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PASTORAL MOVEMENT PATTERNS OF MONGOLIAN HERDERS  
AND THEIR SOCIO-ECONOMIC ASPECTS

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## GLOSSARY OF MONGOLIAN TERMS

- aimag - the largest rural administrative unit (province), consisted of several sums
- atar - general name of lowhill steppe pasture area,
- bag - the lowest level administrative unit in contemporary Mongolia reintroduced to replace the brigades
- bod - general name of large animals (camel, horse and cattle)
- bog - common name of small livestock (sheep and goat)
- brigade - the former production unit of the negdel
- ger - traditional Mongolian dwelling or mobile hut
- jilevch - small iron pot used for preparation of milk bodka
- khot ail - traditional herding unit composed of households camping together and sharing labour
- khainag - hybrids from crossing yak and cattle
- khoshuu - an administrative unit in pre-revolutionary Mongolia
- negdel - former agricultural cooperative existed in the socialist period, territorially equal to sum
- otor - summer move of animals to distant pastures to improve their body condition through intensive fattening
- sum - secondary administrative unit or district in contemporary Mongolia
- suur - independent basic production unit of the negdel consisted of 1-2 households to perform herding and production tasks
- taiga - above-forest belt in high mountain areas of the mountain ranges: Mongol Altai, Khangai, Khovsgol and Khentii
- tarig - common name of cropping area in the western Mongolia
- tugrik - national Mongolian currency
- zambaa - kind of flour made of food grains to use for home consumption. This is not utilized as a manufactured flour for bakery, but it usually is consumed as an additional component to tea or mixed with butter and sugar

# PASTORAL MOVEMENT PATTERNS AND THEIR SOCIO-ECONOMIC ASPECTS

## CHAPTER ONE

### GENERAL

From ancient times the Mongols lived a nomadic way of life and herded major species of livestock. These animals served specific economic purposes and herded according to the geocological conditions, grazing land productivity, water management and location of basic camping.

The Mongolian rural economy is dominated by production from what Mongolians call the "five kinds of animals" (horses, camels, cattle, sheep and goats). Livestock industry is characterised by a complex mix of private, collective (company owned) and state-organised production and marketing activities. Specific geographic and ecological conditions have great impacts on the production and herding strategy of nomadic people. The nomadic economy is largely dependent on natural conditions (pasture growth, drinking water and climate) limited pasture potential and local resources. Therefore, herdsman migrate from one pasture area to another in order to maintain the optimum linkage between livestock and environment and to cope with the changing external pressures. So, it can be said that pastoral movement is the main form through which the Mongolian herders manage the interrelationships between nature and livestock. For the past times, Mongolian herdsman has elaborated a set of specific to Mongolian condition arts of herd management in correspondence with local geographical and environmental specifics. Pastoral movement should be considered not only as a herding task, but it's socio-economic baselines as contributing factors should be looked at and analysed. D. Bazargur, et. al, 1989 points out that the herding movement is at crosspoint of many branches of basic scientific principles, such as sociology, economy and natural sciences, etc. This is, as other specialists argue, a very solid-based scientific approach to pastoral movement and problems around it.

### LITERATURE OVERVIEW

A wide range of problems associated with traditional livestock herding techniques, especially pastoral movement have been studied by many of Mongolian and foreign researchers and numerous of valuable theoretical and practical conclusions and documentations have been made. The basic research approach to problems of pastoral movement among Mongolian herders is tied to a very common assumption that the reasons for pastoral movement are optimum utilisation of natural resources, especially the geocological viable grazing area by livestock. Most of the investigations have been conducted in that strict line and major patterns of movement of Mongolian herder has looked at and analysed in that context. Therefore, researchers came to a major conclusion that the main task of pastoral movement is the rational use of a geocological viable area through optional grazing by highly adapted to the given area livestock in order to secure effective herding and to maintain the environmental sustainability. There has been undertaken surveys aimed to approach the movement in it's linkage with natural condition and

available resource. Attempts have been made to explore the basic and specific principles of organisation and forms of pastoral movements in different geographical and ecological regions and to work out a movement-based zoning of the territory of the country. This has made a valuable contribution to the research findings from earliest studies which were focused on some specific issues of relationship between customary responses, lifestyle and herding techniques. All these work provides a valuable contribution to the scientific-based explanation of a terminology "movement" and to narrowing it's definition.

Simukov, 1934 finds 6 types of pastoral movements in various parts of Mongolia in closer dependence with direction, number and distance of migration, landscape-geographic conditions, density of human and livestock population, and labour supply. Existence of 3 major types of movement which characterised by pasture types, water supply and other natural conditions has been documented by Tsevel, 1945, while Denisov, 1938 concludes that the seasonal movements are interrelated with the changes of productivity of pasture and nutrient composition of major grasses. He writes that the diameter (distance) of movements covers a concrete area with different natural and grazing resources within administrative boundaries which ensures to confirm the administrative division is made in correspondence with the opportunities to practise effective grazing. As it has been noticed by a number of researchers the herding families in the forest-steppe zone are seminomads as they are settled in winter-spring period and move in summer time, while these in steppe and desert area are pure nomads. The latter is due to regular movement over all seasons (M. Shikhin, et al, 1933, Meleshko, 1935. This idea was supported by D. Banzragch, et al, 1989 who studied pasture management techniques of herders. Findings of surveys carried out by Zhagvaral, 1974 show that there are 5 types of pastoral movement differentiated in their number, distance and direction. A conclusion made by Azarov, 1933 that the number of movements are dependent with the number of livestock is not seriously welcomed and supported by others. An assumption put forward by G. Batnasan, 1978 based on the distance of movements allows him to offer a definition that movement is a complex of activities directed to the organisation of the vital relationship between three components: herder, livestock and pasture. D. Tumurtogoo, 1983 points out that the main reason for making a movement is correlated with changes in the grass caused by livestock grazing. D. Bazargur, et al, 1989, Y. Nyamdorzh, 1985 and N. Ukhnaa, 1977 conclude that the reduction of the number of movements is due broader practising of a so called otor in collectivization period and centralised fodder supply, improved service delivery and schooling. This pattern spread among herders in some parts of the country has qualified as a herding style dominated by a seminomadic type in rural Mongolia. As these researchers have pointed out the broad implementation of techniques, improved fodder and water supply, livestock fencing and veterinary service are the main reason herders become more settled and the number of pastoral movements is decreased. A significant impact has brought by the penetration of many elements of modern urban lifestyle into nomadic livelihood system of herders.

Many researchers have pointed out that a herding is made on the basis of better understanding of the conditions of environment. From this point of view, pastoral movement of

Mongolian herders must be looked at in the context of political ecology or an analytical approach to ecological change that seeks for explanations beyond immediate biophysical and technical causes for environmental changes (Thrupp, 1993) or collectivization, privatisation, decollectivisation and economic liberalisation and ethoecology or discipline which investigates the physical and cultural relationships between local population and the land. As regards ethoecology most of attention should be paid to herders perception of ecology or understanding local knowledge and local traditional knowledge (Niamir, 1990). G.Batnasan, 1972 finds three major types of criteria for choose of seasonal pasture: dominant type of livestock, pasture grass quality and composition, and seasonal climatic characters.

For the last 70 years there have been practised a series of political, economic and organisational restructuring in extensive livestock sector which differ significantly from the traditional herding techniques. The impact of these changes on the local knowledge and movement patterns of Mongolian herders has not been analysed yet (R.Mearns, preliminary field work, 1993).

#### HYPOTHESIS

The current literature and other relevant information provided some hypothetical baseline that could be cross-checked. These are:

1. Movement is dependent in a great deal on the dominant herd species;
2. Movement has different direction and distance according to natural resources and herding task;
3. Movement changes in closer correlation with changes occurred in herd structure and it's species composition;
4. Movement is made on herders' perception-based evaluation of pasture quality and climatic changes;
5. Sometimes movement has a competitive character in terms of access to key resources and other facilities;
6. Movement distance and frequency is dependent on the share of large and small animals and availability of back-pack animals;
7. Absentee herding makes the movement more complicated and loose;
8. Trespassing and, local and crossborder livestock thieving are the major contributing factors to reduce movements;
9. Pastoral migration is made to optimise the grazing pressure and to avoid unpleasant consequences that could happen as a result of long-term intensive and less controlled grazing over the grazing area;

These hypotheses were tested in the frame of information and statistics obtained and attempts were made to draw relevant conclusions.

#### METHODOLOGY

In order to answer the questions of how the patterns of nomadic movements of herders have been changing and what are the major factors contributing these changes occurred, different research strategies were used. Secondary data (since 1970) and some of historical sources were consulted for human and livestock population statistics and long-term regional climatic records, as well as historical information. For collection of wide range of

acute information and understanding the herding and movement behaviour of herders different specific techniques: PRA, questionnaire method, semi-structured interview and matrix analyses were used. A substantial part of the data presented in the report were gathered in the course of the field work carried out in Turgen and Sagil sum, and numerous of statistics were collected at the Statistics Board of the Governor's office of Uvs aimag.

#### SAMPLING FRAME:

A list of key informants was produced in consultation with sum officials and old-age people. They were grouped according to their age and employment stage and were asked different questions. Seasonal pasture and pastoral movement area of the sample households camps and bag or customary herding groups was mapped in order to highlight the important changes in movement direction and distance. Attempts were made to define and verify the herders' pastoral perception and movement decision making criteria.

#### OBJECTIVES

The field work aimed to examine the important patterns and changes in pastoral and grazing movement in the context of different ownership and organisational forms of livestock production. The objectives are relate to:

1. relationship between herd patterns and movement;
2. territorial and ecological problems directly related to pastoral movement;
3. herders perception and Criteria for seasonal and grazing movements;
4. some aspects of traditional economic and customary relations among the nomadic people;

#### STUDY SITE

##### Location and climate

The fieldwork was carried out in Turgen and Sagil sum of Uvs aimag. The study area, the focus of this study, lies between the northern end of the Altai mountain range and the western coast of the Lake "Uvs" in the northwest part of Uvs aimag and covers 659.5 (225.3 for Turgen and 379.5 for Sagil) square kilometres of area. Some geographic, climatic and land characteristics of the study sites are given below:

Both Turgen and Sagil sum contain a part of the typical forest-steppe, steppe, semidesert ecological zones. The geographic location of these sums lies between 90-92 degrees of east altitude and 49-51 degrees of north longitude (see the Mongolian national atlas, 1989). Turgen sum is neighbouring with the town of Ulaangom (the aimag centre), Tarialan, Bokhmoron, Sagil, Chandmana and Davst sums of Uvs aimag. Sagil sum is located in the northern part of the aimag and has broad access to Republic of Tuva. Also there is a cross boarder outlet point to Tuva, and a main autoroad connecting Tuva and Uvs aimag.

The study area contains all of the major landscape elements. There can be found high mountains (3000m and more), medium high mountains (2000-3000m), low mountains (1500-2000m), high hills



(1000-1500m) and lowlands areas (less than 1000m) which are located along the longitude. The annual average temperature in the study site is -2...-6C and the amplitude is between +36.4 and -50C. Number of cold below -30C days is 40-70. The depth of snow cover is averaged to be 10-28cm. The annual precipitation is 150-200mm in the most of the territories: 250-300mm in mountains and around 100mm in semidesert areas. Winter-spring camping areas is covered by permanent snow from early October until early April. For some details see an attached climadiagramm for 1980-1990. According to the climatic conditions the spring-summer-autumn area has dry hot or dry cold summer. But summer and winter-early spring area is characterised by comparable cold weather and more precipitation.

Soil pattern is characterised by existence of semidesert light brown, saline steppe meadow chestnut brown, meadow-swampy saline dark brown and mountainous meadow frost and frost taiga chestnut types of soils. The surface layer of soils is very light and sensitive to any kind of soil damaging and deteriorating actions.

#### Grazing resource

The land resource of the study sites in terms of it's pattern of utilization is described in table 1.

Table 1. Land use management of Turgen and Sagil sum, '000 hectare

Name of sum	Turgen		Sagil		Aimag	
Total territory,	225.3	-	379.5	-	6985.5	-
Agricultural land	210.5	93.4	346.5	91.3	6229.0	89.6
Pasture land	207.5	98.5	342.0	98.6	6064.0	97.3
summer-spring	37.9	18.0	102.7	30.0	2109.5	33.8
summer-autumn	53.0	25.2	203.0	59.3	2661.1	42.7
winter-spring	116.6	55.4	36.3	10.6	1195.6	19.2

Source: Grazing land description in Uvs aimag, Ulaanbaatar, 1979.

The division of the land resource of the study sites is made on the basis of land management practices in negdel time. In general, the land use patterns were generated from that in the pre-collectivisation period. It would be safe to say that the seasonal pasture land division has not changed in great deal. Consequently, the figures are to high extent coincident with those from the pre-collectivisation period. By saying this, we are not ignoring small changes occurred within a concrete seasonal pasture. The differences in size of various seasonal pastures in different sums are dependent greatly on the geographical and ecological features of a given area.

According to the description of grazing land in Uvs aimag the study area is situated in Kharkhiraa-Turgen subregion of Mongol Altai mountainous steppe province of Eurasian Steppe region and Sagil-Davst and Ulaangom of Uvs Lake semidesert subregion of the North Gobi desert steppe province. As regards the yield of major pasture groups: high mountain pasture 5-6 c/ha, woodland pasture 5.7 c/h, mountainous steppe pasture 2.5-3 c/ha, steppe pasture 0.6-2.7 c/ha, semidesert and desert pastures 0.5-1.2 c/ha and

meadow-wide mountainous valley 2-5 c/ha. Material presented in table 2. provides a valuable information on the changes in the productivity of pasture land in several sums as a whole.

Table 2. Changes in yield of pasture land, per hectare

Name of sum	1967	1978	Difference, %
Turgen	5.9	2.2	-53.0
Sagil	5.1	2.8	-45.9
Davst	5.0	2.3	-46.0
Tarialan	5.3	4.3	-27.9
Aimag (average)	4.9	3.0	-38.7

Source: see table 1.

The average figures are seem to be little overstated because the yield was measured in summer. Nevertheless, for 12 years period between 1967-1978, the average yield of pasture land in 4 sums of Uvs aimag had decreased by 27.9%-53.0%. The sharp decrease in pasture productivity may be explained by several droughts in 1968, 1970 and 1975. The local people, especially, the specialists are intended to see it as a result of either of overgrazing or land degradation. This is probably, as they herding population perceives, a result of the high stocking rate experienced in collective time.

Depending on the variety of ecological and landscape types the vegetation cover of pastures in the research sites is quit rich and characterised by a range of floristic mosaic. Mostly, there can be registered forage and grass communities such as Nanophyton community dominated by *Kochia prostata* and *Eurotia ceratoides* associated with *Stipa glareosa* (in winter-spring area); meadow consisted of broves of *Salix ledebourinia* and grasses (*Iris lactea*, *Halespestes salsuginosa*, *Carex eneris*, *Carex duriucula* (in winter-spring and summer area); *Stipa glareosa*, *stipa krylovii*, Nanophyton *grubovii* and community composed by *Psathysrostachys juncea* and *Achnatherum splenders*, *Carex duriuscula* and *Iris lactea* subcommunities; bush subcommunity (*Salix berberifolia*, *Dryas oxyodantha*) and *Kobresia sibirica*, *Kobresia bellardia* community; community of *Caragana bungei*, *Caragana pugmaea* and *Stipa krylovii*, *Agropyron cristatum*, *Artemisia frigida*, *Asterothamus heteropappoides* and many others.

The natural resources and various landscape consisted of forests, surface water sources, and grasslands in Turgen and Sagil sums support different types of livestock common in other parts of Mongolia.

#### Population

In 1993, Turgen sum had a population estimated to be 2785 with a 2.3% annual rate of population growth. Population density was 0.5-0.8 persons per a square km. This population can be divided into two major economic groups: herding pastoralists and sum centre inhabitants. The herding group is the largest consisting about 64.3 of the total sum labour force of working age. In 1993, there were 320 herding families and 228 families of

sum centre dwellers. So, about 57.1% of the sample area's households therefore was involved in animal husbandry. In 1989, the former negdel had 511 working members, of which 5.5% was above working age and there were 11 persons under 16. But in 1993 the number of employees in livestock increased up to 738 and there were 164 person above working age. Also, number of youth under 16 years of age increased by 59.1%. The increased number of non-active working age people may be explained by a number of statements of the Pension Law which made the pension age limits more broader in dependence with employed time-duration and increased leave of pupils their school in a challenge to become a herder.

