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## Natural resource mapping and seasonal variations and stresses in Mongolia

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### • Introduction

This paper documents fieldwork carried out in 1991 during the initial stages of a collaborative policy research and training project in Mongolia. The Policy Alternatives for Livestock Development (PALD) project aims to facilitate the transition from a centrally planned to a market economy in the extensive livestock sector which dominates the Mongolian rural economy.

Since the fieldwork reported here was carried out, many changes have taken place in rural Mongolia. Most significant of all has been the dismantling of the pastoral collectives and the privatisation of formerly state or collective-owned animals. The fieldwork, however, is reported in the 'ethnographic present' of 1991.

This report describes a few of the research methods used during the training of Mongolian research team members and gives details of their outcomes. The training programme concentrated on the use of participatory or rapid rural appraisal techniques. Fieldwork was carried out in the Arkhangai *aimag* (province) representing the forest/mountain steppe ecological zone and the Dornogobi *aimag* in the Gobi desert and desert-steppe zone.

The research consisted primarily of case studies of two former brigades, one in each *aimag*, with extensive semi-structured interviewing conducted at household level and supplementary interviews at *aimag* and *negdel* (agricultural collective) levels.

### • Participatory research methods

The programme of research and methods used in each of the two zones followed a broadly similar pattern. First, interviews were held with officials at the *aimag*, *sum* (district) and *negdel* (collective) level. The aims of these were to:

- Introduce the research team;
- Explain the purpose of the project; and,
- Acquire *aimag* statistics, local maps and secondary information.

Next, field research was carried out in a single brigade (50-100 households) within each *negdel*. The research team stayed overnight with herding families in their *ger* (felt tent), which allowed interviews to take place well into the evening, when the herders are less busy. The team divided into pairs or groups of three to conduct semi-structured interviews or participatory diagramming sessions with individual herding men and women or small groups of herders.

The first methods to be used in each brigade were generally wealth ranking and participatory mapping and transects.

### Wealth ranking

The wealth rankings were designed to understand local perceptions of wealth and to produce a simple wealth classification of households in each brigade. This helped to stratify the brigade population and assisted later interviewing on a range of issues for which it was important to understand household background (Mearns et al., 1992).

These methods helped the team to explore the diverse range of circumstances and to begin to understand the different needs and priorities of poorer and better-off households.

### Participatory mapping and transects

Participatory mapping and transects were used to gain a general introduction to each brigade and to begin to identify grazing and other key resources, patterns of seasonal mobility etc. Some team members travelled by horseback which made for extra conviviality in interviewing the herders they met along the way. Covering transects in this manner was a way of avoiding some of the most common biases that arise in conventional field studies, i.e. only talking to more visible and accessible households. It also gave herders a chance to point out things of interest along the way.

### Use of checklists

A checklist of issues was prepared to guide the field research process. These issues were explored using a number of participatory techniques, including:

- Semi-structured interviewing;
- Diagramming of labour distribution, production and other seasonal variations;
- Preference ranking exercises (e.g. for fodder species or animals);
- Historical analysis, especially of ecological change; and,
- Basic income and expenditure surveying, including estimates of income in kind.

The households to be interviewed were selected from each of the wealth classes identified during the wealth ranking exercise. The checklist of issues used during the interviews is summarised below.

#### CHECKLIST OF ISSUES AS A GUIDE FOR FIELD RESEARCH

##### *Household production and marketing strategies, risk and vulnerability*

Seasonal labour profiles (men, women, children)  
 Flexibility of women's labour between productive/domestic activities  
 Income/expenditure patterns  
 Simple demographic indicators  
 Income in kind (production for own consumption, barter transactions, gifts)  
 Vulnerability related to differential asset position of households:  
 Asset management, marriage and inheritance, herd ownership  
 Access to services (and potential changes with higher cost recovery)  
 Herd species composition  
 Herd management strategies  
 Food security

##### *Seasonality, grazing management, natural resource tenure*

Pasture use and management  
 Identification of key grazing resources  
 Seasonal patterns of production  
 Seasonal patterns of migration  
 Animal condition  
 Fodder availability, supply sources and costs  
 Criteria/rules of access to key resources  
 Disputes over access to grazing or other key resources  
 Conflict resolution  
 Historical patterns and changes

## • Animal production and natural resource management

Information about the various aspects of livestock production was collected using participatory methods in a study of Arhangai *aimag*.

