different. He is usually in a position to maintain exclusive rights to pasturage, hay and cropping and so effectively prevent neighbouring village stock from grazing his stubbles and aftermaths, unless by prior agreement.

** But as has already been pointed out, there are in the
- southern districts of the Province considerable areas of range land grazing which are controlled not by village communities, but by individual families or often to the exclusion of the resident villagers settled in the area, A fact that quite often gives rise to dispute.

*** In one village a well-recognised custom prevails that prohibits any one family from owning more than twenty milk cows; but such stock control was not found elsewhere in the region.

back end of the year, except for stock routes in and out. This particular case arose for interesting historical reasons. The land was settled in the 1880s by a petty chieftain from the Caucasus and a small band of followers and retainers who had fled from the Russian conquest of their country. He was granted land and rights of pasturage by the Sultan. He and his followers were few in number and the territory they had been granted comparatively large with no one but themselves to protect the integrity of their grazing rights. It therefore became necessary constantly to patrol the perimeter of the range at the time of year when the grazing was best and the temptation to 'poach' it by their neighbours greatest. The system worked and has been retained to this day. To further establish his control of the area, the chieftain settled various sons at different locations on the perimeter of the range. These settlements have since grown into four villages, but only one muhtar is still elected for the whole group. The descendants of the original chieftain are now settled in Erzurum with interests in business, but in these three villages custom still dictates how the land and pastures are managed.

Summer mountain grazing, yayla* : in addition to the comm' grazing land that surrounds almost every village in the Province (mer'a), many communities have access to alpine pastures to which their herds and flocks resort for

* The distinction between mer'a and yayla can be compared with the distinction between the terms 'in-by' and 'out-by' as used by hill stockmen in the north of Britain.

between two and three months in the summer; these summer grazing lands are termed yayla.* The herds and flocks move up the mountain from the mer'a to the yayla from about the first week in June, when the snow on the high ground melts. Sometimes a village's Yayla may be comparatively close at hand on the mountain slopes immediately above the village. But in some instances it may be a day or even several days' walk away. This is sometimes the legacy of the years of war and strife when many villages and their arable land were left abandoned by their original inhabitants and then reoccupied by pastoralists who already had acquired grazing rights at some distance away.** The way in which the yayla is used and managed varies from community to community and from place to place, influenced by all kinds of factors, some physical and topographical others more sociological.

30. In some villages all the livestock move up to the yayla in others only certain categories of stock. The whole community may move up to occupy a summer yayla village leaving the main village virtually empty except for the very old and a few younger men to guard the crops and mow the hay. In other villages only the herdsmen or selected families with their women to milk the cows and ewes move up to the yayla. They may live in tents or

* The opposite to yayla is kishla: literally, winter quarters or winter grazing. Since in Erzurum the herds and flocks of the resident villagers are housed and little or no winter grazing is possible, this latter term is mainly used by the nomad groups who summer in the area and leave in the autumn to spend the winter pasturing their flocks on the warmer plains.

a more or less permanently constructed milking encampment or aghil. In some instances both milking animals and dry stock stay up on the yayla, with the milking animals being milked up there. In yet other cases, where distance allows, milking animals may make a daily trek between the yayla and the main village where they are milked. This is seldom good husbandry and is usually wasteful and time-consuming, but is often dictated by the convenience of the village women rather than the animals or the herdsmen. In such instances, the young and older dry stock will usually remain up on the yayla with the herdsmen, sheltering for the night in caves or rough corrals of thorn bushes and boulders. The move to the yayla may take the form of a single small migration from the mer'a or it may take place in a series of stages as the herds and flocks move ever higher in the wake of the melting snow.

31. The stock will graze the yayla for between two and a half to three months. Generally the arrival of the flocks on their yayla marks the moment when lambs are weaned and the ewes are milked in earnest. This weaning process may be spread over a period of a week or ten days or even more:

the lambs are shepherded separately from their mothers, and are allowed to suck for a short time after milking. Ewes are usually milked about mid-day while the flocks are resting.* They are usually milked by the women of the family which owns them, unless the flock has been placed in charge of selected families for the summer; in this

- But in one instance the author found ewes being milked twice a day, morning and evening in the same way as is customary for cows.

case it may be the shepherds' wives who fulfill this role. The ewes are milked right through the summer season, gradually drying off prior to their return to the lower ground. With the milk cows it much depends on the time of calving and the state of the grazing. Though some cows continue to milk through the winter months, the majority calve in the spring and early summer and are generally dry by the time the cattle are brought inside for the winter.