### Recent history

According to the administration division map of Mongolia in 1925 Turgen and Sagil sum were located in the territory of two khoshuus of former Chandmana uulyyn aimag: Togsbuyant and Bayanchandmana. In 1931, the contemporary Uvs aimag was founded and the sample sums were established as an independent administration unit. In 1956 in Turgen sum was founded a collective farm called Zhargalyn zam (Path of Luck) which renamed into Socialismyn zam (Path to socialism). The main economic activity of the negdel was livestock with small cropping, mostly wheat and fodder crops. In a period between 1930s and 1950s there were 9 bags in Turgen sum. The bags were reduced up to 3 after complete forming a negdel in 1959. How there are 3 bags in Turgen sum: Bayankhairkhan, Rashaant and Erdenekhairkhan. In September, 1991 the negdel livestock and assets were privatised as part as a major programme of economic liberalisation undertaken by the Mongolian government. Across the country the privatisation took place in two stages. For example, 30 per cent of ex-negdel assets existed in Turgen sum, including livestock, shelters etc. were distributed among negdel members and negdel officials according to their negdel membership or employment. But 10 per cent of total negdel assets was distributed to 228 sum officials in the forms of animals. The remaining of negdel assets was transferred to companies formed as a replacement of the former negdel. All the procedures related to re-organisation of negdel into companies was complete in autumn 1992. At request of the overwhelming part of members of two livestock-oriented companies (Delgermoron and Burgastai) the second stage of privatisation was initiated in August 1993 in order to organise re-distribution of livestock, remained at the companies ownership. By the end of 1993, 98.5% of total livestock owned by two companies were distributed and all members became pure private herding families. At present, the companies re-organised as a small merchant agency for marketing produces of local people and supplying some necessities. Privatisation of livestock and other assets and restructuring the former negdel "Yalalt" at Sagil sum was done in the similar way. So, the rural privatisation in Mongolia resulted in change of ownership of the livestock and livestock facilities including shelters and wells. But pasture land use is still on common grazing. As regards livestock, more than 95% of the national herd has been shifted to private ownership.

## CHAPTER TWO

### CHANGES IN HERD STRUCTURE, COMPOSITION AND, SIZE AND THEIR IMPACTS ON MOVEMENT PATTERN AMONG THE HERDERS IN THE SAMPLE SITES

Livestock system in the study areas is consisted of pure extensive pastoral system that associated with the low semidesert land, dampy plains and lake margins on the one hand, and the high mountain areas surrounded with deep valleys and long river basin, and lowhill steppe areas on the other. Livestock represent the non-human wealth source of the rural people in Mongolia and a change in their number or species composition would impact over the well-being of the herders through changes in herding strategy and production decision making. Also, important changes may occur in grazing management practices, especially in seasonal and grazing migration among the herders. As it was mentioned in the chapter for literature overview the pastoral movement is a phenomena which depends on mix of interlinked factors: structure and species composition, availability of grazing area and water, territorial problems, availability of transport and number and dominant species of pastoral community. It is interesting to mention that the traditional territory division within and out of one sum or bags has a strong effect on the seasonal migration practices among the herders. In order to determine important changes in grazing movement of herders in the sample area and the main contributing factors some of the above-referred components should be looked at and analysed.

#### LIVESTOCK STATISTICS' ANALYSES

##### Aimag

For various reason, firstly impact of nearly completed privatisation on the herd structure important changes in total herd of aimag and of the study site have been occurred. These should be looked at and important moments should be fixed up.

Important changes in livestock refer ownership relation and herding strategy, and production activities. For this purpose, several statistics for 1990 (the year before privatisation) and 1993 (the year after privatisation) are shown in table 3. For the four years' period during which negdel livestock and assets' privatisation took place, the total number of livestock and it's species composition has changed. For example, number of camel, horse and cattle decreased by 0.8%, 1.7%, 0.7% respectively, while goat population has increased by 3.2%. We have noticed that the number and share of sheep has not been changed significantly. Accordingly, the share of each of individual species in the total livestock population has changed in favour of small ruminants. Comparative statistics for 1990 and 1993 shows that number of bod animals has been decreasing since their privatisation. This is influenced by the increased percentage of livestock loss, decline of the number of female stock and survivals per 100 breeding female stock, increased abortion and low conception rate. For example, for this period number of camel calf, fowl, calf, lamb and kid decreased by 3.5, 16.6, 6.5, 17.5 and 7.4, respectively.

One of the potential reasons contributing this decrease is probably due to collapsed livestock breeding and animal health service. Livestock keeping individuals as they became full private

Table 3. Livestock statistics, Uvs aimag, 1990 vs 1993

	Total				Female			
	1990		1993		1990		1993	
	N	%	N	%	N	%	N	%
Camel	40435	2.4	26110	1.6	11411	1.4	7170	1.0
Horse	136739	8.2	107290	6.5	31930	4.0	27559	3.8
Cattle	162289	9.7	146958	9.0	62523	7.9	59845	8.3
Sheep	1020210	61.2	995150	61.0	542711	68.8	464207	64.3
Goat	306976	18.4	352966	21.6	140035	17.7	162056	22.4
TOTAL	1666649	100	1628474	100	788610	100	720837	100

Source: Annual census, 1990, 1993. Governor Office, Uvs aimag.

producers are not paying adequate attention to upgrading their livestock through effective and broader use of the existing potential of these services. Socially, herders are not well learnt how to adjust their livestock breeding and herding activities to market oriented changes in economic life of the country. It seems that most of herders haven't good defined herding and production strategy, so that they can run livestock husbandry in an effective way using the different opportunities allocated by the new goals of economic liberalisation. The above-mentioned decline, as many researchers have pointed out, will continue for next few years while the economic potential of rural Mongolia becomes more powerful and highly adapted to new economic development in terms of good and service delivery for herders and rural people.

Sum

Herding people in the study area raise mixed herds of camel, horse, cattle, sheep and goat. Numerical and species composition statistics of livestock in Turgan sum by the end of 1990 and 1993 are shown in table 4.

Table 4. Livestock growth statistics of Turgan sum, 1990 vs 1993

	Total				Female			
	1990		1993		1990		1993	
	N	%	N	%	N	%	N	%
Camel	802	1.3	663	1.1	197	0.6	199	0.7
Horse	5339	9.0	3953	6.4	1257	3.9	1161	4.3
Cattle	7195	12.1	5955	9.7	2867	8.9	2507	9.3
Sheep	35545	60.1	36409	59.4	21609	67.3	17770	66.4
Goat	10258	17.3	14235	23.2	6207	19.3	5109	19.1
TOTAL	59139	100	61215	100	32107	100	26746	100

Source: Livestock census, 1990, 1993. Turgan sum

Table 4. shows there is almost unnoticeable trend to increase of the number of sum livestock compared to statistics for 1990, the previous year of the first stage of privatisation. This increase

mostly due to increase in the number and share of goat in total sum herd which is a result of high, but always increasing selling price of cashmere in internal markets and increased export. Also, the increase of sum herd is influenced by decrease of livestock sold to state procurement meat supply. Sum officials informed that for the two years number of animals sold for state meat order decreased significantly, which in own turn allowed some increase in the total herd. Number of breeding female stock has almost not been decreased but the number of females given birth declined significantly thus led to decrease of number of survivals.

With the aim to look at the impact of changes in species composition of negdel herd for the last 20 years prior 1990 on grazing movement pattern of collective members, we collected a range of statistics referred livestock growth dynamics. The statistics are shown in Figure 1. Species composition of former negdel existed in Turgen sum had changed during the period of it's existence. There was a clear decrease in the total number of negdel herd and number of each species. It can be said that the portion of different species except cattle and camel decreased significantly: horse by 42.9%, sheep by 32.2% and goat 53.9%.

To give an effect to these figures, a real number of one species or 2 species in comparison to other species was calculated and indicated in table 5.

Table 5. Changes in the species composition of herd, "Path to socialism", Turgen sum

Year	Large animal: sheep ratio	Small livestock:Cattle ratio	Large:small livest. ratio
Negdel period			
1970*	450:100	1790:100	17.5:100
1975*	410:100	1630:100	19.2:100
1980*	410:100	1230:100	19.4:100
1985*	440:100	1103:100	19.0:100
1989*	400:100	1060:100	20.6:100
1990*	392:100	1020:100	21.4:100
Decollectivisation period			
1991**	278:100	660:100	28.0:100
1992**	307:100	705:100	26.2:100
1993**	342:100	800:100	22.4:100

Source: Annual reports, National Association of Agricultural Cooperators (NAAC), 1970-1990 and Livestock census, 1991-1993, Turgen sum.

\* - number of ex-negdel livestock

\*\* - sum livestock number

As the figures show there is a clear decline in the number of small livestock compared to large animals or small livestock to cattle and increase of ratio sheep to cattle. Data presented in table 5. illustrates a wide range of changes in the total and species number of herd over this period with clear shift from a dependence on cattle and small livestock. This change in number of different species is generally due to decreased number of both sheep and goat for 1970-1990 and increased number of cattle for 1991-1993. But for 1991-1993, small livestock population increased as a result of constant growing sheep and goat herd,

while cattle reduced steadily. This had a greater impact on the change in reliance characters. Our informants told that the main reasons for the changes occurred in herd composition ratio are:

1. Following the agricultural collectivization in the late 1950s suurs consisted of 1 or 2 herding families looking after a herd specialised in single species were established. Other species were kept not for real production but as a supplementary part of living and labour needs. This kind of herd management was not appropriate form for optimum regulation and maintenance of the herd structure and species composition. The main and specialised herd was looked after well, while the others were almost out of constant care. This especially refers to negdel large animals which were distributed to the herders at lower number for herding tasks only. Consequently, the overall negdel herd was herded unequally by the members which latterly led to breaking down the optimum herd patterns.

2. There was a strict limitation regarded the number of private livestock in member-herders ownership which had a negative effect over the management of appropriate structure, composition and size of privately owned livestock.

3. In order to meet the state procurement order for supply of livestock products, especially meat and to maintain a sufficient number of subspecies, many of the former negdels were following a common strategy to sell lots of small livestock. This led to a decline in the portion of sheep in the total herd. Therefore, there was not much increase of share of large small in total herd.

4. The long-lasting tendencies in livestock management and herding strategy of negdel and government policy led to some important changes in the structure, composition and size of herd be occurred which, at least, resulted in herd patterns different from that in pre-collectivisation period.

The above-mentioned shift in negdel herd patterns resulted in change of pastoral movements. It seems that the above-referred shifts in herd species composition suggest a trend towards restricted grazing and seasonal movement by pastoral groups. Small livestock dominated herd is not suitable for long distant movement. Therefore this has implications in terms of reducing both the frequency and geographic spreadness of pastoral movements (Al-Najim, 1991). Also, the increased number of cattle requires greater density and reliable water resources and grazing areas of medium altitude with relatively high grass. Finally, the field work shows that there has been a clear shift in species composition of private livestock from a reliance on subsistence production in forms of cattle and small livestock to a reliance on market-oriented production in the forms of multispecies. But the private herd composition has, however, not been managed in response to market requirements. The herd management strategy has still less directed on it's commercialisation, thus reducing the ability and opportunities of rural producers to cope with the changes in the economic and political life of the country. So, rural Mongolia is making some apparently painful economic and social transition to a market economy, but in many cases, modern commercial operations on a regional, national and international scale has not been adopted in due way. There is a clear evidence that future shift in species composition could be expected from reliance on cattle-sheep to cattle-goat-sheep. At present, livestock, especially sheep and cattle represent a moveable and

easy-traded asset, as well important living source for most of the herding families.

#### Multispecies herd pattern

Historical data and recent statistics show that the Mongolian herders were and still are owners of a herd consisted of different kinds of livestock. In pre-collectivisation period, they owned a multispecies herd. As our key informants confirmed that in collectivization time this problem had become of double character: firstly: a loose mix of negdel flock of 1 or 2, sometimes 3 negdel species together with their own private livestock that usually consisted of small number of different (the species number of private animals varied significantly or consisted of 1-5 species) animals. secondly: an unequal distribution and share of different livestock species in the sum herd that led to specialisation in it's herd composition.

In pre-collectivisation and negdel period there were some stockless households, which looked after collective animals or animals owned by others, mostly rich families. The field work failed to find a such of cases, currently existing in Turgen and Sagil sum. But we have established some clear evidence that the multispecies herding practices are re-emerging in the study areas. This process is confirmed by a number of evidences. Under the collectivization most suurs (low level herding unit) specialised in particular species, and even sometimes particular sex or age groups of single species of livestock. Since privatisation, household herds have diversified and majority of households now own mixed herds, despite the economies of scale that can be gained through herd diversification. There are several explanations for this process:

- under privatisation households were distributed a mixed herd from negdel assets;
- it is a response to increased risks faced by individual households;
- herd diversification allows more reduced stocking rates on a given area of pasture, since all species do compete for the same forage plants;
- different animals are required for different tasks and they produce various kind of products essentially important for the reliance by herders on own home consumption;
- Different species "help" each other thus increases overall productivity of diversified herd;

During our field work we asked some questions about the informal institutions that existed in pre-collectivisation period. The informants pointed out that there was no customary organisations in their real forms as these found in other areas in Mongolia. But there were temporary joinings between households; usually poor people/households joined rich households. This was qualified as a form of need-based relationships. At present, there are events that 2-3 households joined each other. We did notice several cases that parents or old people to join their married sons or close relatives. But there were not many cases people to join for pure economical tasks. These joinings have a temporary character and seem to be very fragile. We were told that households of a kin group began to join in winter-spring time to cooperate in order to compensate some degrees of labour



constraints for main herding tasks. For example, in 1993 there were 343 herding families in Turgen sum who are fully engaged in livestock husbandry. They are divided into two bags: 173 in Bayankhairkhan bag and 171 in Rashaant bag, respectively. To illustrate our findings regarding the re-emergence of multispecies herd we did a statistics-based calculation of distribution of different livestock species among households. The details of this study is summarised in table 6. Table 6. shows that a substantial part (96.1%) of the pastoral households keep three or more species of livestock, whilst only 3.9% of herding families keep less than three types of livestock. Small livestock and cattle are the dominant type of livestock in the pastoral economy of Turgen sum since more than 94.3% of the pastoral households hold these

Table 6. Species composition of livestock owned by herding families of Turgen sum, 1993

Number of species	Households	
	Number	%
Stockless	1	0.29
Single	2	0.58
Two	10	2.9
Three	21	6.1
Four	141	41.1
Five	169	49.3
TOTAL	343	100.0

Source: Livestock census, 1993, Turgen sum

animals with some other herd species. This pattern as it was described by other studies in Africa and Mongolia (Al-Najim, 1991, Azarov, 1933, Homewood, 1993) to maintain a multispecies herd in order to take advantages in terms of use of natural resources, coping with shifted risk and socio-economic benefits. As our informants argue the keeping a multispecies herd constitutes a rational strategy for effective management of different categories of subsistence needs, risk security and income.

#### LIVESTOCK DISTRIBUTION AND IT'S IMPACT ON MOVEMENT PATTERN

##### Territorial distribution

The field work suggested that herding households of different bags have slightly different nomadic movement routes and territorial spreadness (division). Our hypothesis was that this would be dependent on the distribution of different types of livestock. It should be mentioned that we had no possibility to work out ecological distribution of sum livestock. So, to cross-check our ideas, we looked at the distribution of different livestock species among two bags of Turgen sum. Results are presented in table 7. Our analyses over the livestock distribution in two livestock bags of the sum suggests that there is no big differences in the total number of livestock in these bags. But the share of different types of livestock varies broadly. So, most of cattle and goat is located in Bayankhairkhan bag, whilst

Table 7. Distribution of livestock species in two bags of Turgen sum, 1993

Species	Bayankhairkhan		Rashaant	
	N	%	N	%
Camel	267	40.2	396	59.8
Horse	1792	48.7	1885	51.3
Cattle	3212	54.0	2732	46.0
Sheep	15472	46.1	18109	53.9
Goat	5438	52.8	4861	47.2
TOTAL	26181	48.3	27985	51.7

Source: Livestock census, 1993.

Rashaant bag has more animals in terms of number of camel, horse and sheep. We were told by our informants that herders of Bayankhairkhan bag use to move in lowlands semidesert area, and mountain slopes and mountainous pasture with insufficient licks, while people of Rashaant bag graze semidesert, low hill areas and mountain slopes with less water resources. This demonstrates on the one hand the species-dependent territorial camping patterns and resource-dependent livestock distribution on the other. The local herders and sum specialists told that the territory of Bayankhairkhan bag is more suitable for yaks, goat and, cattle and less for camel. People from Rashaant bag informed that the bag territory is more convenient for sheep and camel. But we were told that both areas are suitable for horse grazing.

#### Livestock distribution among different ownership categories

It is well known that in collectivization period members of negdel had limited or less than 50 heads of private animals. But after the first stage of privatisation every herding family received some number of animals. The number of private livestock increased significantly after the second stage of privatisation. The growth pattern of private livestock is presented in table 8.

