

COMMUNITY BASED PASTURE LAND MANAGEMENT IN MONGOLIA

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(Mongolia)

1. Introduction

Mongolia is situated between the Russian Federation and the People's Republic of China. The terrain is landlocked mountainous and isolated from the sea at minimum 1600 km distance from Pacific Ocean others even greater. The country is located at a relatively high altitude, and 81.1% of its territory is located at 1,000 meters above the sea level, 50 % - 1,500 meters above. The average height constitutes 1,580 meters.

The temperature values fluctuate greatly not only within the year but also diurnally. The climate is harsh continental with poor precipitation. According to the last 60 years meteorological observation an average annual temperatures are around 8.5 °C in the Gobi and -7.8 °C in the high mountainous areas. The extreme minimum temperature is -31.1 °C to -52.9 °C in January and the extreme maximum temperature is +28 °C to +43.1 °C in July. The annual precipitation amount is low, averaging 200-220 mm and ranging from less than 50 millimeters per year in the extreme south (Gobi desert region) to 400 millimeters per year in limited areas in the north. Most precipitation occurs in June, July and August; the driest months are from November to March. [1, 11,16, 17, 26]

In Mongolia, all natural zones such as high mountains, valleys between the mountain ranges, wide steppes, Gobi desert and semi-desert zones are combined. The territory is surrounded by high mountains that filter both from the northern and western cold air mass and from Pacific moisture air mass.

2. Land degradation & Desertification

Mongolia is situated in latitude 41° 35' to 52° 09' north and in longitude 87°44' to 119° 56' east, occupying 1 million 564 thousand square km area of which 8.3 percent is covered by forest, 80 percent is pasture and only 1 percent remains for cultivated farm land. About 90 percent of the total area is desertification potential and 44.7 percent of it is considered as a desert and desert steppe zone. According to the study 78,4 percent of total pasture land has already degraded. [2, 20, 21]

Main causes to desertification could be an anthropogenic impacts which accelerates the process of land degradation created by natural impacts such as global warming, drought and climate change. These two factors are however interrelated, sometimes they are affecting each other positively, and the other times negatively. Human activities – as a factor of desertification, occur in the frame of natural dryness, causing negative impacts. [2, 5, 8, 19, 21]

Within those of anthropogenic factors animal husbandry has the strongest influence in throughout a year by its exploitation of pasture land that covers 80 percent of the total territory. Therefore, effective Pasture Land Management is the best solution in combating desertification.

3. Research objective and methodology

This presentation aimed to support the activities of developing a new reform in sustainable pasture land management action, land degradation and prevent land degradation process on the base of .

Foreign or country researchers, historians, and many scientific works, recommendations and methodologies have been used in writing this presentation. Over and above outcomes of several projects that are implemented under international or national organizations specifically those intended to advance the traditional land management policy on the base of ancient history have been studied and compared in this presentation. [2, 5, 7, 8, 9, 10, 11, 13, 14, 15, 16, 17, 18, 19, 24, 25, 26]

The author of this presentation was born and brought up among the herdsman. Therefore at an early age he has experienced the herders' life and learnt about livestock breeding, pasture land utilization and its management methods.

On the other hand the author has analyzed and assessed the Mongolian traditional pasture land management doctrine, information and herders inherited experiences in comparison with international modern pasture land management. [1, 2, 3, 4, 22, 23, 24, 25]

Over and above the presentation is focused on integrating the research results, observances with management policy of government, its decision and regulations.

4. Historical periods of Pasture land utilization

Land possessing system and its utilization history of Mongolian nomads falls into three stages in general:

From 400-300 b.c to the end of 1950s. Private or public owned animal husbandry system was dominated.

From 1960s to the beginning of 1990s. Pasture land has been owned by herder's collective (negdel) that is one of socialist type public owned farm system.

From the beginning of 1990s upto present. New era in land utilization sector for private owned animal husbandry has been established.

Let's discuss the features of these 3 periods in detail.