32. All stock are off the yayla by the end of September and come down from the hill to graze hay aftermaths and stubbles. There is usually little to graze on the mer'a at this time unless there has been an exceptional amount of rain. All stock will be housed by early November, though sheep may continue to be taken out to graze during the day time during spells of open weather. By early December there is usually almost total snow cover.

33. A village mer'a and yayla may themselves be divided into different sections known as mintik (or mevki). In some cases, these sections may be grazed by different categories of stock for different periods and at different times of the year. These mintik usually have their own names, which derive from their purpose, geographical features or from some past person or incident. Even if grazing land is not divided into mintik, there may be a system of using different parts of the mountains at different times of the year, according to topographical factors such as the lie of the slope, which affects the timing of spring snow, melt and summer parching. Different communities lay claim to adjacent areas of mountain grazing and conflicts over borders are not uncommon.

There are instances however where blood ties between neighbouring communities have given rise to the establishment of a border area five to seven hundred yards broad over which the stock from either side may graze without dispute.

34. Land rights: in theory all farmers should have title deeds proving their rights to their tilled land and hay meadows. In practice very few do and to date no effective registration of land title or cadastral survey has been carried out. In theory the modern Turkish law of inheritance divides property between male and female in equal proportions. In practice village families arrange among themselves how the land is used by the various siblings, some of whom may be migrant workers. There is almost certainly discrimination against women. It is also a fact that much land has been ploughed without authority or licence and cropping rights are as often as not 'de facto' rather than 'de jure'.

35. In law all range land belongs to the state, a carry-over from Ottoman times when in theory all land was the possession of the Sultan. In practice individual communities and in some instances individual families have acquired grazing rights, which in the event of dispute may be upheld or overthrown by the courts, but to which there is no freehold title in law. These rights may have been acquired in any number of different ways, which may or may not be backed up by documentary proof. These may date from ancestral feats of arms or brigandage, or from a more formal act providing some ancestor or some community with rights of pasturage. These may date well back into Ottoman times or to more recent settlements. Wars and the movements of populations over the last two hundred years have created an immensely confused and varied history

of village settlement and the acquisition of pastoral rights in the area, not all of which by any means have been backed by formal legal process. Disputes which cannot be settled informally usually go through the local agricultural office to the district governor (kaymakam) and the district court for adjudication. If a real fight has developed, as is not uncommon in the southern districts, it may be a matter for the 'gendarmes' and a higher court to sort out.

The commercialisation of pastoral resources, animals and animal products

36. Leasing land: many village communities who find that they have alpine pastures in excess of their own needs make arrangements to lease out sections for the summer grazing season.* These arrangements can prove quite profitable and provide a useful source of cash income. Negotiations for leasing grazing take place in the late winter or early spring. A meeting is convened on a prearranged date, traditionally in some suitable building - the school or the village tea house, where something resembling an auction takes place. A time limit is placed on the meeting and an agreement is struck between the highest bidder and the village community represented by the muhtar and his azar. The bidder may be the representative of one of the nomadic Beritanlar or Savatlar clans,* or a butcher wanting pasture on which to run cattle for slaughter in the autumn. In recent years it has become customary for these agreements

* The true nomads seldom if ever have formal ancestral rights to summer grazing in this Province and must make a fresh agreement every year with those villages or agha who do. Some of the transhumant shepherd families from the Black Sea do. These are located on the high yayla north of the main central valleys.

to be signed in the district centre in the presence of the kaymakam (district governor). This has the advantage from both the villagers' and the kaymakam's point of view of forestalling the disputes that have commonly arisen from such arrangements.