Table 8. Changes in number of private livestock, 1990-1993, Turgen sum

Name of species	1990		1991		1992		1993	
	N	%	N	%	N	%	N	%
Camel	228	1.8	357	1.5	388	1.4	663	1.2
Horse	1722	12.0	2518	10.5	2565	9.5	3876	7.1
Cattle	2904	20.2	4177	17.3	4366	16.1	5944	11.0
Sheep	6732	47.0	10575	43.9	12371	45.6	33581	61.7
Goat	2734	19.1	6435	26.7	7526	27.7	10311	18.9
TOTAL	14320	100	24062	100	27126	100	54375	100

Source: Aimag statistics office, Uvs aimag

In fact, the increase in the number of private livestock has in great deal made by the privatisation of negdel animals. Until 1991, many herders had kept more small livestock to meet the limits of number of private animals set by the Government. But, as a result of privatisation they became able to own different kinds of domestic animals that led to changes not only in herd size but in herd structure and composition. By 1993, the basic patterns, especially share of different species in the total privately owned herd became more similar to that of negdel, due to shift of the total negdel herd to private hand. This has had a great impact on the herding behaviour and movement pattern among the herders. Herders are forced to make optional choose of herding and production strategy in terms of re-division of grazing territory and setting up basic camping area. This causes some new approaches to be adopted in order to secure easy access to major services and marketing outlets as well as adequate cooperation with different production entities. It should be mentioned that the number of distributed animals per household was not equal for various reasons: number of family members, period of negdel membership, etc. The inequality creates unequal distribution of livestock among the herding households. For the last four years number of livestock per pastoral household has decreased because of increased number of livestock keepers and declined number of sum herd. This can be seen in table 9.

Table 9. Number of livestock per herding family, 1990 vs 1992-1993, Turgen sum

Name of species	1990(1)	1992(2)	1993(3)
Camel	3.3	2.7	1.9
Horse	19.7	16.8	9.7
Cattle	19.1	23.4	14.1
Sheep	165.6	122.2	76.9
Goat	31.6	34.7	22.4
TOTAL	239.5	199.7	125.1

Source: Statistics from Aimag Government office, 1990-1993

- (1). Negdel plus private } animals
- (2). Company plus private } animals
- (3). Private }

This partly is due to increased urban-rural migration during the privatisation period. We were told that in winter-spring 1993 about 15 households from sum and aimag centre came to pastoral movement area of Turgen sum. They made winter camps in different sites which were used temporarily in negdel time. Also, 7 families migrated from aimag centre to the sum and now are living together with their relatives or friends. These households received some animals during the privatisation and have not decided where establish their camps. This is a common history and a clear example for the new herding families came to rural regions for herding. This may have led to a false assumption that number of livestock per herding household has decreased. In fact, the new

comers own much less number of animals. Consequently, it is very clear that the real herders own a high number of private animals.

Another interesting figure provided by the author's personal calculation is the number of livestock per sum officials which confirms on the existence of attractive pictures in rural Mongolia. This is shown in table 10. Data presented in table shows that in 1993 number of livestock per a sum officials' family has increased by 2.4 times against that in 1990. This rapid increase of sum officials' herd size creates new unexpected problems, namely: where to keep these animals, whom to ask to look after (absentee herding), etc.

Table 10. Average number of livestock per sum officials' household, Turgen sum. 1990 vs 1992-1993

Name of species	1990	1992	1993
Camel	-	0.3	0.4
Horse	1.8	2.0	3.3
Cattle	5.3	5.1	6.2
Sheep	8.9	15.2	55.0
Goat	7.7	11.2	16.0
TOTAL	23.8	33.6	62.7

Source: Livestock census, 1990, 1992-1993, Turgen sum

Statistics of 1993 show that there are some officials who have more than 150 private animals. It was told that some sum centre households left the urban area in order to maintain own private animals with them. Otherwise, as our informants told, not many people are interested to look after animals of other owners for various reasons:

- high risk to be thieved or lost;
- low payment offered for looking after absentee herds;
- not enough labour available;
- willingness to avoid any unpleasant consequences that may be caused by lost or death or thievery of absentee herded livestock;
- conflicts which can be picked up by their neighbours because of pasture and shelters, etc;

Also, the neighbours and households from the same mainstay are not much friendly with those who herd a high number of absentee herded animals. One crucial problem arisen by absentee animals is that animals come from different areas are always suspicious, so that there is high dangers any infectious disease be transferred or spread. For example, one of our interviewers said that people migrated from Tes sum brought some endoparasitic sheep disease that had previously not registered in Turgen sum.

People have different perception and preferences for different kinds of animals. This seems to be based on real and expected beneficiary rate of each of livestock species for household income generation, and role for households' herding and production tasks. Our informants were asked to make a preference ranking of different kinds of livestock and their perception of optimum size and composition of economically viable herd. The answers given by people of different sex and age are given in table 11.

Table 11. Preference ranking results of viable herd size and composition

Species	Mr.BZL 70	Mr.DPRL 57	Mr.BSN 31	Mrs.NSM 25	Mrs.UMR 32	Ms.NTG 68	Ave rage
Total herd	320	500	300	280	250	350	330
Large animal	80	200	100	80	110	250	136
Female stock	160	230	200	150	90	170	166

Source: Oral information, Turgen and Sagil sum. March 1994

People are not much satisfied with the present size and composition of their herd. There was noticed very strong willingness to increase total number of their animals. As table 11. shows opinions of people of different age and sex regarding the herd patterns varies significantly. Interestingly, females are intended to keep a smaller sized herd, while males prefer bigger herd.

### CHAPTER THREE

#### GRAZING MOVEMENT PATTERNS: CHANGES AND FUTURE TRENDS

##### Pre-collectivisation period

We consulted for some age-old documents and interviewed many people about main patterns of pastoral movements in pre-collectivisation period: organisation, geographical and ecological location, grouping and other important problems.

During our exchange of oral information with some local people we identified some herding ethnic groups, existed in pre-collectivisation period in the territory of current Turgen and Sagil sum. These groups were based on a common kinship origin and lived in a defined viable territorial area with pasture reserves for all seasons, across which their seasonal and grazing movements were made. These groups, however, are not comparable with smaller types of pastoral groups, such as khot ail. In our case the ethnic groups are broader than neg nutgiinkhan or neg usniikhan. Structurally, these groups are very loose and are not joined permanently. Families of a group do not move between pastures together and not necessarily return to the same spot. As far as their economic activities of the groups are concerned, they were nomads. They were engaged mainly in livestock with little grain cropping. Old-aged people are still using the same name that wearied in years backwards. So far, young generation is concerned, this is not being broadly used. Names, approximate composition and major type of economic activities of the existed kinship-based herding groups in Turgen sum in pre-collectivisation period are (1930-1950s) described in table 12.

As it mentioned earlier, these groups had a concrete (informally distinguished) area they moved across. Also, households that composed these groups had established their winter camps in the area to ensure their territorial rights. Otherwise, there were not many relevant legislations strictly secured their grazing land rights. Economically, they were consisted of private

holders, so that they could make decisions for their actions. It is still not clear whether there was any labour-sharing cooperation among households from the same ethnic group or between the groups. These groups existed within the wider organisation of the sum, a kind of customary institution which operated as an autonomous herding units mainly for grazing land management and dispute settlement over pasture areas. Meanwhile, it should be mentioned that any kind of amalgamation of herding families can not be considered, as it has found by many authors, as a form

Table 12. Description of major herding ethnic groups existed in Turgen sum

Name of herding ethnic groups	Number of* households	Main economic** activity	Present*** status/activity
Turgen sum			
Baruun Zasguud	70-80	livestock & grain cropping	exists livestock
Zuun Zasguud	40-50	livestock & grain cropping	exists livestock
Shandivid	60-80	livestock & grain cropping	exists livestock
Sharnuud	20-25	livestock & grain cropping	exists livestock
Kharnuud	30-40	grain cropping & livestock	no people in livestock or cropping
Khamryn amnykhan	30-40	livestock & little grain cropping	not known
Sagil sum			
Borshoonkhon	about 100	livestock & grain cropping	exists livestock
Kharigiinkhan	more 100	livestock & little cropping	exists livestock
Shavguud	50-60	livestock & grain cropping	exists livestock
Shaazgainkhan	NA	livestock	exists livestock

Source: Information orally provided by Mrs.Z.BTL (70), Mr.N.SJ, (63), Mr.U.ORH, (62), Ms.D.NTSG (69), Ms.B.NTSG (78), Mr.Tsd (63)

\* - by 1930s-1950s

\*\* - activities the groups were engaged

\*\*\* - by 1992-1993

mainly for labour cooperation. But the major aspect of this cooperation is, in its real sense, a customary form of grazing land management. Usually, the common interests of herding people are well-regulated access to pasture and key resources. Shortly, to reach this herders do need to perform a wide range of tasks and establish different types of labour-sharing cooperations.

In addition, we were told that there were some small herding groups: modny kholiinhon, zakh bukhyinkhan, ongoinkhon and etc. These were consisted of not more 10-20 households which had small territory and the informants had several difficulties to define their movement routes. These groups were involved in livestock as well as in small-scale grain cropping. As our informants argued the above-mentioned groups could not be likely representatives of the major ethnic groups of the study areas.

An approximate mapping of areas where the mentioned above ethnic group were situated before the nationwide collectivization is shown in Appendix 2. The livestock dominated groups had to move more frequently than others, while these entirely engaged in foodgrains cropping did a less number of long distance movements mostly, between two final destinations. On the basis of the information provided by the informants we tried to calculate approximate number and distance of pastoral movements performed by different groups. The results of this study are presented in table 13.

Table 13. Approximate movement frequency and distance, Turgen sum

Groups	Frequency*	Movement	
		Total distance (km)	
Baruun zasguud	8-12	230-320	
Zuun zasguud	8-11	270-340	
Shandivid	9-13	180-230	
Sharnuud	7-9	170-210	
Kharnuud	5-8	160-190	
Shaazgainkhan	8-11	190-220	
AVERAGE	9.08	233.3	

Source: see table

\* - total number of movements per year, including some, but not all shortdistant movements

The approximate calculation of movement frequency and distance should not be subject of serious emphasis, because it has worked out on the basis of little number of oral information. Nevertheless, figures indicated in table 13. provides to make some simple conclusions: movement frequency and its total distance in pre-collectivisation period was fairly dependent on the major type of economic activity. Households, who were dominantly engaged in livestock had had to move more frequently. It was said large number of livestock requires more often change of pasture and also, bigger grazing area is needed. Many households with large animals used to move to remote pasture areas. As a rule almost every household had to move 4-5 longdistant movements: they move to their winter shelter camp in late October or early November followed by a backmovement to spring area in late March or early

April. Again, herders do move to summer areas in late June followed by a movement back to autumn pastures in the mid of August. The groups dominantly engaged in foodgrains cropping had to move less frequently. Similarly, the total movement distance was shorter than others. This was associated with less number of livestock and bigger tasks to perform for their cropping activities. It was said that they had to spend spring (approximately last 40-50 days of spring) and first month of summer at the same place without doing any grazing movements. But the movements to winter and summer camps and back were performed as usual as others did.

At present, a reduced number of informal representatives of the herding groups are still existing, mostly people from their new generations. But the number of households is significantly decreased and traditional movements routes are less recognizable. Economic activity of groups as a whole, and as well as of herders in terms of it's diversity has become more limited and the customary relations was made remarkably weak. Because of these fundamental changes in overall activities and household composition of the ethnic groups, it is hard to make any proper conclusions. But, very weak traces of temporally joining of advanced age people their children or close relatives has been made able to be found. Since last winter, Mr. DRPL went to their son, who came for herding. His son had no own winter shelter and fixed place to pass the coming winter. In order to secure him some room in his winter shelter Mr. DRPL agreed to join. Benefits from that kind of joining is that they can exercise a rotational herding of small animals. Also, his son takes responsibility for horses and camels, while his father looks after pregnant, but not have given birth small livestock.

#### Collective period

Some of the herders and officials interviewed had expressed very serious points and opinions about the collectivization process in Mongolia. These referred not only livestock but almost every aspects of rural livelihood systems.

The completion of the agricultural collectivization movement in Mongolia was accomplished by fundamental changes in agro-economic policy aimed at national scale institutional reorganisation and reordering of the social relations of production and restructuring livestock property into the socialist type, namely, collective ownership. This brought about not only a new form of ownership but created a new type of herding strategy.

The main positive consequences of the collectivization of herding were as follows:

- A new livestock and cropping production systems was adopted.
- Labour productivity had been increased and labour distribution improved.
- Herders acquired a degree of education and basic economic understanding.
- Herders were well protected from the danger of livestock losses and desertion caused by unexpected natural hazards.
- Labour for the collectives was the main source of income of herders families.
- Herders had more flexible access to negdel transport for pastoral movements.



- The living standard of herders was improved as their needs were met by the earnings from collective and private household activity.

However, the collectivization had a number of negative impacts on the herding activities among the herders. The major ones were as follows:

- Collectivization led to changing policies towards household ownership of livestock.

- Herders were dissatisfied with taxes, and strict plans for livestock production and obligatory targets for meat, milk and wool deliveries.

- Urban migration of people, in particular, young people increased due to rapid industrial development and improved relationship between urban and rural areas.

- Increased enrolment of rural schools and better boarding facilities resulted in very rapid increase of herders children be forced into schools and led to remarkable decrease of young people's engagement in livestock and cropping.

- As a result of centralised and top-down state plans there were a limited interests for effective herding and sustainable utilization of natural resources. The growth of livestock numbers became stagnant and herd structure and species composition destroyed.

- Increased intervention of administration in herding led to reduced movements and increase of less-inhabited areas.

- Because of reduced numbers of herding people and their high age, the number of livestock per herding family became too large and herding behaviour and task performance became weak; this caused disfunctions and led to serious changes in traditional arts of livestock management.

Since we have illustrated some basic aspects of livestock growth and changes in it's structural aspects here most attention was drawn to highlight questions related to important changes in herding, in particular, in pastoral movement activity of herders of the study sites. To highlight some considerable changes occurred in pastoral movement pattern we produced a pastoral movement map which is shown in Appendix 3. This was represented by some households of the main herding groups who used to live in the research areas before the collectivization and be member of ex-negdels.

The simplified map shows that traditional pastoral movement routes have been changed as the groups are considered as a whole. A considerable changes have been occurred in the frequency and routes of movement of individual households. For example, Mr.DRPL had to make long distance winter movements to Bokhmoron sum before collectivization because he had many large animals. Since the collectivization completed he had had to herd a negdel sheep flock. He had given a winter shelter in one of the valleys of the upper part of Turgen river, where he used to spend almost all winter and early spring times in course of the whole period of negdel's functioning.

There were many cases to change the employment status of herders. As an example we would like to present the case of Mr. BZL, who was member of ex-negdel between 1956-1989. He had some number of private animals dominated by cattle prior the collectivization and as he became negdel member he had suggested be a sheepman. He looked after a negdel sheep herd for 6 years. Between 1962-1967 he used to be a horseman. During this time he/his family

moved regularly. Then he came to negdel dairy farm to herd dairy cattle and work for milk processing plant. So he employed for 9 years as a cattleman and as an industrial worker. Since then he was transferred to work for negdel butter making plant, where he employed from 1976-1985. The different types of employment requested him to change his living places time to time and to move according to his employment. When he had had to herd private or negdel animals he moved as frequently as the others did, but since he worked for butter making plant the average number and frequency of movement decreased significantly. In every case, herders changed animals they looked after, similarly, the movement pattern had to have changed. The average of movement frequency and it's distance increases if one herd camel or horse or non-milking cattle. But dairy cattle requests less distant and reduced number of movements. Since mid of 1960s, the easy access to transport and simple forms of settled lifestyle (dairy farm) began increasing, thus reducing the diversity of movement and it's frequency. The herders have tended to place the nearest areas to sum centre or main autoroads and become to some extent uncontrolled grazers. In the mean time, while we talked to herders about their movement behaviour they told their opinions for the major reasons that could have led to increased grazing pressure of areas around sum centres. These are:

- Unwillingness or laziness of herders to wander around instead to move for long distance in order to graze high quality pasture;
- Inability to move far distance due to shortage of transport common for substantial part of herding families or dependence on negdel transports;
- Attempts of school children to have more opportunities to be together with families for longer time as much as possible;
- Willingness to have easy access to central services concentrated in sun centres only;
- Increased number of livestock at sum officials ownership, especially for the last three years;
- Poor management of vegetation of areas around sum centre and less attention to prevent it's natural beauty;

#### Post-collective period

After the first stage of privatisation many of ex-negdel members added the number of animals at their private ownership and herded a mixed herd consisted of private and leased company livestock. Although, a part of winter shelters had given at private hand. Herders had opportunities to continue to utilise their shelters and there had no well reasons to change their winter shelters. In another word, there had no reasons to change their movement routes. But after completion of the second privatisation stage, all herders became private holdings. Many winter and spring shelters had destroyed and sold mostly to urban inhabitants. Herd size enlarged, and structure and composition changed into a multispecies type. For details see table 3. Also, some people came to pastoral population and the overall number of livestock keepers increased. The above-mentioned changes had therefore a considerable effect on both herding and movement patterns among the herders. To verify the current patterns of pastoral movement we produced a map represented by same households from both two bads.

The answer given by Mr. BN, 31, to questions about his movement routes and distance is illustrated in table 14. He is one of the households which did a long distance movement for last two years.

