No. 01

STUDY REPORT
ON
THE PROJECT FOR REHABILITATION OF POWER PLANTS OF SUM CENTERS
IN
THE MONGORIA

MARCH 1998

JAPAN INTERNATIONAL COOPERATION AGENCY

STUDY REPORT
ON
THE PROJECT FOR REHABILITATION OF POWER PLANTS OF SUM CENTERS
IN
THE MONGORIA

MARCH 1998

JAPAN INTERNATIONAL COOPERATION AGENCY

PREFACE

In response to a request from the Government of the Mongoria, the Government of Japan decided to conduct a basic design study on the Project for Supply of Mobile Road Asphalt Mixing Plants and Paving Equipment and entrusted the Japan International Cooperation Agency (JICA) to conduct the study with the assistance of the Japan International Cooperation System (JICS).

JICA sent to Philippines a study team from October 23 to November 3, 1997.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

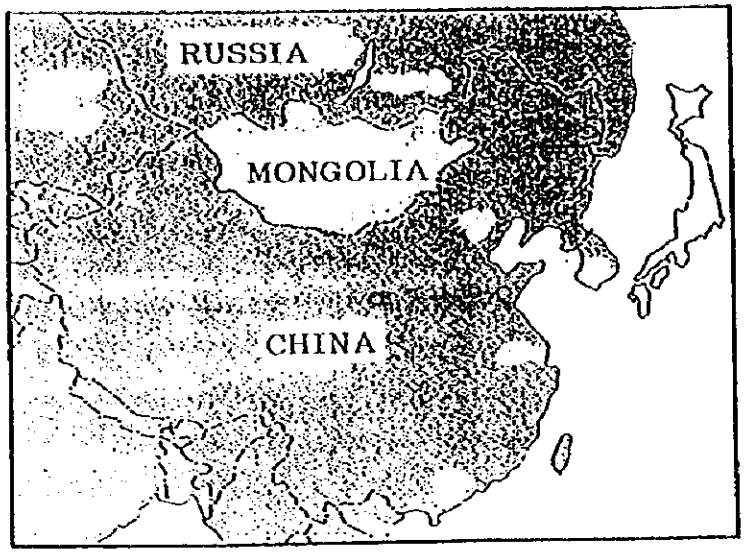
I wish to express my sincere appreciation to the officials concerned of the Government of the Mongoria for their close cooperation extended to the team.