- 1. From 400-300 b.c to the end of 1950s.** Land has been utilized solely for pasture purpose since the animal has been domesticated. In these periods Mongolian economy was simply based on nomadic herder's farming. Hence, Mongolian land utilization system can not be compared with land possessing system of industry and

cultivation sector developed countries at these period. Land was the key factor in nomadic livestock farming existence and overall animal husbandry and pasture land are closely interlinked. Land possessing system commenced during feudalism period in Mongolia and land along with livestock has been feudalists' property. Land possessing system in these phase was not classical choice limited to common public access. Mongolian king had a tradition of inheriting own possessed land to their children. [8, 22]

Until 1921 land was property of kings or khans whoever inherited the area from their ancestors; owned by lords or seniors and noblemen; and utilized by ordinary people. Though land became a State property by the victory of National Democratic Revolutionary in 1921, individual herders and collective herders have been utilizing the pasture land. They used to scatter in a great distance between each others, according to the carrying capacity of certain area. Camping with regard to land seasonal partition was the best traditional land management method in preventing pasture degradation. Mongolian land hasn't been much deteriorated until the end 1950s to compare with the present situation.

2. ***From 1960s to the beginning of 1990s.*** After the National Democratic Revolutionary victory in 1921 and Socialism supported policy establishment in 1924 has reformed the property possessing system during feudalism transforming the land ownership to the State (public). Since then the government of People's Republic of Mongolia has followed above policy upto 1992. In other words prohibiting the individuals to own the land, forced a new type of land management policy. Transferred to the State property, government developed a new policy of utilizing the land which credits its access to the herder's collective and common individual herders. The nomadic pasture household represented freedom and autonomy, whereas the socialist command economy was characterized by rigidity and central control. In fact land was utilized almost only for livestock breeding of herder's collective community. These collectively organized enterprises were created to transform nomad society from a household-based pastoral economy to a Marxist-based communal one. Traditionally, each household controlled all of its herding production and marketing decisions and owned the means of production the livestock. Pasture were controlled by feudal lords but open to all herders. Under socialism, the *negdel* owned the livestock, pastureland and managed production. The heart of *socialist* pastoralism was the *negdel* or "herders collective". A large number of one type livestock centralized in one area of grassland. Since the land owned by State land management policy has been according to the decision made by heads of collective livestock farmers. They centralized families in one place, established dairy farm, organized collective camping program, hundreds herd of ship and coat accumulated.[2, 22, 23]

As a consequences of such management policy areas that are close to the water resource or nearby the settlements has been exploited without having an opportunity to rehabilitate. Since this period land degradation in Mongolia accelerated at the high speed, ensuing the deteriorated land upto 70 percent of total territory in a degree of less, moderate and severely impacted. Since the major land deterioration is caused by increased grazing pressures, the inevitable need arouse to restructure this inappropriate policy.

3. ***From the beginning of 1990s upto present.*** The transit from centralized economy to free market economy opened a new era for pasture land management field. Management policy is focused on sustainable socio-economic development concerning the carrying capacity of earth, ecological balance, and economic efficiency. Since 1991 livestock of herder's collective community is started privatizing. 97 percent of the total livestock of Mongolia has privatized to the herdsmen. Herds are using the land which they have been exploiting during the collective community. In this phase the traditional land management began restored. Herdsmen started living in a group community ("hot ail"). But, its method is more advanced than in 1960s. Now herdsmen can use the appropriate winter and spring camping that has been even used by ancestors. In summer time several "hot ail"s started camping in a valley and use a pasture land according to their management plan of that season. As a result of restored traditional management method, the number of livestock head increased notably. Animal husbandry management system is being modified in correspondence with the market economy. Animal husbandry production volume regulated by market demand and supply.[8, 22, 24, 25]

On the contrary, since the government hasn't yet formed the specific regulation on land utilization (pasture land possession, owning, utilization fee etc.), remote area herders started shifting to the settlements where infrastructure developed better. So thus, land degradation observed severely around the settlement area. This obstacles the sustainable productivity of the animal husbandry, and development of herds' living standard. In addition to the above fact an increasing tendency of inexperienced youths who have brought up in cities became a herder could be one of the factors to desertification process acceleration since they do not have ability to utilize the pasture land in a proper way. According to the recent research 78.4 percent of the total territory is degraded. Hence, we Mongolian need the advanced technology and management system in preventing desertification as well as improving the sustainability of pasture land utilization.

