

GRASSLAND DEVELOPMENT IN CHINA: USE OF THE PARTICIPATORY RURAL APPRAISAL (PRA) RESEARCH METHOD

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Abstract

Most of China's grassland animal system, which was transformed over the 4 decades following liberation in 1949 from a nomadic system to a semi-nomadic one, is currently partially sedentary and partially semi-nomadic. An explanation of the transformation process and impact on the ecosystem is provided for a northeastern section in the province of Inner Mongolia along with the historical and cultural setting. Participatory Rural Appraisal (PRA), the methodology used in an earlier paper by the authors to determine the historical transformation and study the impacts, is explained. This same methodology was used in an analysis of the area in the summer of 2000, and is presented in this article.

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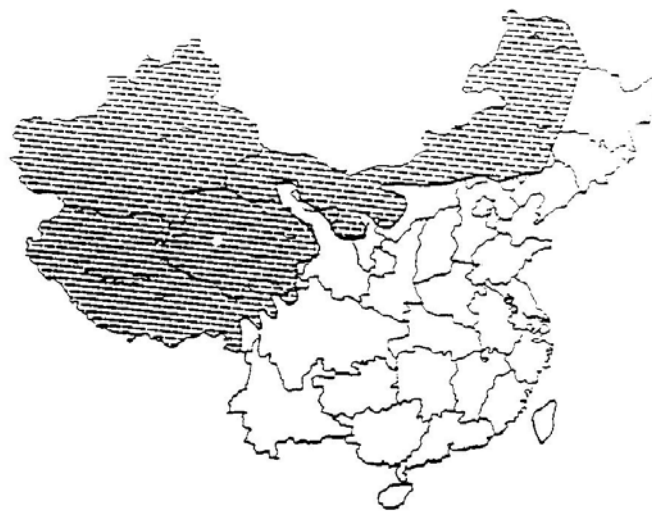
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Introduction

The economy of China is divided into three zones or geo-geographic regions; East, Central and West. There are considerable differences between them in terms of labor productivity, income and other social and economic indicators. The west is the poorest region and has become the focus of most current regional development policy (Yao, 2000). Much of this region, and also the northern part of the Central region—including Inner Mongolia which has recently been designated part of the Western Region by the central government due to its socio-economic features—is grassland. The low agricultural productivity of grasslands and general lack of water and other natural resources is one of the reasons for economic disparity between the three regions. One problem facing planners and development strategists is what to do about the grasslands, and that problem is the focus of the research reported on in this article.

China has one of the largest grassland and pasture areas in the world, covering nearly 2.9 million km². A wide variety of grazing land environments are included, from tiny pastures in the agricultural areas comprising less than one hectare on which a farmer might keep a few sheep or goats, to the roadside communal areas where a producer grazes a half dozen dairy cows or milk goats, up to the vast windswept areas across north China. Equally important are the deserts and rangeland of Western China and the mountainous regions, home to minority ethnic groups and yaks. Roughly half of China is designated as pastoral and grassland, as opposed to agricultural area (Simpson et al. 1994) (Map 1). The grasslands *per se* are immense, accounting for about 30 percent of the nation's total area. About 2.4 million km², or 85 percent of China's grassland and pastures, are in the temperate zone (Zhu et al. 1985).

Map 1. Pastoral and agricultural areas of China, 1990



Historically, the major production system in the grasslands has been nomadic animal management, with a small proportion of the population being semi-nomadic. Over time, and especially since China was opened to the outside world in 1978, there has been a major emphasis on settlement of herders into villages or into houses, i.e. an ever increasing semi-nomadic lifestyle in which livestock owners live in houses part of the year.

