

CHAPTER 4 PILOT STUDY

4.1 OBJECTIVE OF PILOT STUDY

The Pilot Study aims to confirm the viability of projects that will be executed by herders group organized through the Study.

Pasture management should basically be carried out by herders within their herding activities including well management. Both activities should be achieved through the organizing of herders. Therefore, a very crucial point in the Pilot Study is the establishment of an operation and maintenance system for wells as the first step after organizing herders. Establishment of such procedures will come about through implementing the Pilot Study and preparation of the foundations so that Mongolian government can support sustainable organization of herders and well development after the Study. The components of the Pilot Study will include organizing of herders groups for implementing the project to improve livestock farming systems in addition to Operation and Maintenance of the wells, and well construction and rehabilitation.

Herders development effort is essential to establish sustainably the organization and to promote the cooperative activities such as the cooperative Operation and Maintenance of the wells and other collective works. The governmental administration system is also required to support the procedures for their activities. From this point of view, project components are examined for organizing and empowering herders, and simultaneously establishing the governmental administration system and building its capacity to support them.

4.2 SELECTION OF STUDY AREA

Dornogobi Aimag was selected for the detailed study area among three *Aimags* of *Dundgobi*, *Dornogobi*, and *Umnugobi*, where the study on the general plan for Improving the Livestock Farming System in rural areas had been carried out. The Pilot Study process is as follows:

(1) Basic Idea in Selection of Detailed Study Area

In the Pilot Study, with cooperation of the study team and the administrative side, the study sites shall be decided, the herder participants in the study shall be recruited and organized, and then the project shall be executed. For this purpose, the following items were considered in selection of the detailed study area where the Pilot Study area is contained.

- It is most important to achieve visible effects in a short term.
- The results of the Pilot Study are intended to be applicable in each *Aimag* in the Gob-Steppe region. In this respect, the natural conditions of an average *Aimag* in the Gobi region is preferable.
- It is necessary to obtain some results during the project period, and so the working environment in the severe Gobi region is indispensable for the study.
- It is undesirable that a lot of similar projects are concentrated on a specific region from the viewpoint of a national project.

(2) Selection Criteria and Evaluation

If the region is limited, the overgrazing phenomenon generated also should be present in each *Aimag*. From the viewpoint of utilization rate of grazing capacity, excessive use of pasture that destroys balance of plant productive capacity and number of livestock has been generated in most *Soums* in *Dundgobi* and *Umnugobi Aimags*; this can be used as a measure for "How to decrease number of livestock" or "How to rest pastureland". It is a big subject, so there is a possibility that countermeasures may lack balance as *Dzud* countermeasures too.

As for the potential of underground water, shallow aquifers worsens conditions in *Umnugobi* (which has a lot of springs), *Dornogobi* and *Dundgobi* (in that order), and deep aquifers worsen conditions in *Dornogobi*, *Umnugobi* and *Dundgobi* (in that order). In respect to underground water development, *Dornogobi* and *Umnugobi* are in great need, and it is anxiously being guessed where to search for water resources for wells.

The area of the pasture served by one well is as follows: *Dornogobi* (53 km²) > *Umnugobi* (43 km²) > *Dundgobi* (25 km²) in that order, and the area of *Dornogobi* is twice *Dundgobi*. Moreover, the percentage of wells that can be rehabilitated decreases in the order of *Dornogobi* (46%) > *Umnugobi* (28%) > *Dundgobi* (13%), and the percentage of *Dornogobi* is high.

As for damage by *Dzud* and poverty, these are big problems common to the Gobi region; therefore, it is undesirable to select the *Aimag* for the Study by the difference of such an index, considering feelings of the residents.

The important thing is to keep equity and accountability on the administrative side, so that the study can be executed efficiently and effectively, and to secure effectiveness to apply the results to other regions. The Pilot Study is different from the other overall projects, which require long stay at one project site. Sites of the Pilot Study can be distributed to several places, and the Study would require frequent movement between projects sites, the sites and *Aimag* center, etc. In these respects, suitable working conditions are important to carry out the study within the specified time in the Gobi region where there are severe climatic and geographic conditions.

In consideration of the above-mentioned points, finally *Dornogobi Aimag* was selected for the detailed study area.

(3) Regional Characteristics of *Dornogobi Aimag*

Main development agenda of *Dornogobi Aimag* was described in "the Regional Development Policies and Sustainable Development Program for 21st century" adopted in 2002. And each *Soum* of the *Aimag* aims to implement socio-economic development policy directions in accordance with the *Aimag* policies and programs mentioned in the Governor's action programs.

Livestock farming is a main economic activity in all *Soums*; however, mining activities are also important in the economy of *Airag*, *Dalanjargalan*, *Ikhet*, and *Urgun Soum*. Mining explorations are under way in the *Altanshiree*, *Saihandulaan*, *Khatanbulag*, *Mandakh*, *Ulaanbadrah* and *Erdene Soum*.

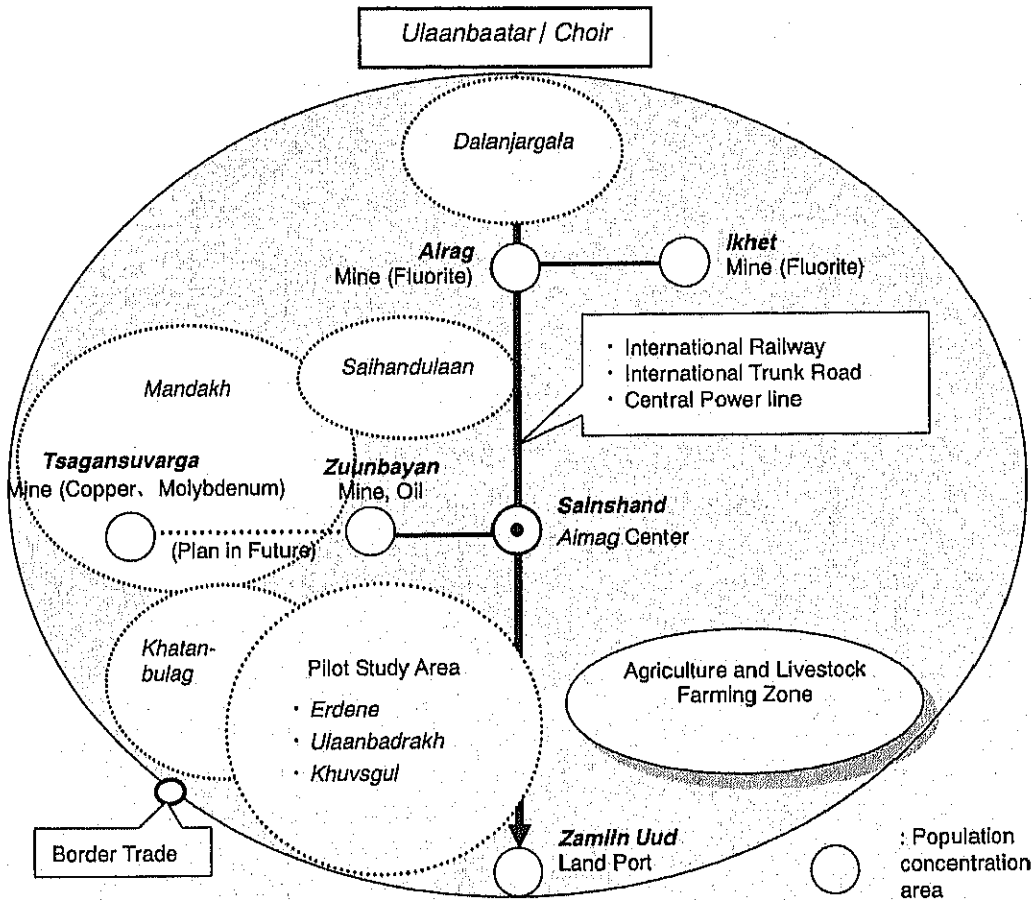


Fig. 4.2.1 Population and Industry Concentrated Area and Agriculture and Livestock Farming Zone in *Dornogobi Aimag*

While *Soums* with mineral deposits such as fluorspar, coal, gold put greater priority on mining sector development, *Altanshiree*, *Khuvsgul*, *Khatanbulag*, *Delgerekh* and *Mandakh Soum* focus on livestock sector development together with the long-term view of developing mining sector if mining explorations succeed.

Zamiin-Uud Soum is on the way to benefit from becoming a free economic zone status. In addition, border trading points in the *Zamiin-Uud* and *Khatanbulag Soums* open greater opportunity for marketing livestock products and more value added production through trade, industry and services development in surrounding areas.

The increasing role of non-herding economic activities opens greater opportunities for broad economic development in the *Airag*, *Dalanjargalan*, *Sainshand*, *Urgun*, and *Erdene Soums* located along the railway as well in the *Soums* closer to border trading points. A clear tendency for increasing non-herding employment opportunities, increasing urbanization of

lifestyle and settlement is seen in these *Soums*. On the other hand, remote *Soums* had tendency for increasing migration of people to more urbanized places. This tendency may suggest that the traditional extensive livestock herding remains as the primary economic activity in remote *Soums*; however, urbanizing places increase the demand for more intensive meat and milk production and the development of more industrialized production and service activities.

It was also observed that families from the poor and vulnerable groups tend to migrate closer to urbanizing places in search of job opportunities and alternative livelihood options, while wealthy herders tend to stay farther from the urban settlements to benefit from advantages of good pastures.

4.3 SELECTION OF SOUM

This study contains the aspect of countermeasure against the *Dzud* disaster; therefore, the extent of *Dzud* disaster damage was one of the key factor of the criteria for the selection of pilot *Soum*, although it was possible to choose an average *Soum*.

The following table shows the number of livestock in 14 *Soums* and their change after 1996.

Table 4.3.1 Change in Number of Livestock in *Dornogobi Aimag*

	Number of Livestock							Change in Number of Livestock (year 1996 =100)							Ratio: (Most Damaged Year/Peak Year)
	1996	1997	1998	1999	2000	2001	2002	1996	1997	1998	1999	2000	2001	2002	
Aitag	65,891	58,993	63,825	68,959	73,615	62,760	67,928	100.0	89.5	96.9	104.7	111.7	95.2	103.1	85.3
Allanshree	53,368	56,455	62,355	69,348	73,770	52,419	55,023	100.0	105.8	116.8	129.9	138.2	98.2	103.1	71.1
Dalanjargalai	80,427	79,313	88,782	94,834	98,901	66,407	69,156	100.0	98.6	110.4	117.9	123.0	82.6	86.0	67.1
Delgerh	78,500	73,010	84,274	97,777	94,733	67,137	71,141	100.0	93.0	107.4	124.6	120.7	85.5	90.6	68.7
Ihhet	57,175	58,037	64,530	67,069	67,173	59,689	57,412	100.0	101.5	112.9	117.3	117.5	104.4	100.4	85.5
Mandah	65,122	70,123	68,684	80,442	69,870	64,483	71,015	100.0	107.7	105.5	123.5	107.3	99.0	109.0	80.2
Urgun	63,087	66,723	71,711	80,707	85,292	67,049	67,494	100.0	105.8	113.7	127.9	135.2	106.3	107.0	78.6
Saibandulaan	54,157	56,889	57,572	65,058	63,321	66,043	65,615	100.0	105.0	106.3	120.1	116.9	121.9	121.2	97.3
Ulaanbadrah	81,681	88,628	92,442	96,881	84,990	68,015	55,846	100.0	108.5	113.2	118.6	104.1	83.3	68.4	57.6
Hatanbulag	125,016	137,116	141,052	139,846	102,175	80,013	86,924	100.0	109.7	112.8	111.9	81.7	64.0	69.5	56.7
Havsgul	72,475	79,369	80,843	88,008	67,980	48,025	46,727	100.0	109.5	111.5	121.4	93.8	66.3	64.5	53.1
Erdene	68,855	76,272	80,141	87,006	80,283	71,138	52,506	100.0	110.8	116.4	126.4	116.6	103.3	76.3	60.3
Sainshand	48,503	54,374	51,897	62,848	64,110	56,979	55,623	100.0	112.1	107.0	129.6	132.2	117.5	114.7	86.8
Zamiln Uud	8,312	7,881	9,751	11,448	10,378	8,104	3,361	100.0	94.8	117.3	137.7	124.9	97.5	40.4	29.4
Total	922,569	963,183	1,017,859	1,110,231	1,036,591	838,261	825,771	100.0	104.4	110.3	120.3	112.4	90.9	89.5	74.4

Note: * Bold-faced type: Peak Year in Number of Livestock

Source: *Dornogobi Aimag*

Because four adjacent *Soums* of *Erdene*, *Ulaanbadrakh*, *Khuvsgul*, and *Khatanbulag* located in the southern parts of *Dornogobi Aimag* are regarded as easily damaged by *Dzud*, and actually they had been damaged in the past, these four *Soums* were considered as the prioritized districts for the project implementation. Thus, the investigation on groundwater in shallow aquifer has been preferentially executed by Ministry of Food and Agriculture. Accordingly, these four *Soums* are basically expected to be selected as the Pilot Study Area. Among them, *Khatanbulag* is 230 km from *Aimag* Center, *Sainshand* and thus it will take about eight hours only for shuttling between these two places. So *Khatanbulag* was excluded from viewpoint of effective study, and consequently three *Soums* excluding *Khatanbulag* were selected as candidates pilot *Soums*.

The Pilot Project was planned to be based on participatory approach of beneficiaries. The project proposals were issued from herder groups through a workshop held in each selected *Soum*. The components of all projects should be examined according to the results of the workshops. But it would be extremely hard to finish the Study in fixed and limited period if consistency between three *Soums* was examined after finishing all workshops. Thus, all three candidate *Soums* should be included in the Pilot Study Area. Through this procedure, *Erdene*, *Ulaanbadrakh* and *Khuvsgul* were selected as the Pilot Study Areas.

4.4 BASIC IMPLEMENTING POLICY OF PILOT STUDY

4.4.1 PARTICIPATORY APPROACH

As for selection of the Pilot Project, the first priority is placed on the intention of herders who are the implementers and also the beneficiaries of the project. This is for the establishment of a more effective and sustainable project operation unit by improving the ownership of the project through adopting the participatory planning method such as organizing herders groups and drafting the proposals by herders themselves.

4.4.2 IMPLEMENTATION PROCESS OF PILOT PROJECT

(1) Implementation Process

The Pilot Project starts from the process that *Soum* governments and the Study Team jointly select proposals presented by the herders themselves. First of all, Project Cycle Management Workshop (hereinafter called "PCM Workshop") was executed by the group to understand their own situation to draft a proposal. Then, each group drafted their proposal based on the problem analysis, through screening of *Soum* government and the Study Team. Finally the Pilot Projects were selected and started. The following figure shows the process until the start of the Pilot Project (for detailed process, refer to Annex F : PCM Workshop).

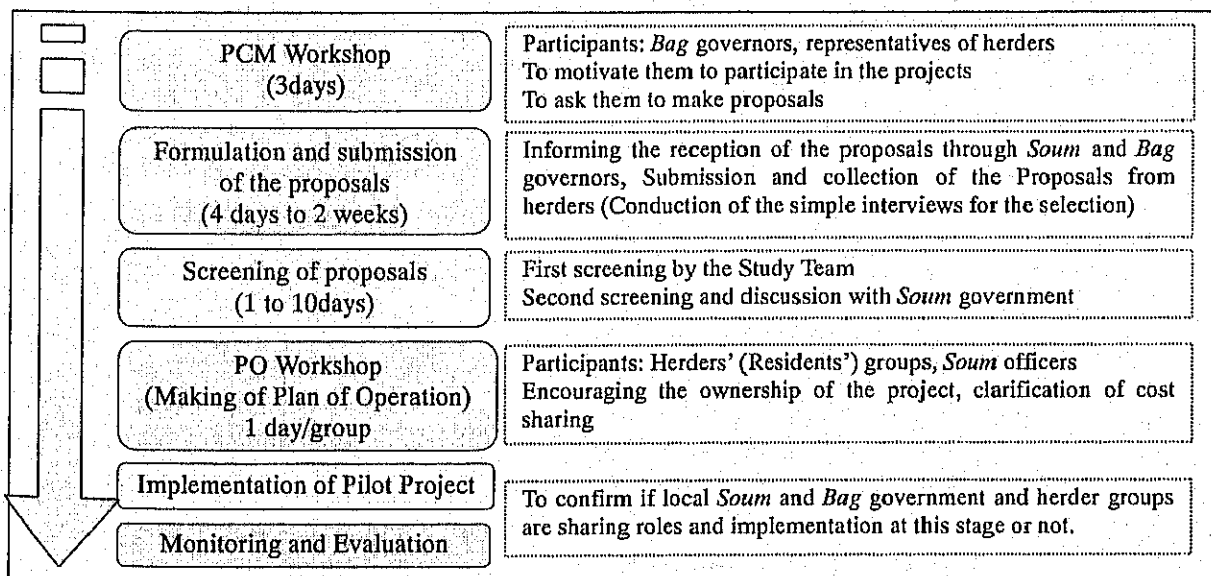


Fig. 4.4.1 Process until Pilot Project Implementation

(2) Holding of Workshop and Establishment of Herders / Residents Group

Workshop was held in two steps: At first, PCM workshop was held and subsequently, workshop to make the "Plan of Operation" ("PO Workshop") that the group adopted. After the start of the pilot project, evaluation and monitoring workshop was executed by the group.

The workshop gave the opportunity for discussion among herders/residents. In PO and evaluation/monitoring Workshop, rules, operation policy, their activities, sharing of roles, and so on were discussed and clarified by group members; it was also training about group management.

1) PCM Workshop

PCM Workshop was implemented with *Soum* officials, residents and herders at the *Soum* government office. First of all, the framework of the Pilot Project was explained, then participant analysis, problem analysis, objective analysis, and selection of approach and explanation of drafting proposal for the Pilot Project were carried out.

2) PO Workshop

PO workshop was implemented for each selected group, and each group made the plan of operation for their own project. The workshop was carried out at group activity site or *Ger* for the herders, and at the *Soum* government related location for the residents group. In the PO, activities necessary for implementation of the project, expected results for each activity, indicators, implementation period, responsible person, cost, cost bearer, remarkable points on implementation were filled in. Through this PO Workshop, the participants held discussion about the items required for the project implementation, shared information within the group, and agreed on decisions about benefit and cost.

In addition, PO Workshop was carried out in consideration of organization strengthening and sustainable activities of each group; it covered the following points:

- To select and make a project, which the herders want to contribute or invest their money to, under the herder's decision, within the purpose of the study.
- For participants to fully understand about cost sharing.
- To adopt the system to promote development effort by participants.
- To consider the creation of incentives / benefits for participants.
- To adopt capacity development of the relevant administrations into the pilot project

3) Evaluation and Monitoring Workshop

The Pilot Study should be executed aiming to verify feasibility and effectiveness of the plan, to feedback lessons to the plan, and to contribute to better planning. To achieve these objectives, "Confirming and understanding of the progress" through regular monitoring (continuous observation) and early findings of the problems that were supposed to prevent smooth implementation of the project, and "changing tracks/

adjustment” based on them are required. Furthermore, based on the results of monitoring, “evaluation” is necessary to understand the progress during the Pilot Study, that is to say, to know if the effects and outputs that project expects are achieved or not, and then to draw “Recommendations (recommendation and advise how to continue the projects of the Pilot Study)” and “Lessons (information as a reference for the similar on-going/ future project).”

While executing the Pilot Study, the projects of the Pilot Project were evaluated three times in total: two mid-term evaluations and one final evaluation at the end of the Study. Methods of evaluation shall be “Participatory Evaluation” through herder participation in Workshops since they were not only beneficiaries but also implementers of the project; this improved herders ownership for the project and understanding of the operational conditions of the project. Based on the plan of operation presented by each group, each group itself evaluates it, and described its achievement, results, evaluation, problems, measures already taken, future measures, implementation period, and responsible person for each activity item in the evaluation table.

(3) Selection of Proposal

The Pilot Projects were selected based on the proposals presented from herders and residents. Selection criteria of proposals are shown below. In addition to these, site survey by the Study Team and simple interviews of activity record of the group were implemented. From the point of view of not only herder’s desire but also livestock farming development in the future, the Pilot Projects were selected under the discussion between *Soum* governments and the Study Team.