### The annual grazing cycle

Figure 1 shows a map of the annual grazing cycle for Hukh Nuur brigade, drawn during a semi-structured interview with *Mandlhai* of Sharbolgin *tasag* (dairying team during the summer months). This indicates the broad pattern of seasonal movements between pastures.

Spring is the only time of year the entire brigade lives in the same general area. Almost all the spring shelters lie along the North Tamir river. The brigade divides into its two *tasag* for dairying during the summer months. Towards the end of the summer, when annual quotas have been delivered to the *negdel*, the *suuri* (herders' base camp) move to other new pastures to complete their own milking during the late summer months. Some move back to the North Tamir valley whilst others move to high summer pastures near the lake.

From their autumn pastures, within which they make two moves during a difficult year, all *suuri* move to their own winter shelters in the deeper, more sheltered valleys of the area. In total each *suuri* makes between four and six moves a year, generally one move per season.

Figure 2 is a diagram of the approximate (maximum) distances from the *suuri* that animals are taken to pasture during the different seasons. During the autumn, the furthest distance moved from the *suuri* is between four and five kilometres. Occasionally it may be necessary to drive stock up to 10 kilometres to graze on mountain tops where the snow is thinner due to the strong winds. Stock are pastured closest to the *suuri* during spring, when young animals are reared.

### Characteristics and location of grazing resources

Figure 3 is a map of the brigade resources drawn by a group of women: Gundegmaa, Altanshagai, Tsovoov, and Tsetsegmaa. It includes special information about particular grazing areas and the incidence of animal diseases. Many of the poor grazing areas are used in the spring. This is the time of year when animals are at risk from poisoning from over-eating the new growth of certain grasses.