Curiously, the sedentarization that planners had envisioned of herders living in houses during winter and spring months, and then following their animals the rest of the year, has changed in a substantial number of pastoral areas. What actually has happened is that herders realized the negative impact of the sedentarization on their grassland resources, and thus

developed a pattern in which they live in yurts during much of the year returning to their houses in March, i.e. the beginning of spring. This is the calving and lambing season, and thus the critical time for good nutrition, shelter and care of young stock. Additionally, this system meets their water problems. Furthermore, they return to their yurts in the middle of June, which by then is on summer pasture, or remain at their sedentary location if they don't have special summer pasture. After going *Aoter* (meaning in Mongolian the short time and fast fattening by frequent moving on pastures with better range conditions), the herders then begin to graze their livestock on autumn pasture. Statistics are not available, but it appears that the majority of livestock in the rangeland areas now fall in this semi-nomadic system.

A critical factor for analysis of grassland production, and pastoral systems in particular, is that they are diverse—and for very good reasons (Simpson, Xu and Miyazaki 1994). There is no one solution to the so-called "pastoral problem" of overgrazing and relatively low offtake rates per ha, but there are a number of viable, logical interventions that could result in considerable improvement in productivity. These are discussed later.

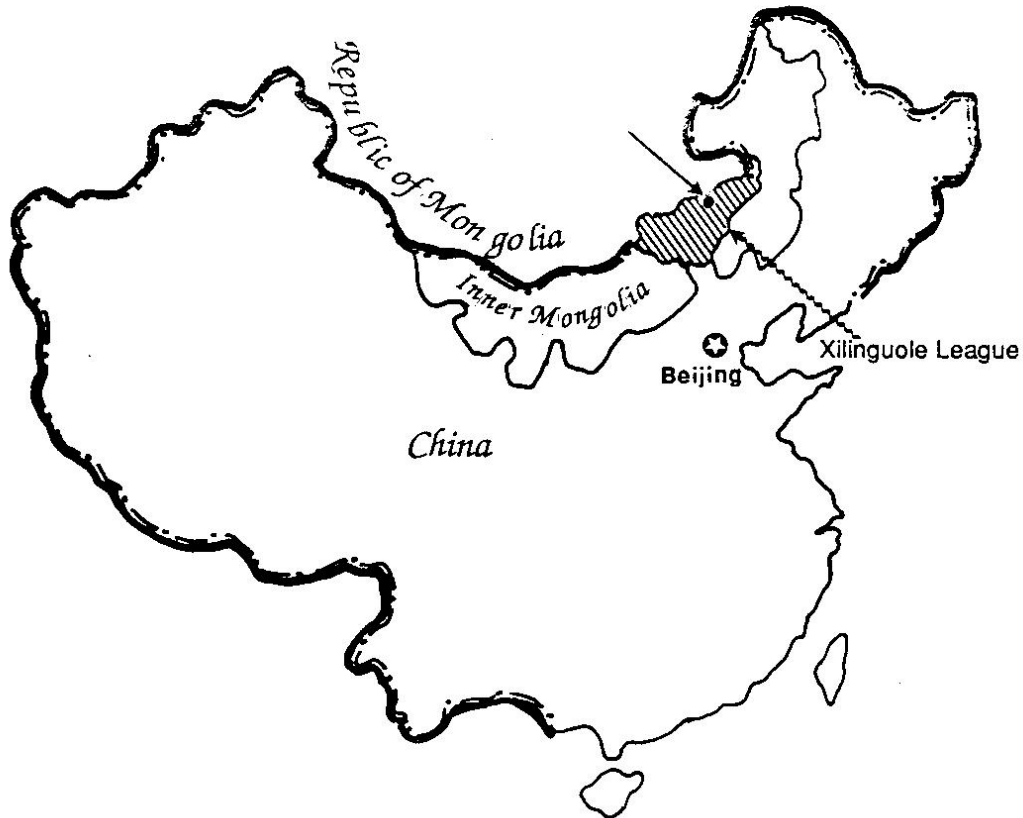
In an earlier article (Li, Ma and Simpson, 1993) a case study was provided of one village in Inner Mongolia which was transformed over the four decades following liberation in 1949, from a nomadic system to a semi-nomadic one. A summary of that transformation process constitutes the beginning of this article with the purpose of explaining how a substantial portion of the semi-nomadic system in China operates. A second purpose is to provide information on changes that have taken place in the past decade to highlight the transformation process, the impact on the ecosystem, and alternatives for some next steps in economic development of these low-income areas. Additionally, an objective is that this article serves as a basis to promote greater regional productivity of the grasslands, long-term sustainability of the ecosystem, increased incomes to producers and national development. This article's regional focus is north-eastern Inner Mongolia. However, the findings have direct implications and relevance for much of China's Western region, an area now targeted for economic stimulation.