Table 4.4.1 Selection Criteria of Proposals

<Selection Criteria of Projects>	Decision Area
1. Existence of the strong leader.	To judge by the structure of group or history of their activity. • long experience for group activities. • experience for group activities related to cash distribution such as joint shipping of cashmere. • percentage of non-blood relations among member, etc.
2. Existence of the highly motivated members in participating in the projects.	To identify the formulation and existence of the group. • long experience for group activities. • variety of group activities.
3. Intention of the cost sharing.	To make sure their willing to pay and its realizability written in the proposal.
4. Possibility of achieving the purpose of the projects.	To make sure the consistency between project purpose and contents logically.
5. Contribution to the improvement of herders’ benefit/ living.	To judge based on technical viewpoints.
6. Sustainability after finishing the project. (Ex. Consideration on the utilization balance between pastures and wells)	To judge based on technical viewpoints. Project component should be discussed with group if its sustainability is not certain but can be modified.
7. Balance between cost and benefit.	To judge by viewpoint of cost.
8. Availability of monitoring and evaluation during the study period. (availability of implementation and appearing the outputs)	To judge if the outputs are expressed in objectively verifiable indicators and can be achieved within the project period.
9. Access to the project sites.	Pilot Project sites should have good access due to expectation for its demonstration effects.
10. Policy of <i>Soums</i> and <i>Aimags</i> .	Discussion with <i>Soum</i> and <i>Aimag</i> .

4.5 FRAMEWORK OF SELECTED PILOT PROJECTS AND IMPROVEMENT LIVESTOCK FARMING SYSTEM IN RURAL AREAS AND THEIR RELATION

As a result of screening, the projects shown below were selected.

Table 4.5.1 Selected Pilot Projects and its Purpose

Name of Project	Name of Soums	Implementer	Pilot Project Purpose
Pasture Utilization and Well Development	3 Soums	Herders group	Overgrazing is alleviated
Livestock Fund	Erdene Soum	Erdene Soum government	Soum government establishes Livestock Fund
Dairy Product Sale	Erdene	Erdene Soum government	Business situation of <i>Burdene</i> sanatorium is improved
Dairy Products Shipment and Sales	Erdene	Herders group	Shipment and Sales system of dairy Products throughout a year is established
Wool Processing and Products Sale	3 Soums	Residents group	Small-scale industry (wool processing) can be established easily by providing a concessional loan
Traditional Well Campaign	3 Soums	Each Soum government	Soum government has the capacity of promoting Traditional Well construction

Note : 3 Soum means *Erdene Soum, Ulaanbadrakh Soum, Khuvsigul Soum* in *Dornogobi Aimag*.

End outcome of the project is "improvement of livestock farming System in rural area" focused on "mitigation of *Dzud* damage and resolving of overgrazing". The following table shows components corresponding to each Pilot Project.

Table 4.5.2 Relation between the Pilot Project and the Improvement Plan of Livestock Farming System in Rural Area

Policy/End Outcome	Component of Development	Project	Related Pilot Project
Improvement of Livestock Farming System in Rural Area (Mitigation of <i>Dzud</i> damage and resolving of overgrazing)	Pasture Utilization/Well Development and Management	Pasture Utilization and Well Development	Pasture Utilization and Well Development Traditional Well Campaign
	Livestock Products Improvement	Veterinary Service Improvement	
		Superior Livestock Breeding	Livestock Fund
		Livestock Farming Technique Improvement	Livestock Fund
		Capacity Building for Risk Management	Livestock Fund
	Herders Economic Stabilization	Livestock Farming Improvement	Dairy Products Shipment and Sale Wool Processing and Products Sale
		Market and Distribution of Livestock Products Improvement	Dairy Products Shipment and Sale Dairy Products Sale
	Human Resources Development	-	Human Resources Development through each Pilot project

"Veterinary improvement" requires high expertise and is unsuitable to the issues that herders/residents tackle; thus, there was no proposal. Support to the Privatization of Veterinary Services supported by German Technology Cooperation Agency (GTZ) was implemented in the *Dornogobi Aimag*, so such a project was passed over to avoid duplication by the JICA Study.

Since livestock fund is one of the Pilot projects designed by pulling elements from “Superior livestock breeding plan”, “Livestock farming improvement plan”, and “Capacity building for risk management”, it is a superior project to them.

As for two components of “Livestock products improvement” and “Herders economic stabilization”, the Pilot Project was partially implemented, so feedback is limited and reflection to the plan is also limited.

On the other hand, “Pasture Utilization/Well Development and Management” is a cornerstone of the livestock farming system in rural area; it combines the two Pilot Projects of “Pasture Utilization and Well Development” and “Traditional Well Campaign” so more detailed feedback can be expected to formulate a specific and detailed plan.

4.6 CONTENTS OF PILOT PROJECT

4.6.1 PASTURE UTILIZATION AND WELL DEVELOPMENT PROJECT

(1) Objectives and Basic Policy of the Project

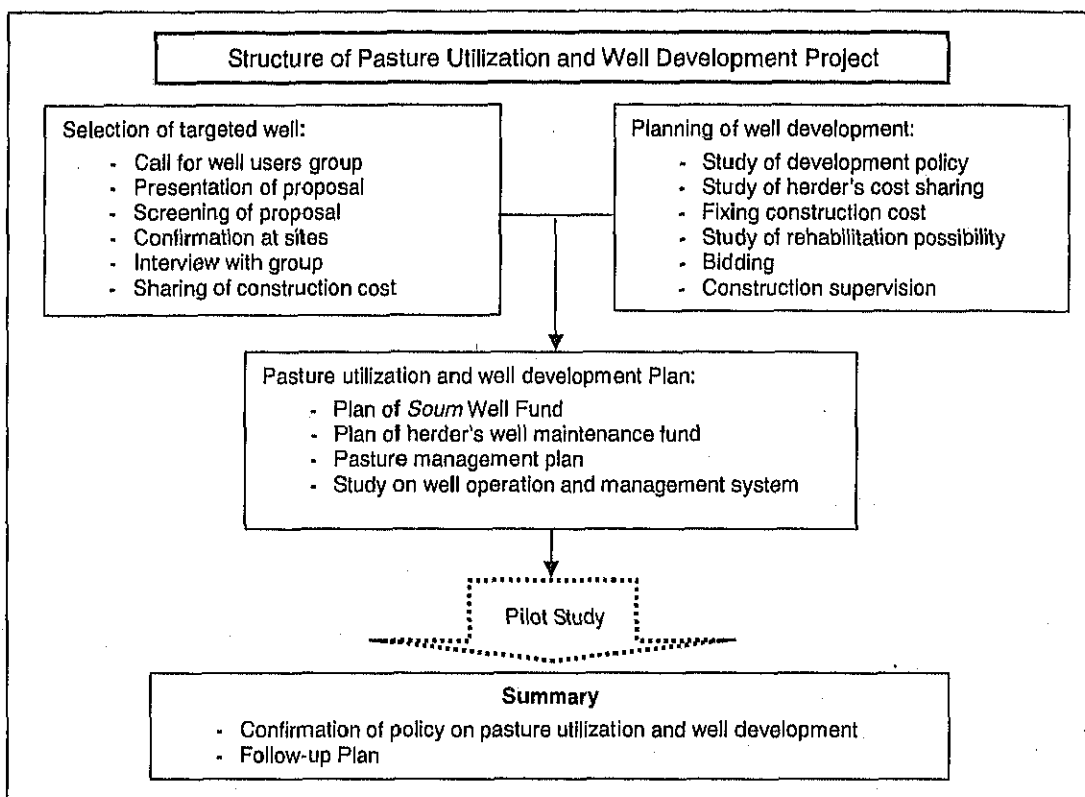
Continuous use of the pasture shall be realized only if the wells installed on the pasture can be maintained properly and used continuously. Overgrazing caused by the concentration of herders and livestock, shall be solved through continuous use of the pasture with consideration for productivity of the pasture.

Accordingly, this project shall be executed with the aim to alleviate overgrazing. Through the main activities executed in the project shown below, it should be targeted for the herders groups to maintain the wells they are in charge of and be able to use the pasture properly through these activities.

- Grouping of the herders who use the wells and its adjacent pasture.
- Promoting well rehabilitation and new well construction.
- Formulating rules for pasture use by the herders who use it jointly.

(2) Structure of the Project

The following figure shows structure of the project. Major issues are how to select and settle targeted wells, herder group use of these wells, and which level to be adopted in well development.



(3) Contents of the Project

1) Targeted Wells to be Developed

The following three type of the engineering wells shall be targeted in the project: 1) Production Well, 2) Shallow Well, and 3) Shaft Well. The location of the wells will be selected based on the request of the herders and the *Soum* government.

2) Process of the Project

Well for rehabilitation and new construction in the Pilot Project was selected based on the proposal from the herders. The number of proposals totaled 49.

Table 4.6.1 Presented Proposals

		<i>Erdene</i>	<i>Ulaanbadrakh</i>	<i>Khuvsgul</i>	Total
Improvement of Well	New Well Construction	4	4	2	10
	Rehabilitation of Well	18	10	11	39

The proposal describes the composition of group (members and their relations), project purpose, problem to be solved, its method and willingness for cost sharing. Moreover, the interview surveys were carried out to collect information about experience of group activities, distribution of members and pasture utilization, etc. when they submitted the proposal. Afterwards, the Study Team visited each proposed site to confirmed rehabilitation possibility (according to method described in section 2.5.3 Water Supply Facilities for Livestock (2) Damage Levels and Rehabilitation Method of Water Supply Facilities), pasture condition, pasture type and its utilization. Also, discussion with the

Soum government and consideration with proposal standard (shown in 4.4 Basic Implementing Policy of Pilot Study, (3) Selection of Proposal) was executed. Finally, the 19 wells listed below were selected.

Table 4.6.2 Adopted Proposal

<i>Soum</i>	Name	Type of Work	Well Type	Well Depth (m)
<i>Erdene</i>	<i>Ulzit (Burudene)</i>	New Construction	Production Well	50
	<i>Tsant</i>	New Construction	Production Well	80
	<i>Bukhel-2</i>	Rehabilitation	Production Well	100
	<i>Durvulj</i>	Rehabilitation	Shaft Well	8
	<i>Butiin Hooloi</i>	Rehabilitation	Production Well	120
	<i>Zuun Khur</i>	Rehabilitation	Production Well	101.2
<i>Ulaanbadrakh</i>	<i>Uvgon Mod</i>	New Construction	Production Well	60
	<i>Tashaa</i>	New Construction	Production Well	150
	<i>Taliin Buuts</i>	New Construction	Production Well	140
	<i>Hooloi Hond</i>	Rehabilitation	Shaft Well	6.9
	<i>Khukh Am</i>	Rehabilitation	Production Well	66.7
	<i>Shuvuun</i>	Rehabilitation	Production Well	93
	<i>Tsaidam</i>	Rehabilitation	Production Well	90.3
<i>Khuvsgul</i>	<i>Yast</i>	New Construction	Production Well	120
	<i>Khyars</i>	Rehabilitation	Production Well	43.3
	<i>Shuvuun Toirom</i>	Rehabilitation	Production Well	170
	<i>Taliin Tsagaan</i>	Rehabilitation	Production Well	94
	<i>Taiin Dov</i>	Rehabilitation	Production Well	150
	<i>Tataaliin Gol</i>	Rehabilitation	Production Well	120

PO Workshop shall be conducted for these 19 herder groups prior to the improvement of wells, and Plan of Operation for the Pilot Project shall be established by each group. The plan of operation is made in this PO workshop. Then, an agreement (refer to ANNEX M) shall be made among the herder groups, the *Soum* government, and the Study Team. The following two points shall be clarified in the agreement.

- The herders groups shall establish the fund for well operation and maintenance.
- The herder groups agree to pay a portion of the well construction cost, and pay it before the pump installation.

3) Well Construction / Rehabilitation Works

a) Bid Tendering

The well construction/rehabilitation works were carried out, and divided into two portions: first time in September to November in 2003, and second time April to June in 2004. 2 of the 19 project target wells would not be developed since the herders group could not agree on their contribution, so that the total number of works became 17 consisting of 13 rehabilitation and 4 new constructions. (refer to ANNEX C: Record of Well Construction and Well Rehabilitation)

Both construction/rehabilitation works were carried out by drilling companies in Mongolia. Candidate companies who could be responsible were nominated in discussion with MFA. The specification of the works were explained and the companies were

selected by price tender. At that time, it was considered better for the future maintenances of wells that the local well construction company make a successful bid. (refer to section 4.7.1 Evaluation of Pasture Utilization and Well Development Project, 2-7 Lessons Learned) However, they did not agree with specification technically in contract negotiation in the first tender and they did not succeed in the second tender in price, so that only companies in *Ulaanbaatar* and *Tuv Aimag* were successful. The considerations in the tender for well implementation works cover the following points.

- Since there are many unexpected matters, for example it is common in Mongolia to use secondhand materials in the works, it is necessary that specification of the work should be described clearly, and expected qualities and methods on both sides should be clarified during price negotiation since they have to conform at the construction site.
- It is necessary that a local (*Aimag's*) drilling company is involved in the works. Therefore, some considerations in the tender are necessary, such as specification and tender documents written in Mongolia, and permission to form a consortium with two or more companies. However, it is difficult to set JV with local company as tender condition since there is only one drilling company in each *Aimag*.

b) Shipping order of equipment

The pump produced by *Grundfos Company* was selected in the projects since it has been used in ADB's project in west part of Mongolia. They were sent from Singapore and 1 month was required to be delivered; it is assumed to be similar by other makers. However, due to its period, equipment had to be ordered just after contract of works in order to complete one process from selection of drilling companies until installation of pump within the 3 months of the field study period.

Therefore, a pump, that was ordered based on expectations beforehand, could not be installed since its performance did not suit with well capacity; thus installation of pump on the well was delayed to a later time.

When the number of pumps is large, it is possible to find proper combinations of pumps and wells according to results of pumping test. However, it becomes difficult when the number is small; so that it is preferable to decide pump type after obtaining pumping test result. Moreover, it can reduce wasted cost and prevent poor yield or not enough well capacity since it is better to match well capacity and pump performance. Therefore, two-step process is more efficient even if it takes time: that the tender for equipment is carried out after construction work, as is proposed in the report (refer to section 5.7 Action Plan),.

Table 4.6.3 Results of Well Construction / Rehabilitation in the Pilot Project

Soum	Name	Type of Work	Record of Work
Erdene	Ulzit (Burdene)	New Construction	Constructed and equipped in 2003
	Tsant	New Construction	Fault in 2003, Constructed and equipped in 2004
	Bukhel-2	Rehabilitation	Equipped in 2003
	Durvulj	Rehabilitation	Equipped in 2003
	Butiin Hooloi	Rehabilitation	Equipped in 2004
	Zuun Khur	Rehabilitation	Equipped in 2004
Ulaanbadrakh	Uvgon Mod	New Construction	Constructed in 2003 and equipped in 2004
	Tashaa	New Construction	Not done since group did not agree on cost sharing
	Taliin Buuts	Rehabilitation/ New Construction	Fault in 2003, New construction and equipped in 2004
	Hooloi Hond	Rehabilitation	Equipped in 2003
	Khukh Am	Rehabilitation	Equipped in 2003
	Shuvuun	Rehabilitation	Equipped in 2004
	Tsaidam	Rehabilitation	Equipped in 2003
Khuvs gul	Yast	New Construction	Constructed and equipped in 2004
	Khyars	Rehabilitation	Equipped in 2003
	Shuvuun Toirom	Rehabilitation	Not done since group did not agree on cost sharing
	Taliin Tsagaan	Rehabilitation	Equipped in 2004
	Talin Dov	Rehabilitation	Equipped in 2004
	Tataaliin Gol	Rehabilitation	Equipped in 2004

4) Contribution of Herders

To improve ownership of wells and activate operation and maintenance by herders, herder's cost sharing for well construction shall be included in the plan.

As for wells constructed/rehabilitated in 2003, it was agreed in the PO workshop, that the Study Team would implement the well with equipment and herder group would repair or improve ground facilities as water storage tank, with fence around the well and pump house. However, the work contribution of herders was not carried out since the herders didn't realize that the agreement of PO was in force, and there was no penalty against the default of the agreement after starting of the well operation.

Table 4.6.4 Herders Sharing Items Agreed at PO Workshop and its Implementation at Beginning of 2004

Location	Well Name		Water Supplying Tub		Pump House		Fence	
			Plan	Achievement	Plan	Achievement	Plan	Achievement
Erdene	Ulziit (Burdene)	New	New Construction 1 m ³	Half cutting of old drum	Hope for Construction (Difficult for herders) Hope for Soum's aid	none	Same as pump house	none
	Bukhel-2	Rehab.	New Construction	none	There is Pump House	Subdivided and Reconstructed. Cleaning is necessary.	No reference	
	Durvulj	Rehab.	Repairing the existent tub	Already repaired	No reference		No reference	
Ulaan-badrakh	Hooloin Hond	Rehab.	Repairing the existent tub (600 l)	Already repaired	Hope for Construction (request for JICA)		20 m	none
	Tsaidam	Rehab.	New Construction (800 l) (Reuse of old chimney)	Already repaired	There is Pump House		Metal Fence	none
	Khukh Am	Rehab.	Repairing the existent tub	Already repaired	Hope for Construction Request for Aimag & Soum		No reference	
Khuvs gul	Khayts	Rehab.	Repairing the existent tub (February)	none	Impossible for Herders		30 m	none

Therefore, herder's contribution was changed to cost sharing for well construction. (As described later, "Cost sharing for well construction" has become the Government's policy.) With reference to international organizations that were implementing well development in 2004, herder's contribution was fixed as follows:

Production Well and Shallow Well: Tg 1,500,000
 Shaft Well: Tg 1,000,000

The herders shall pay a part of the cost in 5 years to "Soum Well Fund" described later. Since major herder's income is biannual, they can make biannual payment, and pump and generator shall be installed after confirming the first payment. Therefore, it was explained in PO workshop held before well construction/ rehabilitation regarding the necessity of the cost sharing, Soum Well Fund and internal saving fund for future replacement in the group. Pumps were set only on the wells where herder groups agreed for cost sharing.

A new joint policy was signed in 2006, June by Minister of Food and Agriculture, Minister of Natural Environmental and Minister of Finance. According to it, herders have to contribute part of the construction/rehabilitation cost of engineering wells. Consequently, the amount of the contribution to the Soum Well Fund by each herder group was changed.

The herder's minimum contribution based on the new policy is between Tg 300,000 to Tg 600,000, and some herders had already paid this amount as of September 2005. The payment amount to Soum Well Fund was revised. The amount was set by well type based on the following concepts refer to calculated amount according with New Policy .

- The payment amounts could be higher in case of deep wells or new wells, if the amount is set by each well individually. Moreover, the amount of contribution isn't always in proportion to its capacity.
- Only the two kinds of payments, for Production Well and Shaft Well, had already been set with agreement with herder groups before new policy. For easy consent and giving unity to the herders, the project set only 2 kinds of contributions, for Production Well and Shaft Well after the new policy application.

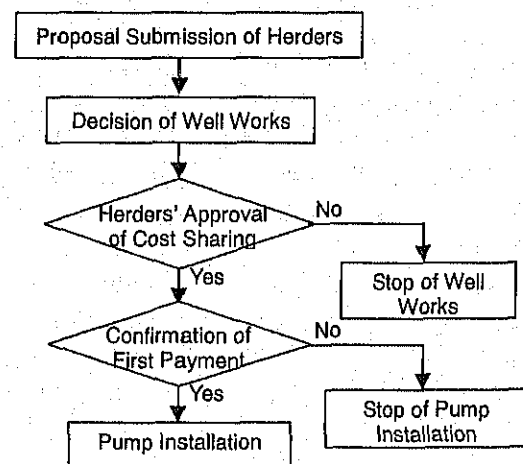


Fig. 4.6.1 Flow to Pump Installation and Cost Payment

Finally meeting was held among Aimag government, Soum governments and the team, and revised herders contribution was decided as follows, based on the desire of the Soum governments that want some amount as source of Soum Well Funds.

- Production Well: Tg 750,000
- Shaft Well: Tg 500,000
- Payment deadline: End of 2007

5) Establishment of *Soum* Well Fund

Budget for supporting well operation and maintenance by herders is not usually developed at the *Soum* government and *Aimag* government. Although the herders are compelled to prepare the funds in case of breakdown of machinery such as a pump or generator, there are some cases where they can't pay the cost for repair and renew of materials due to insufficient savings before the breakdown

Each *Soum* government shall establish "Soum Well Fund" to have the capacity to cope with such situations. The Fund will consist of capital contributions from herder groups which use the wells improved by the Pilot Project. The operation rules of *Soum* Well Fund in each *Soum* were decided. (ANNEX M)

Objective: Future well use development in the whole *Soum*

Activities: Financial support for the herders group as follows:

- Survey of well rehabilitation and rehabilitation works for Engineering Wells in the *Soum*
- Rehabilitation works and new construction of Traditional Wells in the *Soum*
- Repair and renewal of a pump and generator of wells in use at present
- The other activities necessary for the wells in the *Soum*

6) Pasture Management Plan

Pasture management plan in this project is closely related to well development. Regarding selection of well development sites, reclamation of unused and low-used pasture is for activation of herders seasonal migration and improvement of water supply efficiency and for smooth pasture utilization from the viewpoint of pasture management.