37. In the district of Chat much of the range land so leased is controlled by agha. Though they have traditional controlling rights to land and pastures they are more often than not resident in the city or elsewhere in Turkey, usually with other and more profitable business interests than stock farming. Difficulties usually arise from the fact that the local villages whose land borders on the pastures controlled by an agha may themselves have a subservient and sharecropping relationship with the agha who will not permit them to graze their stock on these yayla. Even if they are independent, the local villagers may themselves be short of grazing land for their stock, yet too poor to be able to bid competitively with outsiders for the pasturage. These situations often lead to grazing disputes and even violence that requires the intervention of the law; in which case the agha often have the political advantage.*
38. In some instances a long-standing relationship of understanding and trust may be established between a particular village or agha and a particular group of nomads or

Though the author has met some comparatively poor agha with traditional rights to pasture land, who simply find it easier and less trouble to lease their yayla rather than to graze them with their own stock.

merchant graziers leading to a semi-permanent annual arrangement. But on the whole these leases are primarily of a commercial and strictly temporary nature. It seems that the nomads are well able to hold their own in the bidding for these leases, against the merchant butchers. When a village community leases part of its grazing land, the income goes into a community fund, under the chairmanship of the muhtar, and is used for community expenditure such as the maintenance and repair of the mosque, the building of village water fountains, meeting rooms, tea houses etc. or for any other expense affecting the community as a whole. In the case of the agha the financial benefit goes solely to his own family.

39. Range land leased in this way is declared to be korokh (out of bounds) after the agreement has been signed, and is marked off by small cairns set at intervals around the perimeter, to warn any other local herdsmen that they should not take their stock into the area. This may be a considerable temptation as the nomad flocks and merchants' store animals are often brought on to the yayla later than the stock of resident villagers. The comparatively late arrival of the nomads and merchants on the range enables a system of deferred grazing to be practised.

This is of definite benefit to the pastures, whatever may be said about its injustice in respect of the resident villagers, whose own grazing land may lie very limited,

and who may be debarred from leasing more by their poverty or their subservient relationship with the agha himself. Of further benefit to the pastures is the fact that the nomads usually leave the yayla earlier in the autumn than the resident herdsmen, in order to make their long trek back to the plains before the onset of the cold weather.

As more nomad families take to moving their stock, their tents and possessions by truck, this may be changing as it becomes possible for them to arrange the timing of their departure with more flexibility. The merchants also usually take their animals off the yayla earlier than the resident stock. They have some commercial interest in doing so while both they and the grazing are in good condition.

40. The value of a pasture is assessed on its carrying capacity based not only on the quality of the grazing and the extent of the area, but on the availability and convenience of watering points. As an example, the village of Yavi Koy in Chat district in 1984 leased three of the mevki on its yayla . Two to merchant graziers and one (for the first time) to a group of nomads. The two mevki rented to merchants were let for 700,000 Turkish Lira (approx. £1,400) and 650,000 T.L. (£1,300), grazing 600 and 400 store cattle respectively. The mevki let to the nomads brought in 1 million T.L. (£2,000) and was carrying about 2,000 ewes and their lambs. The villagers claimed that should a proposed irrigation channel be constructed through this section of the range, from some mountain springs to the village arable land, it would be possible for them to double the rent without any difficulty. This would be in addition to increased income from land they would be able to bring into irrigated cropping.

41. Hay marketing: one of the most valuable crops in Erzurum Province is hay. Not only as the most important winter feed crop, but as a crop to sell. This is true of both the hay from the wild meadows and from the fields of planted lucerne and sainfoin. Some farmers in the central valleys grow hay as a commercial crop and many other

villagers sell hay if it is in excess of their own needs. Some also sell hay even when it is not in excess, but because they need the cash, or because they feel the cash value realized immediately from their hay crop is of more use to them than the long-term return they might obtain by feeding it to their stock. Many villagers do sell much of their hay crop and are prepared to keep their own animals, cattle in particular, on a mainly straw-based diet through the winter. The cattle in particular are slow-maturing at the best; quicker and bigger profits are made by those who buy in three to four year old animals from the mountain villages to fatten over a few months for slaughter, than by those who breed the animals in the first place. The villagers are always in need of cash, and the temptation to get the quick benefit from selling hay rather than the postponed benefit from their cattle is very pressing. Few mountain villages are self-sufficient in wheat. They need cash in the autumn to buy winter provisions and flour against the inevitability of being snowed in for days, if not weeks or even months on end.