The Case Site

The case study site for the 1993 article, and the current study carried out in July 2000, is Hurqige *Gacha* (Village), a former production brigade during the commune time between 1958 and 1982. It is one of four *Gacha* of Shamai *Sumu* (township), also a former commune located in Dong Ujimqin *Banner* (county), Xilinguole League (prefecture), Inner Mongolia

Autonomous Region (Map 2). This Gacha of 869 km² is on the border between China and the Republic of Mongolia. The average annual rainfall is about 250 mm, and the vegetation is typical Steppe grassland.

Map 2. Location of the research site



In 1992 at the time of the first study there were 91 households and 516 people, including Han immigrants who had moved to the *Gacha* in the early 1960s. Actually, they have lived at the banner town since the middle 1980s, but still keep their official registration in this *Gacha*. As of July 2000, there were 103 herder households in the *Gacha*. All were native Mongolian herdsmen except for 2 Mongolian immigrants. Besides those households, more than 80 short-time immigrant herders or herder households from a neighboring banner were employed as herdsmen to look after the flocks of sheep and goats year-round. Most herder households in this *Gacha* hire such herdsmen.

Case Site Research Methods

The methodologies used in the study reported on in this article are the participatory approach to development study, integrated with sociology and economics. Selected methods of Participatory Rural Appraisal (PRA), such as group and key informant's interviews, mapping of the seasonal nomadic movement, wealth ranking, seasonal calendar, historical profiles on changes in land use patterns, trend analysis for grassland condition, daily routines and activity profiles (especially for women) were used. In addition, Farming Systems Research (FSR), causal diagramming, etc. were also main tools used in the survey. Forty-two households were interviewed in the first survey (1992-93), including 39 herdsmen living in the *Gacha*. The remainder were Han immigrants. The results from those detailed surveys were updated in July 2000 by this article's authors using similar techniques although only 25 informants, 10 households and detailed interviews with village leaders and office officials were conducted.

The rationale for the research methods is that the growing awareness of the failures of conventional development approaches to meeting the needs of resource-poor people has led to the exploration of alternative methodologies for investigating resource management issues; and for planning, implementing and evaluating development activities. Participatory approaches, such as Participatory Rural Appraisal (PRA), offer a creative approach to information sharing, and a challenge to prevailing biases and preconceptions about rural people's knowledge. Advocates of participation argue that the production of knowledge and the generation of potential solutions should be developed with those whose livelihood strategies form the subject for research.

The methods used in PRA range from field-based visualization, to interviewing and group work. The common theme is the promotion of interactive learning, shared knowledge, and flexible, yet structured analysis. These methods have proven valuable for understanding local perceptions of the functional value of resources, processes of agricultural intervention, and social and institutional relations. Furthermore, participatory approaches can bring together different disciplines, such as agriculture, health, and community development to enable an integrated vision of livelihoods and well-being. Participatory approaches also offer opportunities to mobilize local people for joint action. By participation, a side benefit is that the local rural population can raise their sense of ownership and commitment to the process of development planning, and implementation. In this way programs can produce much more

sustainable impacts. This is particularly important to the development of western China during this fast transition period to a market economy in which there is still a strong tradition of the planned economy approach, especially at the local government level.

Evolution from the Nomadic Pattern

The native Mongolian herdsmen in Hurqige *Gacha* had traditionally followed a long-distance nomadic movement pattern as late as 1956 when the *Bage* (a synonym of *Gacha* in Mongolian) was formed and its boundaries fixed. In 1952, a work team was sent by the banner government to the Hurqige area to teach herdsmen to read and write. Herdsmen continued a short-distance seasonal movement within its boundary until 1985, at which time they changed into a semi-nomadic pattern. Accompanying the evolution of the movement pattern were changes in institutions of administration and production.