5. Research analyzes & assessments

From its origin human beings are living on natural resource. Particularly, resources those are easy to exploit such as fauna and flora, air, water and land reserves been directly consumed to human daily life. Mongolians developed animal husbandry that is the most suitable branch of industrial sector to carry on from time to time, adapting to the country climate specificities. For centuries animal husbandry was the essential industry in Mongolian land productivity, water and salt marsh, climate, and environmental conditions of wide valleys. Cultivation is not very suitable choice for Mongolian short life period of plant species, low soil productivity, deep permafrost in underground, high wind velocity, less precipitation, and drought proven territory. Therefore, the nomadic life style of moving from place to place in various distance according to pasture land productivity, water resource, and climate conditions was inherited to generation to generation. As a Mongolian greatest contribution in world civilization history the nomadic animal husbandry has its own land management features based on climate and environmental conditions. The traditional method of livestock breeding is always being reformed and renewed. One of the specific

characteristics of the Mongolian nomadic livestock husbandry is that the animals take necessary energy and organics in summer and autumn i.e. animals start to gain weight at the end of autumn. [2, 8, 14, 22, 23, 24, 25]

6. Community based pasture land management

Grassland are estimated to cover 125 million hectares about 122 million hectares of the country's land is devoted to nomadic pastorilism grazing of livestock in major form of land use in Mongolian and has been the traditional way for thousand of year.[2, 22] Public owned land management system established during the development of animal husbandry with regard to the political policy. Pasture land management is classified into 2 systems:

- Traditional management
- Modern management

1. *The traditional management* method is based on nomadic life of herdsman that is designed to preserve the pasture according to the situations.

Because of the severe weather Mongolian nomads had to make a seasonal migrations. Hence nomads were always on movement in order to rehabilitate the pasture besides the avoidance from the weather contrast.

Pastoral animal husbandry's "nomadic" management method was a measure for reduction of natural disaster loss, combating of desertification, prevention of land degradation of certain area, avert from livestock disease centralization. Before deciding where to camp herds must consider the following aspects:

- Collect information on focused camping sites
- Inspect and view the focused camping sites
- Select the one from focused camping sites
- Consider the water and pasture land resource while selecting
- Plan the next camping

Every camping become the prior movement to the next camping. Before taking a move herders have to make their mind up for the next camping. Long distance shifting is not very effective thus, herds prefer to move in a shorter distance more frequently. During autumn and spring season the camping should not be far from the winter camping site. The key features of traditional pasture land management is that herdsmen divide their for each season as winter, spring, summer and autumn camping sites.[2, 8, 22]

During some of these seasons, herdsmen move in short distances for several times avoiding from the land degradation. Mongolians traditionally use pastures not by one but by a group of household called "hot ail" which means a group of 3-4 herdsmen household live at one place using the same pasture. "Hot ail" (group of farmsteads) traditional method to cooperate and combine labour and knowledge of mongolian herd's, to adjust its organization and management to the need of marketing, to make hot ail for solving the social problems of nomads and basis for future farm.[22] This "hot ail" means a "community-based approach" of animal husbandry that has about 6000-4000 years tradition. In average each "hot ail" or group of herdsmen has 800-

1000 heads of sheep and goat and 100-400 heads of cattle (cow, horse and camel) each occupying about 100-400 square km² area in a whole.

Information plays an important role in moving from camp to camp. There are two types of information classified by its exchanged distance i.e. short distance and long distance.

Nomadic Mongolians' information exchange encompass a great traditional heritage of centuries. Short distance information exchange between herdsmen directly start with their greetings when they meet each other with the traditional way of words on their area's pasture and weather conditions and grass growth etc. Nomadic herders' information exchange becomes the fundament for land management method. On the base of information obtained they make a tactful decision on moving one place to other within short distance migration. Hence this kind of information on weather condition and fatness of animals spread all over the area and exchanged between neighboring regions. This information become main sources for short and long term pasture land management. These kind of information usually spread over from mouth to mouth for instance A element transfers information to the B one creating direct information exchange system when they meet. In such chain manner that B element passes on B₁ and B₁ to the B_n element etc, spreading out from "hot ail" to "hot ail", from one valley to another.

Horse relay communication lanes help hot ail and community in selecting long distance summer camp where the pastoral productivity is higher. The horse relay communication and its information disseminating method was the origin of the internet networking system. Mongolians traditionally paid significance to information, especially to the speed of its dissemination. It was due to the traditional way of nomadic life where precise and timely information on nature & weather was essential to survive in Mongolia's harsh, continental climate. In the 13th century, the Mongol Empire under Chinggis Khan and his descendents established the first ever international communication network covering most of the Euroasian land mass.[8, 22] The main purpose of that network was to efficiently manage and control the vast territory of Empire. The speed of mounted couriers was astonishing. They covered 600-800km a day, the speed that is impossible even today by car in remote areas. That record speed was overcome only when the industrial revolution brought telephone, telegraph, railway and automobile.[22] The information disseminated by horse relay communication becomes the base of strategic decision on pasture land management. In other words short distance movement decision or tactic, long distance camping or strategy was the fundamental method for pasture land management, preparation of passing severe winter safely, conservation of environment through sustainable use of resource.