7) Problems and Solutions to be Considered for Project Implementation

[Problems about Well Use and Solutions to be Considered]

Problem	Precondition	Solution to be considered
As load of pump operator is large, it is impossible to continue the work. Since operator doesn't stay there, sometimes water supply is impossible.	Herders group consists of independent families. Livestock number is large.	Operator should receive salary or a full-time operator should be hired. All members will take training in pump operation. Time schedule for watering should be prepared.
Well is not used.	Pump breakdown cannot be coped.	Continuous monitoring by <i>Soum</i> government. Establish stock system of spare parts.
	There is other water source and new well is treated as supplemental.	Forced use is difficult. Person in charge of pump operation and maintenance shall be clarified.
Pump can not be used because of breakdown of generator.	Early trouble from generator.	Contacting with the company that executed well construction and rehabilitation.
	Breakdown of generator.	Ordering parts from a maker and change them or bring for repair.

[Problems about Operation and Maintenance and Solutions to be Considered]

Problem	Precondition	Solution to be considered
Herders don't pay money for the operation and maintenance in Herder's Well Fund	Livestock number is small. Pump is not used frequently. There is no willingness to use a pump for long time. Pump is used sporadically.	<i>Soum</i> government instructs herders about savings in Herder's Well Fund. <i>Soum</i> government tells herders of payment need even though they don't use pump every year. To understand saving's condition of each group's members .
One family pays full amount to the Fund, and owns the well privately.	One family (one <i>Khot Aile</i>) uses and maintains a pump, and others use it temporarily.	To set an impartial use charge. To encourage not to own well privately, and to recruit new users from adjacent herders.
Use charge can't be collected for the fund from temporary users.	People are reluctant to demand pay from temporary users when they are relatives.	<i>Soum</i> government sets an impartial use charge, and announces it to herders.
Before any savings in the Fund, well instruments and materials breakdown, and can't be repaired or renewed.	Nothing special	To study financing from <i>Soum</i> Well Fund.

[Rules of Pasture Utilization and Management]

Well development means to increase water source alternatives on pastures. It can be assumed that the present utilization patterns would drastically change due to adding of a new well to the migrating area which has not been used before. Accordingly, the following issues should be examined.

- System of preventing herder concentration in the area around particular wells
- Method of alleviating overgrazing in case of the concentration
- Ensure that pasture and water sources will not be a cause of argument among herders

Main challenges after well development are as follows:

- Appropriate seasonal migration to summer (autumn) camping places and preservation of winter (spring) camping places
- Appropriate combination of well and pasture utilization
- Development of well appurtenance facilities (water storage tank, feed water tank)

(4) Result of the Project

1) Basic Policy of Pasture Management Plan

Operation of the pasture management plan is shown in the following figure.

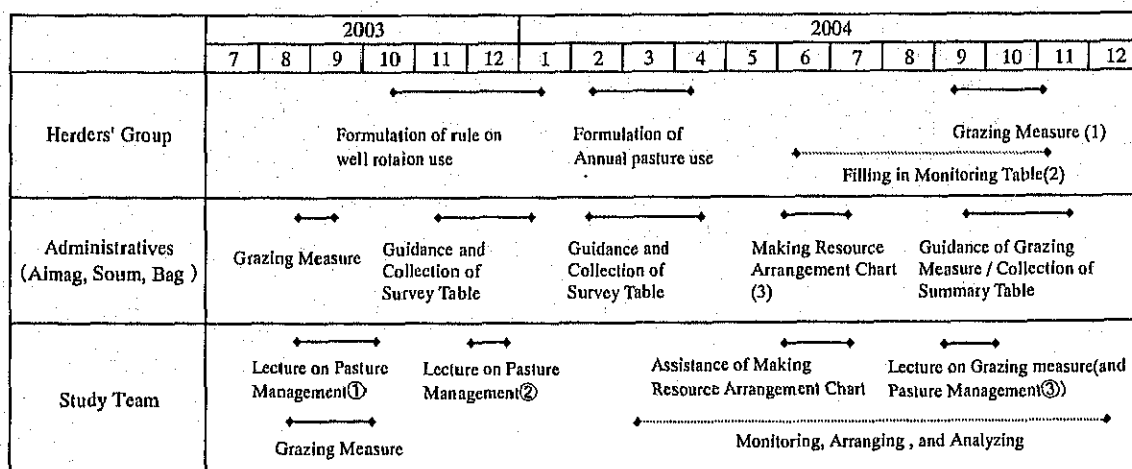


Fig. 4.6.2 Flow of Implementation on toward Pasture Management Plan

In the training seminar on pasture management implemented by the Study Team, the Team explained the importance of executing resource management cooperatively, and prompted to make the rules on pasture management as a herder group. However, as the investigation progressed, the Team understood that it is difficult to make rules on pasture management by the herders alone. Therefore, the Team changed the policy for pasture management, and decided to establish pasture management system that finally builds a database in the future. The herders and the administrative can mutually use it for resources management of pasture instead of making the rules. Also, it is important that the *Soum* government and *Bag* governor shall lead the activity in addition to having herders participation.

2) Training Seminar on Carrying Capability Measurement

As a part of the activity of the pasture management plan, the Study Team organized the training seminar on carrying capability for the herders, agricultural officers, and *Bag* governors in September 2004. After the training seminar, the Team requested the herders groups to conduct a pasture survey around their wells. With teamwork and cooperation of the both herders and the *Soum* government, they can get and file mutually useful information. This is one aim of the training seminar.

The survey method is outlined below.

Simple Pasture Survey Method		Coverage (6 classes and respective scores)		
		Class	%	Avg.
I)	Take two wooden poles and outline a square of 1m by 1m in the pasture at random. (each 3 site on circumference of 1km in radius from and 2km in radius = 6 sites x 60 times measure)	4	75~100%	87.5
II)	Divide the square into four quadrants, and estimate the approximate ratio covered by vegetation inside of the four quadrants to determine its class (c) in the table at the right.	3	50~75%	62.5
III)	Select 5 plants inside of the frame at random, and measure its natural height (H). (The placement of the frame is made 60 times systematically over several kilometers, so total plants measured will be 300.) Two things to avoid: Avoid bias of a specific kind of vegetation, and exclude shrubs over 30 cm in radius.	2	25~50%	37.5
		1	5~25%	15.0
		1'	1~5%	3.0
		+	Exist	0.5
IV)	Record the measured data into the survey sheet.			
V)	Perform this measurement in August every year.			

3) Relation between Seasonal Migration Pattern and Cost Sharing for the *Soum* Well Fund. (Analysis)

【Seasonal Migration Pattern and Classification of Well Types】

According to seasonal migration pattern, wells are classified into three types: Winter/Spring type, Summer/Autumn type and Seasonless (Intermediate) type. The rehabilitated or newly constructed 17 wells are classified as follows:

- Winter/Spring Type: *Durvurj* (Erd), *Tsaidam* (Ubd), *Hooloin Hond* (Ubd), *Shuvuum* (Ubd), *Khukh Am* (Ubd) (5 wells)
- Summer/Autumn Type: *Zuun Khur* (Erd), *Butiin Hooloi*(Erd), *Taliin Tsagaan* (Khv), *Yast* (Khv), *Khyars* (Khv) (5 wells)
- Seasonless (Intermediate): *Burdene* (Erd), *Bukhel-2* (Erd), *Tsant* (Erd), *Uvgon Mod* (Ubd), *Taliin Buuts* (Ubd), *Tataaliin Gol* (Khv), *Taliin Dov*(Khv) (7 wells)

Note: (Erd): *Erdene Soum*, (Ubd): *Ulaanbadrakh Soum*, (Khv): *Khuvsgul Soum*

【Relation between Total Performance Rate of Well Uses and Cost Sharing】

Based on migrating pasture/well use pattern of herder groups (n=116), relationship between total rate of well use and cost sharing per family for the *Soum* Well Fund in each type is described in the figure below.

In Winter/Spring type, total performance rate of well use and cost sharing for *Soum* well fund per household both have extremely high scores comparing with other two types, indicating 37.1% and Tg 59,114 respectively. On the other hand, in Summer/Autumn type, both showed low scores, 19.4% and Tg 14,444. In addition, Summer/Autumn type indicates high rate of herders withdrawing from the group, reaching 61.1%. In Winter/Spring type it is the inverse, 0% (see Fig. 4.6.3).

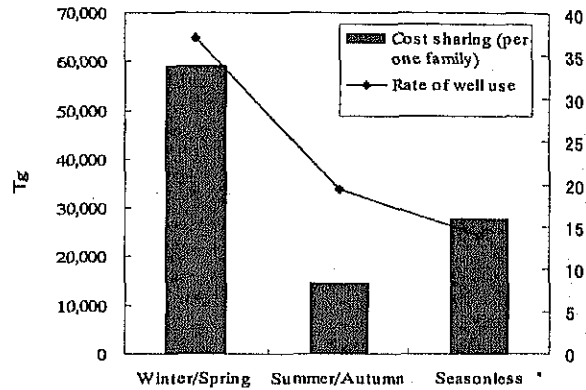


Fig. 4.6.3 Relation between Total Performance Rate of Well Use and Cost Sharing per Household

This brings into focus the stability of Winter/Spring type as a group and the most active payment for cost sharing in three types.

On another front, in summer/autumn camp, many herders gathered to use rehabilitated or newly constructed wells and half have withdrawn from the groups at present. Because of this unstable relationship, rate of unpaid herders in contribution for *Soum* well fund is highest in Summer/Autumn type as shown in Fig. 4.6.5

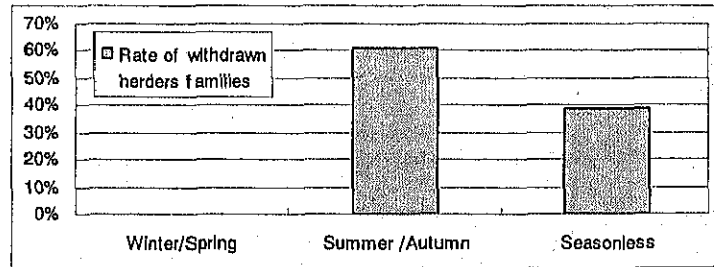


Fig.4.6.4 Withdrawing Rate of Herders from the Well Groups in Each Well Use Type

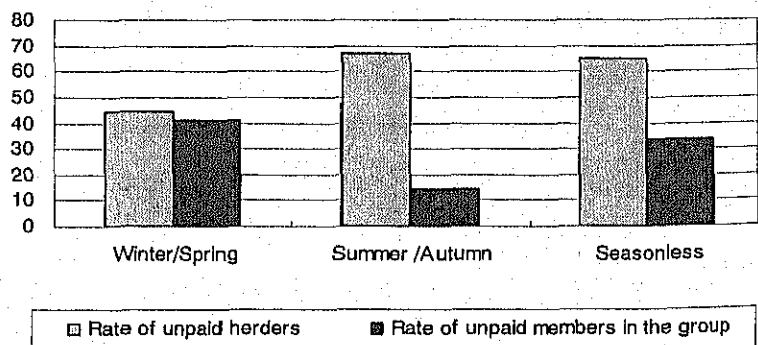


Fig.4.6.5 Rate of Unpaid of Cost Sharing for *Soum* Well Fund in each Type

But, if we compare between remaining members in the groups at present (n=66 : Sep.2005), rate of unpaid members show highest point in Winter/Spring type and rather low in Summer/Autumn type. Team works of group members in Summer/Autumn type are fairly fine and they shared money equally within the groups

even though the amount is not so high. In Winter/Autumn type, in contrast, since members in the groups are constituted by close kinship such as parent-and-child, brothers and relatives, the contribution for *Soum* well fund is paid only from a representative or rich member, which results in high rate of unpaid members in the groups.

4) Well Use

i) Composition of Numbers of the Well Herders Groups

Change in size of the 17 well herders groups of JICA rehabilitated or newly constructed well is shown in the Figure below.

Table 4.6.5 Transition in a Number of the 17 Well Herders Groups (2003.11-2005.9)

	Number of members			Withdrawn in total		Number of temporary users	
	At the beginning (2003.11~2004.07)	2004.12	2005.09	No.	Rate	2004	2005
Total	116	72	66	-50	43.1%	5	14
Average number of herders in a group	6.8	4.5	4.1	-	-	-	-

*Increased from the original members

At the beginning of the project, there were originally 116 families. But 50 families have withdrawn and 66 families are left at present for using wells, which is 43.1% decrease. The number of constituted families in one group has been reduced from 6.8 to 4.1. Wells used by families not belonging to well herders groups are not wholly known, but 6 non-member families in *Yast* were the largest number even if period was rather short, like only for five days.

ii) Combination of Compound Use of Water Sources in Pastures by Well Herders Groups

Some herders are making complex seasonal migration in combination with several water sources. The total number of wells used by each family in herder groups since January 2003 was counted and is shown below (*Burdene* and *Tataalin Gol* are excluded). Water sources were composed on the average of 4.4 in *Erdene Soum*, 6.1 in *Ulaanbadrakh Soum* and 4.9 in *Khuvsgul Soum*, and of 5.1 on average in total.

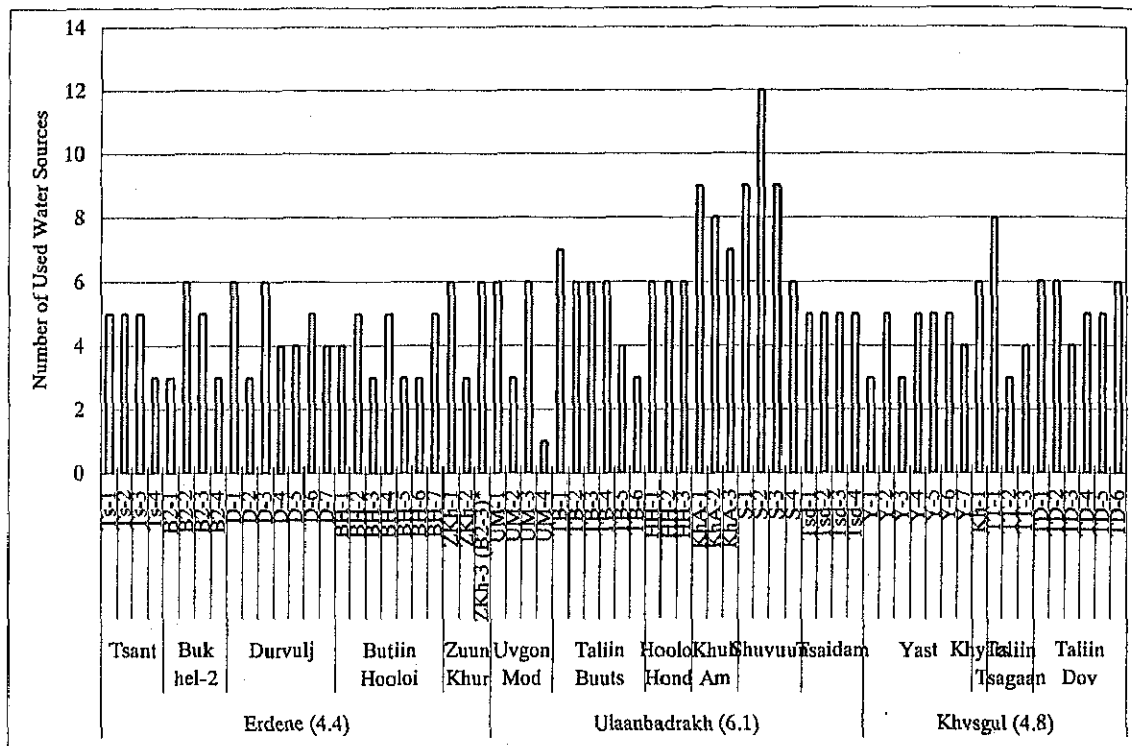


Fig. 4.6.6 Number of Water Source by Herder (2003 to 2005)

iii) Use Period of Rehabilitated or Newly Constructed Wells by Well Herders Groups

Use period of rehabilitated or newly constructed wells is described in the following figure, considering compound use of water sources through herders seasonal migration in wide areas (*Burdene* and *Tataalin Gol* are excluded).

	Year	2003				2004												2005								
		S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S
Erdene	Tsant																									
	Bukhel-2																									
	Durvulj																									
	Butiin Hooloi																									
	Zuun Khur																									
Ulaanbadrakh	Uvgon Mod																									
	Taliin Buuts																									
	Hooloin Hond																									
	Khuh Am																									
	Shuvuun																									
Khvsgul	Tsaldam																									
	Yast																									
	Kyars																									
	Taliin Tsagaan																									
	Taliin Dov																									

Note: *Durvulj* and *Hooloin Hond* are Shaft Wells and had used before rehabilitation.
Use period of rehabilitated or newly constructed wells by well herders groups in three Soums

Fig. 4.6.7 Use Period of Constructed / Rehabilitated Wells

iv) Change of Livestock Number (in sheep units) around Rehabilitated or Constructed Wells

Even though there was high rate of well use, it is not a severe problem at all if the well is used by a small number of both households and livestock in context of pasture

management. Therefore change of livestock number in sheep units around rehabilitated or newly constructed wells is expressed by rate of well use and livestock database for each family in the groups. Livestock number is another indicator in context of pasture management

【Erdene Soum】

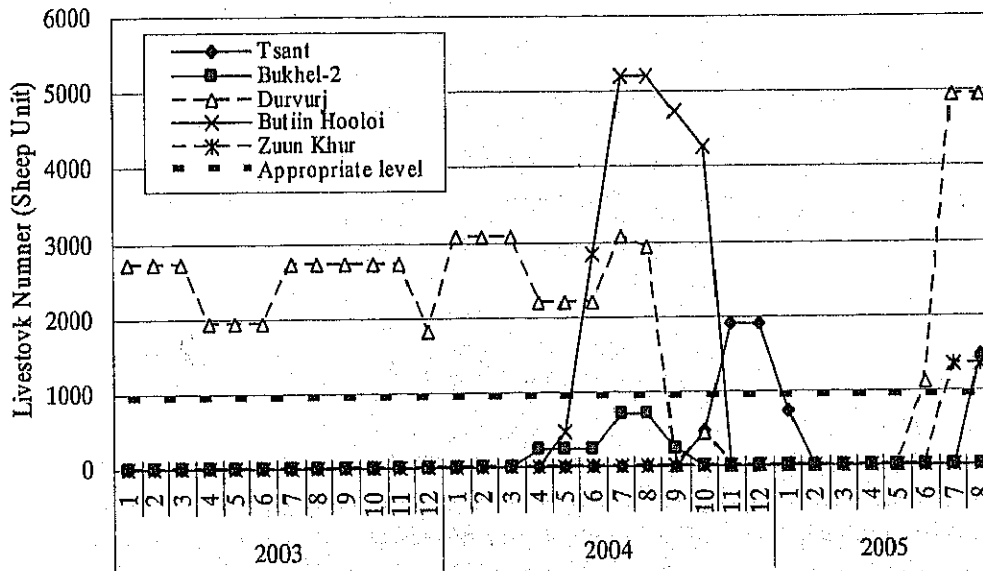


Fig. 4.6.8 Change of Livestock Number (in sheep units) around Rehabilitated or Constructed Wells - Erdene Soum -