Figure 1. Hukh Nuur Brigade: annual grazing cycle

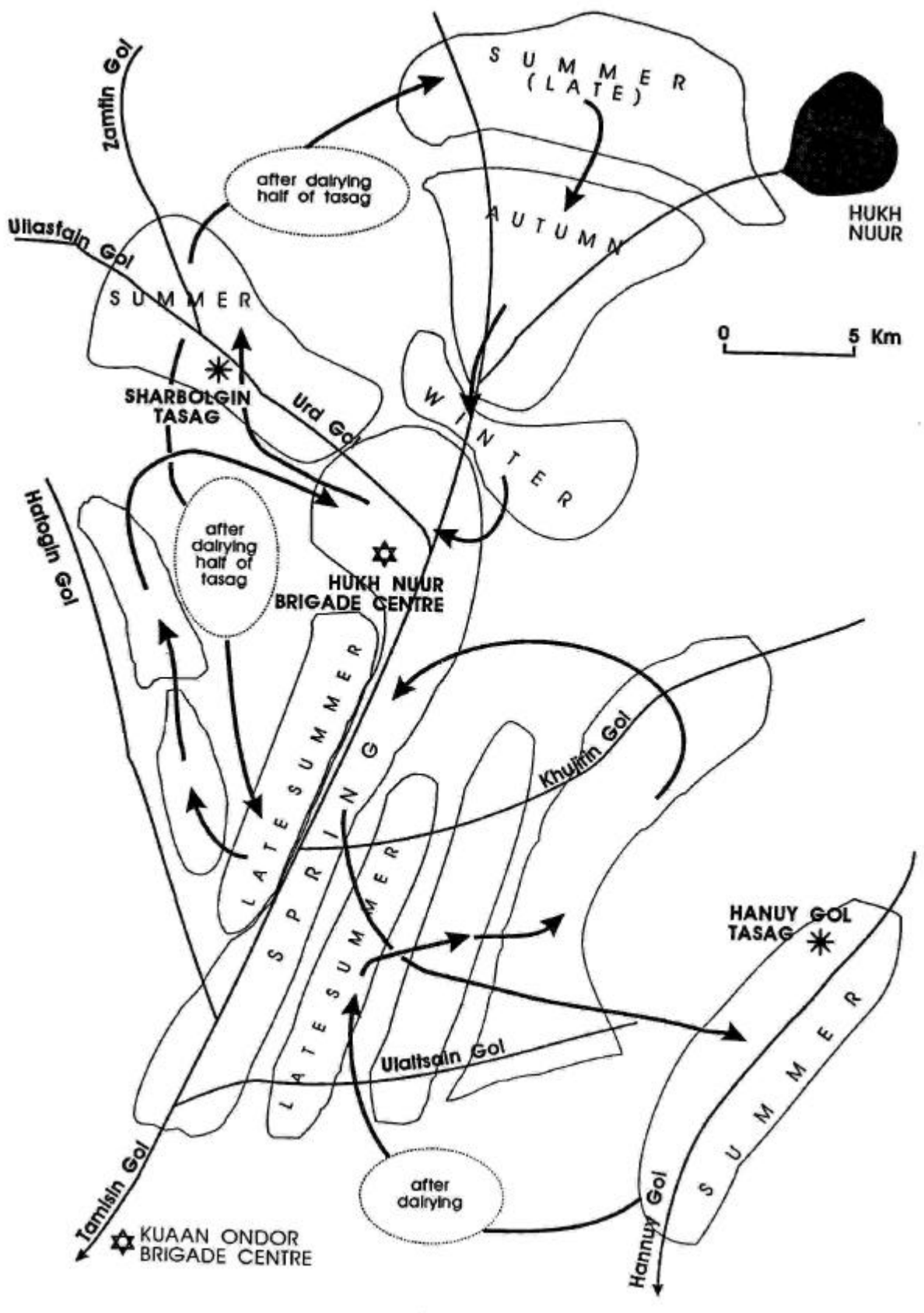


Figure 2. Hukh Nuur Brigade: annual grazing cycle showing seasonal differences in distances covered from Suur to Pasture