Table 14. Description of the movement routes and distance of a sample household, 1991-1993

Movement routes	Movement	
	number	distance, km
Winter-spring	3 (4)	120 (145)
Summer-autumn	5 (7)	85 (115)
Autumn-winter	4 (4)	110 (145)
TOTAL	12 (15)	315 (405)

Source: Information provided by Mr. BN, Rashaant bag, Turgen sum  
( ) - a planned number of movements and their approximate total distance

As the table 14. demonstrates Mr. BN had planned to do 15 short and long distance movements, but he actually did 12 movements. He has 4 camels that is not enough to make so called "yordiin khosgiin huudel" ( movement by draught animals or carts). So, he hired a lorry to move to winter camp and back thus made the routes shorter and the number of movements was lesser than he had to do. Similar answer were given by Mr. BS. The sample household have more small livestock (65-73%) and less large animals. Consequently, it can be taken as an example of small livestock dominated household's type of pastoral movement.

Surprisingly, large animal, especially yak dominated livestock owners are intended to move less frequently. Approximate movement route and distance of a household is given in table 15.

Table 15. The movement routes and total distance of a sample household, Turgen sum

Movement routes	Movement	
	number	distance, km
Winter-spring	3 (4)	40 (140)
Summer-autumn	2 (5)	30 (120)
Autumn-winter	2 (3)	40 (90)
TOTAL	7 (12)	110 (350)

Source: Information, provided by Mr. KHS, Turgen sum

We were told that since late 1980s, former dairying units of yak and khainag (hybrids from yak and cattle) have reduced the number of movements as they did before. This was a result of a decision taken by negdel administration to save transport costs needed for lorry or tractor services. Instead of camp movement animals were taken 2-3 times in year to salty licking places or to nearest salty lake "Uureg" which is a boarder line between Turgen and Sagil sums. Therefore, the yak keepers are still managing this type of herd management due to common lack of back-pack camels and

less availability of autotransport. There has been noticed a very exceptional case that in 1991-1993 a family with a sheep dominated herd has been moving to Bokhmoron, a neighbouring sum where in pre-collectivisation period many herders used to go. As we have found the main reason that the household is doing a long-distant movement is: (i). their parents in law are living in Bokhmoron sum, (ii). the family is highly interested to graze the better and less utilised area in the sum through winter-spring movements. So, it is only case among the new generations of Baruun Zasguud group used to move to areas where their parents did migrate regularly.

Another issue of major concern to movement patterns is it's total duration of herd migration or number of days spent for movement only. One way movement from a winter camp to a typical spring grazing area continues approximately 5-7 days with several intervals of 1-3 days. But movements to summer or back to autumn pastures are relatively quicker: 2-3 days only 1-2 days of intervals. When a herd is driving back to spring area, owners prefer to make 2-5 days rest in order to allocate a partial grazing to new born young stock and sick or exhausted animals and to prevent the herd from so called "nuudliin kharshaa" (movement tiredness). In case of long distant migration, the duration is longer.

#### CRITERIA FOR TIMING OF MOVEMENT AND CHOOSE OF MIGRATION AREAS

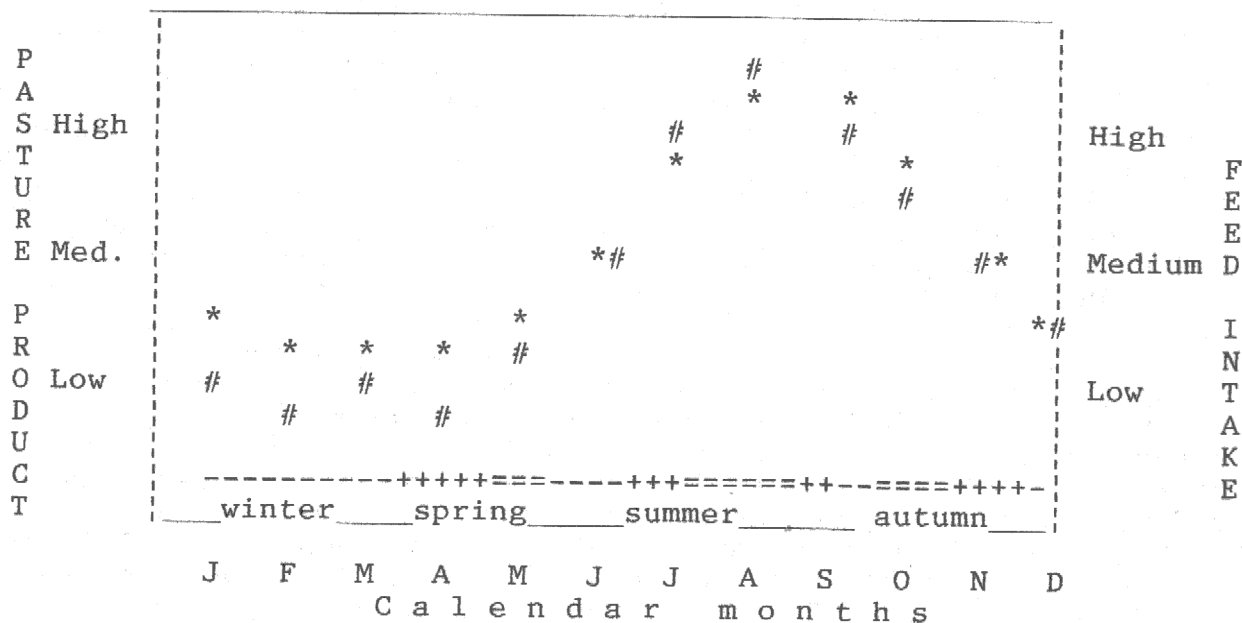
A package of questions were asked how do herders choose seasonal and grazing movement area and a semi-structured interviews were organised. There are several important Criteria that are used as major indicators for movement. These are of different characters and can be grouped; climatic, resource-based and social. Also, these Criteria can be subdivided into different categories, as follows:

1. Type of livestock dominant in livestock;
2. Climatic and geoecological characters of localities;
3. Conditions of natural pastures in terms of their types and productivity and relevant changes;
4. Availability of transport;
5. Degree of dependence and absorbing ability of to major services;
6. Access to lick and water resources;

#### Local perception

The basic principles of traditional grazing management is based on the grazing cycle of surrounding natural pastures in the 4 seasons of year. The grazing cycle is much broader aspect which includes basic routes and their distance, and refers in particular pasture quality in terms of it's capability to seasonal grazing. As the figure shows there is weak relations between the pasture productivity and the movement intensity. But the movement is made to change the basic camps less according to changes in pasture quality and it's nutrient value. This does not mean that the pasture productivity is not major indicator for pastoral movements. Normally, pasture quality changes in the course of the growth cycle of the grass. If herders are forced to move following the shortlasting changes it would need to be in endless mobility. The major thing what the herders do is choose a good area and graze it as long as possible. So, this would be the major

Figure 1. Seasonal grazing cycle and movement intensity



Source: Semi-structured interview, Sagil sum, March 1994

# - changes in the pasture productivity

\* - changes in feed intake of animals

-- - less

== - medium } movement intensity

++ - high

explanation why the coincident between the movement and pasture quality is weak.

Questions how do the herders choose pastoral areas are closely integrated with the perceptions of local herders and officials about environmental potentials and constraints, and especially their views about the extent and importance of environmental damage. Local herders generally felt that the pasture in the study area is still good and few expressed any serious worries about degradation of particular grazing land in valleys along the mountain passes which are grazed repeatedly and areas lying along across the routes to summer and winter pastures. A more serious problem identified by the herders which may impact upon the long term availability of forage in these areas and in areas of increasing seasonal settlement. The very intensive and unscheduled grazing of pasture along the mountain passes by not only by local (Turgen and Sagil sum) livestock keepers but many trespassers from other sums (Davst, Tes, Malchin) and aimag centre is expressed of being of great dangers for the sustainable productivity of these key areas. Herders are worried about the likely implications of increasing seasonal settlement among herders. There is a common perception that pasture would continue to improve in the future, provided the following major problems have had solved in due way and right order (sequence):

- Maintaining a normal stocking rate for important spots of seasonal pastures in major grazing season;

- Eviction of the trespassers and restrict unauthorised cropping and exploration of natural resources by external people, especially any kind of actions damaging the natural pasture;

- Stopping on-going wood cutting in the upper area of south slopes of Kharkhira mountain and southern areas of Turgen river;
- More limitation and further decreasing the seasonal settlement pattern;
- Strengthening the customary grazing land rights of herders over specific spots in best combination with the new Land Law;

Climatic indicators

During the field work, we met and talked to different people of different age and herding background. Assuming information, what we collected regarding the climatic reasons for pastoral movement, the following indicators can be suggested as major ones.

1. Seasonal changes in general climatic regimes typical to the region are concerned as general indicators for seasonal movements. Our informants provided valuable information on the time and climatic indicators and events for indication of different seasonal movements. The climatic factors are referred according to their major impacts are summarised in table 16.

Table 16. Approximate timing and climatic events for different seasonal movements to be made, Turgen and Sagil sum

Seasonal movement	Time	Climatic events
Leaving the winter shelter	20 March- 10 April	Melting permanent snow cover and cold continues crosswinds
Moving to summer pasture	20 June- early July	Hot and mosquito
Back movement to autumn pasture	15 August- 25 August	cool and early frost; continues heavy & windy rain and
Movement to winter	25 October- early Novem.	breezing cold and early snow in lowlands

Source: Information provided by key informant-herders and sum officials

The information provides an orientation to determine the approximate time-schedule for basic movements. In addition, herders do need to make several shortdistant grazing movements not depending to the above-referred climatic changes. The number and distance of the intermediate movements include these are made between the two extreme destinations and within the seasonal area is not possible to be determined in detail due to availability in their frequency and distance. Nevertheless, it can be guessed that an ordinary herder makes 5-6 intermediate movements in a normal year. The climatic changes vary across different geocological localities in terms of time of their appearance and degree of impacts on livestock and over human life as well. Important changes, as the herders perceive, are snow, early cold and spread of mosquito and other insects the female of which sucks the blood of people and animals.

## Resource-based indicators

Mongolian ecological conditions and pastoral resources are unique. Part of the unique nature of Mongolian pastoral livestock husbandry is that it is a low input, low cost and economic system, well adapted to the generally low and variable productivity of Mongolian ecosystems. In-dept interviews were carried out with a number of herders; the interviews focused on long-term practices choose of pastoral migration areas in terms of their vegetation, water, salty licks and accessibility. The pastoral system of the study area are subject to severe important changes in biological capability of grazing land. The basic indicator is a common type of grass as determined by herders as "thin" and "thick" (Maria-Fernandez, 1993). Herders believe that "thin" grass is most suitable for early spring and late summer, and winter grazing by small livestock and horse, while "thick" grass is preferable to summer, late spring and early autumn grazing by cattle, horse and partially by small livestock. For details see a sketch map (Appendix 4). Also, herders do evaluate pastures according to what extend have been grazed in the same season. They use to classify grazing area "eaten" or heavily grazed and "good" or not grazed in the same season, known in Mongolian as "sorgog". In this context, any kind of movement is made in order to avoid the "eaten" area and to graze a "sorgog" pasture according to the dominant livestock species at their ownership. Water is not essential problem in all seasons except winter. In winter time animals used to eat snow because most of the surface water is frozen. But herders are intended to prefer and select areas with flowing water rather than lake or small ponds. The attractivibility of different rural services is one of the main factors contributing the mobility of herding households. Since the herders had experienced a good service delivered by ex-negdel, there is an intention to have broader access to the services. This firstly refers health and trade as well as schooling. People are keen on the service and are less interested to occupy currently underused areas thus reduces the frequency and distance of pastoral migration in over all rural regions.

A preference ranking was carried out to discover which of the natural resources is most important to herders. Results of this exercise is shown in figure 3. As the figure 3. shows herding

Figure 3. Pairwise ranking of most desirable attributes of movement related natural resources

	Quality of pasture	Water avail.	Type of grass	Remoteness of pasture
Quality of pasture	XXX	XXX	XXX	XXX
Water avail.	Quality	XXX	XXX	XXX
Type of grass	Quality	Type	XXX	XXX
Remoteness of pasture	Quality	Water	Type	XXX

Source: Information provided by Mr. BSN, DRM, BSN, BZL and Mrs. SBL and ORH, Turgen sum. March 1994

people are drawn most attention to quality of grazing land and type of grass and lesser to water and not at all to remote pastures. This provides an idea that herding movements are based mostly to get these grazing areas capable to maintain as many animals as possible for longer time and provide different types of grasses to supply good fodder intake. As turning back to the herders perception and understanding it can be said that the pairwise ranking of different pastures reveals that pasture productivity is chief criterion in choosing grazing area, degradation is not enter into herders' perceptions of pasture. But there is a thought that some pastures are more sensitive to grazing that can be adjusted by herders themselves. Even some herders are intended to confirm that some of heaviest grazed areas have been improving in recent years, due to the good rains the area has had. Usually, herders did not regard autumn and spring pastures which have been grazed for several years intensively as degraded, but felt that it was "overused" or "overloaded". Not less consideration is paid to the carrying capacity of a given area in terms of capability to what extent of grazing intensity can be taken and how much suitable for the dominant and joining species of livestock. Finally, pastures suitable for most of pastoral species with rich and composed by various and dense vegetation perceived as a good.

#### Choose of seasonal pastures

Mongolian herders divide the grazing land into 4 major categories: winter, spring, summer and autumn (Batnasan, 1972, B.Purev, 1990). The aim is to maintain a sustainable pasture use systems in closer relation to grazing resources and ecological conditions of a given area. Similarly, there are basic Criteria for choosing seasonal pastures. This is linked not only with the forage supply for livestock, but it has a direct correlation with pastoral movement decision making processes. As it has mentioned, the traditional seasonal division of grazing g resources and grazing schedule is not chaotic but it is regulated by socio-political controls and indigenous knowledge.

The main criteria for choose of spring pastures is the availability of new grown young grass. To graze the young grass, herders do choose areas warm places protected lowlands from direct and crosswinds and areas at distance from damp and swamps. The main herding aim is directed to recover the exhausted animals for a short period through grazing bulk of staple dead and new young grasses. Herders sometimes do a series of shortdistance movements called "mal nogooluulakh" or taking animals to early grown grass area when the grass turns green, sending out new shoots from old roots in order to accelerate the intensity of body recovering processes. Due to rapid grass accumulation herders the number of moves averages 2-4 times. Spring is the only time of year most of herders come closer, but not next to each other, occupying comparably small pasture area, where livestock can graze new young grasses. Summer pastures are chosen for their good grass and water availability. During the summer time herders are aimed to put more weight on their animals through summer otor or grazing movements. Otor movements are made with only few people who move animals to "sorgog" pastures staying for several days. Autumn pastures are selected for improved liveweight gain and improving the fastness of animals. Animals are driven to areas where fattening grasses



are found. During summer grazing fattening of animals is consolidated and the ability of livestock to endure harsh cold is built up. By late autumn camps are taken more closer to winter camps. Pastures around winter shelters are chosen for dominant species in the herd. Main herding tasks are focused on minimizing the liveweight loss or conservation of fatness. All these basic informations are summarised in Appendix 9, 9a and 9b.

Our informants classified their movements into 3 groups according to the distance and purposes: primary, intermediate and grazing. Primary movement is a long distance migration between two extreme seasonal pastures or seasonal camps. In many cases, herders make 4 primary movements at a distance 60-180 km: from winter camp to spring shelters, from spring pastures to summer pastures, from summer pastures to autumn area and from autumn area to main winter camp. To reach one of the extreme seasonal pastures or seasonal camps it is needed to make several intermediate campings. These are not considered as a special purpose movement. The intermediate campings are essentially important for planning their primary movements. Animals can not driven directly to the final destination without any intermediate camping. Shortly, intermediate movements are those which are made between two intermediate camping distances. More intermediate migrations are made during the primary movements to winter shelters and to spring pastures. The average distance of an intermediate movement is 20-30 km. Grazing movement is one of the important type of pastoral movement. It is made within a seasonal grazing area due to adverse local grazing conditions. The grazing movement aims to take animals to best area with good growth of grass, water and lick supply, moving lightly and rapidly, in an organised way. The grazing movement is made at a shorter distance than other types of pastoral movements. As some herders argue the distance is usually less than 10 km.

### Social principles and rules

The social factors that limit the herding movements among herders were asked to gain an understanding of the criteria local people use to determine principal social guidance and rules. The main social principles wear a series of limiting and credential characters. The limiting social principles include different attitudes linked mostly to different customary responses:

1. Herders do not desire to move during lambing time to avoid mortality of newborn stock;

2. Herders who keep small livestock dominated herd prefer not to be neighbouring with some family who herd large animals, because large animals easily graze and damage the nearest to camps pasture;

3. Herders do not move when they please, but they use to select special days that are said good for movement; they consider that if one moves in wrong time he may suffer different misfortunes;

4. Herders do not move soon after any public ceremony, such as wedding, child hair cutting and anniversary ceremony of older people;

5. Herders refrain to move to suspected area in any disease or having harmful scoundrels;

6. Herders do not like to neighbour bad herding people whose animals are unattended or diseased; In case, if the residents are

not keen they come to the same area, they do usually not prefer to do so;

7. Herders are not much interested to move across and graze others' territory to avoid any kind of conflicts and quarrels;

8. Three basic informal rules are common to all herders; avoid areas already in use, keep at an appropriate distance from others, and avoid areas just recently vacated by others.