【Ulaanbadrakh Soum】

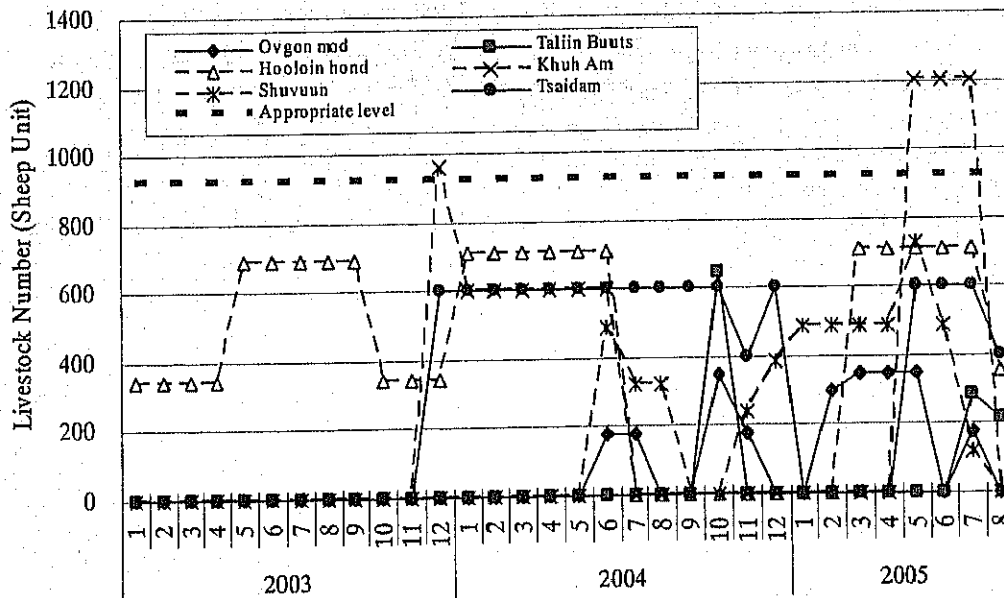


Fig. 4.6.9 Change of Livestock Number (in sheep units) around Rehabilitated or Constructed Wells - Ulaanbadrakh Soum -

[*Khuvsgul Soum*]

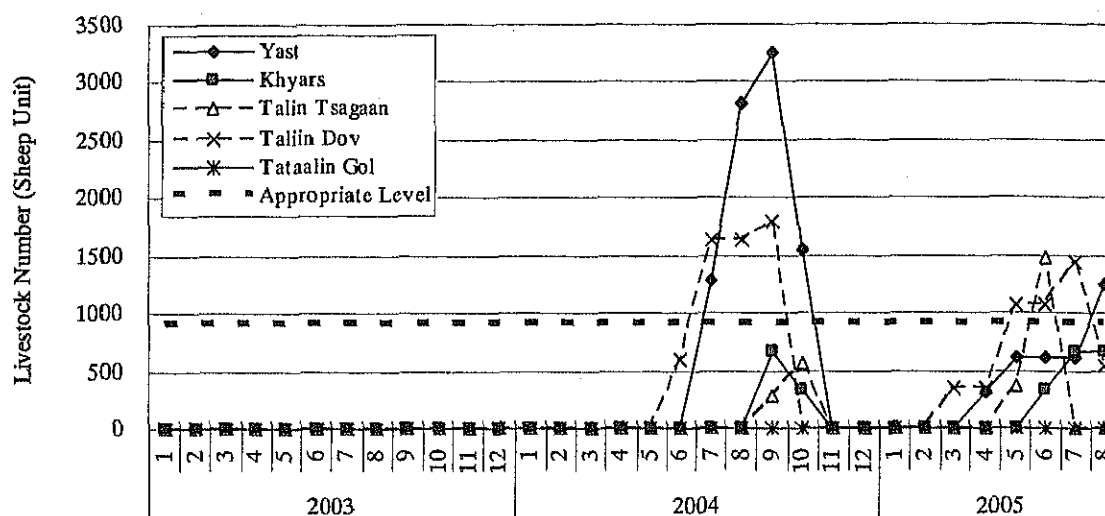


Fig. 4.6.10 Change of Livestock Number (in sheep units) around Rehabilitated or Constructed Wells -*Khuvsgul Soum*-

v) Unused Wells

The responsible herder groups are not decided in two of the 17 wells which were developed by the Project: one is *Burdene* well in *Erdene Soum* and the other is *Tataalin Gol* well in *Khuvsgul Soum*. Future utilization of these unused wells was discussed by each site's *Soum* government.

a) Present Conditions of Unused Wells

The characteristic of *Burdene* well and *Tataalin Gol* well are shown in Table 4.6.6. Both wells are located in pasture which can be used during the whole season. However, they have some negative conditions like a bad water quality, lack of potable water nearby and sandy environment, etc. Therefore, herders may not ever use these wells.

Table 4.6.6 Information of Unused Wells

	<i>Burdene</i>	<i>Tataalin Gol</i>
Location	30 km from <i>Erdene Soum</i> Centre. It is located in the sand dune area, thus the access is difficult.	10 km from <i>Khuvsgul Soum</i> Centre, easy to access
Feature of pasture in surrounding	Sandy pasture. Possible to be used annually. It is used as preliminary pasture.	Sandy pasture. Dominant vegetation is shrub, only camel and goat can eat. Grass, can be eaten by sheep; it grows only in fairly rainy condition.
Feature of surrounding water sources	The pools and springs are scattered in the dune. However, it has happened sometimes that all of them were dried up.	One Traditional Well for drinking water has existed in <i>Negdel</i> period. But it dried up by shortage of rain in recent years.
Original purpose of well construction	Used as a sub water source when other waters are dried up. Good quality water was also expected.	Expected to develop water resource to use pasture for Camel
Reason of non utilization	It was found after well construction that the water contains quite a lot of iron. It can be used for livestock animals, but herders do not want to pay for it. They intend to get good condition wells since they will be charged some cost.	There are difficulties to stay a long period due to lack of drinkable water for humans, and pasture condition does not suit sheep either. Herder gives water for herd of large animals when they return to the water point; therefore, they do not take the herd to water point for supplying water. It is difficult to use the well without someone staying there.

b) Countermeasures

The following three measures were examined to use the pumps and generators in both wells.

- i) Removing the generators and pumps from unused wells and stock as spare equipment for other wells in the Project.
- ii) Removing the equipment from unused wells and set it on other wells.
- iii) Leave the facilities on the place for emergency use. *Soum* government would have the responsibility of maintenance and management.

Alternative i) "removing and stocking the generators and pumps" was recommended to *Soum* government by the Study Team in the beginning of discussion, based on the understanding that the wells were not used and many of installed generators were broken.

c) Intention of *Soum* Governments and Countermeasures

Due to drought conditions in 2005 in *Dornogobi*, *Soum* governments did not want to remove and stock the pumps and generators. They requested to keep the wells in usable condition, because they did not want to waste opportunities to use equipment efficiently.

In conclusion, not to remove the equipment of both wells and having the opportunity of using the pasture around those wells was decided. The policy was set that *Soum* governments will maintain those wells, set a utilization fee, and collect it to finance maintenance.

5) *Soum* Well Fund

i) Payment to *Soum* Well Fund

All herders groups except *Tataalin Gol* in *Khuvsgul Soum*, where well users group is not yet formed, have begun payment to *Soum* Well Fund. *Burdene* well in *Erdene Soum* had been initially studied about joint operation by both the herders group and *Soum*, and only *Soum* carried out payment.

Erdene Soum, which is actively stimulating payment to the groups, is in better payment condition. Even the groups that have not yet carried out second payment expressed their willingness to pay through the evaluation workshop.

Table 4.6.7 Payment to *Soum* Well Fund (unit: Tg) Status of November 2005

<i>Erdene</i>		<i>Ulaanbadrakh</i>		<i>Khuvsgul</i>	
<i>Ulzit (Burdene)</i>	210,000 (<i>Soum</i>)	<i>Uygon Mod</i>	100,000	<i>Yast</i>	230,000
<i>Tsant</i>	150,000	<i>Taliin Buuts</i>	100,000	<i>Khyars</i>	100,000
<i>Bukhel-2</i>	420,000	<i>Hooloi Hond</i>	150,000	<i>Taliin Tsagaan</i>	150,000
<i>Durvulj</i>	380,000	<i>Khukh Am</i>	250,000	<i>Taiin Dov</i>	390,000
<i>Butiin Hooloi</i>	510,000	<i>Shuvuun</i>	600,000	<i>Tataalin Gol</i>	-
<i>Zuun Khur</i>	450,000	<i>Tsaidam</i>	160,000	-	-
Total: 2,120,000		Total: 1,360,000		Total: 870,000	

ii) Operation of *Soum* Well Fund

Amount of money received to *Soum* Well Fund was Tg 2,249,500 in *Erdene*, Tg1,360,000 in *Ulaanbadrakh*, and Tg 1,000,290 in *Khuvsgul*. This amount also includes charge of equipment used in the Traditional Well campaign project.

The number of loans financed by *Soum* Well Fund was 1 in *Ulaanbadrakh* and 1 in *Khuvsgul*.

Table 4.6.8 Condition of Money Received and Loans in Each *Soum*

Item		<i>Erdene</i>		<i>Ulaanbadrakh</i>		<i>Khuvsgul</i>	
		Money Received	Loan	Money Received	Loan	Money Received	Loan
Income	Repayment from Well Users Group	2,120,000	-	1,360,000	-	870,000	-
	Lease of Pump	82,760 (6 times)	-	-	-	-	-
	Lease of Tractor Repairing Cost of Equipment	40,000 (1time)	-	-	-	13,000 (9 times)	-
Loan	Procurement of Pump	-	-	-	500,000	-	-
	Procurement of Water Tank	-	-	-	-	-	200,000
Total		2,242,760	0	1,360,000	500,000	1,000,290	200,000

iii) Establishment of Herders Well Fund

Out of 15 herder groups operating wells (excluded the completely unused two wells of *Ulzit(Burdene)* in *Erdene* and *Tataalin Gol* in *Khuvsgul* from the 17 wells), 7 groups opened bank accounts and deposited money. In addition, 4 groups are collecting money and setting up their fund, although bank account is not yet opened. More than two-thirds of the groups have started to deposit money. The Study team induced the groups that collected money to open bank accounts during the Workshop.

The groups that have never been collecting money for Herders Well Fund are not using the wells or not forming a users group itself.

iv) Operation and Maintenance of Equipment

9 generator or pumps were sent to *Ulaanbaatar* to repair as shown below. In addition, 2 generators will be repaired at *Soum* by using parts sent from *Ulaanbaatar*.

Table 4.6.9 List of Generators and Pumps Requested to Repair at *Ulaanbaatar*

Name of Well	Defect and Detail of Repair	Note
<i>Tsant</i>	Engine stops when loaded. (Adjustment of ignition)	Free of charge
<i>Durvulj</i>	Hiatus of pump filter	Free of charge
<i>Butiin Hooloi</i>	Control box was broken by someone	Free of charge
<i>Taliin Buuts</i>	Stop moving due to remodeling of piston rod	Tg 75,000
<i>Tsaidam</i>	Interfusion of screw into generation coil. (initial defect)	Free of charge
<i>Yast</i>	Remodeling of air filter. Breakdown by infiltration of sand inside of engine.	Tg 115,000
<i>Yast</i>	Not operational after emitting black smoke	Under repair
<i>Kyars</i>	Abrasion of piston ring. Plan to change	Under repair
<i>Buhel-2</i>	No operational	Unknown because herders themselves sent it to <i>Ulaanbaatar</i> and repaired it.

Table 4.6.10 Repair in *Soum*

Name of Well	Defect and Detail of Repair	Note
<i>Uvgun Mod</i>	Not operational after emitting black smoke (Exchange of worn parts of engine)	Tg 38,000
<i>Shuvuun</i>	Not operational after emitting black smoke (Incorporation of extraneous material into generation part) Planned to attach used part.	Free of charge

In addition, although there was no problem in operation of generators, there were lots of breakage of starters. In asking its cause to the maker, the answer was the following: if user doesn't operate it properly when starting the engine, forceful pressure affects starter, and consequently it is liable to breakdown.

In addition to these small breakdowns, there is also problem that diesel engine does not easily start especially in the winter, so many herder groups complained that quality of the generator is no good. For this complaint, the Team offered guidance in the following matters.

- To operate according to directions written in the manual when starting the engine
- To use proper winter dedicated fuel and oil for a diesel engine.

Since it is necessary to build operation and maintenance system in *Soum* to cope with breakdown of the equipment, it was studied and based on the study, training on enhancing ability to treat generator was implemented.

6) Revision of Well Maintenance System

In the project, up to now, a lot of machines became out of order. One of the reasons is shortage of engineer near the herders, who consults about the disorder of well equipment and responds to repairs quickly. In the information exchange meeting in 2004 and workshop in 2005, headers requested that *Soum* government stock spare parts and train an engineer who to be in charge of maintenance work such as overhaul check or repair.

However, the number of equipments was small and the supplier wouldn't agree to build the maintenance system voluntary as part of their services. Thus, the project provided training to educate an engineer in charge of maintenance management in *Soum*.

It was decided that the training would be carried out with nominated persons from each *Soum* who had technical attainment. However, it was expected that the *Soum*'s engineers will need some professional assistance when they face a problem they cannot deal with. Then, through the discussion with *Aimag* government and *Dornogobi* Well Construction Company, the company agreed to support them, and it was decided that maintenance management will be done according to the following system.

- Three days training seminar would be carried out to educate an engineer in each *Soum* in charge of well equipment (generator) management. *Aimag* government would bear its cost.
- The experienced engineer in *Dornogobi* Well Construction Company would give support to *Soum*'s engineer.

- Spare parts would be stocked in *Soum* government office financed by the *Soum* Well Fund. Trained *Soum* engineer or *Soum* government would manage these spare parts.

4.6.2 LIVESTOCK FUND PROJECT

(1) Objectives and Basic Policy of the Project

The basis of subsistence in the *Soum* is sound livestock farming. It is necessary for sound livestock farming to keep a fixed number of livestock. The herders increase the number of livestock for consuming some of it; however, if they drastically reduce the number of livestock for some reasons, the amount of consumption exceeds the production. Then, they cannot increase the number of livestock easily and fall into "negative cycle". If they fall into this condition once, it is very difficult to work out from there. Livestock Fund Project aims to offer the herders in this condition, the chance of being independent. Reduction of the poor herders can be expected through changing the negative cycle into the positive cycle of livestock farming.

The project also aims to increase as many high quality livestock as possible within the *Soum*. Therefore, it should be considered that as many high quality livestock as possible are introduced and their offspring are expanded within the *Soum*.

The project was proposed by the *Erdene Soum* government and would also be independently managed by it. As the startup funds are limited, misstep at the initial stage will be a fatal for the future of project. Therefore, it is very important to succeed at the initial stage to be able to expand it in the future. This is the first experience for *Erdene Soum* government; therefore, it is important to move forward carefully and gradually accumulate experience.

Some herders lost a lot of livestock by *Dzud* in *Erdene Soum* and some lost all of their livestock. Although the project aims to support such herders, severe selection criteria should be set for screening herders to receive loans. Also, the support system should be involved in the project implementation system because the success of the project largely depends on the qualifications of the herders.

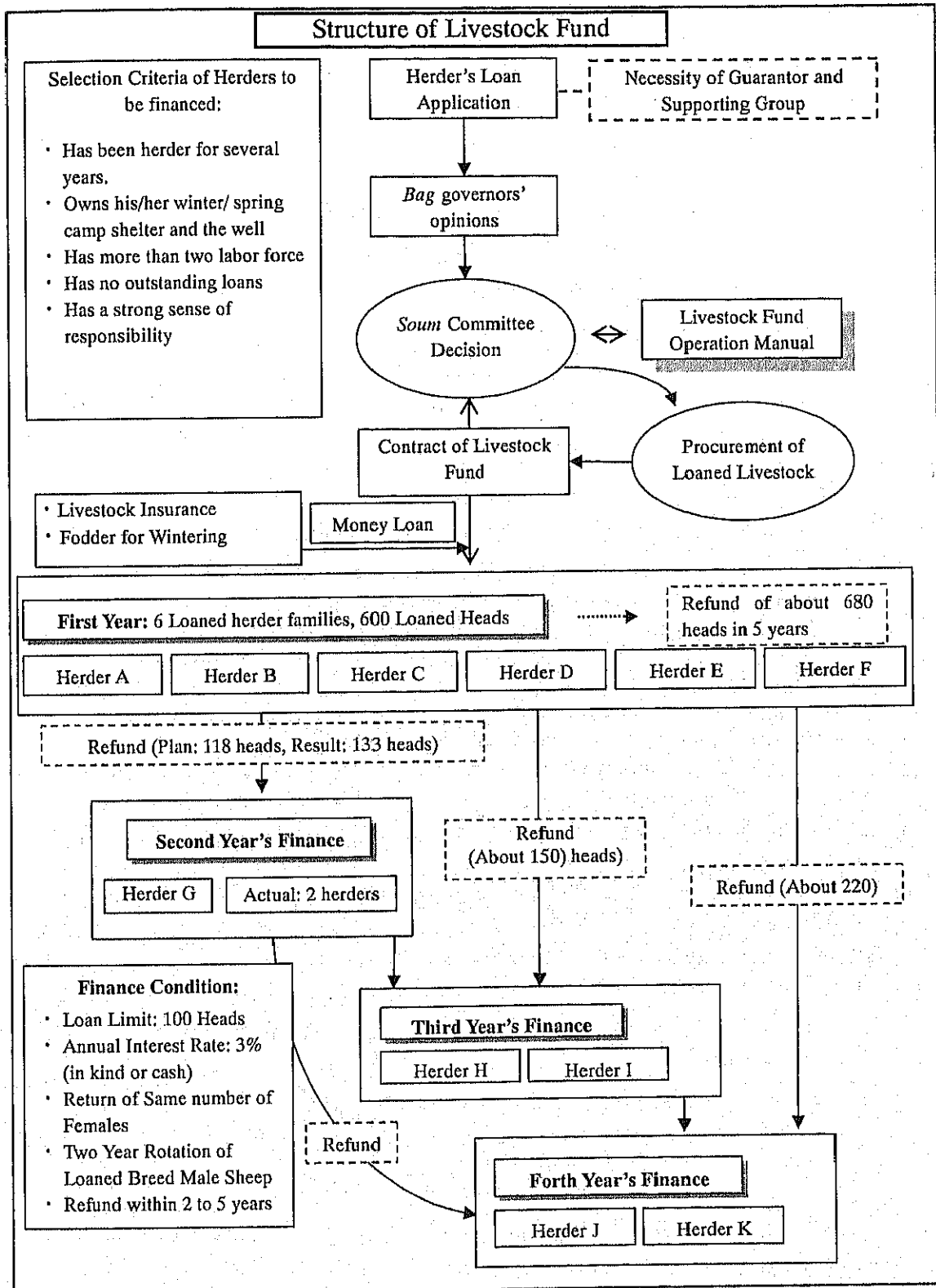
(2) Structure of the Project Implementation

Livestock Fund Project is to improve the livestock condition of as many herder families as possible by recycling the funds for a fixed number of livestock to the herders, and then re-using the repaid funds for livestock to the next herders; thus, it is necessary for the project to have obtain enough funds at least for the second year, to keep continuity of the project. The project is designed to start by financing 600 heads¹ (100 heads² to 6 herder families).

¹ It is difficult to secure the number of livestock to be loaned in continuing years when total number of livestock is less than about 600.

² It is also an idea that the number of loaned livestock is assumed to be several dozen. However, the loaned livestock was decided as 100 heads, based on examination of livestock growth plan considering self-consumption and also confirmation that small-scale herders can repay all debt within 5 years if loaned 100 livestock.

The *Erdene Soum* government will set up "Operation Manual of Livestock Fund" and operate it. The structure is explained below.



Objectives of Fund Use:

- Loan of Livestock
- Loan of high quality livestock

Responsibility of *Soum* Government:

- To setup fund operation conditions
- To select the supporting herders groups for loaned herders
- To procure and distribute the loaned livestock to the herders
- To evaluate and control the refunded livestock in kind
- To periodically advise the loaned herders and give technical advice
- To monitor the refund process

Money for Livestock Fund Foundation:

JICA will pay the money necessary for starting the project, including finance for six herders who are selected as suitable candidates for loans by the Livestock Fund by the *Erdene Soum*, which will be the foundation fund.

Interest of Livestock Fund Operation and Refund Method:

Livestock Fund will be operated with annual interest of 3%. It is a principle to refund livestock equivalent to the loaned livestock. However, when the borrower has no such kind of livestock, he/she can refund by money equivalent of the estimated value subject to approval of the fund executor.

Selection of Borrowing Herders:

- Borrowing herders have to satisfy the criteria of the Livestock Fund.
- Borrowing herders have to be recommended by the *Bag* governor and approved the *Soum* governor.
- Borrowing herders have to have a guarantor who will assume all the responsibilities.

Kind and Number of Loaned Livestock:

The number of loaned livestock is limited to maximum 100 heads regardless of kind of livestock. The herder who wants a loan requests the *Bag* governor, and states the reason and number of each kind of livestock that the herder wants and the number of livestock owned already. The *Bag* governor checks the request contents and then forwards it to the *Soum* governor.