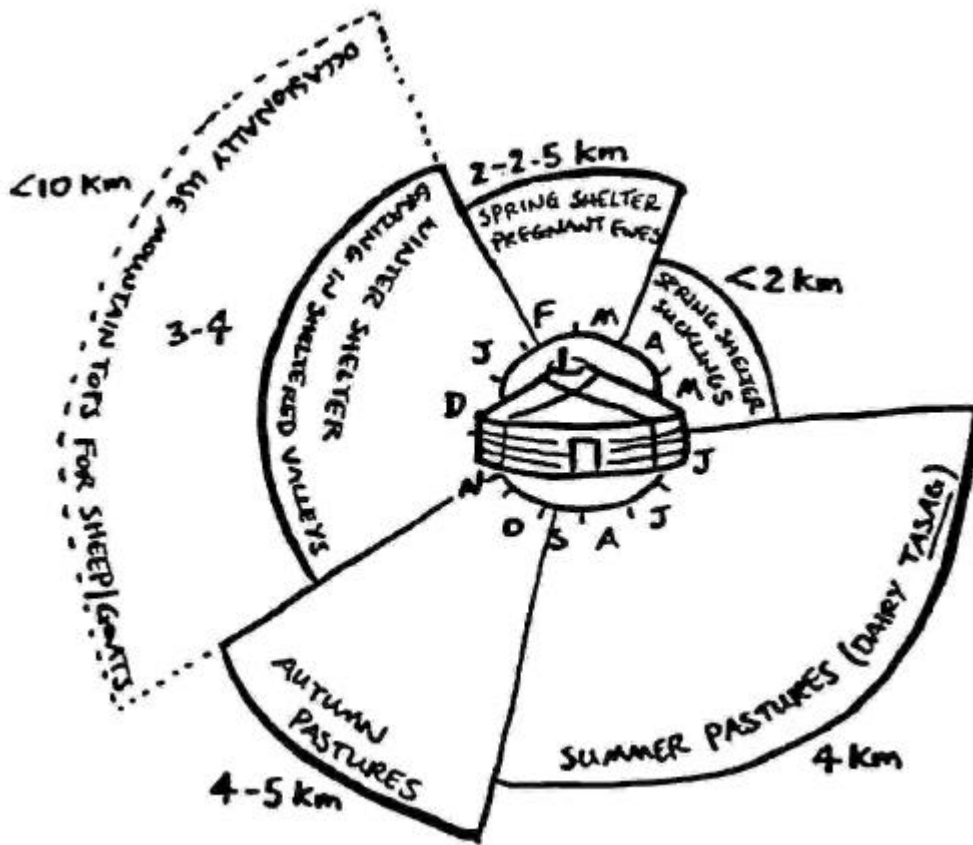
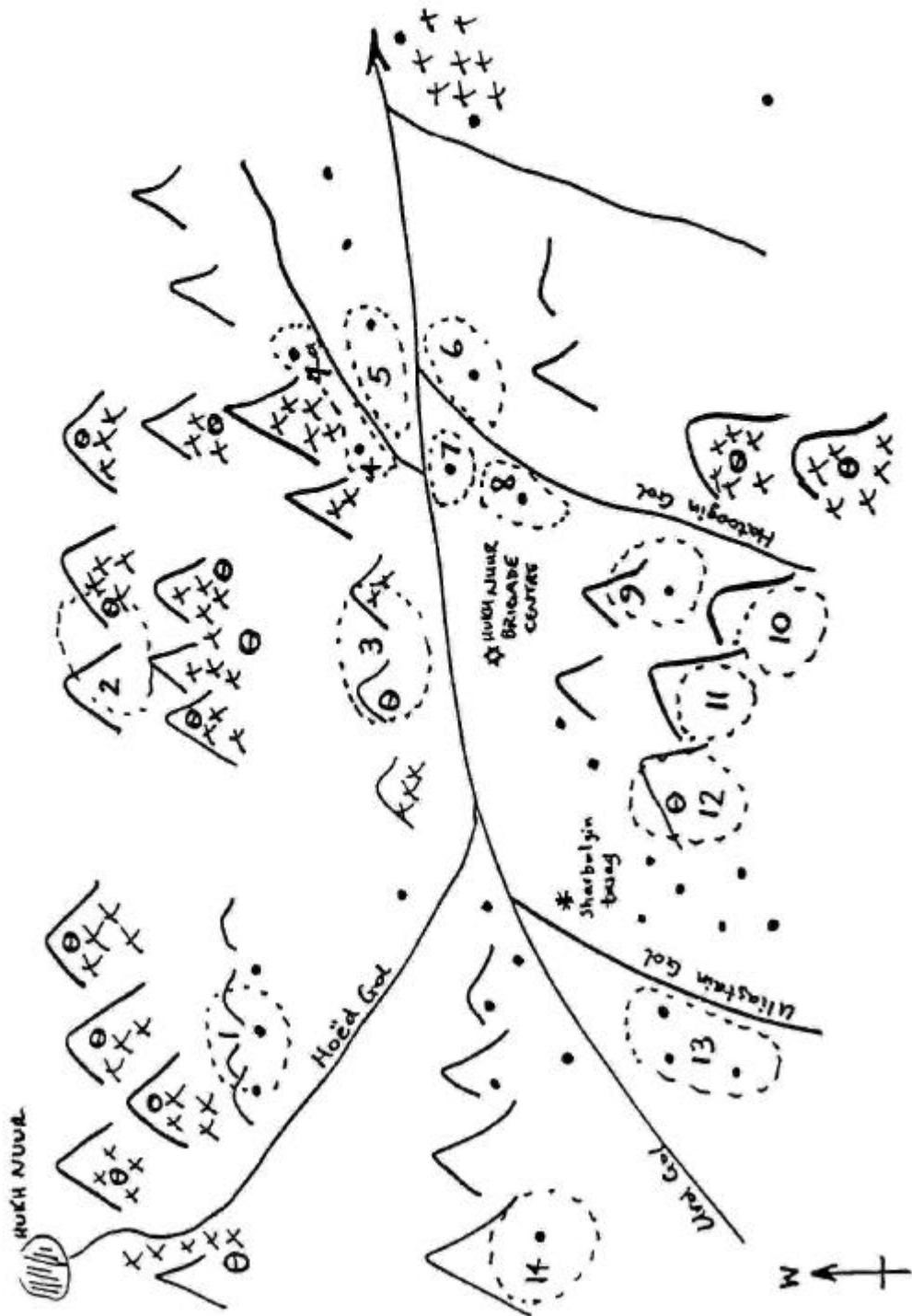


Figure 3. Hukh Nuur Brigade: Women's Map of Grazing Resources

KEY	
Name of Area	Comments
1. Nairin Ee	Poor grazing
2. Udam Holois Dewar	Bad for rearing lambs
3. Hfionol Bolong	Increased incidence of sheep parasite
4. Buldagarde Bolong	
4b. Awood Bolong	Unsuitable for pregnant animals
5. Arlin Tarich	Increased incidence of sheep parasite
6. Marnat Bolong	Unsuitable for pregnant ewes, calves sometimes die, spring sheilers are old
7.	Increased incidence of sheep parasite
8. Hooogin Sahr	Calves sometimes die
9.	Sometimes poisoning from new plant growth
10. Sharbolog	Foliage of sheep
11. Tsholoo Tolrol	Low fertility
12. Maaofin Owoe	Increased incidence of sheep parasite
13.	Calves sometimes die, eg. 1989
14.	Poor grazing
e	Winter shelter
.	Spring shelter
xx	High quality grazing
o	Poor grazing (higher incidence of disease)
.	Summer pastures