In 1957, the "collective movement" was introduced into this area. By 1958, all animals had become the property of collectives, which paid the owners for the animals during the following 25 years. During the commune period, the brigade was responsible for production and financial management as well as development planning. The brigade leaders made arrangements for seasonal use of grazing land, allocation of labor and money for production, selling products and distribution of income among the Accumulation Fund (for investment), Public Welfare Fund and the households. The households got their income based on their Labor Points (Work Score) gained mainly from looking after the animals.

The nomadic movements were frequent in 1960s. The moves were also shorter (about 2-4 km) within each seasonal pasture, usually a total of 6-8 times (or more) each year. Herders stayed in one camp (i.e. physically took down their yurts and moved them) no longer than two months. But, due to the equalitarianism in income distribution and loose management during the Cultural Revolution, they moved less and less, down to 4-5 times every year during the 1970s.

Since 1985 the seasonal movement in Hurqige *Gacha* has changed into a completely semi-nomadic pattern. Several factors have contributed to it, and intervention from the regional and local governments can be traced back to the 1970s. The government considered nomadism

as backward and something to be gotten rid of. Originally, they encouraged the herdsmen to build permanent houses and shelters in winter pastures and follow a nomadic mode during the warm grass-growing season. However, due to water resource shortages or limited grazing land, and the critical time for calving and lambing being in the spring, houses and shelters were actually built in the spring pastures in most of the pastoral areas in Inner Mongolia. The case of Hurqige *Gacha* provides a typical representation not only of Inner Mongolia, but also of a substantial portion of the northern grasslands across China. Apart from the general reasons mentioned above, one in particular is that former summer pasture with water resources (about 200 km²) was returned to Sunite Pastoral Farm (a commune) in 1986. That farm was forced to move from the national border area in the early 1960s and only returned in the early 1980s to become a new *Gacha* (Bayinaobao *Gacha*) of Shamai *Sumu* in the middle 1980s. What this means is that the herdsmen of Hurqige *Gacha* had to remain all spring, summer and early autumn in their former spring pastures.

In 1985, the herdsmen obtained utilization rights for the grassland after getting back ownership of the animals in 1983. The certificates of use right clarified the area size as well as the boundaries. Beginning in 1987 the households started to build houses, shelters, pens and above ground bunkers for hay storage. By the end of 1992 all the herdsmen had built facilities and also had 35 to 200 ha of fenced pasture in their spring camps. More than 90 percent of them built houses, mainly of brick with tile roofs. There is now 0.5 - 1.5 km between the permanent homes in those spring and summer “camps.”

The herdsmen remain sedentary from the middle of March to the end of August to carry out the spring and summer activities. Then, the men or young couples of the families drive the flocks of sheep and goats to the winter pastures for 10 - 20 days for *Aoter* fattening (going *Aoter* in Mongolian means the short time and fast fattening by frequent moving and less watering in the pasture with better range condition). The cattle remain at the permanent residences. After returning back to their permanent homes they herd their animals 2-4 km from their houses, but not more, otherwise it will be too far from water resources. In late October, when snow is available for water, they move to the autumn pasture and stay there until the end of December

when the snow cover becomes too thick for animals to graze. Then, they move to the winter pastures where grass is more available.

The new arrangement for animal ownership and grassland utilization is the result of the reform policy. The commune system was dissolved in 1983 and replaced by *Sumu* (for commune), and *Gacha* (for brigade). Village committees took the place of the former brigade committees, and play a greater role in service than in administration. For example, the leaders look for marketing channels for the herdsmen's animal products now that marketing has become decentralized and prices freed. They negotiate the price of hay for herdsmen with some Han immigrants who come back to the *Gacha* during the mowing season. The *Duoguilun* (group in Mongolian, an organization existing also during the commune period under the brigade) has been reorganized based on the distribution of herdsmen's homes. Within the group, clipping, washing, AI, etc. are organized. *Gaote* (which in Mongolian means a pair of herder households staying and moving together to share the task of looking after a flock of sheep and goats) plays a more important role than before. The two households are usually brothers, or father and son. They put their own animals together to form one flock of sheep and goats, one herd of cattle and another of horses. In this way they can save labor and better utilize infrastructure.