Livestock Refund Plan:

Loaned herders have to make a refund plan including consumption, sales amount, and refund per year for each kind of livestock, and get approval of the fund executor. In addition, livestock breeding is calculated on the following basis: wintering ratio of small animals is assumed to be 90%, and impregnating ratio is assumed to be 90% of sheep and at 85% of goats. Also, the loaned breed male sheep shall be refunded two years later.

Livestock Refund Period:

Refund period of the loaned livestock shall be within 2 to 5 years.

Extension of Livestock Refund Period:

When the scheduled refund will become impossible due to natural disaster along the way, the herder shall review the refund plan subject to approval of the *Soum* governor.

Review of Livestock Fund Operation Manual:

If a change is requested in the fund operation manual, it can be made after due consultation among the *Soum* governor, the official in charge of food and agriculture, and the accountant.

Loan of Wintering Fodder Purchase:

The *Soum* government will loan the money necessary to purchase wintering fodder.

Buying Livestock Insurance:

The herders have to buy the livestock insurance to minimize the damage in case the loaned livestock will die in large quantity.

(3) Content of Project**1) Selection of Loaned Herders and Actual Condition of Herders**

Change in the number of livestock after 1999 owned by the first six loan candidates in Livestock Fund Project is shown in Table 4.6.11.

Table 4.6.11 Change of Number of Livestock of Loan Candidates

Herders	Years					Herders	Years				
	1999	2000	2001	2002	2003		1999	2000	2001	2002	2003
A	140	31	62	0	32	D	206	164	140	78	82
B	163	133	122	90	66	E	54	41	61	48	57
C	143	113	67	22	36	F	406	276	295	86	75

For herders A and C, they owned around 140 animals in 1999; however, in 2002, herder A lost all livestock, and herder C was reduced to 22 animals. Since then, they have increased their livestock with support from relatives. The livestock of herder E has been hovering at the lower level since 1999. Herders B, D and F were breeding a lot of livestock around the year 1999; however, they rapidly lost their livestock since the *Dzud*, and they are now extremely struggling with a smaller number of livestock. The *Erdene Soum* government perceives that the herders who need the livestock fund project total about 40 families (about 10% of all the families) in the whole *Soum*.

2) Livestock Composition and Breeding Plan**【Livestock Composition】**

The number of loaned livestock was limited to maximum 100 heads. Based on the number of present livestock owned by the herders, a variety of livestock, which they did not have enough, was financed. In addition, from the viewpoint of spreading a superior

livestock within the *Soum*, the plan was to introduce 12 fine breed male sheep (distribution of two heads for each family) and about 20% of the quality female sheep from *Sukhbaatar Aimag*.

The number of livestock owned by the herders at beginning of the project and financed by the project are shown in Table 4.6.12 (present portion between male and female is estimation).

Table 4.6.12 Present Number of Livestock and Financed One by Herders

Herders	Before /After Loan	Sheep				Goat				Cattle			Horse			Camel			Total				Total with Babies
		Served	♂	♀	total	Served	♂	♀	total	♂	♀	total	♂	♀	total	♂	♀	total	Served	♂	♀	total	
Herder A	Before		4	8	12		8	10	18	0			2		2	0	0	0		14	18	32	178
	Loan	2	8	42	52	1	6	37	44	0	3	3			0		1	1	3	14	83	100	
	Babies		26				17				3										46		
	Total	2	12	50	64	1	14	47	62	0	3		2	0	2	0	1	1		28	101	132	
Herder B	Before		5	12	17		10	19	29	2	2	4	5	8	13	1	2	3		23	43	66	213
	Loan	2	6	32	40	1	9	45	55	0	4	4			0		1	1	3	15	82	100	
	Babies		5				38				4										47		
	Total	2	11	44	57	1	19	64	84	2	6	8	5	8	13	1	3	4		38	125	166	
Herder C	Before		17	17	34		16	30	46	1	1	2	2	3	5	1	3	4		37	54	91	204
	Loan	2	6	32	40	1	9	45	55		4	4			0		1	1	3	15	82	100	
	Babies		0				10				3										13		
	Total	2	23	49	74	1	25	75	101	1	5	6	2	3	5	1	4	5		52	136	191	
Herder D	Before		8	17	25		10	21	31	5	5	10	4	4	8	4	4	8		31	51	82	252
	Loan	2	5	43	50	1	4	45	50			0			0			0	3	9	88	100	
	Babies		38				32														70		
	Total	2	13	60	75	1	14	66	81	5	5	10	4	4	8	4	4	8		40	139	182	
Herder E	Before		10	20	30		7	18	25	1	1	2	5	8	13	2	3	5		25	50	75	214
	Loan	2	5	48	55	1	4	35	40		5	5			0				3	9	88	100	
	Babies		17				17				5										39		
	Total	2	15	68	85	1	11	53	65	1	6	7	5	8	13	2	3	5		34	138	175	
Herder F	Before		2	4	6		17	26	43	2	2	4	2	2	4			0		23	34	57	200
	Loan	2	8	32	42	1	8	44	53		5	5			0				3	16	81	100	
	Babies		23				15				5										43		
	Total	2	10	36	48	1	25	70	96	2	7	9	2	2	4	0	0	0		39	115	157	
Total	Before	0	46	78	124	0	68	124	192	11	11	22	20	25	45	8	12	20	0	153	250	403	1261
	Loan	12	38	229	279	6	40	251	297	0	21	21	0	0	0	0	3	3	18	78	504	600	
	Babies		109				129				20										258		
	Total	12	84	307	403	6	108	375	489	11	32	40	20	25	45	8	15	23	0	231	754	1003	

Source: Erdene Soum, Study Team

All of the herders were loaned 100 heads which was the maximum, totally 600 heads. The herders who owned horses were selected, and therefore, the loaned livestock did not include horses. The loan composition is: 279 sheep, 297 goats, 21 cattle, and 3 camels.

Loan with Babies:

Actually loan with babies was done, so totally 258 babies were included.

[Refund Plan and Number of Yearly Refunded Livestock]

The refund plan is shown in Table 4.6.13. Especially for the herder who has small number of livestock, it is very urgent to increase their number at the early stage because

refund is required in 5 years to complete. For the herders who have more than a minimum number of livestock, it is possible to refund within 3 years.

Table 4.6.13 Yearly Number of Refunded Livestock

Year	Herder A	Herder B	Herder C	Herder D	Herder E	Herder F	Total
2005	12	13	36	13	18	26	118
2006	17	18	34	18	27	36	150
2007	26	47	27	25	32	37	194
2008	27	24	0	26	33	0	110
2009	32	34	0	33	0	0	99
Total	115	115	107	115	110	109	671

Since the interest rate is 3% per year, 671 livestock in total shall be refunded against the 600 financed livestock. As for large animals, it is difficult to adjust the interest in short period, and therefore a part of the loan might be paid in cash. The refunded livestock number in the first year shall be 118 livestock, and then these livestock shall be loaned to the next herder.

Refunded livestock number in the first year:
For the 118 heads to be refunded in the first year, actually 133 heads were refunded.

3) Setting of Livestock Procurement Sites and Its Price

As for 12 fine breed male sheep (two heads for each herder), 6 fine breed male goats (one head for each herder) and the superior livestock (20% of procuring sheep and goats in total) which were requested by *Erdene Soum* government, the plan is to procure them from *Sukhbaatar Aimag*.

When the superior livestock is procured in the other *Aimags*, it requires confirmation of the superior livestock certification, veterinary checkup, and vaccination. The veterinary checkup is again necessary when it comes back to *Erdene Soum*. In addition, it will take a lot of time to procure the livestock because of the long distance. Therefore, accompanying by the herder who will take care of the livestock is necessary during transporting.

As for the other livestock, the *Soum* government plans to procure good ones as cheap as possible within the *Soum* by widely announcing the procurement of livestock to the herders. In such way, many of livestock will be procured and might shift from those who have many livestock to those who have few livestock within the *Soum*. This will be a redistribution of the livestock within the *Soum*.

As shown in Table 4.6.14, there was no significant difference between the planned cost and the actual one required for the procurement.

Table 4.6.14 Livestock Procurement Cost

	Item	Unit	Quantity	Planned Cost		Actual Cost		Note (Procured Places)
				Unit Cost(Tg)	Cost (Tg)	Unit Cost(Tg)	Cost (Tg)	
I	Procurement of Qualified Livestock				3,208,800		2,824,360	
1	Transportation Cost	L.S.	1		780,000		694,560	
2	Fine Breed male Sheep	Head	12	45,000	540,000	42,083	505,000	<i>Sukhbaatar Aimag</i>
3	Fine Breed male Goat	Head	6	35,000	210,000	31,667	190,000	<i>Sukhbaatar Aimag</i>
4	Qualified Sheep	Head	24	33,000	792,000	30,000	720,000	<i>Sukhbaatar Aimag</i>
5	Qualified Goat	Head	30	28,000	840,000	22,267	668,000	Northern part of Erdene
6	Vaccination	Head	72	150	10,800		10,800	
7	Check by Veterinary	L.S.	72	500	36,000		36,000	
II	Procurement of Livestock				19,415,000		18,226,040	
1	Sheep (male)	Head	38	40,000	1,520,000	31,737	1,206,000	<i>Erdeen Soum</i>
2	Sheep (female)	Head	205	30,000	6,150,000	26,663	5,466,000	<i>Erdeen Soum</i>
3	Goat (male)	Head	40	35,000	1,400,000	33,200	1,328,000	<i>Erdeen Soum</i>
4	Goat (female)	Head	221	25,000	5,525,000	22,647	5,005,000	<i>Erdeen Soum</i>
5	Cattle (female)	Head	21	180,000	3,780,000	199,048	4,180,000	<i>Erdeen Soum (2 heads from Sukhbaatar Aimag)</i>
6	Camel (female)	Head	3	280,000	840,000	250,000	750,000	<i>Erdeen Soum</i>
7	Transportation Cost	L.S.	1		200,000		291,040	
III	Livestock Insurance				106,781		97,157	
IV	Miscellaneous						150,500	
V	Total (I+II+III+IV)				22,730,581		21,298,057	

Procured Site of Superior livestock:

All the superior livestock couldn't be procured in *Sukhbaatar Aimag*, so superior goats were procured at the northern part of the *Erdeen Soum* which has many. It is better to procure superior livestock but lower priority. Higher priority is to procure from close regions since a lot of difficulties are attended to procure many livestock from a distance place.

Livestock Procurement Timing of the Project:

The earlier procurement is desirable to get better livestock, if any are available, and the loaned herders also wanted to get early livestock and fully raise them during the summer under their responsibility, and then make ready for wintering. However, it is impossible to procure livestock during bearing before weaning because the time when the baby livestock can be weaned from the female is the end of August; thus procurement timing is a difficult factor to determine by rule. Actually the procurement with baby livestock was done at the end of July.

4) Number of Refunded Livestock and New Finance

Table 4.6.15 shows the number of yearly refunded livestock and new loaned herders after the commencement of the project.

The number of livestock to be refunded in the first year after commencement of the project will be 118 heads, which brings one or two newly loaned herders. But after the second year, 2 to 3 herders can be financed every year. Accordingly, about 20 herders including 6 herders in this project can be benefited over 6 years.

Table 4.6.15 Number of Refunded Livestock and Newly Loaned Herders

Year	Number of Yearly Refunds						Number of Newly Refundable Livestock	Number of Newly Loaned Herder
	1st	2nd	3rd	4th	5th	6th		
1	118						118	1
2	150	23					173	2
3	194	29	34				257	3
4	110	38	43	50			241	2
5	99	21	55	64	47		286	3
6		19	31	83	60	56	249	3
7			28	47	77	71		
8				42	44	92		
9					39	52		
10						47		
	671	130	191	286	267	318	1324	14

(4) Record of Project

1) Livestock Procurement and Distribution

To meet the hope of the loaned herders to start the project as soon as possible, the procurement was implemented. Thus time of the livestock distribution to the herders was before the end of August when the baby livestock can be weaned from the female; therefore, in most cases loans combined adults with the baby livestock. Hence, refund with the baby livestock shall be also obliged.

As for procurement of fine breed livestock, it was difficult to procure them at the same place; therefore, the *Soum* government finally procured the fine goats at the two places in the northern part of *Erdene Soum* since the fine goats were once procured from *Sukhbaatar Aimag* and bred there.

As for the other livestock, the *Soum* government procured them from about 30 large-scale herders in the *Erdene Soum*. Two methods were applied: one was that herders who wanted to sell livestock brought them and then the loaned herders selected the better livestock among them, and the other was that the *Soum* committee and the loaned herders visited the herders who had livestock to sell and selected them.

Since the livestock procured at *Sukhbaatar Aimag* was already vaccinated, it was skipped there, and the livestock were vaccinated again when they arrived at *Erdene Soum*. As for the livestock procured at the northern part of *Erdene Soum*, the veterinary visited there and vaccinated them.

Livestock distribution of to the loaned herders was done under supervision of the *Soum* governor, the agricultural officer, and the accountant. As for care of the livestock procured at *Sukhbaatar Aimag* before distribution, the *Soum* government paid for and entrusted it to two herders. One herder out of the two herders specializes in breeding male sheep and goats by subcontract.

2) Livestock Insurance

The loaned herders insured their livestock. However, horse and camel were excluded from the insurance because the horse was originally excluded from the loan and the loaned camel totaled only three and they were rather strong. The insured livestock includes the newly loaned livestock and the originally owned livestock (excluding horses and camels).

Concerning the advance money of the insurance cost, each family promised to pay it after selling the cashmere, at the meeting held between the *Soum* and the loaned herders on January 26, 2005. Payment condition at the end of May is as following: four out of six families have already repaid the insurance cost, and two not yet.

Number of Insured Livestock: 430 sheep, 474 goats, 33 cattle; 937 in all
 Insurance Cost: Tg 62,058 (Unit Insurance Cost: Sheep Tg 90, Goat Tg 76.5, Cattle Tg 675)

3) Procured Forage

Generally herders families are suffering from shortage of resources to procure necessary forage, because their cash usually vanishes before early spring. Because of this and as one of the methods for wintering in 2004 to 2005, the *Soum* interviewed the loaned herders the necessary forage, and procured concentrate feed from the *Aimag* Center and hay from the military forces in the *Erdene Soum*, and then distributed it to the borrowing herders. They intend to repay the loan after selling cashmere in spring.

Condition of the procurement of stockpiled forage and the repayment of the temporary loan (at the end of May, 2005) are as follows:

Table 4.6.16 Quantity of Procured Forage, Detail of Temporary Loan and its Repayment

Name of Herder	Kind of Forage	Procured Quantity	Unit Price (Tg)	Amount (Tg)	Temporary Loan (Tg)	Repaid Amount (in May)
Herder A	Concentrate Feed	5	7,000	35,000	48,000	48,000
	Hay	10	1,300	13,000		
Herder B	Concentrate Feed	2	7,000	14,000	44,500	
	Hay	10	1,300	13,000		
	Bran	5	3,500	17,500		
Herder c	Concentrate Feed	5	7,000	35,000	61,000	61,000
	Hay	20	1,300	26,000		
Herder D	Concentrate Feed	3	7,000	21,000	53,500 PP* PP*	53,500
	Hay	25	1,300	32,500		
	Bran	5	2,500	12,500		
	Hay	10	1,000	10,000		
Herder E	Concentrate Feed	3	7,000	21,000	47,000	
	Hay	20	1,300	26,000		
Herder F	Concentrate Feed	3	7,000	21,000	34,000	34,000
	Hay	10	1,300	13,000		
Total (Targeted Feed)	Concentrate Feed	21		147,000	288,000	196,500
	Hay	95		123,500		
	Bran	5		17,500		

Note: *PP - Personal Purchase

Concerning to the repayment, four out of the six families have repaid and the other two families have not yet repaid. The unpaid herders promised at the meeting with the *Soum* that they would repay it by the end of June, and if not, they would pay a monthly interest of 3%.

Repayment:

One family repaid it at July in 2005 and the last family repaid it in October, so all was repaid in full.

4) Wintering Rate and Fertility Rate

Various indicators on wintering of the loaned herders are shown Table 4.6.17.

Table 4.6.17 Wintering Rate and Fertility Rate

Name	Number of livestock at the end of year 2004	Number of died Livestock			Wintering Rate (%)	Number of Births					Estimated Fertility Rate (%)	
		Total	Sheep	Goat		Total	Sheep	Goat	Cattle	Camel	Sheep	Goat
Herder A	165	3	1	2	98.2	77	38	36	3	-	76.0	76.6
Herder B	203	0	-	-	100.0	119	49	67	2	1	111.4	104.7
Herder C	190	4	2	2	97.9	114	40	70	3	1	81.6	93.3
Herder D	236	0	-	-	100.0	111	47	57	6	1	78.3	86.4
Herder F	177	1	-	1	99.4	88	40	43	4	1	80.0	81.1
Herder F	190	3	1	2	98.4	74	30	40	4	-	83.3	57.1
Total	1161	11	4	7	99.1	583	244	313	22	4	85.6	83.5

(Source: Study Team)

[Wintering Rate]

In spite of rather worse pasture conditions in 2004 to 2005, herders recorded extremely higher wintering rate. Two herders had no livestock die. In addition, the wintering rate of the whole *Soum* was good.

[Number of Birth and Fertility Rate]

The total number of the loaned livestock was 869, which included 600 adults, and 269 babies. Correspondingly, the number of births was 583, which was almost equivalent to the number of the loaned livestock. The breakdown of sheep and goats are as follows:

Compared to the estimated number of births of 249 for sheep and for 287 goats, actual results were 244 sheep and 313 goats. Consequently, the average fertility rates were 79.5% for sheep and 83.5% for goats. The results of the births approximately achieved the estimated figures. However, it was due to the higher wintering rate.

5) Number of Consumed Livestock and Sold Livestock

Number of consumed livestock and sold livestock are as follows:

Table 4.6.18 Number of Consumed Livestock and Sold Livestock

Name	Number of Consumed Livestock					Number of Sold Livestock			
	Total	Sheep	Total	Sheep	Total	Sheep	Total	Sheep	Total
Herder A	5	1	3	1	-	4	2	2	-
Herder B	6	1	4	1	-	4	2	2	-
Herder C	20	10	10	-	-	5	-	5	-
Herder D	14	3	10	1	-	2	-	-	2
Herder E	14	5	7	1	1	27	23	4	-
Herder F	7	2	4	1	-	3	-	3	-
Total	66	22	38	5	1	45	27	16	2

(Source: Study Team)

[Number of Consumed Livestock]

According to interviews with the herders, one family reduced its consumption to meet repayment, and the consumption of other families was as usual. Single digit consumption of the three families was assumed, but the remaining three families one was much larger. Although two of them have large households with grown men, they should carefully watch consumption, because decrease of livestock in the first year might negatively impact the livestock growth plan for the succeeding years.

[Number of Sold Livestock]

Except for one family, families generally sold their livestock conservatively. However, this one family was distinguished in not only consumption but also sales. Although the reason for their behavior was based on school expense of their children who lived at the *Soum* center, large amount of sales should be carefully watched because it can negatively impact the livestock growth plan in succeeding years.

6) Estimated Income

Based on the interviews, income of the loaned families was estimated as follows:

Table 4.6.19 Estimated Income of Herders Families

		Herder A	Herder B	Herder C	Herder D	Herder E	Herder F
Cashmere	Sale (pieces)	25	30	40	30	23	30
	Unit Price (Tg/kg)	25,000	27,000	29,000	25,000	25,000	25,000
	Total (Tg)	625,000	825,000	1,200,000	795,000	575,000	750,000
Sheep (Living)	Qty / Price (Tg)	2/60,000				23/690,000	
Goat (Living)	Qty / Price (Tg)	2/50,000	2/75,000	5/167,500		4/60,000	3/50,100
Cattle (Living)	Qty / Price (Tg)				2/140,000		
Hide (Sheep)	Qty / Price (Tg)	1/8,000	2/14,000	10/90,000	3/18,000	5/25,000	2/10,000
Hide (Goat)	Qty / Price (Tg)	3/30,000	3/30,000	10/70,000	10/75,000	7/70,000	4/52,000
Hide (Cattle)	Qty / Price (Tg)		1/3,000				
Others (Milk of Camel)						Sanitarium Project	105,000
Total		947,000	773,000	1,028,000	1,527,500	967,100	1,420,000

Cashmere contributes the largest part of the income. Herders sold 23 to 40 kg of cashmere. Its price depends on selling time; the highest price is usually in March. Thereafter, it declines gradually. Although the herders desire to sell cashmere as soon as possible, they usually sell in April or May since they fear the death of livestock from cold after being sheared. Among the six families, Tg 31,000 per kg was recorded as the

highest selling price at the end of March. However, all loaned herders obtained considerable cash in comparison to the previous year's income.