## Preference ranking of grazing resources

A pairwise preference ranking was conducted with two male herders to compare the grazing qualities of the territories of the five brigades in Ih Tamir *sum*. This exercise helped the team to understand which characteristics of pasture areas herders consider to be important. It showed the important features to be access to water supply at all times of the year, good quality pasture and opportunities to make hay and shelter from snow and wind. The information collected during this ranking exercise was confirmed during a transect ride through the brigade territory.

## Seasonal production calendar

Figure 4 indicates the main seasonal pattern of production in Khukh Nuur brigade, along with variations in climate, incidence of diseases and labour. *Tsagaan Sar* marks the beginning of the Mongolian year. Soon after this comes the parturition season - the period of peak labour demand and also the time of highest mortality among young sheep and goats from pneumonia. It is also the time of peak demand for mineral supplements.

Supplementary animal feed is prepared during the summer months for feeding to animals in the winter and spring shelter. Men and boys cut the hay using scythes and women prepare *zodoi* (small hand-made balls of fodder) for young animals. After harvesting, hay is carried to and stacked in the winter shelters and stockyards. The date of moves between seasonal pastures are given quite precisely, since this is when transport is made available by the *negdel* for those who require it.

## Seasonal production variations and stresses in the Dornogobi Aimag

Figure 5 shows the major events and seasonal variations in the production calendar for Tsagaan Khutul brigade in the desert-steppe zone. Climatic parameters vary considerably from one year to the next. The diagram shows a relatively high rainfall and snowfall year to indicate the times when most precipitation falls.

Dry and variable ecological conditions require flexible management and mobility. In this dry Gobi zone most *suuri* make at least a dozen nomadic moves a year to ensure access to grazing resources over a large area. Mobility is most important during the summer period for fattening animals, when moves are usually made every two or three weeks. Autumn and winter are not difficult times of the year. There is rarely deep snowfall and temperatures do not drop low. Fodder supplementation is not usually required unless the depth of snow exceeds 10cm. The *negdel* and state will assist herders during periods of stress. For example, additional labour is brought in from the district centre to help clear snow, feed hay, transport hay or make protective coats for young stock.

The difficult seasons in Dornogobi are spring and summer. These seasons are very dry, winds are desiccating and what little rain there is falls late in the summer. At this time animals are moved regularly between *suur* sites. These are chosen primarily by the location of wells, and secondarily by the presence of surface water sources and salt/soda licks. Many areas of good pasture are unusable simply because they lack wells or other water sources.

Camels are rarely milked during the summer months as it is too dry. Camel herds are usually divided into two parts, calving in alternate years to ensure an almost continuous supply of milk. Similarly, nobody keeps milk mares during this season because they are suckling their foals.

Figure 4. Hukh Nuur seasonal production calendar, showing climatic variations, incidence of disease and labour requirements