9. Herders who are going to move never to take animals belonging to other people with their animals for any reason. Before they move check each others' herds going around.

There are many positive customs and preferential principles. These involve the following:

1. Herders move in good time for human being and livestock in a hope be hosted by the supernatural faculties and be liked by the place where they would stay;

2. Herders prefer to move together with their closer neighbours so that they have equal share of pasture;

3. Herders do prefer to move after the areas have grazed properly; they are not so much pleased to "grasshopper" type of movers, who move excessively frequent.

4. Herders are keen to announce the exact time of impending movement and place where to resident, so that others have informed;

5. Herders do go out to area where they wish to move, before the real movement takes place. This is aimed to evaluate the pasture quality and to discover whether other people have put a shav (a special sign) or made an announcement.

6. Herders prefer to ask the residents of the area where they are moving whether they are keen on their appearance.

7. Herders do prefer to move together with their saakhny ail (a household with whom they exchange milking ewes and does to keep them away from their lambs and kids). If one of the saakhny ails is going to move, ultimately, they are informally obliged to inform others;

The above-mentioned social principles have different origins: religious, mentally and worldly. These are not secured by all of the herders but as a rule they are intended to take them into serious account in order to avoid the unpleasant consequences may brought by their misactions.

#### Woman involvement in movement decision making

At present, woman is considered as a main family member who can deal with important decision making. In negdel time, movement-related problems were settled mainly by sum or brigade officials with formal involvement of males. Now, as the herding families became full private holders, woman's role for movement planning is getting more important. This is dependent mostly on the facts that the woman's involvement in everyday household and herding tasks increases. Production decision making also, can not be made by husbands. This allowed by well-distinguished labour division that female member of a household wears responsibility for activities around the ger, whilst the man performs the so-called out of ger tasks. Active involvement of woman in household production and marketing, increased and shifted risk and it's management, reduced rural service delivery, increased feed self-reliance, less intervention of companies and administration in seasonal and grazing movement, insufficient transport allocation and declined

money circulation are important contributing factors for improved woman involvement in decision making processes related to pastoral movement in rural Mongolia. The increased woman role makes many of herding strategies are solved efficiently in terms of movement and choose of viable territory for sustainable development of livestock systems.

#### Other considerations

In choose of pastures, herders do have to consider a number of important aspects:

1. Sometimes, animals moved to new localities are intended to run back to their previous pasture. So, in choose of pastures people are needed to weigh whether the animals would stay for longer time not causing any additional care.

2. Young and less-experienced households prefer to stay close to well-skilled families, especially in winter.

3. People always need to communicate with other herders and administrative officials as well as service delivers.

4. Households who have no or not enough pack animals are needed to hire them from other people. So, their migration takes place always later.

5. Herding people may pay a considerable attention to risk-avoiding strategy. There is a great deal of dangers that maybe caused by predation, sudden climatic events, and human and livestock disease.

6. Best to utilize the same pastures, used by one's father and grandfather, because herders would have more knowledges about the geocological and climatic behaviours, and productivity of pastures.

#### CONTRIBUTING FACTORS

##### Poor transport availability

One of the hypothesis on factors influencing the migration patterns among herders was the availability of draught animals as a major transport for any kind of pastoral migration. In Turgen sum people use camels as a main transport means for seasonal and grazing movements. In the collectivization period number of adult camels that can be used for moving gers and other herding facilities: hay, firewood, salt lick and products, such as wool, hide, etc. significantly decreased due to easy availability of negdel transports. After the privatisation people are more interested to have enough number of camels to move own ger and other things. This has not proved successfully because of the limited number of camels distributed by the privatisation and less opportunity to buy camels. Table 17. shows the distribution of draught camels among the herders of two livestock bags in Turgen sum. The lowest number of adult camels that needed for moving a family is accepted to be not less 5 heads. One, who has less than 3 camels are considered not able to make neither seasonal nor grazing movements. Those with 4 or 5 camels are able move but with some difficulties. Table shows that 84% of total herding families in the sum are below the threshold line in terms of number of draught camels. The rapid growing demand of camels as a draught animal leads to a sharp increase of selling prices of camels that are not reasonable for many of the herding households. In

addition, each household has distributed and own an insufficient number of camels. The lower number of these animals, on the one

Table 17. Availability of back-pack camels, Turgen sum

Bags	Number of camels				Total	
	0	1-2	3-4	5 & more		
Bayan-khairkhan	94	24	30	24	173	
Rashaant	49	43	41	27	161	
N	143	67	71	51	334	
Total	%	43.1	20.2	21.4	15.3	100

Source: Livestock census, 1993

hand, are not reasonable good for the satisfactory expanded reproduction of the herd and not efficient to be utilised for movements, on the other. This unavoidable shortage of draught camels has resulted in hiring lorries (private or company's or sum) for very high cost. For example, a company lorry is charged for 4750 tugriks and a hiring these owned by private people is paid 2 young sheep or 6000-7000 tugriks for transporting of a family to their winter shelter or back to spring or autumn mainstay. We were told that 7 households out of 47 households wintering in Omno atar (winter area lying south the river Turgen) have enough number or 5 and more camels. This means many of herding families suffer high shortage of migration transport. Chairman of Bayankhairkhan bag allocated an useful information that several households are dressing male hybrid yak or male cattle for short distance movement. For example, Mr. KHS has trained 3 young castrated males and these are being utilised for collecting firewood as well as for transporting lick salt and baled hay as well. He said that many people are "studying" his experience and are willing to follow him. In case of dressing many number of cattle and use them for movement and transport purposes it would result in better mobility of herding families and improved grazing of less-accessible pastures. Also, it will be important for refugee migration in a bad time, especially extreme cold or deep snowy or frozen snowy winter. As one have enough number of draught animals he/she would be able more regular grazing movements whenever wishes.

#### Territorial conflicts

At present, there have come several households from other sums: Tes, Malchin and aimag centre. By March, 1994 as the sum governors constituted more than 20 herding families migrated to Turgen sum and also, more than 30 households from Tes sum. For the last two years, 20-30 households are regularly coming to summer and spring grazing area. At present, about 190 places out of 250 places where winter shelters were built up by the negdel have been resided by herders. There is a need to establish about 60-80

new winter camps. In 1992-1993, many of the newcomers and those who had not given shelter by the privatisation built up less than 40 new camps.

The herders we met along our field work explained their arguments for re-establishing the current territorial boundaries between Turgen and Sagil sum. There is a common understanding among the majority of the herders of Rashaant bag that a part of the best winter-spring pastures have been belonged to Sagil sum. They told that these areas were part of Turgen sum before a bordering expedition in 1968 and there winter shelters were established. Since then, some herders still have access to these pastures without any serious conflict. Main worry is that their further access may have to cut by the new Land Law. Many grazing areas have been abandoned by the local people because of the unauthorised residents from other sums and aimag centres. One of our informants said that land has given to outcomers without any sanction of sum administration. Consequently, herders of the study sites felt strongly that both the aimag and sum administration needed to intervene in herders land use management through restoring the former border lines with Sagil and Chandmana sum and eviction of unmandated presence of households from other localities. Local people are hardly suggesting the following questions should be re-assumed as soon as possible in order to secure optional herding life within the frame of the current sum territory and to solve existing territorial conflicts. The inhabitants of Bayankhairkhan and Rashaant bags of Turgen sum argue that the free riders from Davst, Chandmana and aimag centre are causing some difficulties in territorial arrangements by early moving to summer and autumn pastures when local households arrived to find that the best grazing land had occupied by trespassers and heavily grazed. In this case the traditional arrangements and customary regulation on the seasonal rotation of pastures have been undermined. Interviews with local herders who had not moved early revealed that the following year, if the "offending" households moved early, they would move with them, and the seasonal rotation would become more fragile, even may be led to be entirely collapsed. Also, there had been noticed many cases that local herders had been staying in the spring or summer pastures that was being used by other households for many consequent years, while other local herders have moved to next rotation. This is evaluated as actions that had taken contrary to local customs and current legal regulations and to the local grazing territory arrangements among the local people. In summer 1993, many local herders stayed in winter area throughout the summer and had grazed the pastures around winter shelters belonged to other herders.

Some orientating mapping is attached (see Appendix 5 and 6.) Neither a message to the offenders nor a claim to the sum or bad governors has sent. Herders with winter shelters in that area went to negotiate with the households to move. But no actions were taken.

The free-riders have found their own explanations for their actions;

- owing to a limited number of the mountain passes they are compensatory needed to free riding some good autumn and spring areas belonged to Turgen sum.

- households from Tes and Malchin sum as the local people told are refugees who had had to move to the study sites because of low access to better grazing land in home areas. This is widely

refused by local people and evaluated as refugees because of suspected actions. We had failed in finding any information that could support the local perceptions.

- in order to avoid repeated long distance movement they have had to built up permanent winter residents in territory of Turgen and Sagil sum.

The increased free riding has resulted in wide abandon of grazing land by local herders due to unauthorised residency of major autumn and summer pastures. Local people are not moving there almost any more to avoid conflicts with the trespassers.

The main conclusion to what the herders had come is they should have allocated great seal of opportunity to be proprietor of the sum territory, who could enjoy their full set of grazing land rights according to the current legal frame and local customary arrangements. Otherwise, there is a real dangers for weakening of the seasonal movement rotation and local pasture land tenure arrangements unless these conflicting situation and outstanding problems have solved in favour of the local residents.

Also, since the negdel time, some pastures of regular trespassing (but it was not perceived as official) where people other sums used to come in some seasons used as an area of informal intervention by families from other neighbouring sums. This was, mostly a result of re-ordering of the territorial boundaries, leaving people out of their grazing areas resided from old time. An approximate mapping of a such areas is provided in Appendix 5. The areas are still resided by some people without any official permission. Neighbouring herders are not strongly refusing their appearance as a negative or trespassing, because they have accepted it as a need-based action. Approximate number of livestock entered into the intervention area is given in table 18.

Table 18. Number of livestock and time-duration of their stay in major intervention grazing area in Turgen and Sagil sum

Sums	Name of areas	Time	Animal	
			dominant type	number
Turgen	Khort, Gashuun, Nariin us in Sagil	15Nov-25Jan	Bog	5000
			Bod	2000
Turgen	Olon nuuriin ekh Khulst in Bokhmoron	15Nov-20March	Bog	500
			Bog	150
Sagil	Khondlongiin gol in Turgen	Oct-Febr	Bog	10000
			Bod	20000

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Source: Information by Sum Governors, March, 1994

#### Symptom of seasonal settlement

Due to reduced availability of transport and less opportunities to move frequently many herding families have become seasonal settlers. To qualify this pattern herders use a terminology "seasonal settler" which is amplified as a common name for those who stay a whole season in the same area not moving out. Official information provided by the governor of Bayankhairkhan bag in 1993 about 30 households spent autumn months in their summer grazing area, while others were moved to autumn pasture. We were told that this spring (1994) about 30-40 families

have decided to stay in the common winter-spring area. Generally, according to our estimation, there is enough spots in Turgen sum for re-building winter shelters. But, it has accounted that areas for spring permanent shelters are not quite. This leads to informal temporally joining of different households in winter time to provide opportunity to utilize the shelters jointly. For some details see Appendix 5. This type of false and loose joinings creates an informal re-division of existing shelters and pastures around them thus leads to change of normal camping and movement routes.

#### Crossborder and intersum livestock thievery

One of the progressing negative events in rural Mongolia, especially in the study areas is increased livestock thievery. There almost no herder can be met who suffered the crossborder and intersum livestock thievery. A recent example is that about 10 households wintering in Nariin us (30 km north the aimag centre) have lost more than 10 large animals. Some of the thieveries have already discovered by the local police, but the number of cases is still high. Livestock thievery is very common in spring and autumn area, which is located closer to aimag centre and some overcrowded area in Chandmana sum. Because of the increased cases of livestock thievery many herders has stopped to move regularly to their spring and autumn pastures. This alters the seasonal pasture rotation and leads to so called "seasonal settlement". Animals, thieved usually are driven across the state border to Tuva and other sums of Uvs and Bayan-Olgii aimags: Davst, Tarialan, Tes, Naranbulag, Bokhmoron, and coal mining village "Huurst Khotgor and Khar Tarvagatai (all Uvs aimag), and Tsagaannuur, Bayannuur and Nogoonnur (all Bayan-Olgii aimag).

In general, there is a wide range of commonalities and divergences in the herding movement patterns in different periods of historical events occurred in the socio-economic development of the country. The detailed description is given in table 19.

Table 19. The commonalities and differences in the movement patterns and other herding activities of herders in Turgen and Sagil sum

	Pre-collectivisation	Collectivisation	Present status
Transport	back-pack animals	mostly autos less animals	autos+ back-pack animals
Distance	long & medium	medium & short	short & medium
Frequency	more	less	less
Movement dependence	livestock	transport	transport & livestock
Herd structure	multispecies	specialised	multispecies
Dominant type	grazing	seasonal	seasonal

Decision making	herders	administration	herders
Criteria	pasture quality & climatic changes	climatic changes & pasture quality	pasture quality & climate
Risk	high	low	high
Settlement rate	less	increased	satisfactory
Access to key area	high	fairly	less
Grazing pressure	medium	intensive	medium
Grazing land rights	customary	administrative	not clear
Housing rate	medium	high	poor
Water supply	good	excellent	fair
Fodder supply	poor	good	poor
Herding art	well	mixed	mixed
Labour supply	poor	fair	poor
Self-reliance	high	fair	high

Source: Personal communications and official information obtained during the field research. March, 1993.

## CHAPTER FOUR

### FOODGRAIN CROPPING AS AN ECONOMIC ACTIVITY

#### GENERAL

Foodgrain cultivation is one of the major economic activities of rural people. This provides food for human consumption and fodder for livestock. The traditional grain cropping based on manual labour utilization was common not only for the main grain growing area, also, it was widely spread in other parts of the country. The creation of state farms primarily for crop production has been augmented the traditional grain cultivation. The grain growing was driven by the requirement for improving the food security of the herders and the income level through sell and exchange for living needs. The cropping was very risky and comparably low because mostly of climatic factors. The cropping activities were managed so well and were successfully combined



with livestock keeping, that the herders engaged in cropping were able to perform their livestock herding tasks in normal way.

## History of foodgrain cropping in the study area

### Production system

In 1930-1950s, there were several areas in the territory of current Turgen sum, where 50-60 households were sown a mosaic of cereals for their own living needs and sales, mostly barter trading. We were told that the size of a parcel of land sown by each of the households was approximately 5-6 hectares (a smaller size of 2-3 hectares was told by some people). As the yield is concerned the key informants confirmed that the total harvest was 30-40 sacks (60 kg each). It was calculated the yield to be 3-4 centners per hectare. The households consumed about 6-7 sacks of grain mostly for making a so called "zambaa" which is one of the specific light diets of the western Mongolian people. Also, some quantity was used for making flour. For seed reserve for the next year they usually stored 3-4 sacks of grain. The rest of the total harvest was sold. As one of our informants told single people and a whole camel caravan was coming to Turgen sum from the east, south and southwest sums of Uvs aimag and some of the nearest sums of Khovd aimag to buy grain or exchange for different goods, including livestock products and staple foods. Foodgrain growing has invaluable importance for not only for households' consumption needs, but it has great significance for traditional quasi-redistribution. After harvest, the growers distribute 1-2 jilevch of grain to local poor people to contribute to food reserve for winter to come. In summer, the poor people come usually to the cropping area to help them on the voluntary basis looking to have their share through the local quasi-redistribution mechanisms. Also, many pors are hired for major work: ploughing the land, seeding and grain cutting, and dressing and sacking. They take some amount of grain as a payment for work they have performed.

### Distribution and engagement scale

All varieties of foodgrain were reproduced and multiplied locally, but they were different in quality and yield. For example, Tsagaankhuree tarig, a cropping field for Baruun Zasguud and Zuun Zasguud, which measured to be of about 120 hectares was popular with high yielding (in local perception) wheat and barley, while Tsagaan khag tarig, a sown area of Sharnuud and Shandivid people, was well known with its tasty barley and rye. In the area in Tsagaan Buraa there was about 20 families growing mostly cereals. According to the common classification of pastoralists by their prevailing economic activity, they may have to be accepted as representatives of a group of agropastoralists. Surely, this is very simple consideration, since there is no other arguments that could give some supporting effect. The grain growing was irrigation-based through widely diversion of Turgen and Khondlon rivers. The location of cropped land and primary and branch canals that used for water diversion are shown in Appendix 7. Location was mostly oriented to equally water availability. There is one long primary canal driven from Khondlon river. Reason is to minimize dangers that can be brought by summer flooding of rivers. But plots fed by short canals driven from big mountain rivers are

faced seriously to flooding. So, people do prefer to take water from rivers at long distance.