42. Most of the hay is sold to merchants who transport it to the Black Sea towns. There it is sold to small farmers who produce hazel nuts and tea; they all keep a few cows but have very little forage. These small farmers are comparatively prosperous, since they produce high value crops; many have in recent years bought jersey or jersey cross cattle. Though these hay merchants offer some price differential for lucerne/sainfoin hay as opposed to wild meadow hay there does not appear to be the same sort of price differential between the best and the worst grades in each of these two main categories, Thus farmers spoken to did not expect to get a substantially different price

for the hay from their best meadows, full of clovers and vetches and from their worst full of sedges and rushes. This means that there is little market incentive for farmers to produce top quality hay. Even the lucerne is generally cut when too mature and stemmy. It is not easy to say how much hay leaves the Province each year. No figures for this trade exist, and a detailed study needs to be carried out before it can be properly understood.

43. Conditions in the stables are dark and foetid and feed is usually in short supply by the end of the winter. These are compelling factors that encourage villagers to turn their stock onto the chayir as early as possible in the spring. There is little growth on the meadows at this time and the ground is often still waterlogged from melted snow and rain. Stocking rates are high and the pressure on the grazing extremely heavy. None of these factors are ideal for the production of a good hay crop or maintaining a good sward. It has to be recognised however that the conditions that lead to these practices will have to change before villagers can be persuaded to alter them.

44. After the stock have left the chayir, the meadows are irrigated once or twice before the hay is cut. Each family is responsible for flooding its own meadows, though the maintenance of irrigation channels, and drainage ditches (if any) is the joint responsibility of all users. The quality of this maintenance varies from good to extremely poor and depends very much on the corporate spirit in the village and/or the strength of character of the muhtar to get things organised. The chayir are cut for hay from early July onwards. In most cases the herbage is maturer than is ideal to produce the best hay from a feeding point

of view; but as pointed out bulk is what most farmers are looking for.

45. Hay is still mown and baled by hand throughout most of the Province; by men with scythes on the flatter land and sometimes by men and women with sickles on very steep slopes. It is carted from the field with ox and horse-drawn carts, or tractors where these are available. There is little mechanisation of the hay crop as yet except for some places in the central valleys where small self-propelled mowers and a few mechanical balers are in use on the larger units. Few farmers can afford this kind of capital investment. The traditional methods of hay-making are however well suited to local conditions, and the weather on the whole is excellent for making hay; although rain can delay the operation for a day or so. After mowing, the hay is left in its swathes for a day or so before being raked into windrows. It is then rolled into tight cylindrical bales bound round with skillfully spun lengths of grass rope. The size and shape of these bales, bagh, vary somewhat between locations. Bales of wild hay are generally larger than those of lucerne. Bales may vary between 25 and 50 kilogrammes in weight, but are generally of a size that can be loaded onto a traditional solid wooden-wheeled ox cart, kagne, by a man working on his own.

46. The process of carting and stacking hay is laborious and time-consuming and often overlaps with the cereal harvest. The bales of wild meadow hay may lie out in the fields for several weeks until the villagers have time to cart and stack them. Their cylindrical shape however provides some protection against the occasional thunder storms that are a feature of this season. The traditional rolled bales

are also particularly well suited to making good lucerne hay, since valuable leaf can be lost when moving loose hay. After the bales have been carted, the meadows are usually irrigated before the stock are allowed on to graze the aftermaths and any autumn re-growth that there may be.