Well organized pasture land management would help herdsmen to overcome severe winter with heavy snow cover till spring and summer come. Some years in Gobi and Steppe zone of the country we observe so called " Gan" (severe drought). It is a really drought no grass growth due to absence of precipitation in result of which many loss of animals take place. This type of natural disaster occurrence increased in recent years.

Two major types of threats are considered as the most dangerous in the historical period of nomadic life and its development process. These are could be listed as:

1. Natural disaster
2. War and plunder

Both the threats are complicated to predict in advance.

Natural disaster. Plant withers and dries up, water resource becomes scarce, livestock productivity reduces, and food supply cuts down in long period of drought.

The most significant consequences of drought for agriculture are loss of yield and reduction of rangeland output. As for Mongolia with its dominating pasture cattle breeding pattern, owing to droughts millions of herd of livestock have to suffer fodder deficiency preventing them from fattening and, consequently, have low biological potential to be able to overwinter and survive.

If the summer drought is followed by zud ("zud" is a local name used when heavy snowfalls occurring in autumn and winter seasons resulted in that the livestock being unable to reach its fodder covered with thick snowdrifts is lost en masse) then it becomes the real "socioeconomic drought". Over the last six decades, there have been recorded six occurrences of severe winter conditions taken place following the severest droughts that affected over 50 per cent of the country's territory.[2, 10, 26]

Temporary camping is the most effective measures to avoid from cattle loss during the drought season and to prevent land degradation. In this way short distance information or horse relay communication lanes support a long term sustainable land conservation and utilization in pasture land traditional management. In making a temporary camping for a good pasturing herds must consider the following for issues.

1. To mitigate disaster impact and protect livestock from natural disaster such as drought, zud, snow or dust storm, and flood;
2. To feed up with the livestock well in a better seasons of summer & autumn as a preparation of severe winter & windy spring seasons;
3. To develop an effective land management policy that supports sustainable utilization & prevents desertification process;
4. To exploit virgin areas and protect ecological balance.

War and plunder. Is mainly created because of desire for high productivity land, pastoral resources and water sources. There is even an incidence of war created by these kind of disputes.

2. **Modern management method** is directed to transmit nomadic animal husbandry to the sub sedentary livestock breeding; and to improve the securities of herders life during the natural disaster of Gan (drought) and Zud (heavy snow) cover, blizzard, dust storm etc., and to promote animal productions processing in order to sell for higher rate in the market, and disseminate updated information to herdsmen.

For combating desertification, preventing degradation we should pay more attention to integrate the traditional and modern pasture management. We will try to support the community oriented Decision Support System (DSS) for pasture land management and will make oral presentation on results of progress made in this direction. DSS for pasture land management have used Remote Sensing data, data in-site measurement and Geographical Information System GIS).[2, 3, 4, 12]

Some suggestions or ideas concerned with the improvement of technology in pastoral animal husbandry; output increments of the animal husbandry that uses the scarce natural; and pasture resource optimal utilization, are expressed in this article.

As an outset, the development of community oriented Decision Support System based on the pasture condition assessment, database collection and monitoring that advances the technology in Pastoral Animal Husbandry field in new century have been summarized.

Protection and sustainable use of the ecosystem components is necessarily required in the sustainable development of pastoral animal husbandry. Primarily soil, vegetation cover, source of surface or ground water and those resource exploitation has to be controlled. In its turn the pastureland management policy could be the most important measure in this context. Modern Pasture Management consists of:

1. Monitoring sub system including pasture condition assessment, inventory and mapping ;
2. Establishment of sub system for Database and Geographical Information System(GIS) on Pasture Condition
3. Developing Community oriented Decision Supporting System for pastureland management

Pasture Resource Monitoring might be described by:

- a) Ground survey and assessment,
- b) Remote sensing and geoinformation system

Ground survey and assessment forms by the physical data: biosphere data and cultural heritage data. Sources of above information are hydrometeorological data issued by agrometeorological stations every decades; results of permanent study by the Academy of Sciences and Research Institute for Animal Husbandry; data from Animal Inventory in aimags, soums and bags; data from Database of Ministry for Nature and Environment (MNE) and socioeconomic data or information from National Statistical Board.