### Processing and Marketing

The grain growers used a selling standard measurement unit, common for all tarig, called "jilevch" which is approximately equal to 6-8 kg. One castrated adult pack camel was exchanged for 30-40 jilevch or 210-240 kg or 5-6 sacks of high quality dressed barley. Regarding livestock products, 0.8-1 jilevch hursan (dried curd) was equal to 1 jilevch of barley. Oral information provided by some of our informants allows to say that the grain cropping supplied about 50-60% of annual household income. Similarly, foodgrain made up almost all the sell income of a household. So, it can be said that in Turgen sum in pre-collectivisation period there were two types of pastoralists: agropastoralists, who were broadly practising grain cropping and pastoralists who partly or to lesser extent engaged in cropping in order to secure household's needs in grain only. One interesting fact found here was that the grain processing or milling it into flour was taken place, locally in Turgen sum. This was run by foreigners: Russians and Chinese people. As our informants told there were some Chinese near by the present aimag centre, and one Russian and one Mongolian who run water and donkey run stone grain mills. Home consumption of grains varied across different households. Zambaa was the main form of grain processing in pre-collectivisation period. Surprisingly, now many households produce zambaa using small hand run stone mills. Households who cropped grains produced a concrete amount of zambaa to sell to their neighbours and people from other localities. Some large families used almost everyday to produce zambaa because of high home consumption.

### Recent history

It has noticed that since 1992, some developments occurred in the grain cropping in Turgen sum. Only one household came back for cropping of wheat and small amount of barley in 1992, after the first stage of decollectivisation. The sum officer for social development and policy informed that in the summer of 1993, 13 families (mostly sum centre inhabitants) planted about 50 hectares of the abandoned land. Also, more than 10 people from aimag centre rented a parcel of land in Turgen sum accounted in 40-50 hectares. They grow barley and wheat. The harvest is sold to Ulaangom flour plant or borrowed to individual millers to make flour for the growers' home consumption. In the latest case, grain owner and miller divides the flour an 50 on 50 or half of the grain is paid for milling. The sum officer told that the average harvest yield in 1993 was very variable: 10-20 c/ha. At present, the herders are not widely involved in grain growing for various reasons, listed down:

- Lack of practices;
- Shortage of technics and finance;
- lack of enough labour force;

The herding people met were asked whether they wish to come for cropping. The answer was positive. But the major problem is lack of working power, such as tractor and plough. People do need better seeds suitable for small scale traditional cropping. At

present, all the cropping work is made by use of hired big machineries. The use of powerful technics makes the cropping less profitable and the soils more damageable and sensitive. The marginal benefits that can be expected from the current grain cropping schemes is proven to be more negative on the herders willingness.

#### Technological aspects

During the field work we tried to gather some information related to traditional techniques of grain cropping in Turgen sum in terms of land allocation, irrigation schedules and other.

Each tarig (cropping area given to a cropping team) had own leader called "angiin daamal", who had to experience a wide range of ruling forces regarding the cropping activities of the whole tarig. Usually, the tarig leaders decides where to crop through several consultative meetings. The consultative meeting makes a final decision and, the decision is announced and the cropping land is divided between the cropping teams. People who wished to crop are called early spring to dig a so called "moson buh" (digging and cleaning the previously used for river diversion canals, while they are frozen). All people participated in the spring canal digging are secured to crop in the same year only. The watershed cleaning takes place in March. The carrier and branch canals are cleaned from ice and other settling and prepared for pre-cropping irrigation. Interestingly, the cropping people had no permanent plots. Every year they choose lang through their tarig leader who usually arranges for a concrete land on behalf of his team. Before land processing begins people from the same tarig come to the chosen area and the leader shows and explains about the size, margins of whole tarig area and how to get water for irrigation of the cropped land. Then they are called for a horse racing competition for dividing the land amongst them. But this kind of horse racing is completely different from that organised during public ceremonies, such as ovoo naadam (sacrifice to local good genius) or national holidays or other events. People riding their best and quicker horses gallop and put their hats at a top end of the land where he/she wishes to crop and their knout at the it's other end. In that way, they divide the cropping land area. Then all people come together to agree when, how to crop. Also, they agree the total size of each plot by defining the wights of the plots through making stone semi-altars markings. There is no discrimination for newcomers from other groups or for those who wished to be engaged in grain cropping newly. Manuring the cropping land is made by night keeping of livestock until the land is ploughed. The traditional cropping activity in the study site is known as a khuviin tarialan (private cropping) and the final full stop was put when a state livestock mariner station was established. This station was build up to serve the newly created negdels with machineries and techniques for grain cropping, hay-making and fodder growing. Major part of the cropping land previously planted by individuals was given to the station and many people stopped completely their cropping activities. But the station failed to support the private cropping among the local people and led to discouragement of an important economic activity with well organisational and long traditions. The degree of grain cropping amongst the local herders was very high and there was many cases that rich households were cropping.

There are lots of attractive questions how the herders succeeded to combine the herding and cropping at the same time. As the informants argued the grain cropping had no significant effects over the herd management practices of the herders, especially their pastoral movement behaviour. Even the households were more co-ordinated in timing of seasonal movements in order to prevent uncontrolled grazing of major pastures by offenders, while many people are busy with cropping tasks. Major request to all local households is to prohibit or not to allow animals to graze near by the tarig area and to pasture their animals close to the main camps. In summer time, the cropping households move to common summer areas and only few individual people come down for irrigation of crops, leaving the main camps behind in the seasonal pastures. Before the harvest time the households move with their livestock to autumn pastures and resided at a distance from the tarig areas.

The households engaged in private cropping suffered two types of major constraints: insufficient labour for grain seeding and harvesting operations and for herding in late spring and mid autumn. For the grain seeding and harvesting tasks, the grain growers hired local people, who were paid certain amount of grain and supported by charge-free feeding for the time they hired. As far as the herding labour is considered, females and children do perform major herding tasks additionally to their home activities. There were experienced some closer cooperation in allocation of working animals for land ploughing and grain dressing. People who had working animals hired them to grain growers or allocated without charging.

#### LINKAGES BETWEEN THE NEIGHBOURING AREAS OF MONGOLIA AND TUVA

In the past times there were several types of aimag level and sum level (in case of Mongolia) linkages with peripheral areas of Tuva, bridged through administrative and party exchanges. These included exchange of herding families to pass grazing seasons, human resources, goods and much quantity of petrol for the regional supply and wheat and fodder (concentrates and hay from the central cropping area) for aimag needs. Since the economic and political reform started some of these forms of mutual contacts have ceases to exist and commercial and trade operations has taken over to great extent. Previously, there were many cases to exchange of suurs of grazing livestock (herds) in winter time to graze some less-loaded area near by the state border under a general agreement between Governments of MPR and ex-Republic of Tuva. As an example, The areas, where animals from Tuva were permitted to enter into the Mongolia were located in Davst, Sagil, Tes, Zuungobi and Bokhmoron sums. In 1950s, about 100 households from Sagil and 2-3 households from Turgen were passing winter in some areas in Tuva and 5-6 households from Tuva used to spend winter in Sagil sum. These had herds composed of small livestock and cattle. This reciprocal pasture use agreement aimed to assist herding people driving their livestock to the sites of wintering in bad year. Activities under this agreement continued successfully until an infectious disease epidemic in yaks entered from Tuva in the spring 1992 have cancelled for unknown time. The wide range of reciprocal pasture use agreement provided good opportunities to exchange herding skills and help each other mutually. The herders had good relations and shared their labour

mostly for: (i). repairing and cleaning animal beddings and shelters, (ii). hay cutting and transport, (iii). exchange of draught animals for transport needs, (iv). animal shearing and milking, (v). exchange of surplus foods, (vi). distant looking for animals of their neighbours. But they were not allowed to share the same camps because of restrictions settled by the intergovernmental regulations. Interesting thing is that heads of households had issued a crossborder pass. So, people who were wearer of this document had permitted to cross the state border for grazing only. The herd exchange has no negative results for environmental sustainability and pasture performance of the sites. It should be mentioned that for the last few years traditional forms of measures aimed to strengthen the cultural relations between two nations have been re-emerging, mostly through political activities such as "ev modny naadam" (ceremony for making a friendship wooden figure, putting together it's parts kept permanently by the sides). This ceremony has been organised recurrently by the sides. But this is known as a politically motivated rather than public (informal) due to increased involvement of administrative bodies.

Easy access to East-South Siberian markets through Tuva appears to be an attractive ground for increased pure commercial actions experienced by the trading contingent of Mongolia and Tuva in order to take advantages of the permanently functioning crossborder outlet, more safety tracks and high demand of goods offered. Number of people coming to Khandgait (a Tuva-Mongolian crossborder point) from less-accessable areas, like Khovd aimag has tended to increase. It is not known whether does this kind of relation between different people bring any benefits in terms of cultural and environmental conservation in these neighbouring areas.

As it has mentioned earlier, the crossborder livestock thievery seems to result in increased suspicions not only among peaceful neighbours of the same localities, but in respect of people from the neighbouring country. Because local police and ordinary people have witnessed many cases of livestock thievery where a participation of local people and people from the border area in Tuva has taken place. Also, it has appeared to be one of the reasons that limit the crossborder mobility of herders. Nevertheless, local herders we met along the way of field research are welcomed their former neighbours from Tuva, because they don't want to cease the friendly relations which had been proven to bring some economic benefits. At present, a bridge activity which is serving Tuva's herders is the fodder transportation to some areas of Tuva by lorries. The lorries use to drive the main road which comes cross the state border and some switching areas between Turgen and Sagil through the mountain pass "Ulaan Davaa" (Red Pass).

#### CONCLUSION

The field work undertaken in Turgen and Sagil sum and analysis of changes in livestock population statistics and movement behaviour of herders reveals several conclusions.

First, the present commonality in herding movements is that based on multispecies herd management.

Second, the migration patterns among the herders of the study sites have changed in that much more emphasis is on individual decision, rather than group level.

Third, pastoral movement frequency and distance has reduced to it's minimum with more emphasis on short distance migrations.

Fourth, the sustainability of the migration system, as it is so sensitive to price changes in fuel, fodder and other services is in question.

Fifth, change in herd species composition has had impact on the pastoral production strategies. With respect to production, these changes have brought about a modification in herd management techniques, from a dependence on a principally subsistence economy to a market-oriented, but not highly commercialised economy.

Sixth, the foodgrain cropping has re-emerged to very limited extent in the form of mechanised way that significantly different from the traditional form. The overwhelming part of the growers are settled people. Herders are not much enthusiastic to be engaged in cropping owing various reasons.

Eighth, the concentration is tended steadily increasing in particular pasture areas, not as a result of the destruction of pasture land or improved water and fodder supply, but as a result of trespassing and increased livestock thievery. For these reasons, many grazing areas are continued to be resided by outcomers. This may become a serious socio-economic and legal problem, which would call for administration be intervened.

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As is usual, the author acknowledges that any errors, omissions etc. remain his sole responsibility.

#### REFERENCES

1. D. Bazargur, B. Chinbat, S. Shiirev-Aduya, 1989 | Pastoral movement in MPR. State Publishing House, Ulaanbaatar
2. M. Shikhin, L. Kolosov, "1933 Livestock husbandry of MPR." Journal "Sovremennia Mongolia", No1
3. A. A. Meleshko, "1935 Problems of nomadism." Journal "Sovremennia Mongolia". No2
4. A. D. Simukov, "1934 Pastoral movement in Mongolia." Journal "Sovremennia Mongolia" No4
5. Ya. Tsevel, "1933 Pastoral movements." Journal "Sovremennia Mongolia" No1

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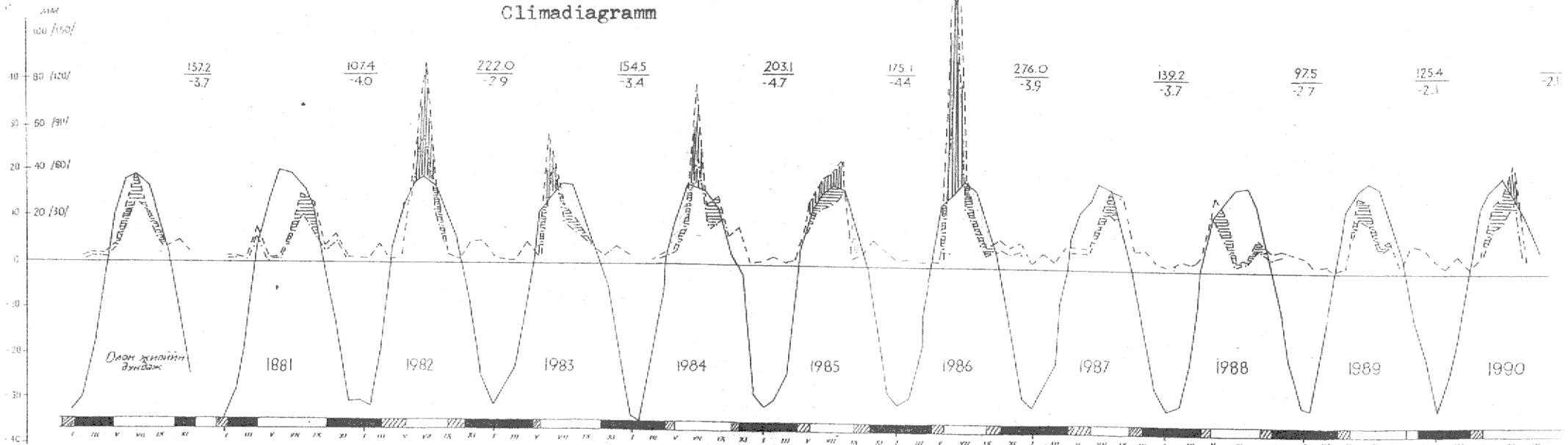
6. N.I.Denisov, 1946 Livestock of Mongolia. State Publishing Office, Ulaanbaatar
7. S.Azarov, 1933 Herding techniques of nomadic livestock. No2
8. N.Jagvaral, 1974 Araty i aratskoe khozyaistvo. State Publishing House, Ulaanbaatar
9. D.Banzragch, C.Davaajamts, 1970 Methods of pasture use. State Publishing House, Ulaanbaatar
10. G.Batnasan, 1978 Livestock herding strategies of herders in MPR. State Publishing House, Ulaanbaatar
11. D.Tumurtoogoo, 1983, 1983 Labour in livestock husbandry. State Publishing House, Ulaanbaatar
12. U.Nyamdorj, 1985 Sociological questions of herders' settlement in socialist period. State Publishing House, Ulaanbaatar
13. ZH.Ukhnaa, 1977 Livestock team State Publishing House, Ulaanbaatar
14. L.A.Thrupp, 1993 Political ecology of sustainable rural development: dynamics of social and natural resource degradation. In Food for Future: Conditions and Contradictions of Sustainability. New York: John Wiley and Sons.
15. M.Niamir, 1990 Herders decision making in natural resources management in arid and semi-arid Africa. Rome: FAO
16. Mujeeb N Al-Najim, 1991 Changes in the species composition of pastoral herds in Bay Region, Somalia. Pastoral Development Network. Network paper 31b
17. Maria-Fernandez-Gimenez, 1993 "Fences don't make grass grow". Herders perception of pasture resources and ecological processes in the Mongolian forest-steppe. A research Conference, Racine Wisconsin, Nov., 1993
18. K.M.Homewood, 1993 "Livestock economy and ecology in EL Kala, Algeria" Pastoral Development Network, Network paper 35a
19. G.Batnasan, 1972 Movement behaviour of private herders. In: Studia ethnographica, tomus IV, eds: S.Badamkhatan. Ulaanbaatar.
20. B.Purev, 1990 Traditional livestock management in Mongolia. Proceedings of an international workshop on pastoralism and socio-economic development, Mongolia, 4-12 Sept., 1990,