47. Throughout most of these uplands only one cut of hay is possible off the wild meadows, though two are possible with irrigation in the warmer valleys of the upper Choroh system. Several cuts of lucerne are normal in most places. Each cut is followed by an irrigation, water permitting. On the uplands two cuts are normal, but in the warmer valleys up to four cuts are not uncommon. Many farmers spoken to seem aware that it is bad management to graze their lucerne aftermaths too soon and too heavily in the autumn after the last cut, before the plant has had a chance to recover its strength before the cold weather. Many stated that they did not customarily put their stock onto their lucerne fields until 25 to 30 days had elapsed since the last cut. Observation however indicates that the need for pasturage in the back end compels many stockmen to put their animals on earlier than is ideal. It is here that the hardier local ecotypes with their inherited ability to survive rough management come into their own.

48. One more observation needs to be made, on the siting of village haystacks. Throughout the central valleys it is customary in most villages to stack the hay either on top of or immediately beside the owner's house and stables. In the southern districts however hay is normally stacked one or two hundred yards from the village itself in a communal rick-yard. There appear to be good reasons for this: the mainly Turkish-speaking villages of the central valleys seem to have lived in comparatively greater harmony

with their neighbours than many of the villages in the southern districts, where a history of blood feud and lawlessness have traditionally been much commoner. In such a situation the risk of arson has been much greater not only from without, but also from within the village community. Should a rival village set fire to your ricks at least your house will not burn down, and should your neighbour have it in mind to burn your hay he will run the risk of burning his own ricks at the same time. The final siting of the stack yard in many villages with a history of lawlessness is the responsibility of the local gendarmerie commandant.

49. Cereal harvest and straw: The wheat and barley harvest starts in late July in the warmer Chorob valleys, but the main harvest on the Erzurum uplands does not really get underway until August and can still be going on well into the second half of September in the higher valleys. In Erzurum the grain is still harvested by hand with scythes and sickles. Threshing is now mainly done with small tractor-driven threshing machines, which also winnow and chop the straw to the size that is customarily fed to stock. Straw is customarily stored under cover, usually in part of the domestic/animal quarters complex. The stubbles provide a valuable source of pasturage in the autumn, as do the fallow land weeds. In some places and in some years chopped straw can fetch a price comparable to coarse meadow hay.

50. Sale of livestock: most resident stock owners sell excess stock and ram lambs in the late summer and autumn. Bulls are sold at between 2 1/2 and 3 years old, ram lambs at about nine months old. Though in the case of the latter, stock owners who are able to keep some ram lambs through the winter will do so in order to sell them in the early spring, when supply is short and prices generally high. Kurdish nomads sell ram lambs and sheep in excess to breeding requirements prior to their departure for the plains. There is a practical advantage in taking only the minimum number of animals on the long autumn trek, over hills that have been well grazed out earlier in the year. It is also sensible to sell sheep while in good condition of f the alpine pastures.
51. Many animals are bought in this way by merchant feed lotters and butchers who truck the animals westwards nearer to the main centres of urban consumption where they are fattened and slaughtered. In recent years, trade with Turkey's neighbours, Iran and Iraq, has been officially encouraged. This has helped to discourage the old traditional cross-border smuggling of animals and encouraged the stock merchants to come out into the open and trade officially. This in its turn had led to the establishment of fattening and slaughter units in and around Erzurum itself; a business in which many of the city's richest citizens are engaged.
52. A well established market in livestock exists, with the merchants having well established trading links in the villages as well as buying stock that are brought into the city stockyards for sale. Sale of livestock by auction

is unknown in eastern Turkey, but the system appears to work reasonably equitably with all parties having an acute understanding of market demands and prices. The demand for bank credit to finance the building of fattening houses and for the purchase of store animals and feed has increased considerably in recent years. This has proved particularly attractive to farmers whose land adjoins the strategically placed main road to the east, running from Erzurum through the towns of Pasinler and Horasan (see map).

53. In addition to the official stock yards in Erzurum, and the more informal purchase of stock in the villages by travelling merchants, a number of traditional weekly stock fairs take place on certain Strategically placed yayla, where the province of Erzurum borders with the provinces of Artvin and Agri in the north-east. Here stock owners and merchants meet on Thursdays between the end of June and the middle of August.