Remote sensing data is obtained from daily information of AVHRR/NOAA, some data gathered by TM/Landsat and SPOT satellites.

These data processed by digital processing methodology, using digital processing system.[3, 4, 9, 12]

Sub system of Database & GIS contains:

- a) Data on pasture condition and data from inventory and registration of pasture resource
- b) Information and Analyses on Pasture Utilization and Natural Resource
- c) Optimal linkage and Planning for Processing above information and Data into Database
- d) Infrastructure & socio-economical information

Database has to be established on the intensive link of GIS.

GIS is basically used for creating natural resource analyses particularly obtaining pasture land data in the terms of space and time.

Decision Supporting System for Pasture Management In the result of complex use of analyses and results of processed data and information mentioned above and of assessment and results of systematic approaches from the database and GIS, it will be possible to introduce Pasture Management.

Creating Decision Support System (DSS) for Pasture Management, we will be able to overlap various information layers (as natural resource, social and economical) and it will give more opportunity to achieve above tasks more effectively.

It is needed compatibility of above mentioned data and information having the same projection method or the same scale in mapping and same standard in data processing.

Decision Support System for Pasture Management can be used as next:

- Evaluation of Pastoral or other resources and the resource utilization in the past and future and in current situation in correlation with other potential resources;
- The advantage of the System is the possibility to evaluate facing problems (for example shortage of water availability etc.) in relation to potential resource (unused pasture etc.) and its ability to locate them in space;
- Possibility to minimize consequence of natural disasters and improvement of Risk Management. For example, using existing data, detection of areas with higher risks of natural disasters;
- To assess important areas needed in covering by Protection Status. In relation to Concepts of Country's development and Right of population to live in healthy surrounding, it will give possibility to assess areas needed to be protected by State and Regional Status;
- Correlation and Coordination of Natural Resource and Environmental Management.
- The System will cover many fields as an Assessment of Environment and Natural or Pasture Resource, Detection of Degraded or Highly polluted Areas and Evaluation/Support of Progressive Methods and Initiatives in Use and Changes of Environment.
- Systematical and Effective Management tool in coordination of Use of Natural Resource and Socio-Economical Information.

The Decision Supporting System for Pasture Management will be used and implemented as next:

1. Assessment of Carrying Capacity of Pasture and Regulation of Animal Population size
2. Restoration and Recovery of degraded or overgrazed pasture
3. Proper use of pastureland with segmentation and seasonal changes
4. Increasing productivity of animal husbandry, to improve living condition of herders

Restoration or recovery of degraded and overgrazed pasture will be solved by certain investment and methodology. It is clear that only in the case of land possession of herders as their owned property, they will make investment in restoration or recovery of pasture.

The methodology of seasonal use and segmentation of pasture is the choice of the Mongols made by their traditions and experiences shaped by centuries. So Decision Supporting System for Pasture Management will be related finally with increase of outputs or productivity of Animal Husbandry and improvement of herders' living condition. Also the System can be named as main part or background of Management in Animal Husbandry production. In the case of harsh climate of Mongolia and restricted natural resource, Pastoral Animal Husbandry has limited prospect in increasing its productivity and outputs. But pastoralism is the cheapest and easier way to exploit extensive pasture, which occupies 80% of total territory of the country. Therefore, pastoral animal husbandry is main branch of the country's economy supplying population by food from ancient time until today. Furthermore, this cheap production can be used for decades. In other hand, If the husbandry would be held in traditional way, there will be no progress and achievements in the country's development. At present, the first priority is to increase the output of animal husbandry releasing it from dependency from natural hazards and linking with worldwide tendency of development or globalization. In the first, it is needed education of herders with the development in animal husbandry to fit them in carrying capacity of various natural and ecological zones. Therefore, it's needed the training and owning of herders, who could turn livestock and pasture into production tools, in animal husbandry methodology fitted to market economy improving their Pasture Management.