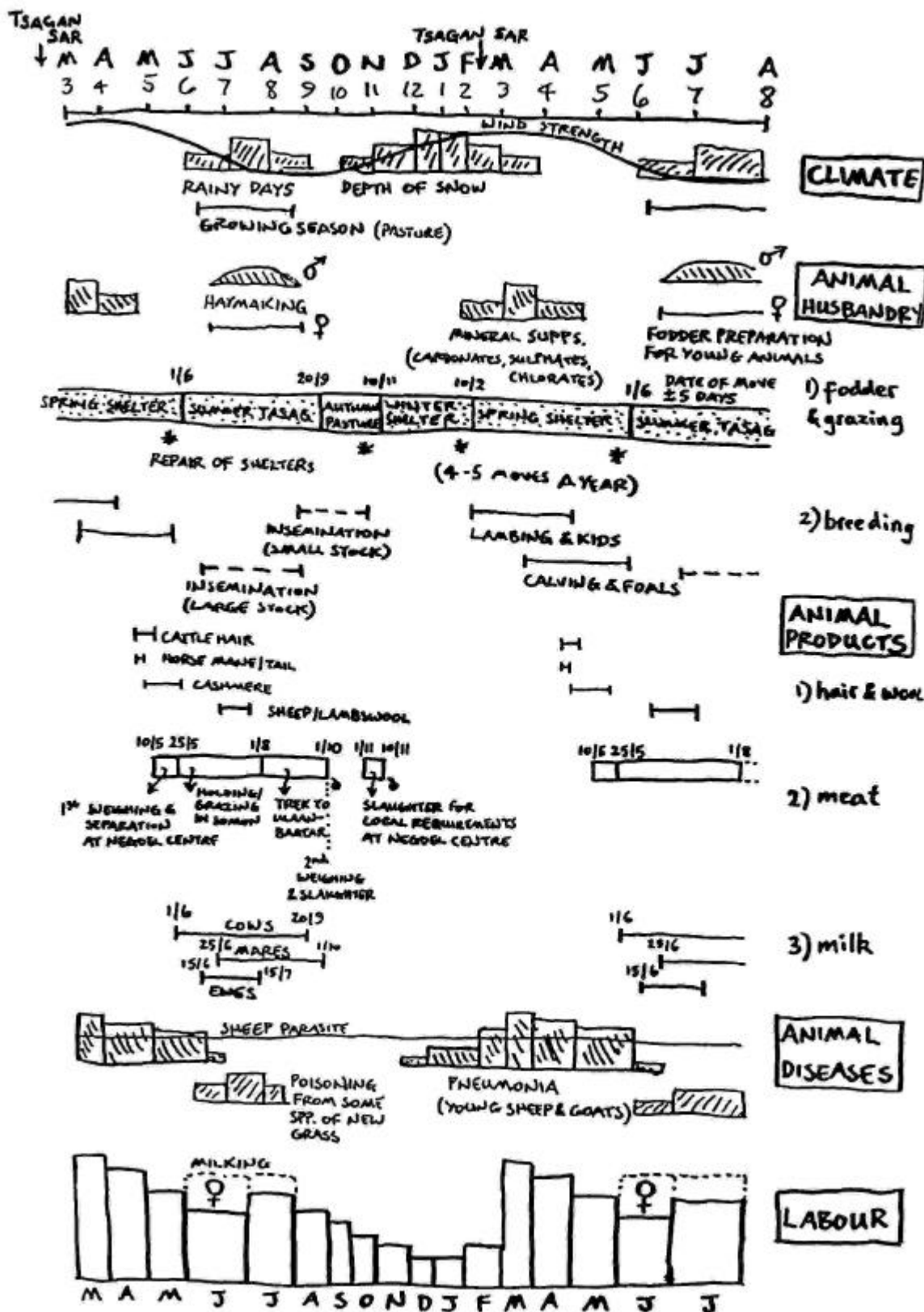




Figure 5. Tsagaan Khutul Seasonal production calendar