7) General Overview in First Year

[Role of Guarantor and *Soum* Government Office]

Although the guarantor has a big role in the Livestock Fund Project, the actual performance of the guarantor is different. No herders received any physical support from the guarantor. Some herders never met the guarantor after financing, just because there was no need for the guarantor support. Some herders are getting support of laborers such as watering and tending livestock in the daily grazing work, and shearing cashmere. However, some guarantors frequently visit and check on the herders.

On the other hand, the *Soum* government office sensitively follows up with the herders by using chances such as quarterly visit, monthly patrol by *Bag* Governor, and follow up of the Livestock Fund project.

[Distribution of Livestock]

Distribution of Livestock is important for the loaned herder. In the Project, a complaint, that condition of loaned livestock was poor, happened after distribution, even though the livestock were selected by herder himself with relative persons. *Soum* government aimed to solve this problem by having the loaned herder talk directly with selling livestock herder. Based on this lesson, it is required to *Soum* government give enough explanation to loaned herders during livestock distribution.

[Herder's Appraisal of Project]

Since the herders obtained much more livestock and cash compared to the previous year, they highly appreciated the Project. They expressed their strong will to carry out their responsibility of repayment, with confidence acquired through the actual achievement that they could really increase livestock.

On the other hand, the herders kept spending corresponding to the income, and they have no habit to save money little by little, and so they repeat their penniless situation where they need money, and therefore request for the continuation of the system of providing loans to the herders for the procurement of forage.

[*Soum's* Appraisal of Livestock Fund Project]

The *Soum* Governor promotes the policy to enhance "poverty reduction" and "improvement of quality of livestock" in the activity plan, and is aware that the project fits well to these policies. Also, the Governor recognizes that the project laid the groundwork for continuously addressing these tasks.

For the *Soum* staff, they could build up their experience with financing operations through the project; they might utilize this experience in future *Soum* activities.

In addition, the project has changed the loaned herder's mentality, and increased their responsibility, which has an impact on other herders too.

8) Condition of Second Year Livestock Fund

[Repayment of Livestock]

The number of repaid livestock was 133 heads compared to 118 estimated. This happened because all herders repaid the planned number but one herder refunded 40 heads over the planned number of 26 heads. The reasons of early refund are that he wanted to returned as large a number as possible because: confidence in livestock growth plan because livestock increased rapidly, and fear of a cold winter in 2005.

[Selection of Loaned Herders]

On the premise that 118 heads would be refunded, the *Soum* had planned to loan these livestock to two herders. In reference to opinion of the residents of each *Bag*, each *Bag* selected two herders; thus, in total 8 herders were nominated as candidates of the project. Then each *Bag* Governor narrowed the selection to one herder, in total four herders. Finally the livestock fund committee selected two herders as candidates of the second year livestock fund project. Considering the inadequacy of the first year's result, first priority in the selection was herder responsibility.

Number of livestock of the two candidates is shown below. Due to the *Dzud* in 2000 and 2001, they lost lots of livestock; however they have gradually increased their livestock afterwards.

Table 4.6.20 Change of Number of Livestock of New Candidates

	2000	2001	2002	2003	2004
Herder G	389	248	60	79	87
Herder H	75	98	26	34	50

[Number of Loaned Livestock]

The returned livestock of 133 heads were distributed as follows:

Table 4.6.21 Number of Livestock before and after Loan

Herder	Herder G			Herder H		
	Before Loan	Loan	Total	Before Loan	Loan	Total
Sheep	18	25(6)	43	3	37(25)	40
Goat	42	28(8)	70	20	41(22)	61
Cattle	3	2(2)	5	6	0(0)	6
Horse	20	0(0)	20	20	0(0)	20
Camel	4	0(0)	4	1	0(0)	1
Total	87	55(16)	142	50	78(47)	128

(): shows number of the baby livestock

Number of livestock loaned for herder G was 55 heads (71 heads including babies) and it is rather small than 100 heads in first year. He mentioned that he has a confidence to increase enough livestock with the loaned livestock, but on the other hand, since condition of the pasture was worse in 2005, even if he got damage of the *Dzud*, he wanted as small a number as possible.

[Condition of Loaned Livestock]

The new candidate and the *Soum* person in charge of the project visited the first loaned herder's *Ger* and the new candidate looked for desirable livestock from among the herd prepared by the latter and marked the livestock. Then he revisited to receive the livestock afterwards. In general the loaned livestock has been growing well as of November 2005.

4.6.3 DAIRY PRODUCTS SALE PROJECT

(1) Objectives and Basic Policy of the Project

The *Burdene* sanatorium (hereinafter referred to as the Sanatorium) operated by the *Erdene Soum* provides treatment for kidney disease and arthritis based on Mongolian traditional medicine. At first, the patients sweat in the sand dune warmed by the solar heat in summer. Next, they drink *Botsargaa*, processed fermented milk of the camel that contains high nourishment in order to make up for lost water. These two processes are effectively combined for the treatment. Because patients come from cities such as *Ulaanbaatar*, *Sainshand* and other *Aimags* in summer, the demand for the fermented milk increases in the period. The *Soum* purchase fermented milk from neighboring herders.

For herders living around *Burdene*, selling dairy products to the sanatorium has been an important way to earn money. In this context, the improvement of the sanatorium will expand the opportunities to sell dairy products, and will lead to activate the region, and contribute to improvement of herders living standard. Also, the sanatorium will be benefited to expand its service activities through purchasing dairy products stably from gathered many herders. Mutual prosperities of herders and the sanatorium are the ultimate goal of this project.

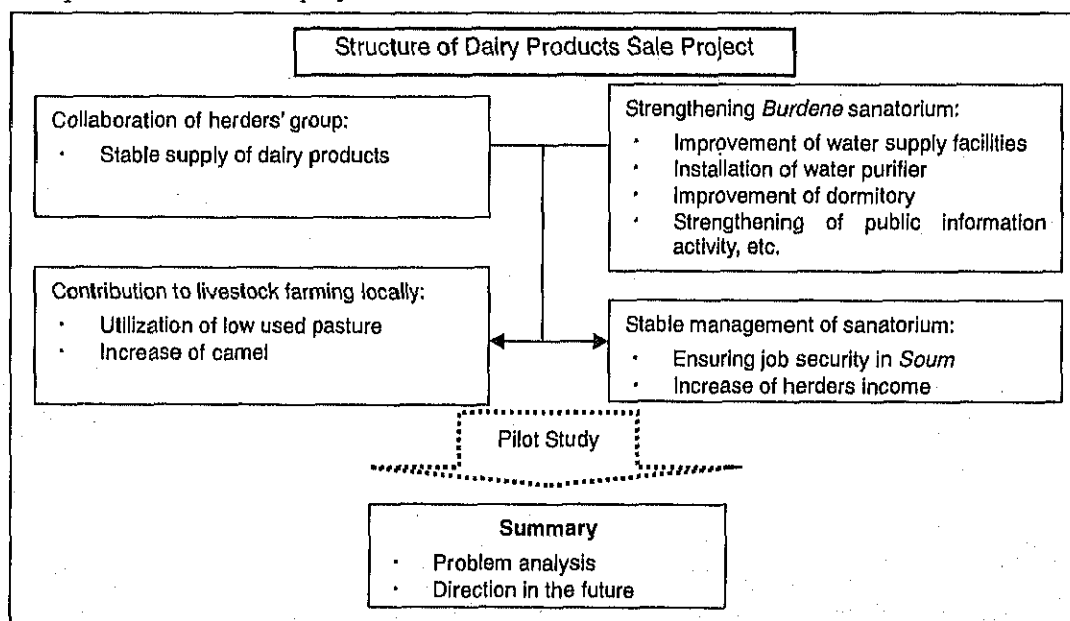
Basic policies of this project are as follows:

1. To collect milk in traditional seasonal pasture utilization. Not to construct an intensive dairy farm as in a developed country, but to construct semi-intensive farm system to take advantage of nomadic pastoralism.
2. To improve the position of the camel, which tends to decrease in Gobi region. To reform a single-product market system of selling cashmere owing to its high cash-earning ability. To increase numbers of camel, which is suitably adapted to the Gobi environment.
3. To establish a production system of dairy products in a remote area. To correct the

concentration of dairy products production to densely populated areas such as *Soum* Center and *Aimag* Center. In *Burdene* sanatorium project, selling of dairy products is planned in collaboration with Pasture Utilization and Well Development Project. Therefore, it will be one of the important basic policies to use remote low-use pasture within approximately 32 km from the *Soum* Center, and approximately 80 km from the *Aimag* Center.

(2) Structure of the Project Implementation

The following figure shows structure of the project implementation, based on the basic policy. Cooperation between the herders and the *Soum* government is critical in implementation of the project.



(3) Content of Project

1) Targeted Dairy Products and their Quantity for Sale

The main herders dairy product sold to sanatorium is camel milk, which will be processed to *Botsargaa*. In addition, goat & cow milk, dried cheese will be sold together. Quantity for sale of camel milk in 2003 and 2004 is shown in the table below.

Table 4 6.22 Sale Result of Milk in 2003 and Planned Sale in 2004

	2003	2004
Milk (l/person/day)	0.75	1.5
Patient number in average	30	40
Period of medical treatment (days)	45	45~60
Total amount of milk (l)	1013	2700~3600

The plan for consumption of milk per person per day is to double its amount from 0.75 liters in 2003 to 1.5 liters in 2004. It is because the sanatorium started to reconsider its supply amount of fermented milk (*Botsargaa*) for medical treatment of kidney disease,

which did not reach a sufficient level in 2003. According to *Erdene Soum* government, they are planning to increase the offering of fermented milk up to 3.0 liters per person per day in the future. The sanatorium depends on weather conditions, especially temperature, since they use warmed natural sand for medical treatment. Thus, there is a possibility that the sanatorium will be open for from 45 days to 60 days at the maximum.

2) Plan of Production and Shipment System

It was expected that the well newly constructed by JICA in autumn 2003 would create the opportunity to use low used pasture for winter grazing. At the same time, multiple functions were also expected such as establishing selling points for camel milk to the sanatorium by herders and supplying water to kidney disease patients. Especially from the view point of selling the milk, the distance between the sanatorium and the milk producing-based wells has been reduced dramatically. For the sanatorium, it is a priority issue to overcome the chronic deficiency of fermented milk, for medical treatment. The supply amount of camel milk was expected to increase as a consequence of gathering herders around the newly constructed well.

But according to the discussions with herders, it was gradually clarified even though distance between the sanatorium and the well became shorter, it would attract few herders to sell camel milk. Frankly speaking, the sanatorium still remains as an unappealing dealer for many herders. It was supposed that the main reason for herders not to sell in a more positive manner was the low purchase price of camel milk set up by the sanatorium. In spite of few opportunities of selling camel milk in general, it was priced at Tg 700/l, relatively higher price compared with the other livestock milk. On the other hand, the purchasing price of the sanatorium was set at Tg 450/l in 2003 and it was very low.

Consequently, for obtaining the targeted amount of camel milk, it was essential for the sanatorium to consider to increase the milk purchasing price to herders. Meanwhile, the sanatorium has set its service charge at a low level, Tg 2,500/person/day, and so has no other choice but to cut down expenses. However, as shown above, the low price of fermented milk did not attract herders to sell to the sanatorium. Accordingly, sanatorium had operational dilemma failing to get amount of fermented camel milk for the medical treatment at the Greek calends.

As a result of consultation and investigation with *Erdene Soum* government to break through this vicious circle, first of all, importance of the annual repair or/and reinforcement of the facilities was fully admitted. The basic policy of the sanatorium, however, should highlight medical treatment as a fundamental characteristic and on improving services such as increasing amount of camel processed fermented milk supplied to patients. The following issues were determined:

- To set an attractive purchasing price for herders so the sanatorium can obtain abundant amount of milk. This requires to raise the price from Tg 450/l to Tg 650/l.

- The sanatorium has good access to the railway station connecting with *Sainshand* and *Ulaanbaatar*. Moreover, the sanatorium has a good location, i.e. natural sand dune exists around the sanatorium, which is also a magnificent landscape. Thus, it can be justified to increase the service charge from Tg 2,500 to Tg 3,500/ person/ day.
- *Erdene Soum* government should put stress on advertising activities more in a positive manner and to keep patients coming stably. At the same time, it is required to give information to herders in advance about the number of reserved patients for the sanatorium and demand for fermented milk.

3) Profitability of the Project

Presumption of balance sheet in the *Burdene* Sanatorium is shown below.

Income: Tg 6,031,200

- Sanatorium patients service fee Tg 3,500 x 40 persons x 14 days x 3 course
= Tg 5,880,000
- Income from hides and skins Tg 2,500 x 14 days x 3 course = Tg 105,000
- Fee for natural conservation (Tg 150 (for a person) x 4 person + Tg 500 (for a car)) x 14 days x 3 course = Tg 46,200

Expenditure: Tg 5,494,575

- Camel Milk: Tg 650/l x 60 l x 14 days x 3 course
= Tg 1,638,000
- Expenditure on food: Meat Tg 900,000 + Foods Tg 1,000,000
= Tg 1,900,000
- Labor cost: Water transportation: (Tg 25,000/course, Collecting cattle dung Tg 20,000/course, Salary for cook Tg 30,000/Course x 2 persons, Salary for conservation of natural conservation: Tg 15,000/course) x 3 course + Slaughtering (Tg 1,500 x 14 days x 3 course)
= Tg 423,000
- Gasoline cost: Tg 210,000
- Cost for operation and maintenance of the well: Tg 62,775
- Cost for operation and maintenance of water purification machine and reserve fund for renewing machine: Tg 260,800
- Improvement of facilities: Tg 1,000,000 (Cost for modifying kitchen, and purchasing dishes, curtain, pillow, sheet etc.)

Income : Tg 536,625

4) Matters and their Solutions of Establishing the Project Implementation System

At the sanatorium, it is inevitable to be influenced by weather conditions due to utilization of natural sand dune warmed by the sun for the medical treatment. But the most important issue is to establish the project framework to gather patients and herders respectively around the sanatorium in an effective way. Thus it will be important to

advertise and give information to both patients and herders. Relevant to the sanatorium, performance goals are needed to increase the number of patients from 30 to 40 persons in the course this year and to raise service charge from Tg 2,500 to Tg 3,500, although it is required to state the reason. *Soum* government made brochures to advertise the sanatorium and distribute them to several organizations in *Sainshand* and *Ulaanbaatar*. For increase of service charge, the following reason is explained to patients: to substantially improve services in the sanatorium such as increase of fermented milk and improvement of water quality through introducing a small water purification machine. On the other hand, it is also essential to make frequent contact with herders to give current information about the number of patients and the demand of fermented milk. Through these hard-working efforts, it is important to build a relationship with herders who are going to move to *Burdene* to sell dairy products.

(4) Result of Project

1) Preparatory Period of the Sanatorium before its Operation in 2004 (From October 2003 to June 2004)

i) Installation of Production Well in *Burdene* (November 2003)

In the past, herders used *Burdene* as winter camp due to its rich springs. However, because of the recent decline of water source, it is not used in winter. In summer, only a few herder families come to sell milk and dairy products to the Sanatorium. Even though there is a Traditional Well near the Sanatorium, its water volume is low. The Production Well in *Burdene* was installed to improve the unstable and inconvenient watering environment and to satisfy the tight water demand of the Sanatorium. The *Soum* agreed to share 70% of the maintenance cost for the well and *Soum* Well Fund because the herder leader moved to another place and the remaining herders economically cannot afford it.

ii) Installation of Water Purifier Machine (May and June of 2003)

The quality of the water at the Production Well is worse than expected, so the experimental introduction of the water purifier machine was examined since it was concluded that the water is not suitable for drinking water for human beings. The *Soum* built a building for the machine and, a water purifier machine by reverse osmosis membrane method was installed beside the Production Well in the middle of June before the Sanatorium opened on June 21. It was decided that the sanatorium pays its maintenance cost.

iii) Improvement in Management

As a part of management improvement, it was requested to advertise for not only the patients and also herders who provide milk and dairy products. The *Soum* promoted this by using its network with other *Soums* and hospitals and through the telephone

and leaflets. Especially, the Sanatorium explained the improvement of water supply by the Production Well and water purifier machine and the increase of fermented milk supplied by more herders. In addition, from April, the agricultural officer announced the increased price of fermented milk through *Bag* governors.

2) Operation Period of the Sanatorium (June 21 to August 2 of 2004)

i) The Number of the Patients

In summer in 2004, Sanatorium operated 43 days: June 21 to July 4 (First shift), July 5 to July 8 (Second shift) and July 19 to August 2 (Third shift). The total number of the patients increased 21 patients from 2003, and reached 141 (17.5% increased) patients, as shown in the following table.

Table 4.6.23 Number of Patients of *Burdene* Sanatorium in each Shift

	Shift 1	Shift 2	Shift 3	Total	Avg.	Total number of staying days	Average number of staying days per patient
2003	52	43	25	120	40.0	1,360 days	11.3
2004	38	51	52	141	47.0	1,498 days	10.6

Moreover, the total staying days of patients increased by 10.1% and reached 1,498 days. However, the average staying days per a patient decreased slightly from 2003.

ii) Herders

【Sales of Milk and Dairy Products】

In spite of *Soum* promotion, herders did not gather easily. At the beginning of its operation, the number of camels for milking was only five to six, and the Sanatorium could obtain only 20 liters of milk that did not meet the requirement. There are two main reasons that the herders did not gather. The first is that, due to the drought near *Burdene*, the condition of the pasture was not so good. The other reason is that herders postponed moving to the remote area in order to vote in the election of the state parliament that was held in the June, 2004.

The activity to organize a herder group was carried out in the beginning of the Project, but it did not succeed since herders did not like to leave their livestock with another herder. It was a problem that groups were not active in the area and herders did not feel the necessity to achieve common purpose of selling milk to sanatorium. Community spirit was considered an important benefit through group activities such as involving herders in purchase price negotiation to increase the incentive of milk selling.

Although the condition of the pasture was not improved during the Sanatorium operation period in 2004, the herders stably supplied about 30 liters of fermented milk with 17 camels because herder D joined to sell milk with more than 10 camels that were almost equal to those of two herder families after the election. The herders

supplied 40 liters of milk on the peak day. The following charts show the amount of camel milk and goat milk in each shift.

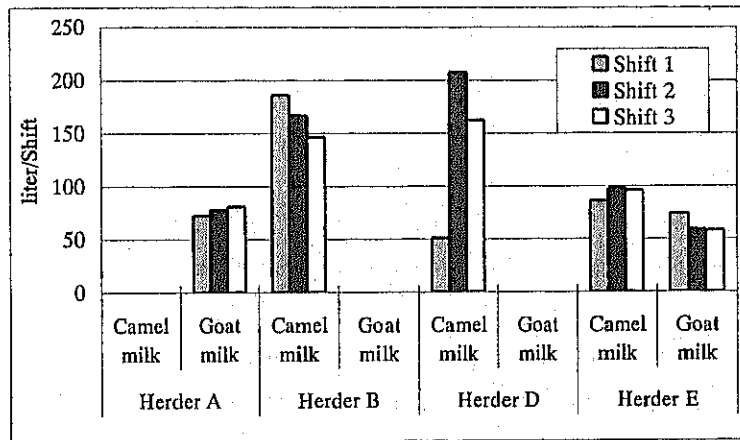


Fig. 4.6.11 Shipped Amount of Camel Milk and Goat Milk by Shift

【Sales Income】

The amount of sold milk increased for the following two reasons. The first reason is that the unit price of the milk increased to Tg 650 per liter (44.4% increase). The second reason is that the demand of the milk and dairy products rose because the number of the patients increased (17.5% increase) and the length of stays extended (10.1% increase). Furthermore, the consumption of fermented milk per patient per day slightly increased from 0.72l of last year to 0.8l. As a result, the herders who sold mainly camel milk enjoyed the increased cash income. The total income of the herders from selling milk in 2004 increased to Tg 756,915 from Tg 425,893 of last year (77.7% increase). The following table shows the amount of sold milk and dairy products for four families (herder D owns two family's livestock, thus it was practically five families) that participated in the project this year.