54. Processing and sale of milk and milk products: milk is an important part of the economic value of the herds and flocks in Erzurum Province. Observations confirm the importance of milk in the domestic economy of the Province's villages, not only in providing an important staple of diet, but also as an important source of income from the sale of cheese and to a lesser extent of fresh milk. Recent estimates put the consumption of dairy products in North East Turkey among the highest per capita in the country. Even so these are

possibly an underestimation and based on somewhat conflicting data. Though between 3 and 4 thousand tonnes per annum of raw milk is sold to a government milk plant in Erzurum,* the only such plant in the province, this is known to account for only a fraction of the total production in the province. Most milk is either consumed by the producers themselves or marketed privately.

55. Though most communities process a certain amount of their own production into cheese and yoghurt for their own consumption, many sell the fresh or skimmed milk to professional cheese-makers who operate at various levels of sophistication usually near to the source of supply and also usually only seasonally during the months of greatest milk flow. These small cheese plants, known as mandira, are found scattered throughout the Province. Sometimes they operate in permanent buildings established in some centrally located village, convenient for milk collection. Often these mandira employ skilled professional cheese-makers contracted for the season and coming from as far away as Turkey's western sea-board or Thrace.

Other mandira are operated by migratory family groups, usually of central Anatolian origin and often originally of nomad stock. These family groups operate from tented encampments which they set up in the mountains or near to a series of village yayla, often for many seasons in succession. They operate only during the period of greatest milk flow and may move round the whole country in this way. In these Instances the stock owners either sell full cream milk or skimmed milk. Among the Kurdish villages it appears to be mainly skimmed milk that is sold, the villagers making and consuming their own butter.

Against the factory's capacity of 15,000 tonnes per annum.

A few villages have established their own cooperative cheese plant, but this appears to have seldom worked unless established under the village's own, rather than government, initiative. Most villages with surplus milk to sell seem to find it easier to sell to a third party rather than to manufacture the cheese themselves. This is perhaps a reflection of dissensions within and between many village communities. Other villages have little milk surplus to their own requirements. In this case each family looks after its own needs and disposes of any surplus to neighbours or in the local town.

57. Some of the more sophisticated cheese makers have good contacts in cities like Istanbul where family members may be settled, and once the season is over, take their production to retail in these places. Most of the cheese made is of the typical Middle East/Balkan type of white feta cheese, or variations of this: sometimes stringy in character, sometimes crumbly, and stored in goat skins. Some mandira specialise in making a hard cheese, possibly of Russian origin, known as kashar. In addition to cheese, yoghurt is made and consumed in most rural households.

58. Dung fuel: except for those villages in the north of the Province with access to forests, the only fuel available to most villagers is a mixture of dung and straw dried into bricks of between one and three kilos, known as tezek. Without this important commodity, the villagers of Eastern Anatolia would freeze, and its importance is reflected in the time and care that is taken in its preparation. The mixture of dung and straw from the stables is brought out in the spring after the animals have left for the mer'a. Some water is added if necessary

so as to be able to work the mixture better. It is then puddled, mixed up and spread out level on the ground to dry. This process may take several weeks. Once dry the mixture is cut with a special knife, into oblong blocks and then stacked into hollow bee-hive-shaped cones about ten or twelve feet high. The shape of these piles of tezek varies from location to location, as do the details of the drying and stacking process. Sheep's tezek is reputed to burn much hotter than that made from cattle dung - almost as hot as coal in the estimation of most villagers; but cattle dung is easier to manufacture. Cow pats are even gathered from the meadows to add to the fuel supply.

59. It is estimated that every village family needs approximately between eight and ten livestock units to produce sufficient tezek to keep them warm through the winter: that is approximately 4 to 5 cattle plus 16 to 20 sheep. A high straw diet may not be very nutritious for the animals, but it produces better dung for burning than a high grain or concentrate diet (if villagers could afford to buy it). Those villagers who have a surplus of tezek sell it to those in the village less fortunate than themselves. Enquiries indicate that between 25 and 35 T.L. (5 to 7 pence) can be obtained for each brick of tezek. This fuel requirement has been a very powerful factor influencing the numbers of livestock grazing the meadows and pastures. With no alternative means of keeping warm this valuable source of fertilizer is being lost to the arable fields - though the ash at least is used. Most farmers spoken to appear well aware of this, but there is little they can do about it.