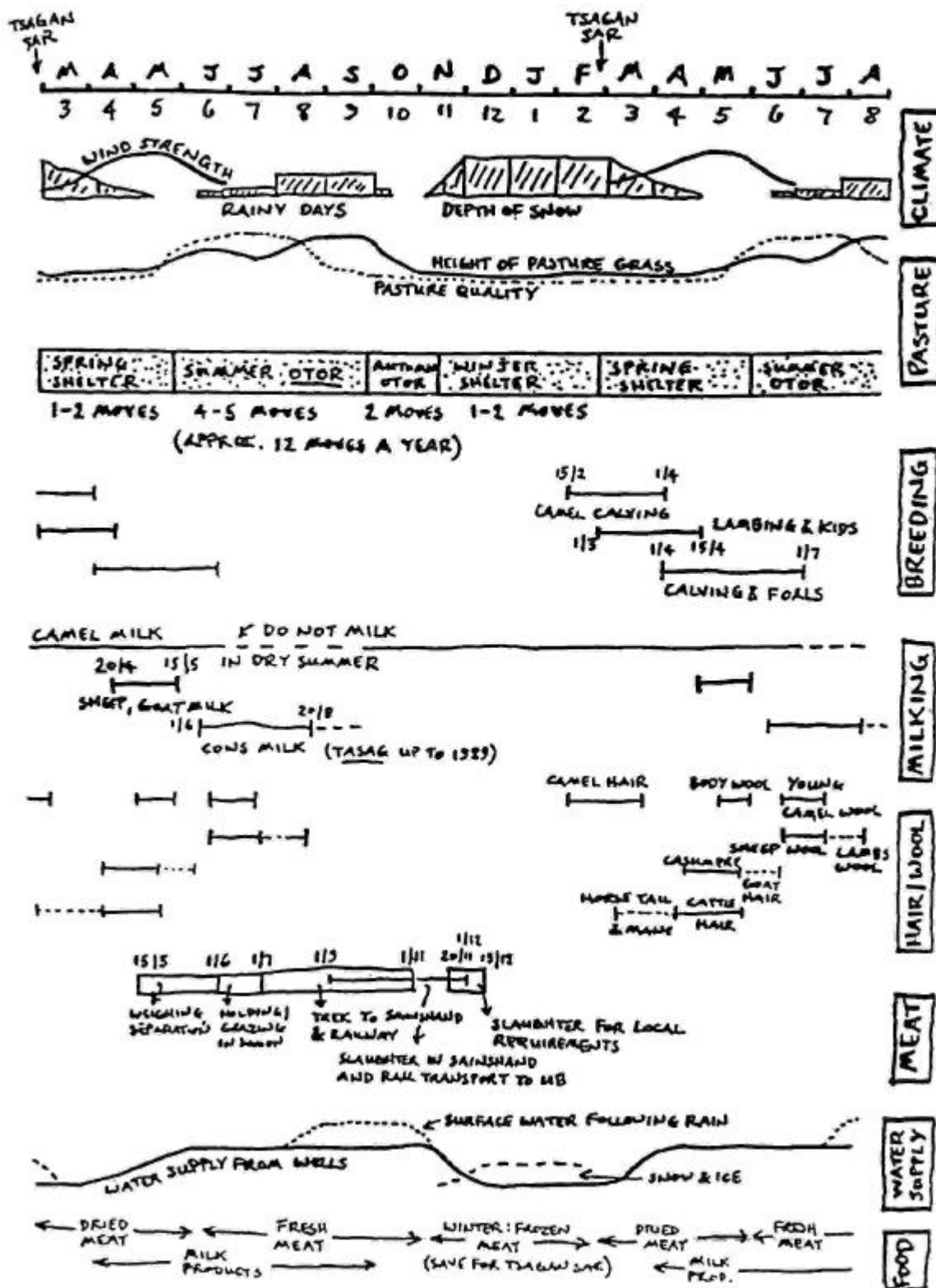
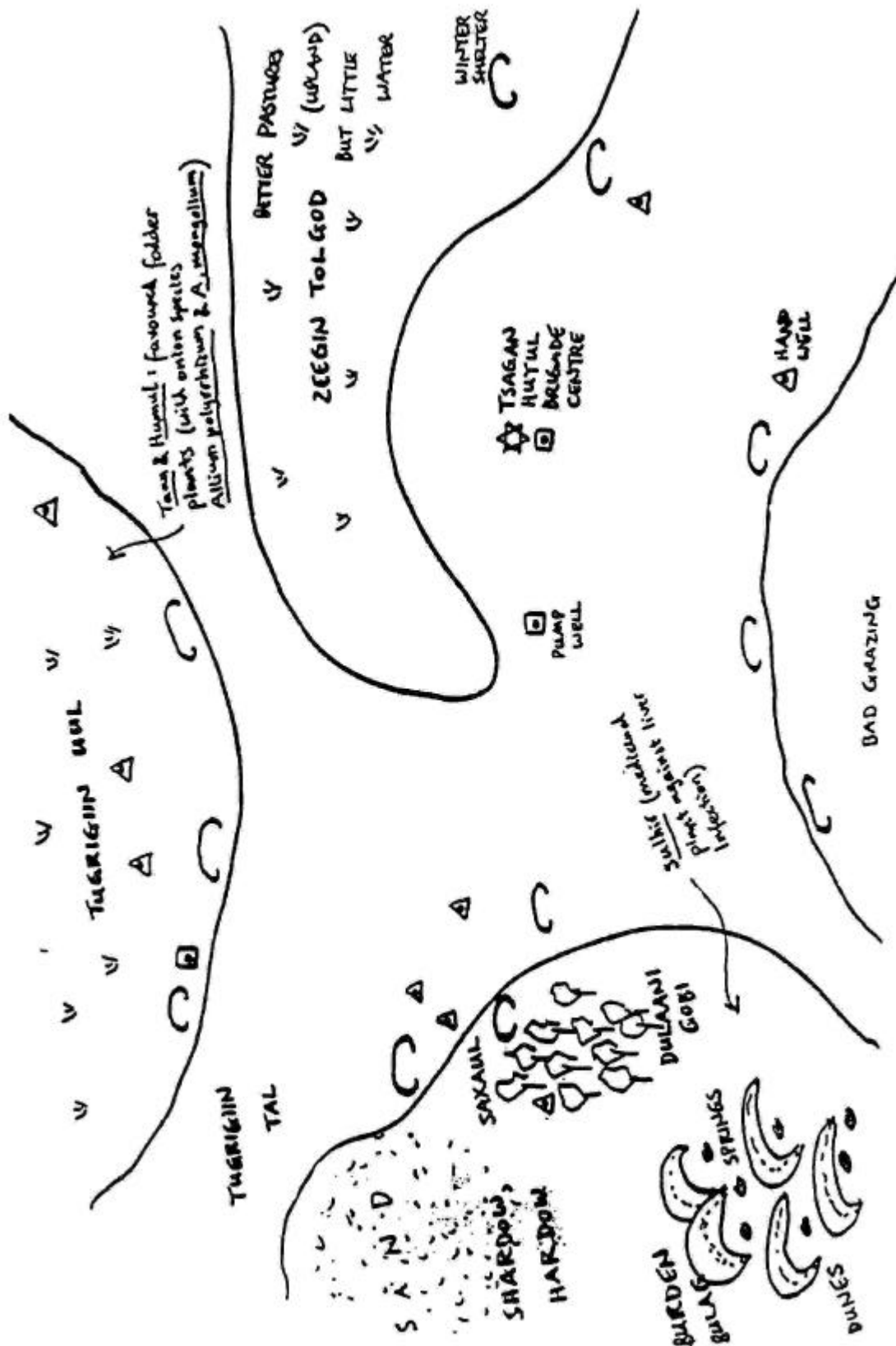