On the other hand, the income from goat milk also increased from Tg 112,375 to Tg 143,439 while the total demand increased with 27.6%. However, the unit price remained Tg 350 per liter that is the same as last year.

It seems better strategy to increase cash income by aiming to increase number of camels, not goats, for long term, because demand for camel milk in the sanatorium is quiet high. Moreover it has the advantage in that the pasture which the camel likes is dominant around the sanatorium.

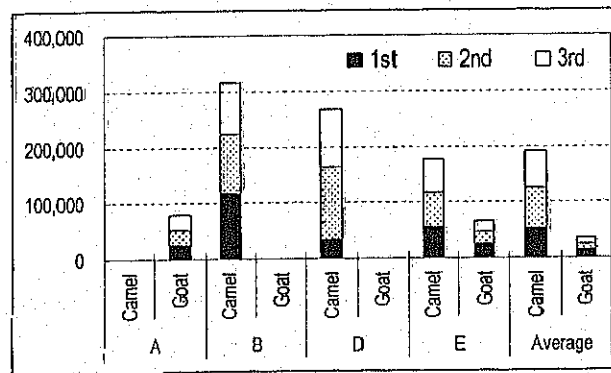


Fig. 4.6.12 Income of Milk & Dairy Products Selling Herders in 2004 (Tg)

(Source : Erdene Soum)

It is serious problem for the sanatorium to secure enough camel milk for their treatments. The shipment from distance places to sanatorium will become possible with some more adjustment. It seems possible that herder will request another raise of purchasing price including transportation cost to *Soum* government, contingent on the stabilization of supply amount.

【Usage of Pasture】

The chart shows the usage of pasture in *Burdene* 2004. Although the condition of pasture was not so good, 5 herder families gathered near *Burdene*. However, at the beginning of August, herders started to move to other places to look for better pasture because they needed to fatten livestock sufficiently before winter from viewpoint of the livestock breeding management in Mongolia, even though they needed cash income.

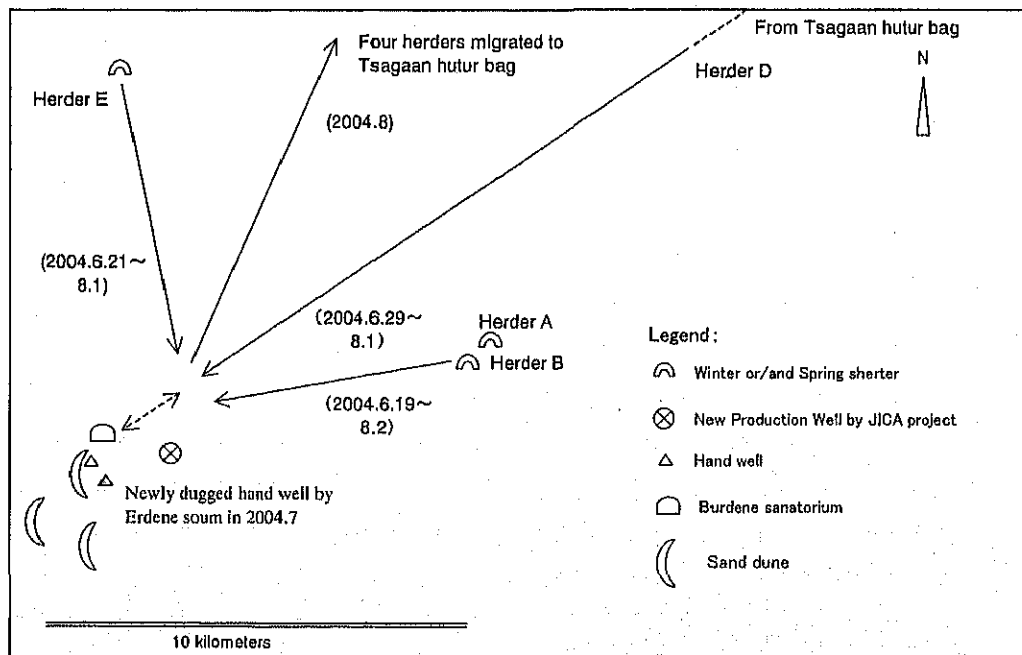


Fig. 4.6.13 Pasture Utilization around *Burdene* Sanatorium

iii) Activities of the Sanatorium

【Financial Result】

The income statements of the Sanatorium from 2003 to 2005 are shown below. Although the Sanatorium made loss of Tg 203,250 in 2003, it turned a profit of Tg 247,530 in 2004 due to the effect of increased charge and it made loss again slightly in 2005. Its future challenge is to secure money to purchase milk by cutting the waste cost for food.

Table 4.6.24 Financial Result of *Burdene* Sanatorium (2003-2005)

Item	Detail	2005	2004	2003
Revenue		5,735,800	4,537,100	3,226,900
Sanatorium charge	3,500Tg/day, 3shifts	5,679,100	4,443,600	3,106,900
Income of leather and skins		56,700	93,500	105,000
One 2 years old lamb				15,000
Expenditure		5,761,582	4,289,570	3,430,150
Milk (camel milk, goat milk)	650Tg/l (fermented milk) 350Tg/l (goat milk)	1,045,350	928,200	538,550
Eating	Meat + Food	2,896,004	1,385,078	1,399,034
Labor costs	Water transportation + Collecting cattle dung + Cook Doctor	405,216	320,000 42,000	292,713
Fee for natural environment conservation				203,250
Fuel		415,850	156,250	200,000
Subtotal		4,762,420	2,831,528	2,633,547
Cost to improve facilities	Reforming kitchen and purchasing dishes, curtain, pillow, sheets, etc.	738,900	898,042	796,603
Subtotal		5,501,320	3,729,570	3,430,150
Cost for water	For water purifier	260,262	560,000	0
Profit		-25,782	247,530	-203,250

[The Water Quality Problem of the Production Well and the Trouble of Water Purifier Machine]

After the *Soum* and the Study Team jointly installed water purifier machine in the middle of June, it was operated for a week. But, immediately after the pumped water turned red in the water tank and the purification capacity was sharply decreased, it was stopped. The prefilter of the water purifier machine was considered to be clogged because the iron in the water of the Production Well was oxidized and separated under the hot temperature in summer. Fortunately, the reverse osmosis membrane filter had no trouble and clogging was solved after the change of prefilter in the water purifier machine. However, it was almost impossible to purify the water of the Production Well. The water purifier machine was reinstalled at the new Traditional Well next to the Sanatorium. The well, that was dug in this exigency (by the tools for Traditional Well campaign) and an existing Traditional Well, succeeded to provide some water amount. But, since the amount of the water purified by the machine decreased again two or three days after the reinstallation, the *Soum* stopped using the machine again. According to the result of the survey in September, removing the air from the machine was not enough and the storage of solar power was not sufficient. These factors were considered to decrease the purified water.

3) Operation of the Sanatorium in 2004

[Patients Reaction]

The Production Well and the water purifier machine that were promoted by the *Soum* had several troubles. Also, the supply of the fermented milk did not meet the required amount. However, the price is still lower than that of other sanatoriums and there was no strong complaint about the increased charge.

【Herders Reaction】

The herders that sold fermented camel milk were very satisfied with the income increase due to the increased unit price. On the other hand, the herders that sold only goat milk were not satisfied with the decreased sales per family. However, all five families wanted to participate in the project if they would have sufficient livestock for milking next year, too.

【The Sanatorium and *Soum* Reaction】

The water supply service for the patients was not enough. Moreover, the supplied amount of fermented milk did not reach the target (1.5l/ a person /day) since enough herders did not gather because the weather condition caused poor pasture. These two things were issues. However, there was no complaint from the patients. The Sanatorium and *Soum* were very satisfied with the change of management strategy since it made profit due to the increased charge.

【The Viewpoint of the Pasture Management】

The pasture of *Burdene* this year was not so good due to tendency of drought. However, because only five families joined the project, herders gathered with minimum number of livestock for sale, and the use period was limited to 1.5 months in summer, so there was little worry about overuse of the pasture in *Burdene*. Since *Burdene* area will be possibly utilized as emergent winter shelter camp in the future, from the long-term viewpoint, it is necessary to consider a pasture usage restriction in summer.

4) Operation of the Sanatorium in 2005 and Herders Milk Products Sale

i) Preparatory Period of the Sanatorium before its Operation in 2005

In 2005, no equipment was installed to start operating the *Burdene* Sanatorium operated by *Erdene Soum*. But, the water purifier, which was installed last year did not function well; an attempt was made to confirm its function and how to use it in the beginning of June at *Soum* government office. In addition, it was suggested to *Soum* government to procure camel and goat milk from herders, who are the final beneficiaries and live around the Sanatorium, that the production adjustment among herders to secure the amount should be promoted under the initiative of *Soum* government. The accommodation fee of the Sanatorium and purchase price of milk were followed one of revised last year. The following are implemented subjects in this year.

ii) Operation of the Sanatorium in 2005

【The Number of the Patients】

In this summer, the Sanatorium operated in 3 shifts the same as last year. The total operation period was 39 days: June 25 to July 8 (First shift), July 9 to July 22 (Second

shift) and July 23 to August 1 (Third shift). The third shift had to be cut to only 11 days operation (1 shift means 14 days normally) due to decline of supplied milk amount by herders since they started to migrate to other summer camps. However, total patients in this year increased to 174 people, or by 33 people compared with last year. The negative influence of rise of accommodation fee in last year was not seen on the patients.

Table 4.6.25 Number of Patients in each Shifts

	Shift 1	Shift 2	Shift 3	Total	Average	Total number of staying days	Average number of staying days per patients
2004	38	51	52	141	47.0	1,498 days	10.6
2005	69	74	31	174	58.0	1,960 days	11.3

【Sales Amount by Herder】

Four people, i.e., a decrease of 1 person from last year, sold milk to the Sanatorium in this year: 3 of them shipped milk continuously for 2 years since last year and 1 herder sold only goat milk.

The total number of livestock for milking was 17 camels and 50 goats. The Sanatorium needed large amount of camel milk so that the *Soum* government requested to supply 16 l/day for each family. The sales volume of each herder to the Sanatorium by shift is shown in the following Figure.

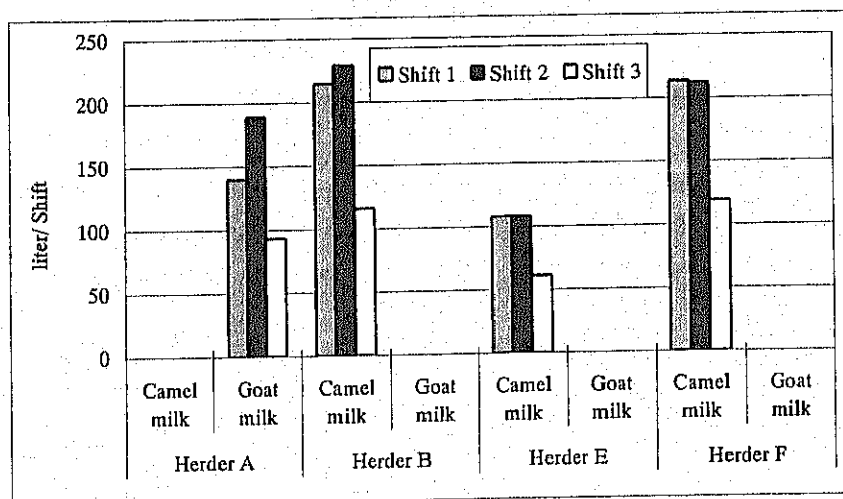


Fig. 4.6.14 Shipped Amount of Camel Milk and Goat Milk by Shift

Three herders shipped camel milk; Herder B and Herder F supplied 12 to 15 l/day on average. However, Herder E could only supply less than 8 l/day since he had only two camels for milking. Herder A did not have camels, so that, as a result of product mix adjustment, other herders did supply goat milk, which is cheaper than camel milk. Moreover, similar to last year, they could sell dairy products not only to the Sanatorium, but also to the patients as souvenir such as *Aarul* (cheese) and processed fermented milk. It became sub-income of herders.

【Income of Milk and Dairy Products Selling】

The next figure shows the average income of herders from selling milk and dairy products to the Sanatorium from 2003 to 2005.

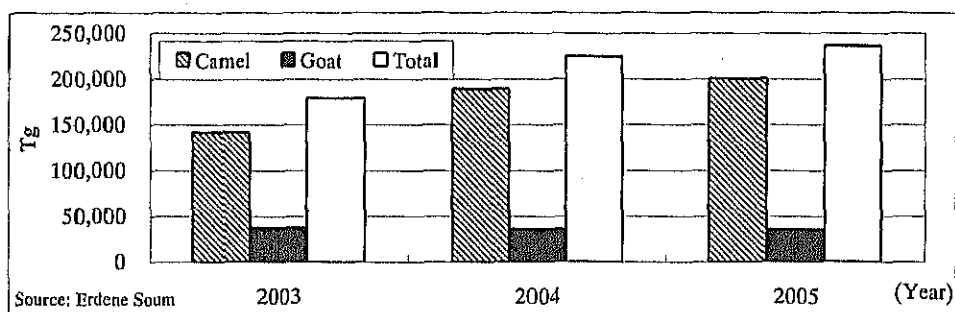


Fig. 4.6.15 Average Income of Milk & Dairy Products from Selling by Herders

The income of herders selling camel milk was increasing since 2003 before project began. On the other hand, income from goat milk has not increased because its demand is flat since it is recognized only for meals and it is not used in the treatment. However, the income of Herder A was increased compared with last year since herders adjusted their product mix this year as mentioned before.

【Operation of the Sanatorium in 2005】

Above-mentioned,

【Water Purifier Machine】

Similar to last year, the water purifier machine operated with the water of two Traditional Wells, constructed last year and the existing one. The machine was operated everyday since high increasing of patients in this year, but its purifying capacity was only about 30% to 50% of normal speed. It is assumed that the following three points are the cause of it.

1. Removing the air from the machine was not enough.
2. The clogging of filter was progressing earlier since the water quality was bad.
3. The charging of solar power battery was not sufficient.

At present, there is no method of improving very bad water quality in the Gobi region except the reverse osmotic membrane water purifier installed by the Project. However, such use was not expected and test data of purifier capacity with such bad water source is not available. Due to that, it is important to collect data continuously in the future.

4.6.4 DAIRY PRODUCTS SHIPMENT AND SALE PROJECT

(1) Objectives and Basic Policy of the Project

The project is a trial to grasp what the dairy products shipment and sale in the nomadic society after the market economy shifts should be. The project aims to supply fresh dairy products to the urban area by herders themselves, persistently keeping to the nomadic life style, and overcoming various handicaps surrounding the nomadic herding such as collapse of organized milk collection system, incomplete transportation infrastructure, and small scale production.

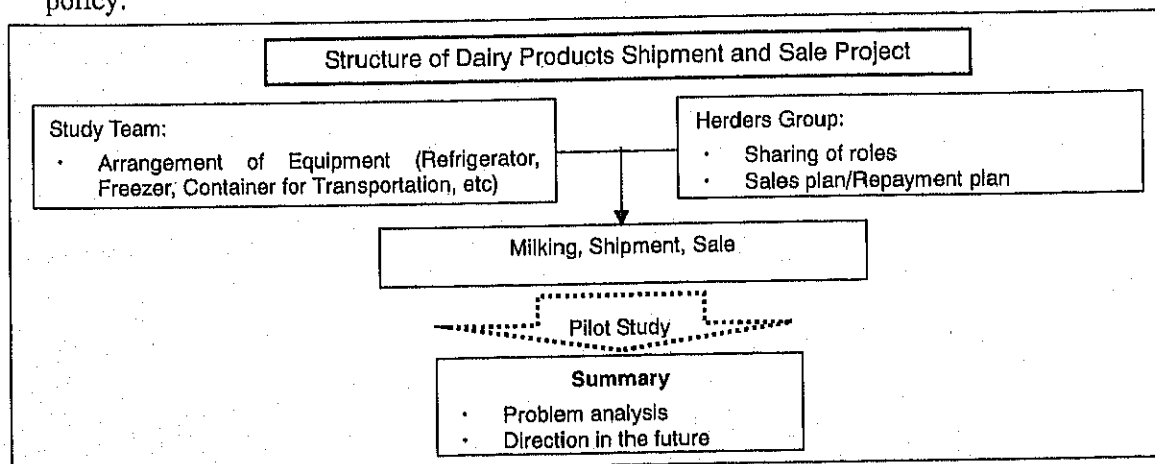
It seems that the market is going to be swept by dairy products imported from various countries. However, it seems to be fully possible to get sales income because there is big demand if *Tsagaan idee*, which is the Mongolian traditional food produced in *Ger*, and means "white food", can be transported to the City, targeting the niche of the market. The issue is how to keep perishable milk and dairy products and securing a lot, and then how to arrange the transportation system to the City from the *Ger*. The aim here, as one of the Pilot Studies, is to verify about shipping method during the non-frozen seasons (May to October), to support the herder groups who are already shipping camel milk through the railway transportation in frozen form during the frozen season (November to next April). It aims to show a third method to gain cash which is steady through year and brought through change from livestock products shipment of the seasonal products such as cashmere, meats, etc. through the broker (change), by establishing shipping technology throughout the year for the milk and dairy products.

The basic policy is the flowing two points;

- To establish production and shipment technology in a form of seasonal pasture use of the nomadic herding in the nomadic society.
- To do all of the processes for sales from production by the herders themselves without mediation of a broker.

(2) Structure of the Project Implementation

The following figure shows structure of the project implementation, based on the basic policy.



(3) Content of Project

1) Selection of Targeted Herder Group

After that, the *Erdene Soum* government called on herders again, three groups had interest, out of them two groups presented a proposal. As a result of interview selection, the group was selected, consist of 4 families including Mr. *Galsan* in *Dulvurj Bag* who had the results of a camel milk sale during frozen season (November to next April).

2) Members Composition of Herders Group and their Roles

[Composition of Members]

Shipment and sale group consists of four families with leader, Mr. *Y. Galsan*. These four families take charge of sale to *Ulaan-uul (Soum center)*. Sale at *Zamiin-uud* is implemented jointly with friends in cooperation with shipment during frozen season.

[Role Allotment]

4 families included Mr. *Galsan* consist of 16 families members in total. Out of them, the following 10 persons take roles of working process to sale from production.

Milking & Processing: 6 persons

Transportation to *Soum Center* & Station No. 1016: 2 persons

Selling at *Soum Center*: 2 persons

Transportation to *Zamiin Uud* from Station No. 1016 and Selling: 4 persons

3) Sold Dairy Products and Quantity for Sale

The group of Mr. *Galsan* is planning shipment and sale once a week at the *Soum center* and *Zamiin Uud* during the non-frozen season of May to November. Sold dairy products and quantity for sale is shown below.

Table 4.6.26 Targeted Items and Sales Quantities

Season of Production and Shipment		Targeted Item	Unit Price	Quantity of Production and Shipment (per week)	Estimated Sale (Tg) (per week)
Frozen	Nov. ~ Apr.	Camel milk	800 Tg/l	30 l	24,000
Non-frozen	May ~ Nov.	Camel milk	600 Tg/l	20 l	12,000
		<i>Aaruul</i> (Cheese)	2,500 Tg/kg	3 ~ 4 kg	7,500 ~ 10,000
		<i>Shartos</i> (purified butter)	3,500 Tg/l	200 ~ 300 g	700 ~ 1,050
		<i>Tarag</i> (yoghurt)	500 Tg/l	15 kg	7,500
		<i>Orum</i> (Cream)	1,500 Tg/slice	1 ~ 2 slice	10,500
		<i>Shimin Arkhi</i> (Mongolian vodka)	1,500 Tg/l	3 ~ 4 l	4,500 ~ 6,000
		<i>Ayrag</i>	800 Tg/l	15 ~ 20	12,000 ~ 16,000

They have a plan to place shipment of camel's milk throughout year at the center and sell together with various dairy products during the non-frozen season. Still, they are already shipping the camel's milk during the frozen season of November to April..

4) Production and Shipment System Planning

【Livestock Number】

Out of Mr. *Galsan's* group of 4 families, number of livestock and milking livestock of 3 families who take charge of dairy production are shown in table 4.6.27 (as of September, 2004).