Impacts of the Change from a Nomadic to Semi-nomadic pattern

All herdsmen interviewed in 1992-93 were positive about changes from the shift to a semi-nomadic system. For example, that the sedentary lifestyle had improved living and working conditions, strengthened production stability and provided greater resistance to natural disasters. But, on the other hand, the herdsmen were also aware of some negative impacts. Most herders interviewed in 1992 and 1993 considered that the grassland in Hurqige had deteriorated compared to the 1940s, and it was already worse in the 1970s—the Cultural Revolution period—than in the 1950s. Virtually all the interviewees attributed the reasons for deterioration to the high animal population and over-grazing. Change toward a dryer climate than in the 1950s and 1960s ranked second. A problem found was that animals graze the pasture in sedentary areas during the entire spring and summer (which totally covers the grass growing season) rather than being moved periodically. Herdsmen said that the grasslands were almost

bare in May and June (before the rainy season) in most years.

Most people believed that animal performance, especially resistance to bad natural conditions, had decreased due to reduced exposure to natural hardship and worsened grassland nutrition. They mentioned that the sheep in Mandalatu *Gacha*, where snowfall and cover are always heavier and thicker than in Hurqige, are more tolerate to severe winters. Nevertheless, in general, sedentary life has noticeably reduced animal mortality and increased the stability of animal production. The other important factor has been increased incentive through privatization. The animals belonged to the commune in 1970s, while by 1985 they were privately owned.

The living and working conditions of herdsmen were considered to have greatly improved due to their semi-sedentary life and other infrastructure improvement, especially for women. Most households had tractors which the men drove to fetch water and animal droppings (used for cooking fires) rather than this just being women's work. Wives did not milk cows as much as before because the cows are on their own and the crossbred calves needed more milk. In the evening, sheep were often enclosed in pens, which prevented access by wolves so that wives could sleep peacefully with their families rather than getting up during the night to check on their livestock.

Another important impact on attitudes and behavior of herdsmen was not directly caused by the nomadic pattern change, but rather by changes in the land tenure system. As a result, herdsmen had developed a confidence in their utilization rights for grassland, and no longer worried about new families getting land from the *Gacha*. Ironically, and in contrast to views about degradation of pasture quality, they said they wanted to maintain their assigned pasture in good condition for the upcoming generations. In the previous five years they had spent 15-25 percent of their total expenditures on fencing, building shelters and houses, and developing wells. Rapid increases in animal product price and income in recent years also helped. The result was that total *Gacha* expenditures increased four fold from 1985 through 1992. Nevertheless, all agreed during the 1992-93 interviews that there was still an urgent need to introduce and adopt appropriate technologies in the new semi-nomadic pattern to stop grassland

deterioration, and to keep the ecosystem and pastoralism oriented to a sustainable development manner.

Case Study Site Interviews in 2000

The PRA survey carried out in July 2000 not only served as an update on understanding the changes in the institutional setting and nomadic movements in the Mongolian pastoralism areas, and the impacts on the grassland ecosystem and Mongolian herder households' culture and life, but also traced the new changes and challenges the herder households are facing. From Table 1, it can be determined that income disparities between households widened from these in 1992/93. Informants used the number of livestock as the indicator of wealth status. Thirty-six households (about 1/3 of the *Gacha*) had less than 500 livestock. Fifteen of them had even less than 300, a number so low that it results in a difficult life considering the increased annual expenditures in living and production. The informants attributed the growing differences mainly to the capacity of individual herder's planning and management in production, income and expenditure. The stage in a family's life cycle also contributed to the disparity. Because the grassland is limited, new and young families have less grassland and livestock per capita than other households.