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# Климатдиаграмм

/ Улаангом , 1160 м /

## Climadiagramm



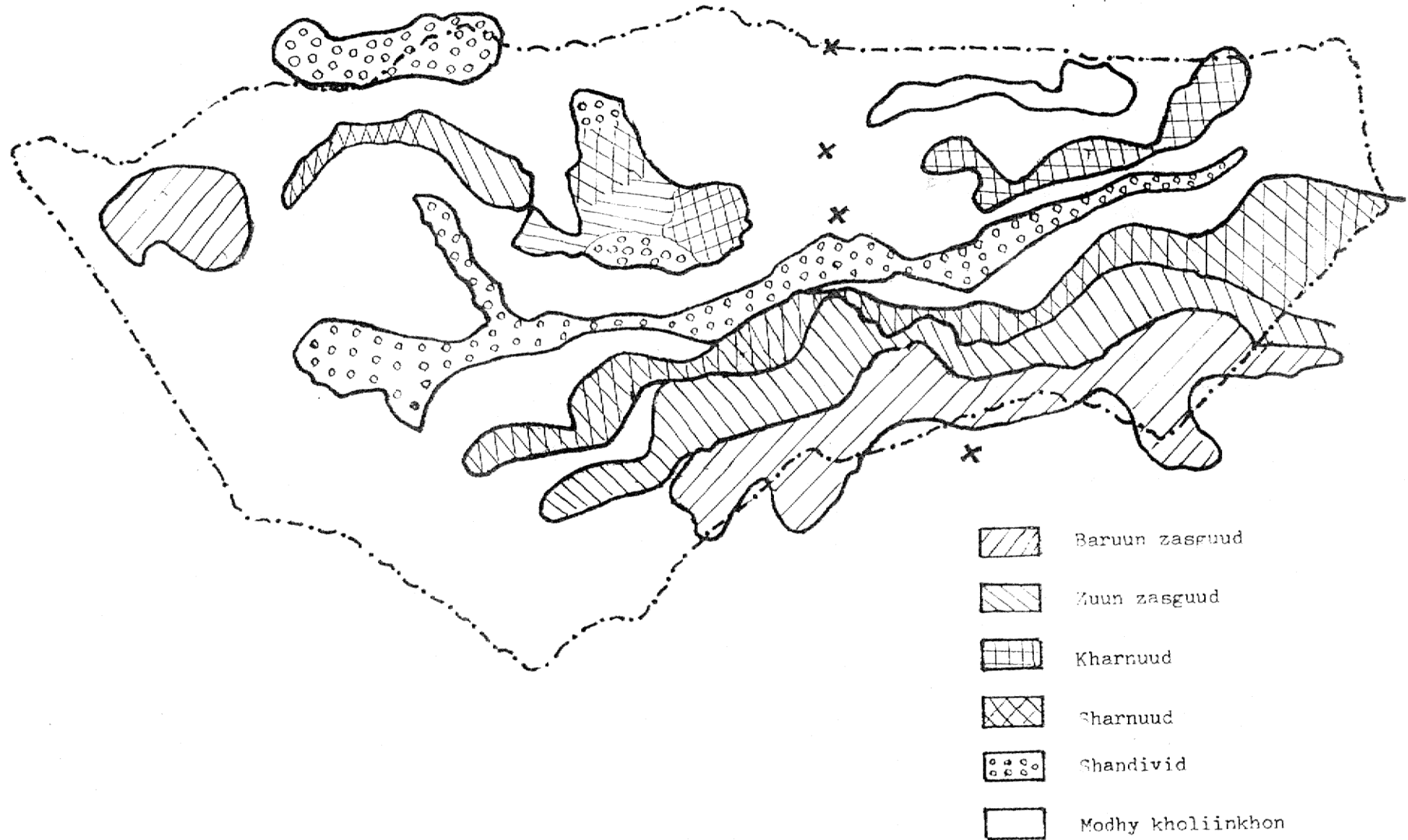
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1882	222.0	-2.9
1883	154.5	-3.4
1884	203.1	-4.7
1885	175.1	-4.4
1886	276.0	-3.9
1887	139.2	-3.7
1888	97.5	-2.7
1889	125.4	-2.1
1890	132.2	-3.7

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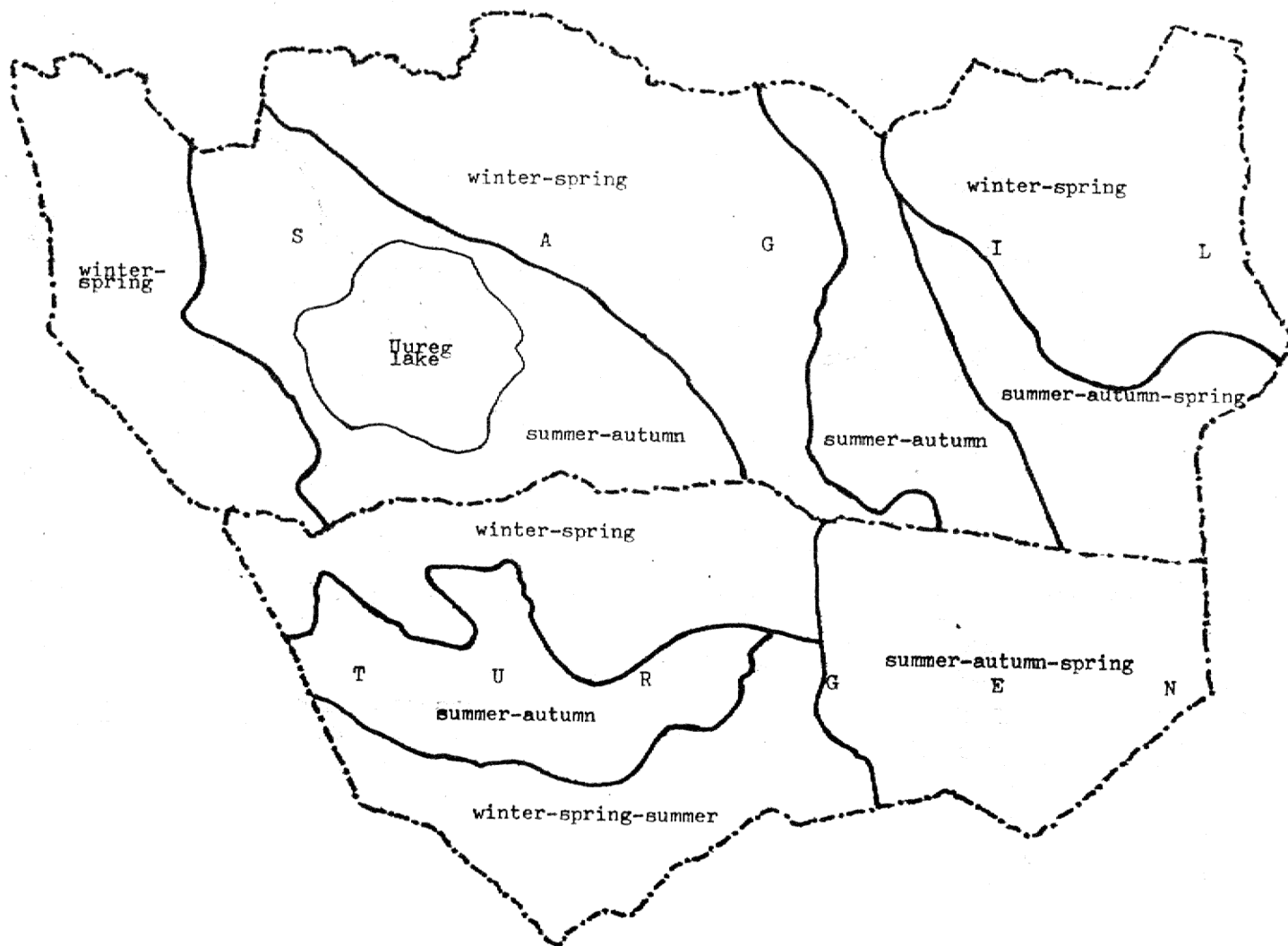


TERRITORIAL LOCATION OF HERDING ETHNIC GROUPS



PASTURE USE MANAGEMENT IN TURGEN AND SAGIL SUM  
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Appendix 3.

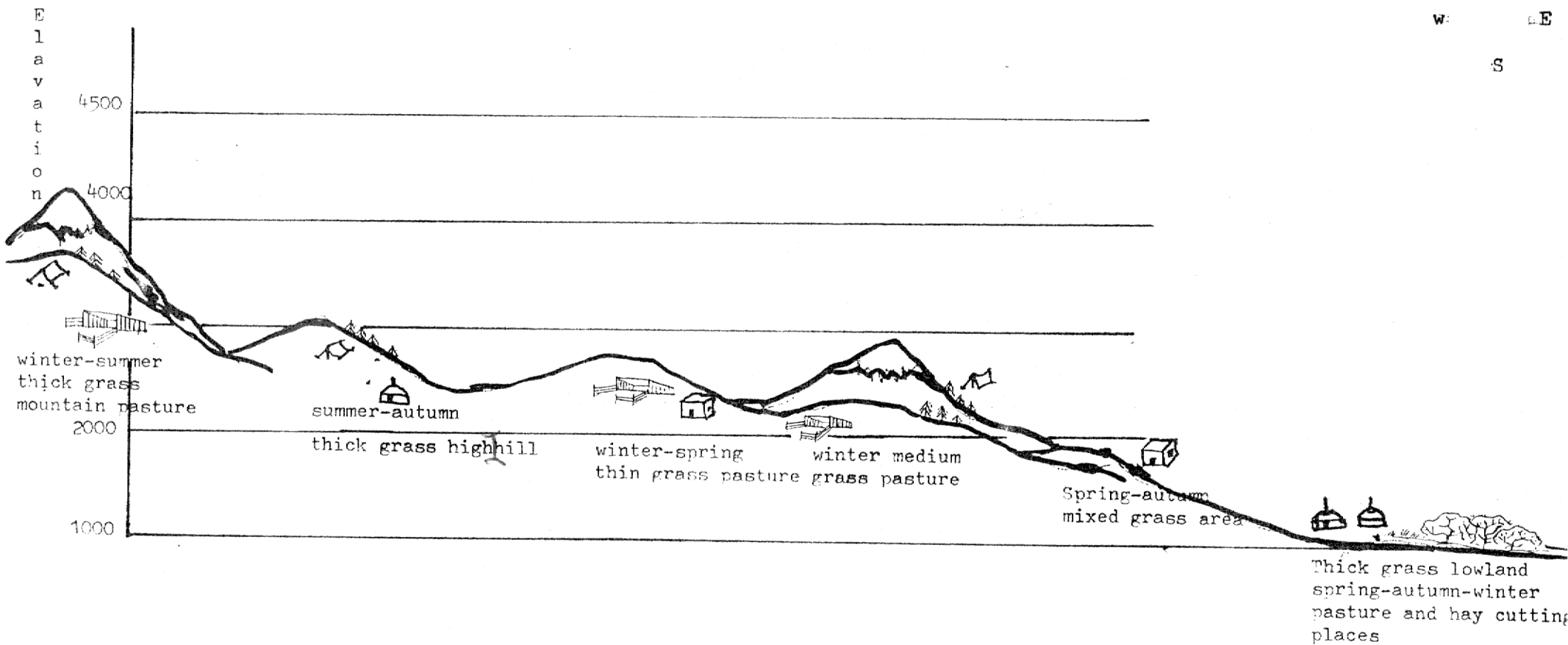


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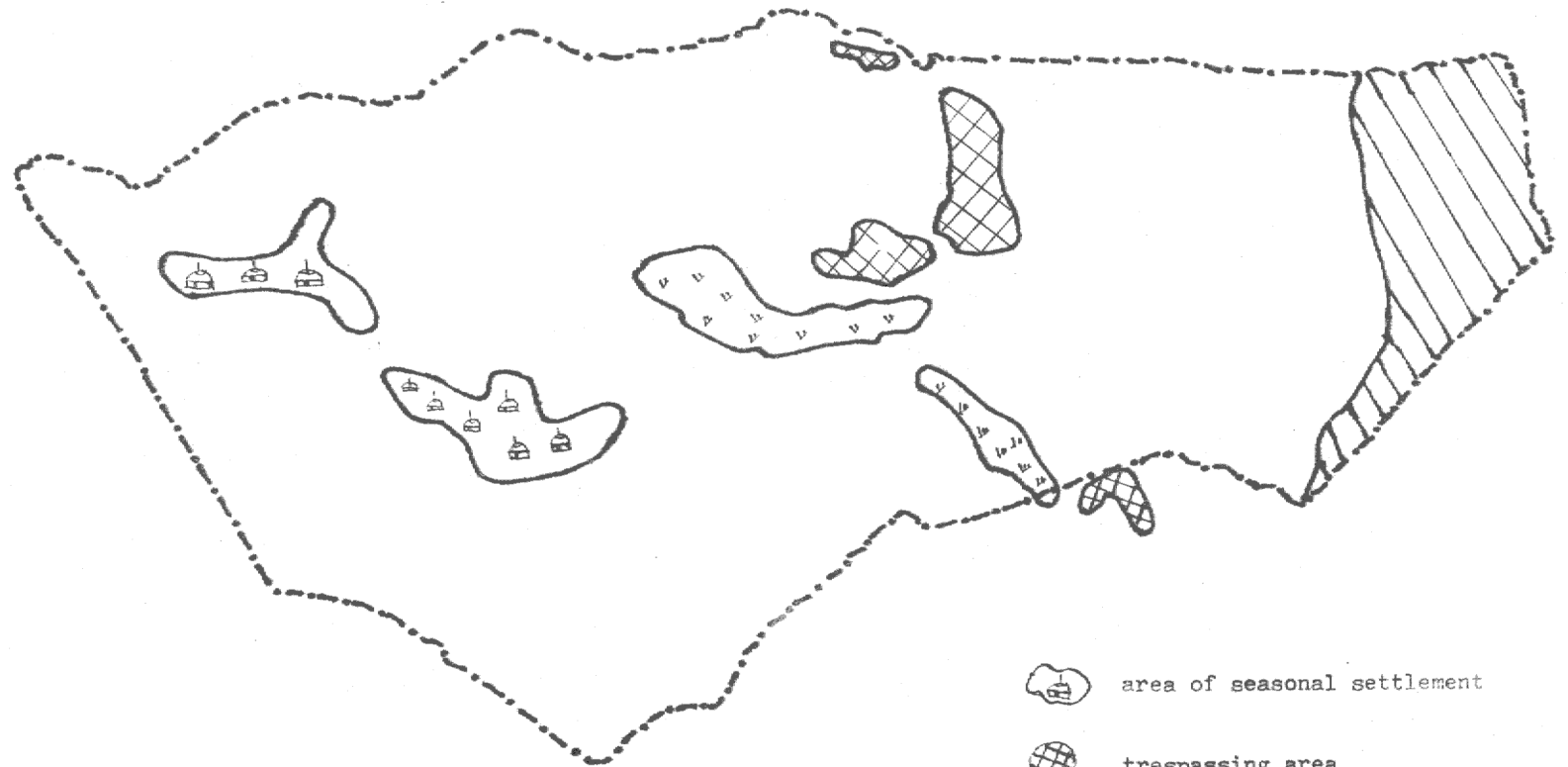
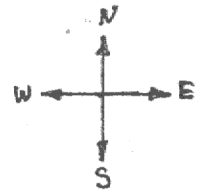
Appendix 4.





WEST-EAST TRANSECT OF TURGEN SUM

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W E  
S



DEBATABLE PASTURE AREAS IN TURGEN SUM



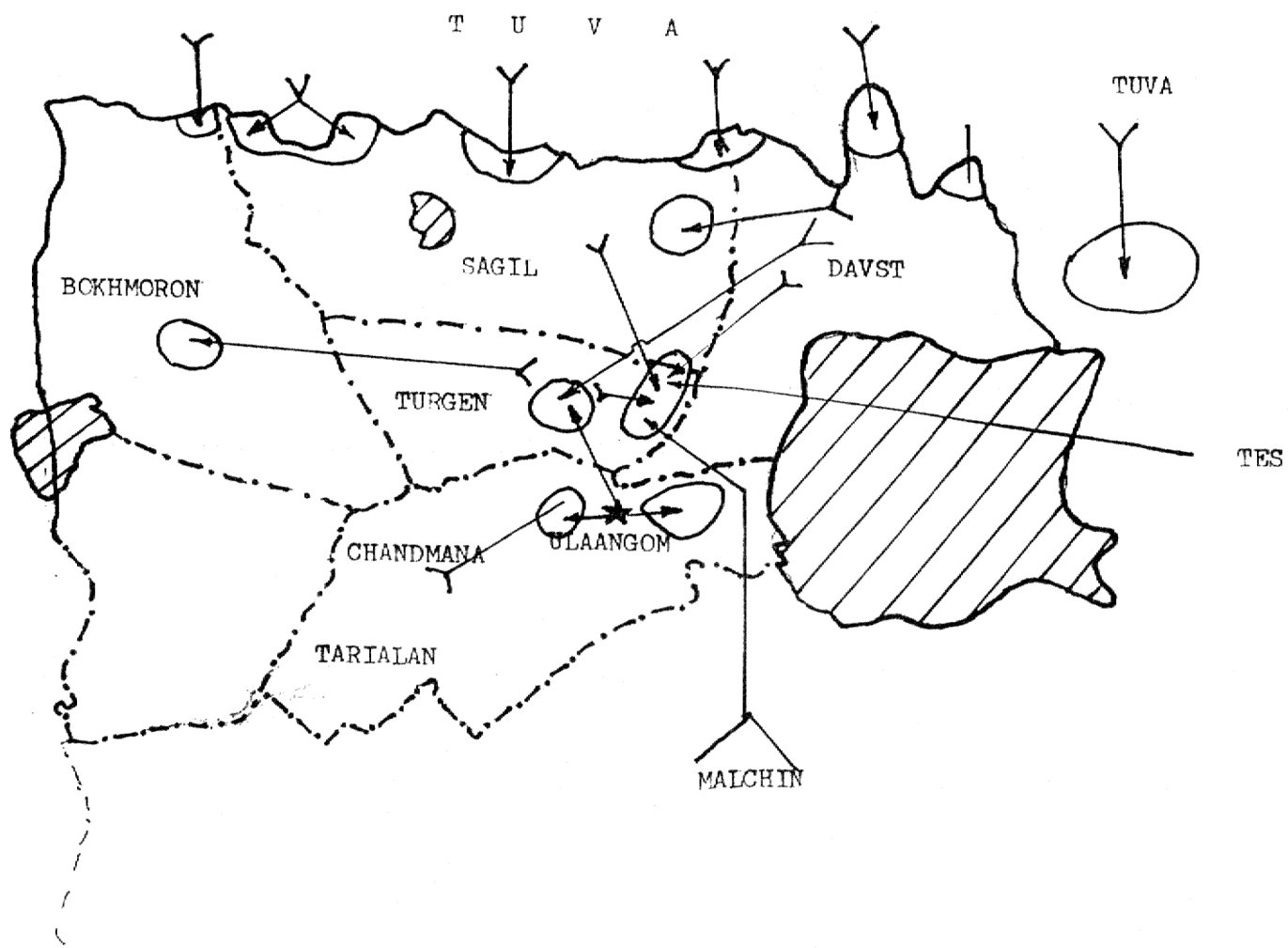
-  area of seasonal settlement
-  trespassing area
-  sensitive area
-  overloaded trespassing area



CONFLICT PASTURE AREAS  
AREAS OF PASTURE CONFLICT.