Table 4.6.27 Total Livestock Number of 3 Households in Mr. *Galsan's* Group (2004)

	No. of livestock	No. of females	No. of milking livestock
Camel	52	22	10
Horse	121	21	21
Cattle	56	25	25
Sheep	150	52	52
Goat	310	113	110
Total	689	233	218

【Shipping Route and Transportation Measures】

Their production and processing are done based on Traditional Well that is apart by about 20 km from *Ulaan uul* (*Soum* center), and shipment is done there too. There are two shipment routes of *Ulaan uul* and *Zamiin uud*. Milk and dairy products are stocked in the *Ger*, and transported once a week after securing a lot. Camel and horse besides motorcycle are used together for transportation of the dairy products. Shipping route and transportation measures are illustrated in Figure 4.6.16.

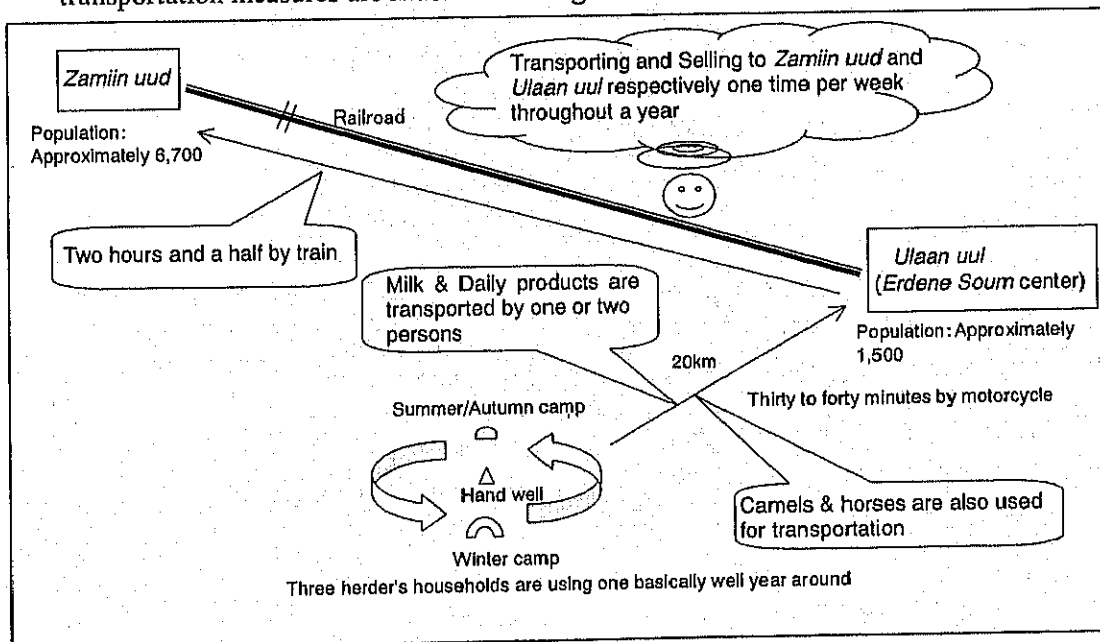


Fig. 4.6.16 Shipping Route and Transportation Measure

5) Production and Sales Schedule

The herders are planning shipment once a week and four times a month. The members collaborate milking, processing of dairy products, and storing toward shipping day. However, it is necessary to transport products effectively with some amount of lot size, since there is a limit in livestock milking per day. Therefore, they adopt non-electric

refrigerator¹ as a preserving technology after milking, and ship products to *Ulaan uul* in a lot. They set a selling base in *Soum* center at the house of one of the group's members in *Ulaan uul*, and they provide refrigerator and freezer there. In addition they sort sales for *Zamiin Uud*, and freeze them, and then ship them.

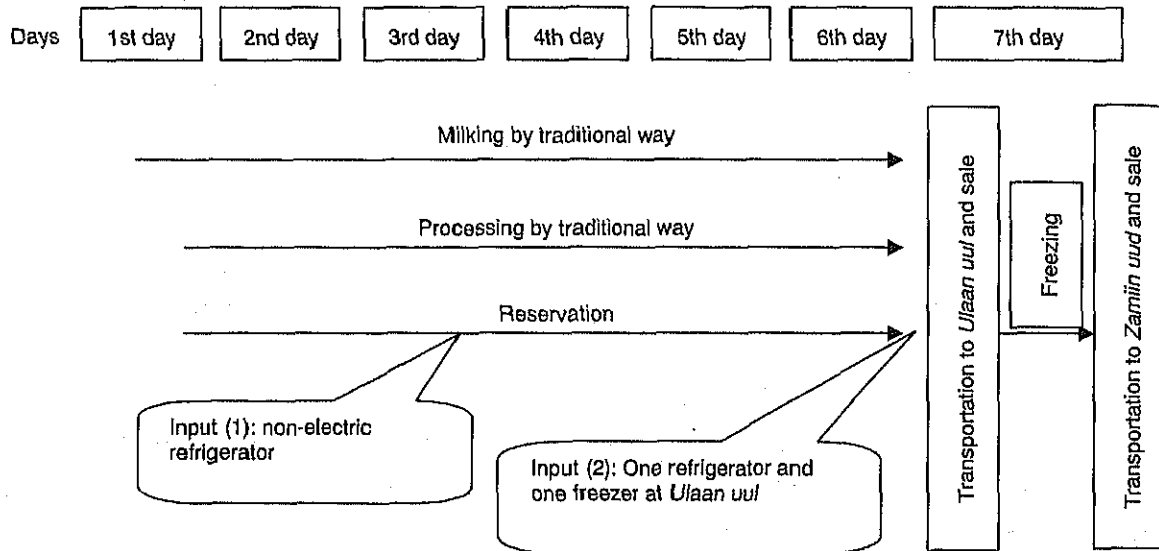


Fig. 4.6.17 Schedule Calendar of Production and Selling for Unfrozen Season (From May to October)

6) Notable Points on Shipment and Transportation

It is indispensable that frequency of transport have to be reduced to gain benefit because price of fuel for transport is rising. In the project, as a way to keep transportation to a minimum and to control the transport cost, and a way to effectively preserve it in *Ger*, non-electric refrigerator was installed experimentally as a pilot case.

7) Feasibility of the Project

The following table shows the expected balance sheet of the group in the frozen season (November to April) and non-frozen season (May to October). The Figure shows the total value of the group (4 families), and expected incomes: monthly Tg 84,192 during the frozen season, monthly Tg 151,382 for shipping period of *Ayrags* (July to August) during the non-frozen season, and monthly Tg 95,382 for period of September to October during the non-frozen season.

¹ Non-electric refrigerator is still in testing stage. However, it may contribute to improve herder life very much if will be functioned.

Table 4.6.28 Expected Balance Sheet of the Group

Assumption: Transportation to Zamiin uud
(Unit: month)

1. Frozen season (November to April) (Unit: month)

Sale:			
Item	Unit price	Quantity	Sale
Milk of Camel	800 Tg/l	120 //	96,000
Total			96,000
Cost:			
Item	Unit price Tg	Times	Cost(Tg)
Transportation Cost to Station No.1016 (motorcycle)	952	4	3,808
Transportation Cost of Railway: No. 1016 to Zamiin Uud	2000	4	8,000
Total			11,808
Profit:		(Tg)	
Total		84,192	

2. Non-frozen season (Mar. to Nov.) (Unit: month)

Sale:				
item	Unit price Tg	Quantity	Sale (1)	Sale (2)
Milk of Camel	600 Tg//l	80 //	48,000	48,000
Aariul (Cheese)	2,500 Tg/kg	14 kg	35,000	35,000
Shartos (Purified Butter)	3500 Tg/kg	1 kg	3,500	3,500
Tarag (Yoghurt)	500 Tg/kg	60 kg	30,000	30,000
Orum (Cream)	1,500 Tg/slice	7 slice	10,500	10,500
Shimin Arkhi (Mongolian Vodka)	1,500 Tg//l	14//	21,000	21,000
Ayrag (July to August))	800 Tg//l	70 //	56,000	0
Total			204,000	148,000
Cost:				
Item	Unit price Tg	Times	Cost (Tg)	
Transportation Cost of Railway: No. 1016 to Zamiin Uud	2,000	8	16,000	
Transportation Cost to Station No.1016 (motorcycle)	952	8	7,616	
Generator Operation (6 hours/time)	4,338	4	17,352	
Electric Fee (for Refrigerator at Ulaan uul)	263	30	7,890	
Hygiene Inspection Commission	470	8	3,760	
Total			52,618	
Profit:		Sale (1)	Sale (2)	
Total		151,382	95,382	

* Profit includes the profit of Ayrag in July to August. Profit is one of the other months during the non-frozen season.

8) Initial Inputs

The following equipments were installed for herders group to improve their unstable dairy products shipment during non-frozen season (from May to October) and to establish the year-round shipment technology.

Density and Component Measuring Equipment was not procured because measurement by herders was not generally practiced. Moreover, the herders group hoped and requested to install the freezer and small generator in their Ger. In this case, herders cost increases because the initial input cost increases. Therefore installation of these equipments was postponed in consideration of negative condition such as increase of operation cost caused by increasing in fuel price. Freezer was installed in a group member's house in Erdene Soum Center the as same as refrigerator. Non-electric refrigerator was additionally installed.

Table 4.6.29 List of the Initial Input Equipment (Unit: Tg)

Item	Specification	Unit Price	Qty	Total Price
Freezer	169 l	175,000	1	175,000
Refrigerator	BIRYUSA B-10 240l	249,000	1	249,000
Container for	40 l	48,000	1	48,000
Transportation	10 l	9,000	2	18,000
Container for	10 l	13,000	1	13,000
Stock in	8 l	11,000	1	11,000
Refrigerator	6 l	9,500	2	19,000
Scale	Made by aluminum	7,000	1	7,000
	Made by plastic	1,500	2	3,000
Density and Component Measuring Equipment				0
				543,000

9) Contribution of the Herders Group

i) Expected Amount of Annual Benefit

The following table shows the expected amount of annual benefit of the herders group of dairy products shipment and sale project.

Table 4.6.30 Prediction of Total Benefit of Milk & Dairy Products Selling Herder Group (Unit: Tg)

	July August	May June September October	Frozen Season		
Benefit/month (Tg)	151,382	95,382	84192	Total Benefit of Group	Total Benefit of one Household
Duration (month)	2	4	6		
Sub total benefit (Tg)	302,764	381,528	505,152	1,189,444	237,889

ii) Contribution

Initial cost of equipments rest on the herders group and the whole price, which is Tg543,000 will be paid back to the *Ulaan uul* Fund, which is *Soum* Development Fund of *Erdene Soum*. Total amount of net profit of the group is Tg 1,189,444 per a year. However, repayment plan will be set up three years for a dead line, considering fluctuation of income due to external factors such as drought years.

10) Notable Points on Monitoring

Initial input of the project was carried out in May, 2005, aiming to start shipping in the non-frozen season start. However, the herders group has already started the shipping in the frozen season since November, 2003. Monitoring shall focus on change of living standard of the herders by shipment throughout year, in comparison with shipment in the frozen season. Notable point is that the number of milking livestock is changing every year. In addition, the quantity of milking of each livestock changes by the influence of the state of the pasture. Careful attention should be paid to see that proper milking be done correspondent to the pasture condition of the year. In addition, dairy products except camel milk is the first full-dress shipment for the herders. It will be monitored to see if

the group acquires certain information about seasonal demand in the city. In addition, although shipment targets the products, that recognized as a traditional food, they should always pay attention to food hygiene management, so as to construct mutual trust with the market.

(4) Result of Project

1) General Condition of Pasture

Risk management for winter such as long distance migration (*Otor*) for searching favorable pasture land is forced on herders because *Erdene Soum* is suffering from serious drought the same as last year (2004). The herder group also migrated two or three times in this summer. Since August, they migrated to the pasture land near the border with China which is far from the well which they use throughout the year.

2) Shipment of Dairy Products

Milking volume was reduced from last year because lactation of livestock decreased under the unfavorable pasture conditions, although shipment during non-frozen season was executed in June and July. Therefore, freezer using non-frozen season shipment to *Zamiin Uud* was never achieved because not a big enough shipping lot of milk was secured. Shipment destination of the group was only to *Soum* Center for this year. As a positive factor of this drought, other herders shipments to *Soum* Center were very limited. And camel milk was dealt at high price Tg 800 which was Tg 50 or Tg 100 higher than last year in the *Soum* Center market since sense of scarcity of milk and dairy products. This year, the group sold three kinds of the dairy products such as camel milk, *Botsargaa* (processed fermented camel milk), and *Tarag* (yoghurt processed from cow milk) although the shipment of seven kinds products was planned. All products were sold within one or two days and there was no unsold product because milk supply was insufficient. Also, the work of mouth publicity for the group products was given to the consumers by a group member who lives in *Soum* Center.

3) Result of Shipment

Monthly sales of dairy product are shown in the next figure. Both shipment and sales decreased in April, May, and July to September because of unfavorable pasture condition. For the same reason, there was no shipment in August. In June, both shipment and sales increased because of the better pasture condition with adequate rainfall. Moreover camels to give birth this year were few, because camels gives a birth once every two years. That was also one other reason of insufficient shipment of this year.

Effect of the project cannot be verified this year because the pasture condition was unfavorable although the project aimed for the increase of dairy product shipment during the summer. Also, the plan to shipment to *Zamiin Uud* of frozen milk was not achieved because of insufficient shipment and their sales were limited to *Soum* Center.

Dairy products were sold by the fixed price as follows: camel milk Tg 800/l, *Botsargaa* Tg 1,000/l, *Tarag* Tg 500/l. The group never changed the price by seasonal demand and supply during their active period.

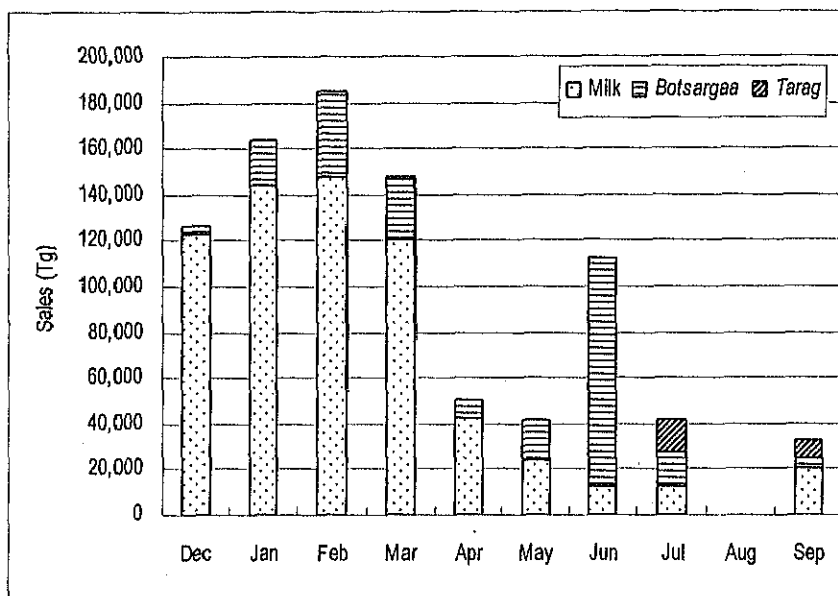


Fig. 4.6.18 Monthly Sales of Dairy Products

4) Status of Use of Initial Inputs Equipment

[Equipment such as Freezer, Refrigerator and Container]

It is judged that the installed equipment such as freezer, refrigerator and container were used well generally because shipment number was over 22 times during 52 days although shipment was limited to the *Soum* Center and production of milk were insufficient. However, freezer was not used properly for frozen milk shipment because shipment to *Zamin Uud* was not achieved because of insufficiency of dairy product.

[Non-Electric Refrigerator]

Non-electric refrigerator was installed in end of June 2005. At the time of installation it had been used but its use had been stopped since July because the inside temperature of the non-electric refrigerator rose abnormally high. Temperature observation was consigned to the herders. Then, inside and outside of the non-electric refrigerator was measured three times per day. High temperature from 23 to 29 °C was recorded even in the night for the period from July 15 to July 25. The group migrated from summer camp to a remote area near border to search for good pasture land because of the drought in August. The opportunity to use non-electric refrigerator was lost. However the group will try to use it again next year, and heat insulator to improve its performance by covering the top of non-refrigerator was delivered in September.

5) Repayment Schedule to the *Soum* Development Fund

Repayment schedule to the *Soum* Development Fund was determined by the discussion between *Soum* government and Mr. *Galsan* who is the group leader held in August 25, 2005 and the first repayment was executed on same day. The group will repay totally Tg 101,000 for this year because of the unfavorable pasture condition and the balance Tg 450,000 will be repaid by dividing it into 4 portions.

Table 4.6.31 Repayment Schedule for the Dairy Products Shipment and Sale Project

Maturity Date	Amount (Tg)
2005/08/25	51,000
2005/10/25	50,000
2006/03/25	100,000
2006/06/25	150,000
2006/10/25	100,000
2006/12/25	100,000
	551,000

6) Technical Guidance for Booking

Technical guidance was given to the Group in 15 September 2005 at *Soum* government office. Activity records for three months since the project started were used as a teaching material and the financial report was made with accountant of the *Soum* government and the Group. The result of the report is shown in the following table. Both of the accountants agreed that this financial report should be made every 6 months until the end of the repayment term.

Table 4.6.32 Financial Report of the Group Activity from 1 July to 15 September 2005

Expense	Amount	Benefit	Amount
Transportation Fuel for Motorbike	36,600	Camel Milk	32,000
Electricity Rate for Refrigerator and Freezer	8,000	<i>Botsargaa</i>	20,000
Repayment to the <i>Soum</i> Development Fund	76,000	<i>Tarag</i>	22,500
Total Expense	120,600	Total benefit	74,500
Current term net profit	-46,100		

7) Improvement Points

Galsan's herders group has extraordinary desire to ship their dairy products. It is expected that original shipment pattern as scheduled can be recovered when the pasture condition is recovered although the pasture as a shipment base could not used because of the drought in this year. The group planned to purchase small generator by themselves and move the freeser to their *Ger* camp site if the benefit improves when their activity gets on the right track. However, as stated many times, reducing the transportation cost by motorbike and some device of preservation or cold storage technology at *Ger* site are indispensable.

4.6.5 WOOL PROCESSING AND PRODUCT SALES PROJECTS

(1) Objectives and Basic Policy of the Project

In *Dornogobi Aimag*, there are two *Ger* felt factories: in *Altanshiree Soum* and *Urgun Soum*.

Table 4.6.33 *Ger* Felt Factories in *Dornogobi Aimag*

<i>Soum</i>	<i>Altanshiree</i>	<i>Urgun</i>
Ownership	<i>Shine Saruul Zam</i> Cooperatives	Sole Proprietorship
Establishment	1996	1999
Capital	Cooperatives capital: Tg 17,000,000	N.A.
Production period	5 months per year	3 months per year (July to September)
Output	400~500 <i>Ger</i> felt sheets (Required raw wool: 11 tons)	120 <i>Ger</i> felt sheets, 480m (Required raw wool: 2.5t)
Machines	Used machines made in Russia (Several breakdowns)	Owner assembled used parts purchased in <i>Ulaanbaatar</i> , and made machines.
Target customers	Herders in the <i>Soum</i> and neighboring <i>Soum</i>	Herders in the <i>Soum</i>
Place of Sales	Cooperatives store	Factory (No door-to door sales for herdgers)
Loan	None.	Tg 1,000,000 loan from a bank during production period every year Reason: Low demand of <i>Ger</i> felt causes shortage of working capital in summer

In *Soums* except for *Altanshiree* and *Urgun*, herdgers visit *Ulaanbaatar* or *Sainshand* to buy *Ger* felts or produce the products by themselves. Also, the herdgers produce felt products such as socks, hats or mattress by themselves with simple and traditional processing methods, and there are no factories that produce these felt products in this area.

The objective of the project is that participating groups and herdgers in the projected *Soums* increase their cash earnings through establishing wool processing businesses. Although the amount of annual raw wool in 2003 is about 25 tons in *Erdene Soum*, about 24 tons in *Ulaanbadrakh Soum*, and about 17 tons in *Khuvsgul Soum*, selling the raw wool is not main income source for the herdgers due to its low selling price (the average prices in three *Soums*: Tg 100~200/kg). If participating groups can sell value-added wool products, they can have chance to obtain cash income. Also, if herdgers in the *Soums* would sell the raw wool to the participating groups as suppliers, they can stabilize their lives.

In this Pilot Project, the Study Team will evaluate whether the groups, that can prepare necessary start-up working capital but do not have enough fund for equipment, could start wool processing businesses and continuously manage their businesses by receiving concessional loan (no interest and long-term loan) and technical and management advice. Also, the Study Team will assess how the surrounding herdgers will receive the benefits from the businesses.