Table 1. Results of wealth ranking of herder households in Hurqige *Gacha* (by Mr. Danbi, Da Alaha and Batemengke)

Category	Households	Livestock	Features and reasons
1	31	800 – 2,000	With the same environment and conditions, they are good at management, arranging/planning the inputs and income. Therefore, they could expand production scale.
2	36	500 – 800	Similar with category one, however, the population increased, new families were split, pasture reduced, which limited the production expansion.
3	21	300 – 500	No good at management, planning & arrangement of inputs and income. Some of them engaged in the activities other than pastoralism in part time.
4	15	150 - 300	Poor at management and arrangement of income and expenditure. No plan for production and living. Some of them are lazy.

The following table (2) shows the investment, income and expenditures of two households representing the 1st and 2nd categories of households respectively.

Table 2. Expenditures by interviewees, July 2000

HHhead	No. ca	Proper stockin g rate	Current stockin g rate	Infrastructure investment since 1991	Machinery investment	Average of 10 years	Income 1999	Production expenditure	Present gifts	Seeing doctor
Enkebayar	6	953	1,717	132,600	53,000	18,560	80,650	27,000	5,000	n.a.
Suhe	4	n.a.	n.a.	40,000	60,750	10,075	32,740	15,327.76	n.a.	5,000

From this it can be concluded that:

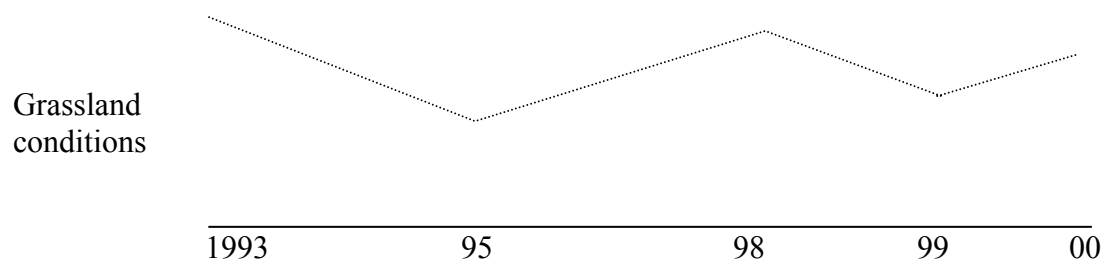
- The better-off and upper middle income households have considerable capacity for investment in housing, animals shelters, and pens, fencing of pastures, machinery, etc. accounting about 20 – 30 percent of their annual income (1999). The two households had about 3,000 and 1,000 mu (15 mu equal 1 hectare) or 18.9 percent and 13.1 percent, respectively, of their grassland fenced.
- Some of the young families, such as Mr. Suhe, have unnecessarily high investment in machinery, showing poorer planning ability as mentioned by the informants.
- Production expenditures were quite high, especially for young families with fewer livestock.
- Presenting gifts among relatives was a quite high proportion of living expenditures for herder households. Some households had high medical expenses, which often contributed to the lower wealth status of those households.

This section of the interviews revealed that about 50 percent of herder households in the *Gacha* have the means to significantly improve their grassland and animal system. But, information on appropriate technological methods and management knowledge/skills are still missing, as they were 7 – 8 years ago. Besides these, it was also found that current grazing pressure was much more than the proper stocking rate identified in 1985 when grassland use rights were allocated. The results of summer interviews showed that, considering the proposed fall sales of animals, grazing pressure would be reduced. However it would still be much more than the proper stocking rate, the current one of which should be lower than the one identified in 1985, considering the grassland deterioration since then.

The trend in range conditions since 1993 was evaluated using time line analysis and causes as analyzed by key informants. It was found that although general conditions had fluctuated, it had mostly decreased. The conditions of livestock production and herder

households' life were evaluated at the same time (Figure 1).