60. Wool and carpets: the sheep's wool is coarse and in the case of the mor-karaman breed also coloured; however, it appears to have a ready market in eastern Turkey. Some villages weave carpets and a variety of flat weaves (called kilims, jijims and sumaks depending on the type). These are mainly the Kurdish villages and certain Turkish villages in the northern and north-eastern districts. Very little commercial weaving however goes on in these villages, where the looms serve a mainly domestic requirement. The surplus wool is sold to private merchants or to the state-controlled wool and mohair organization.

Conclusion

61. In all the cases mentioned above there is a reasonable hope that some improvement in grazing and pasture management will be possible with the active cooperation of the stock owners themselves. A number of such communities have been selected for future programmes to develop systems of deferred and rotational grazing combined with practical trials to investigate the economic viability for villagers and small holders in top-dressing their meadows and pastures. At the same time as improving the management of the pastures, it will be necessary to improve the hay meadows by drainage and fertilization as well as increasing the area and yields of planted fodder crops, mainly lucerne and sainfoin. In many places this will mean re-establishing grazing species on worn out cultivated land, especially on sloping ground. Some financial assistance will almost certainly be necessary, the cost of such initial establishment being beyond the means of all but the better off

villagers. It is also planned to initiate or improve existing programmes to improve the quality of the live-stock themselves by selective breeding, Improved feeding and health care. But in many villages growing populations and overstocking of limited pasture land pose almost insuperable problems. In such cases it is extremely difficult to institute good management practices, and the need for dung fuel alone makes it extremely difficult to persuade village families to keep fewer animals.

62. In most cases there is some hope of encouraging villagers to increase their production of fodder crops, not only lucerne and sainfoin but also vetches, clovers and fodder grasses. At present there is a regrettable shortage of suitable seed, but it has been proposed to devise incentives for farmers to produce more of their own seed themselves. In the past, official policy has led to a growing dependence on the government to supply fodder seeds, where once farmers had no alternative but to produce it themselves. It is hoped in the longer term to develop the local ecotypes which observation shows to be so well adapted not only to the local climatic conditions, but also to the rough management they receive. Work has been started by the Regional Agricultural Research Institute to collect plant samples and seed of local types of lucer and sainfoin, as well as various local species of Trifolium, Vicia and fodder grasses such as Dactylis etc. This is of course a long-term project, while many of the needs are immediate.

63. In earlier times much more of Eastern Anatolia was grazed on a nomadic or semi-nomadic basis. The settled population was smaller and the pressure from a resident

population of livestock on the grazing land far less and much more seasonal than it is today. Where vestiges of the old nomadic system survive, the mountain pastures still tend to be in reasonable condition. The nomads, so often condemned as abusers of the range land, appear in this instance to be using it in the most appropriate fashion. There is little doubt that all too commonly village populations have outgrown their pastoral resources and are locked into a spiral of poverty in climatic and geographical conditions that place severe restrictions on their development potential while limited to an agricultural/pastoral base.

64. There are however indications and clues to future trends provided by the social dynamics of those village communities (still a minority), which have developed viable sources of income outside the village, and which are no longer so dependent on agriculture and livestock husbandry for their survival. In certain communities, populations are beginning to decline to a level more easily supported by their land, though the scars of over-exploitation in the shape of the bare eroded slopes left by old cultivations remain. Provided alternative work opportunities in industry and manufacturing grow in Turkey, this could be a long-term solution to a rural area which will always be limited by climate and topography. But most industrial development is far away in the west of Turkey, if not outside the country altogether. There are few inducements to invest capital in manufacturing businesses in the east of Turkey, which tends to be shunned by Turks of ambition and education. Outmigration has its wider social problems such as the mushrooming of shanty towns of gece-kondu (Lit. 'put down in the night') that surround many of the main Turkish cities-

hotbeds as they are of potential political unrest if also mines of comparatively cheap labour. The problem is complicated by the inevitable return of large numbers of workers' families from West Germany and other European countries, where they are no longer either needed or particularly welcome. These comparatively sophisticated labourers will increasingly be competing for work with their more rustic brothers.