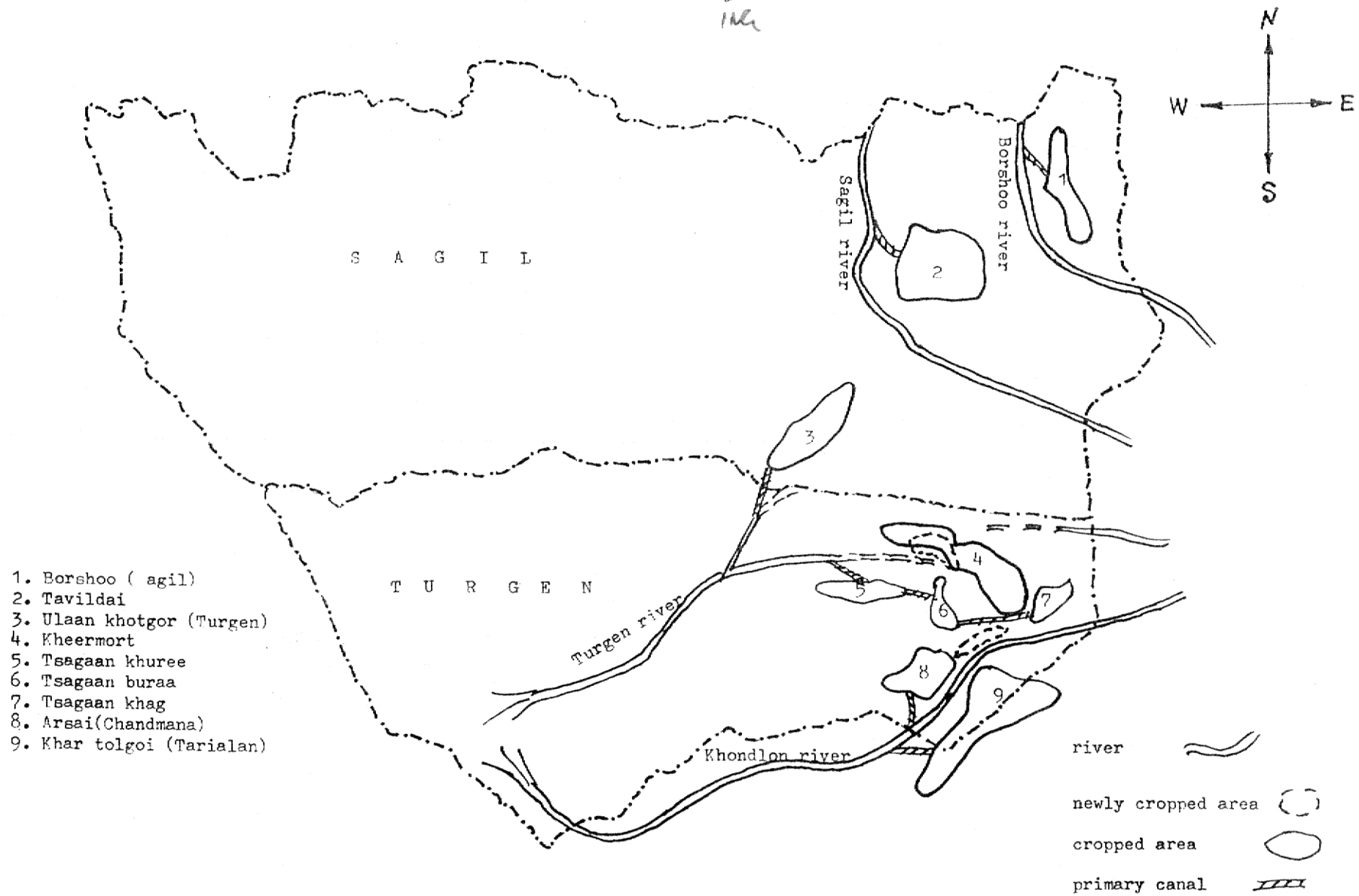
Appendix 6.

N  
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FOODGRAIN CROPPED AREA

Appendix 7.



25

Figure . Changes in number

of private livestock

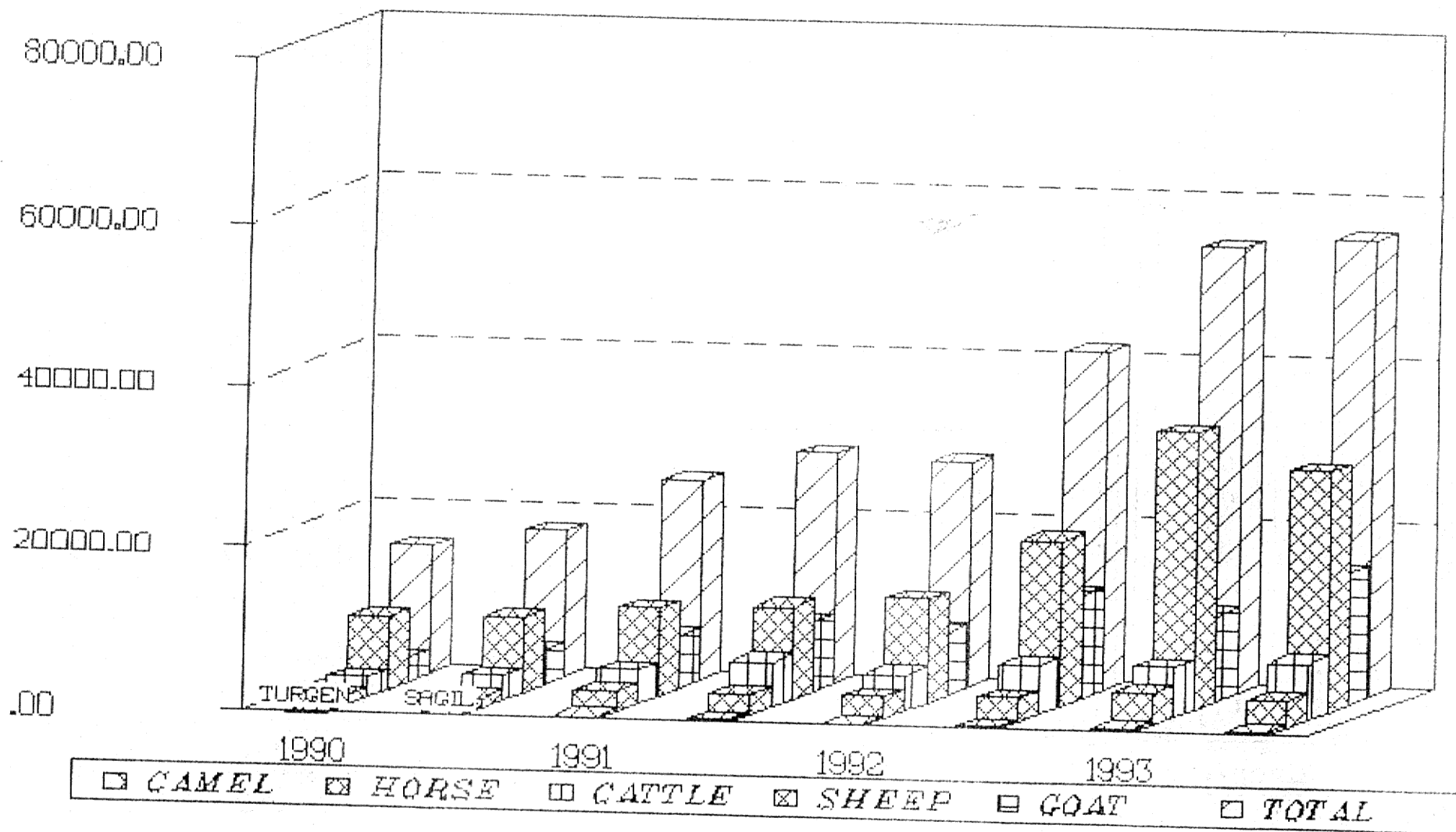
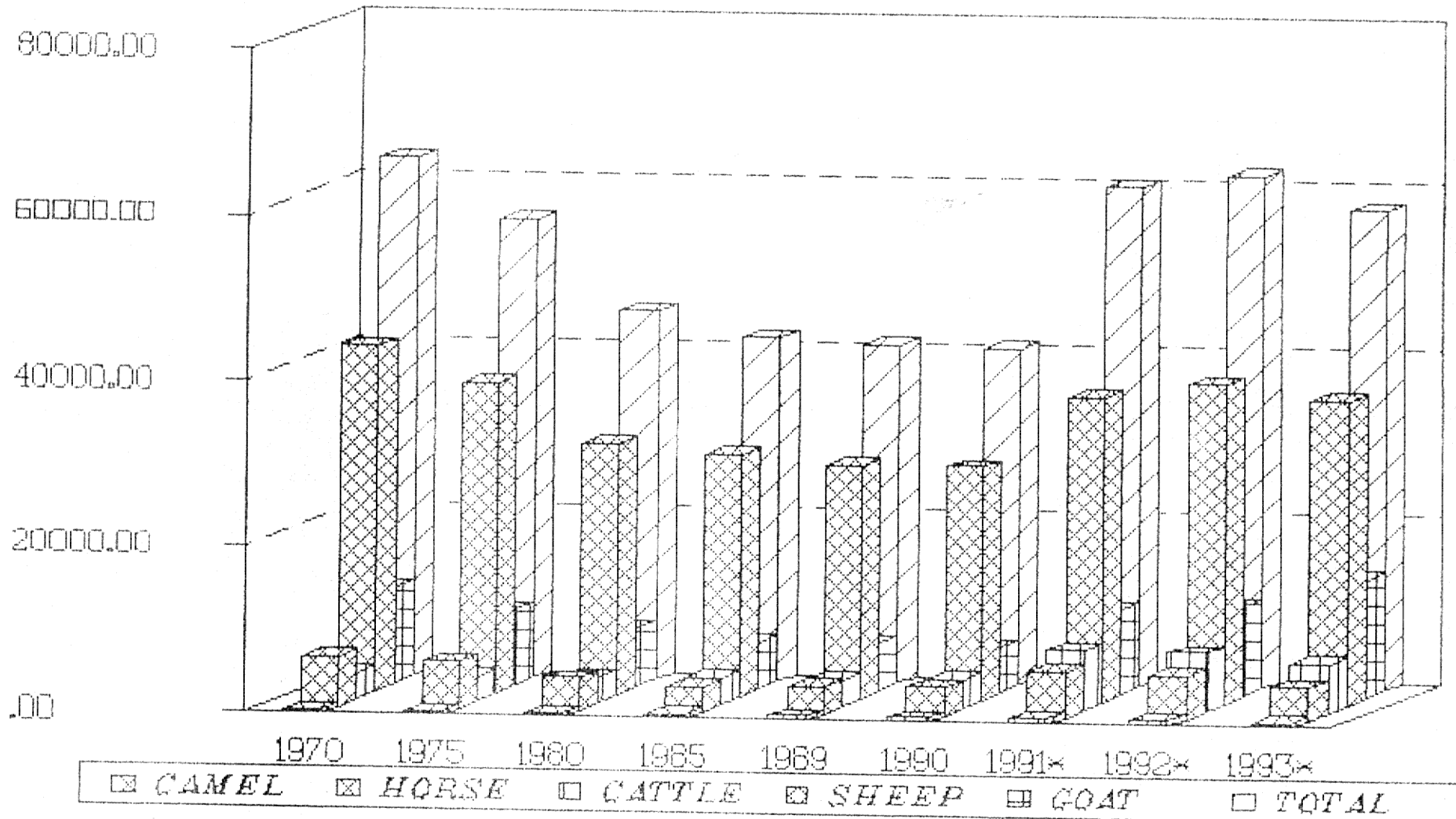


FIGURE . *HERD SPECIES COMPOSITION,*

*TURGEN SUM*

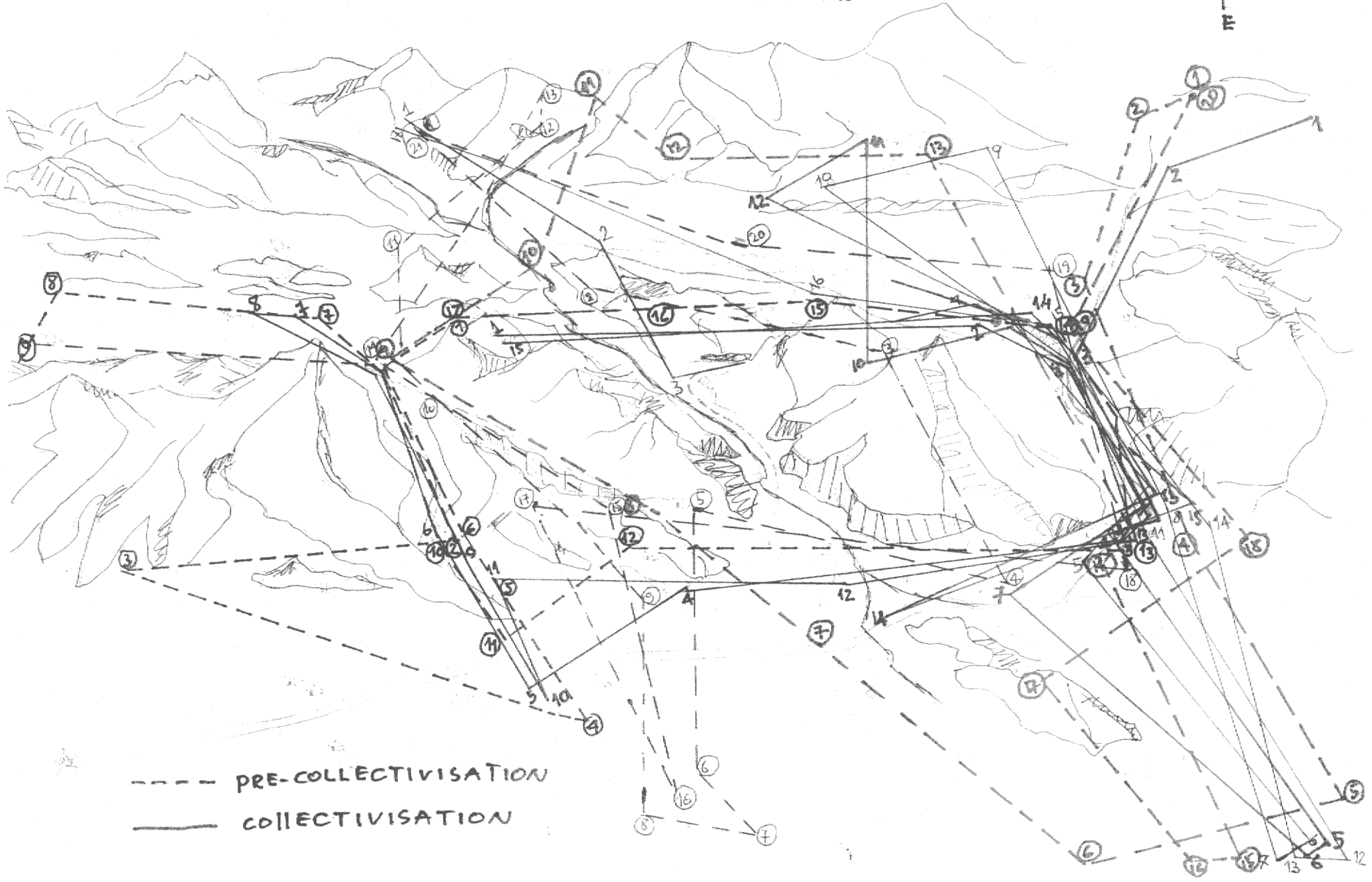


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Appendix 9a.

# MOVEMENT ROUTE OF SAMPLE HOUSEHOLDS



Appendix 9b.

DIEFERENT MOVEMENT PATTERN  
POST COLLECTIVISATION