Figure 1. Situation analysis (by Mr. Da Alaha and Enkebayar on July 16, 2000)



Reasons for fluctuations and decreasing range conditions:

- Changes were mainly due to drought. The stocking rate would not be a problem if it rained during May to Aug, otherwise it would.
- Grasses in dry years cannot conserve rainwater. There is no longer pasture for hay. It was allocated to individuals (in the east part). Hay making is now done individually.

Livestock condition:

- Production performance has decreased somewhat (in fattening).
- Animal survival rate has increased due to the improvement of infrastructure and epidemic prevention (a kind of responsibility system is applied for the latter one).
- Livestock numbers have increased.

Living conditions of herder households were summarized as:

- Income and expenditures have increased (infrastructure construction and machinery in production, presenting gifts, etc.)
- Taxes and levies have increased.
- Workload basically remains the same as in 1993.

In terms of dealing with grassland deterioration, the herder households have taken measures to change the movement pattern. Compared with seasonal movement patterns, it was found that herders now remain *less* time at their sedentary locations. Instead of staying at it until October, with only 10 – 20 days of break during going *Aoter* from late August to early September, those households with summer pasture return to their yurts at the middle of June on summer pasture. After going *Aoter*, the herder households move on to autumn pasture to graze their livestock until the middle of November when they move to winter pasture. In other words,

it means the grazing pressure on the spring pasture where the sedentary house is located has been reduced.

It was also be found that although most of the herder households hire labor to look after the flocks of sheep and goats all year round, they are still busy at other activities that are the most important to their income generation. They themselves look after the flocks of ewes/female goats with lambs and kids in lambing season. They take care of cattle and horses all year round, including calving. They do all of the veterinary prevention for livestock and harvest of products such as cashmere and wool.

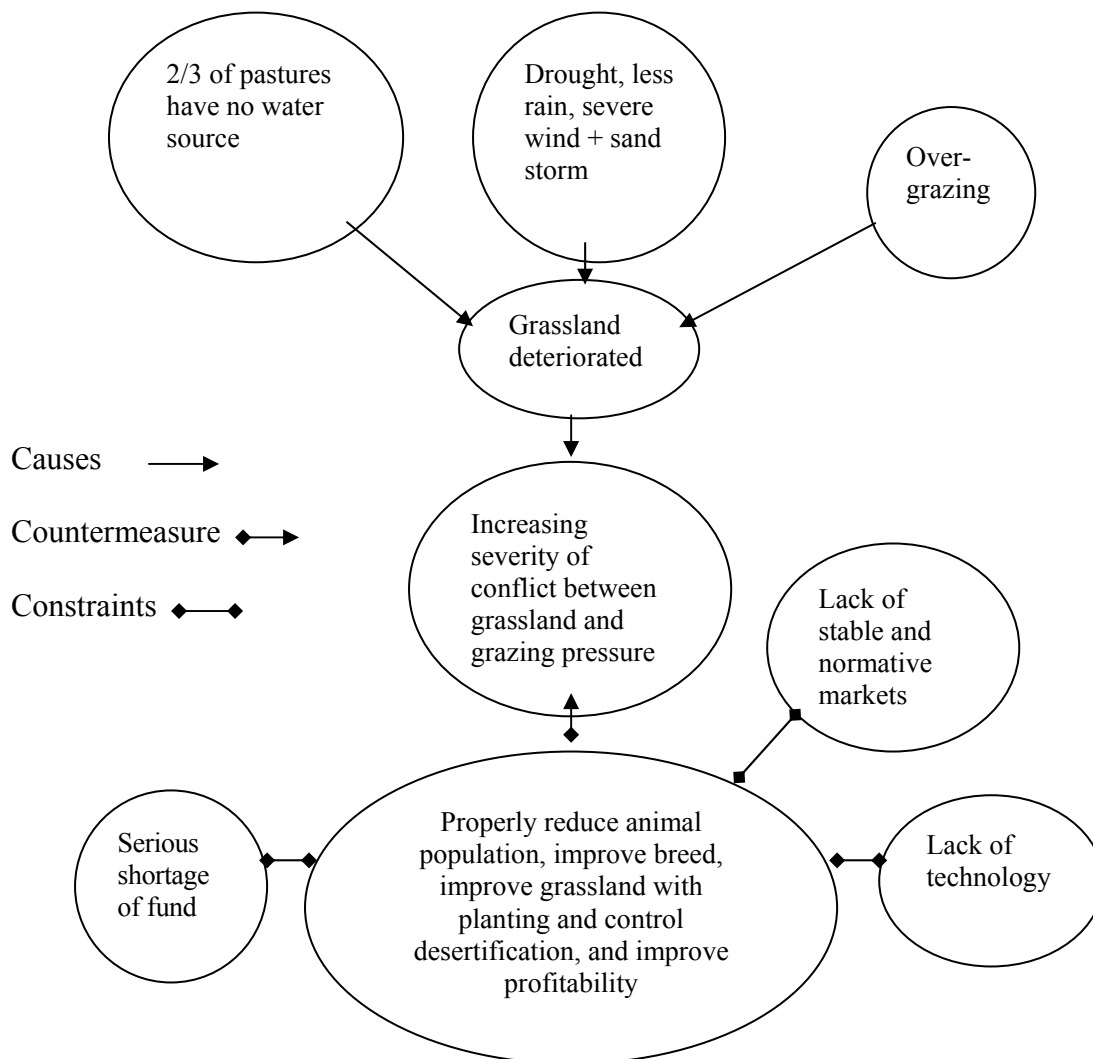
Following is a problem analysis made by group interviews, moderated by Li Ou on July 17, 2000. The main points are instructive to really understand more about the herder's daily life. It was found there was:

- A shortage of water
- Overgrazing
- Degraded grassland
- Lack of funds
- Lack of technology
- Lack of marketing channels
- A heavy burden of taxes and levies, exceeding the national regulation (5% of net annual income per capita).
- A few herder households that hire people to look after their livestock rather than doing it by themselves although they have relatively few livestock.
- Very high herder's costs of boarding their school children in town (renting a house and school fees) are very high because they do not have a registered permanent residence in town. They like children to study in town to build a better academic foundation, especially in Han Chinese, mathematics, foreign language, etc.
- A low quality of school at the *Sumu* although the education law stipulates that elementary schooling should be carried out locally.
- Among the young (< 30 years old) few or no skills for non-pastoralism work, and they are low in education.

From the following causal diagramming, (Figure 2) more awareness of the herders on the grassland deterioration and causes, and solutions, can be found. It was determined that Mongolian herders have the ability and potential to analyze their problems and find solutions. Outsiders should facilitate the process, but not instruct them to do this and not to do that. PRA provides the approach and methodologies to the process. In this way, herders will hold a

sense of ownership and commitment over the planning results and actions of the process. In addition, considering all the relevant factors, some off-pastoralism activities might be alternatives to sustainable development of the grassland area and animal systems in the western area (including Inner Mongolia) of China.

Figure 2. Problem analysis (by Mr. Danbi, Da Alaha and Batemengke, moderated by Li Ou)



Conclusions and Discussion

From the analysis made by the group of informants, it was concluded that the senior herders and former *Gacha* leaders were worried about the attitude and behavior changes of the young herders towards labor work, which might result in loss of Mongolian herders' culture. They want their children to get more education, and for some to find jobs outside the grassland area and pastoralism, an attitude that is in contradiction with their concern about culture loss. This is quite interesting considering that such cultural transition conflicts are happening all over the world in development situations. They are expected to increase as the west of China receives increased economic development priority.

It can also be concluded that when the methods and tools of PRA are thoughtfully selected and systematically used, the current situation, problems, needs and countermeasures can be well defined and analyzed within a short time. The changes and differences in space and time, and among herder households can be easily and clearly found and from them better research and development planning can be organized.

Finally, Mongolian herders are aware of the negative impacts of livestock over-populations on their grassland resources. But, livestock are their only source of income. Considering ever-increasing production and living expenditures, it will be difficult to reduce the number of livestock to the proper stocking rates too sharply and fast. Rather, alternatives should be found to meet additional income generation.

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