65. Despite these related problems, some rural communities in the East do now appear to be declining in population as out-migration has overtaken population growth. At present it is confined to special cases, usually villages which for some reason or other have had the opportunity to 'better' themselves and perhaps more importantly the will to grasp the opportunities available to them. This trend is likely to increase over the next generation as village education increases and if Turkey's industrial and commercial growth can be sustained. This may in the future lead to a decline in village community pressure on the pastures and possibly lead to an increase in the leasing of range-land to a class of merchant stockmen and ranchers. Though the nomad way of life as it was is dying there is even a possibility that the most successful nomad families may join the ranks of the merchant graziers. It is interesting to observe how well in fact these nomad groups manage to hold their own in the bidding for grazing leases in the southern districts, in competition with the urban butchers and stock merchants.

66. Development plans have a way of being swept away by social and economic events outside their control. In this instance however they should take into account two

important things. The first is the necessity to develop sources of income in the area other than strictly agricultural and pastoral, so as to reduce the dependence of whole communities of resident villagers on their livestock not only for food and income but also fuel. Attention must be paid to the development of a local industrial base rather than one which is far away in the West. This is essential if the government wishes to keep a large and viable population on its eastern frontiers. Population trends must be carefully monitored. There is little doubt that the best hope for range land improvement lies in those villages where a decline in village population solely dependent on their livestock has already begun.

67. The second is the need for extension staff to recognise and build upon already existing practice, Despite popular official opinion to the contrary, villagers do not always use their common grazing indiscriminately. Only when a situation is understood can a sensible extension and development plan be made. This must always be made with the cooperation of the villagers. A good example from local experience has been the use of the custom of marking an area of range land korokh (out of bounds) by building cairns of stones around its perimeter, When village agreement has been obtained this is all that has been required. Fences have seldom proved either financially sensible or effective: if agreement has been obtained they have proved unnecessary; if it has not the wire has been cut and the stock let in in any case.

68. The use of official forces of law and order may work in the short term, but do little other than increase the sense of alienation between the rural community and the

government agricultural officers. There is often talk of the necessity of passing draconian laws relating to the use of range land, and even to such things as the sale of hay out of Erzurum Province. But there are grave dangers in instituting a series of blanket regulations that concern a poorly understood situation, and take no account of the great diversity of conditions -

69. Villagers have a number of conflicting decisions to make, and their poverty often forces them to accept immediate and certain benefits against, less certain, if possibly greater, benefits later on. Many villagers continue to grow poor crops of wheat on land that would grow far better pasture or fodder. They do so to ensure a minimum amount of self-sufficiency in this staple. They must be provided with some security on this score before they will take the risk of turning their wheat fields over to pasture and fodder.

70. In the forthcoming season certain villages will be selected in each district for projects to improve fodder production, range management, livestock husbandry, breeding and disease control. Initially these are likely to be communities where an improvable system exists and where there is a good chance of obtaining the free cooperation of the community. This is essential to any plan relating to deferred and/or rotational grazing, or to the benefits of overseeding or fertilization. The Project provides an opportunity to shield the villagers from the financial or other risks they may fear in any change in their existing practices. Where a system of sectional grazing already exists, there is usually some chance of introducing small improvements in such things as a

variation in the timing and order in which the sections are grazed by different categories of stock. But this requires the situation to be well understood and can only succeed with the cooperation of the villagers.

71. Much study work remains to be done, and development and management plans must be flexible and kept under constant review. This paper has been primarily a descriptive one aimed at providing those interested in pastoral development with a picture of an area that has received little detailed attention hitherto, though it is of considerable importance to the livestock sector of Turkey's rural economy. Though Turkey has growing industrial and manufacturing aspirations it is still primarily an agrarian country which, though able to feed itself and provide an exportable surplus, is still operating well below its potential, and in some danger of losing its agricultural advantage. Much of North-Eastern Turkey is best suited to livestock and a pastoral economy - which for all its problems has the possibility of real improvement, provided that it is first of all properly understood