Figure 6. Sketch Map of Part of Tsagaan Khutul Brigade Territory



## • Access to key resources

In a risky environment like the Gobi zone, key resources such as valued areas of grazing and browse, or shallow wells, tend to be reserved for difficult periods. Flexibility in natural resource tenure agreements is vital for successful dryland management in the Gobi. To negotiate seasonal moves, especially those which cross *sum* or *aimag* boundaries, each *suur* normally informs the *negdel* chairman of their preferred grazing destination. They then place a bid for it, usually following a reconnaissance visit to assess pasture quality. On this basis the chairman decides which *suuri* will go where.

A brief case history of how herders in Tsagaan Khutul brigade have used these resources in recent years is presented in Figure 6. This is a map drawn by Choisureen and Tumurhoeg. It shows an area of sand dunes located in the far west of Tsagaan Khutul brigade territory. The key resources in this area are as follows:

- The sandy hills of Shardow and Hardow;
- The surface water springs of the dune area, known as Burden Bulag; and,
- The saxaul tree (*Haloxylon ammodendron*) grove of Dulaani Gobi.

The whole area is avoided during the summer when it is too hot and dry, but it provides valuable resources during difficult winters. Burden Bulag is particularly valued for the warmth and shelter provided by the dunes in winter.

Saxaul is valued as browse for camels and, in exceptional circumstances, for other animals. Even camels generally only browse it during a rainy spring when green shoots emerge. By the summer the leaves are too dry. During a very hard winter when snow covers the ground camels may graze it as a last resort. Saxaul is also used for shade by small stock and the dead wood is used for fuel.

Band and Tuvdendorj recalled a recent harsh winter with 30-40cm snow in much of Tsagaan Khutul territory when a number of *suuri* moved to this area of key resources. Unfortunately, there was high mortality amongst animals during that winter so the

same group moved to Argalin Uul in the neighbouring *sum* of Orgon. However, another group had also decided to move here because of the better quality pasture (steppe-type grass rather than short Gobi vegetation). There has been a dispute over this land since the mid-1970s when new wells were sunk to improve water supply. The *aimag* administrations were brought in to supervise migration to the area. They made agreements that the pasture could only be grazed if there was no rainfall and on condition that they returned as soon as possible to their normal grounds.

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