7. Conclusions

1. The location of Mongolia belongs to the extreme dry natural zone. Just 8.3 percent of the total territory covered by forest and 90 percent is vulnerable to the desertification.
2. Summarizing from the surveys and researches 78 percent territory of Mongolian is assessed as already degraded. This is a negative consequences unsuitable of socio-economic policy that created inappropriate land management.
3. Nomadic Mongolian herders has a rich land management experience traditionally inherited for centuries.
4. Pasture land management method derived from community based "hot ail" campsite. Community based pasture land management method aims for temporary camping for a good pasturing around with the areas that have a sufficient water resource.
5. Information plays a very vital role in selecting a temporary camping site. Considering the information obtained herders do make their plan where, when, how many times to move in that year.
6. Objectives of hot ail based method of temporary camping for a good pasture could be satisfied by preventing of land degradation and desertification process, improving animal husbandry productivity and promoting the living standard of herders.
7. This traditional pasture land management method was modified due to the herder's collective animal husbandry during socialism extreme number livestock gathered in one site.

8. In last decade “hot ail” pasture land management method restored because of the privatization.
9. There are some methods have been developed to promote Modern Pasture Land Management.
10. Decision Support System for Pasture Land Management based on information and data obtained from space. Developing Pasture Land Management System would enforce the activities of preventing land degradation and desertification process.

8. Reference

1. Mongolian Action Programme, for the 21st century, (MAP-21), UB, 1999, 297 page.
2. Adyasuren Ts. Environment and Development issues in Mongolia, Ulaanbaatar, 1998, 96 page.
3. Adyasuren Ts. Decision support system for Pasture Management.- Research on Ecology and Pasture Livestock. Mongolian Development Strategy Research Project. Ulaanbaatar, 1999, 34 page.
4. Adyasuren Ts. Balance between the Pasture Capacity & Animal Husbandry Production- International Symposium on “ Nomads and use of Pasture today” Abstracts. Ulaanbaatar, 13-15. Dec.1999.
5. Dash. D. Landscape- ecological Problems of Mongolia, Ulaanbaatar, 2000, 254 page (in Mongolian).
6. United Nations Convention to Combat Desertification, UN publication, 1994
7. Hydrometeorological Research Institute. Papers in Meteorology. Special Issue. Ulaanbaatar, 1996, 230 page.
8. Ministry of Nature & Environment; Some issues on combat desertification of Mongolia, Ulaanbaatar, 1999, 127 page (in Mongolian)
9. Ministry of Nature & Environment, Mongolia, Environmental Database & GIS; Ulaanbaatar, 1995-2000.
10. The First PRC- Mongolia Workshop on Climate Change in Arid & Semi-arid Region over the Central Asia; Ulaanbaatar, 1993, 140 page.
11. Climate Change in Arid and Semi-arid region of Central Asia- Proceedings of the Second Mongolia-China Symposium; Ulaanbaatar, 1995, 152 page.
12. Erdenetuya.M. Assessing Pastoral Condition by using Satellite Information Data, Proceedings of Hydrometeorological research work, UB, 1999
13. Unatov.A.A Basic concepts natural plant in Mongolia Publication of Academy of Science, USSR.1950. 244 page. (in Russian)
14. Bazargur D. Geography of Pastoral Animal Husbandry. UB, 1998, 379 page.
15. Bira.Sh. Studies in Mongolian history, culture and historiography (selected papers). UB, 2001, 528 page.
16. Atlas of Climate and surface water resources in Mongolia, Leningrad, 1989, 73 page.
17. National atlas of Republic of Mongolia, UB, 1989.
18. Tsegmid.Sh. Physical geography of Mongolia, UB, 1967.

19. State of environment in Mongolia, UB, 1996, 131 page.
20. National Report of implementation on UNCCD, UB, 2000, 54 page.
21. National Plan of Action to Combat Desertification in Mongolia, Ministry of Nature and Environment, UB, 1997, 71 page.
22. Nomads and Use of Pastures today, International Symposium, International Institute for the Study of Nomadic Civilizations, UB, Mongolia, 256 page.
23. Melyn C.Goldstein and Cynthia M.Beall. The Changing World of Mongolia's Nomads, Hong Kong, 1994, 176 pages.
24. Purevtseren.G, Enkhjargal.T. Land policy and Land Monitoring Papers of Seminar on "Strengthening of Land Policy" Report ADB, 1996
25. Enkhamgalan.A. Economical aspects of Pastureland use-Strategy of Mongolian Development, UB, 1999, page 92-111
26. Namkhai.A. Desertification & Drought Assessment in Mongolia. Symposium in Japan, 2001