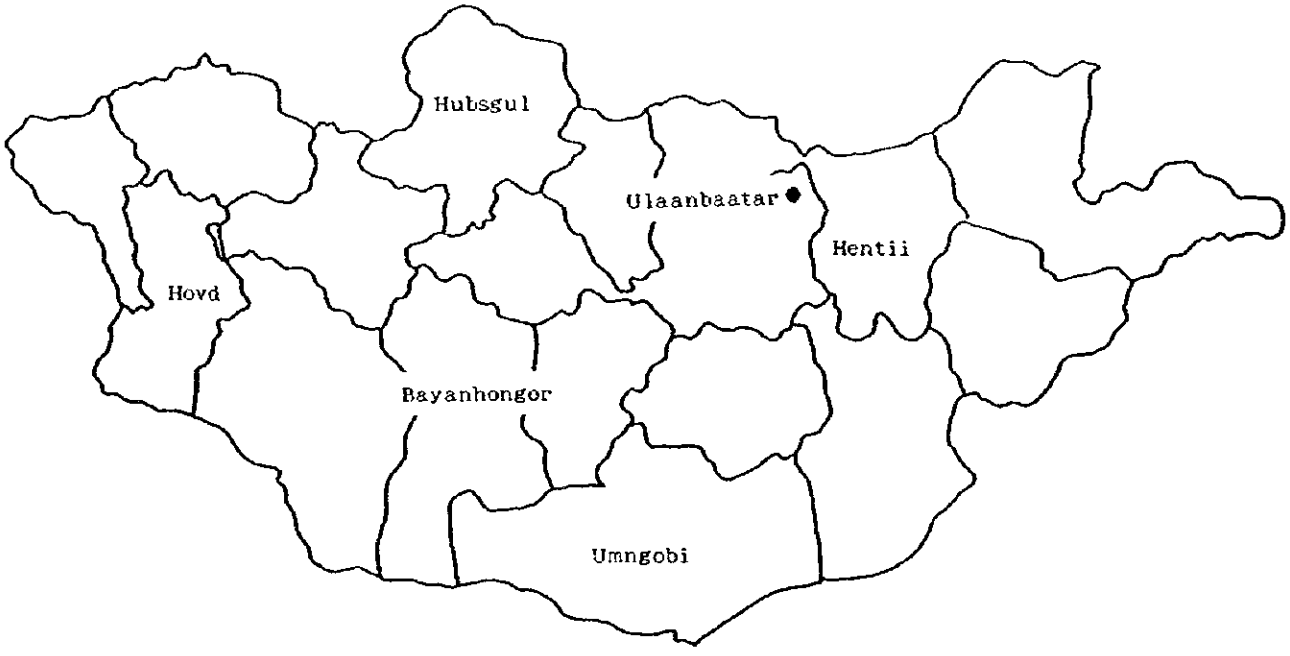
March 1998

Kimio Fujita

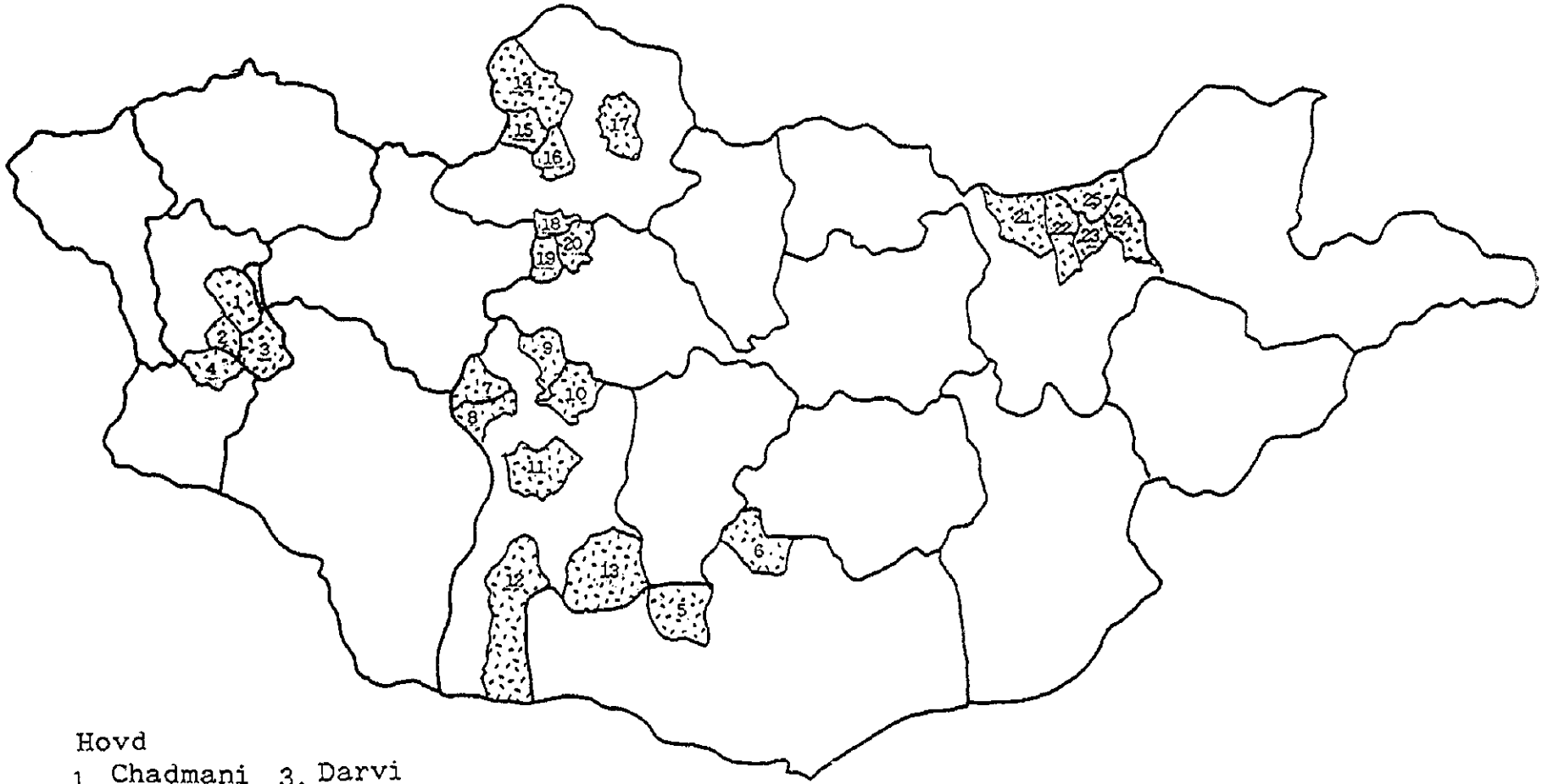
President

Japan International Cooperation Agency





Location Map of Mongolia



Hovd
1. Chadmani
2. Zereg
3. Darvi
4. Must

Umngobi
5. Sewrei
6. Mandalovoo

Bayanhongor
7. Bayanbulag
8. Hureemaral
9. Jargalant
10. Galuut
11. Baatsagaan
12. Shinejinst
13. Bayanlig

Hubsgul
14. Ulaan—Uul
15. Bayanzurh
16. Arbulag
17. Chandmani—Undur
18. Shinider
19. Jarglant
20. Galt

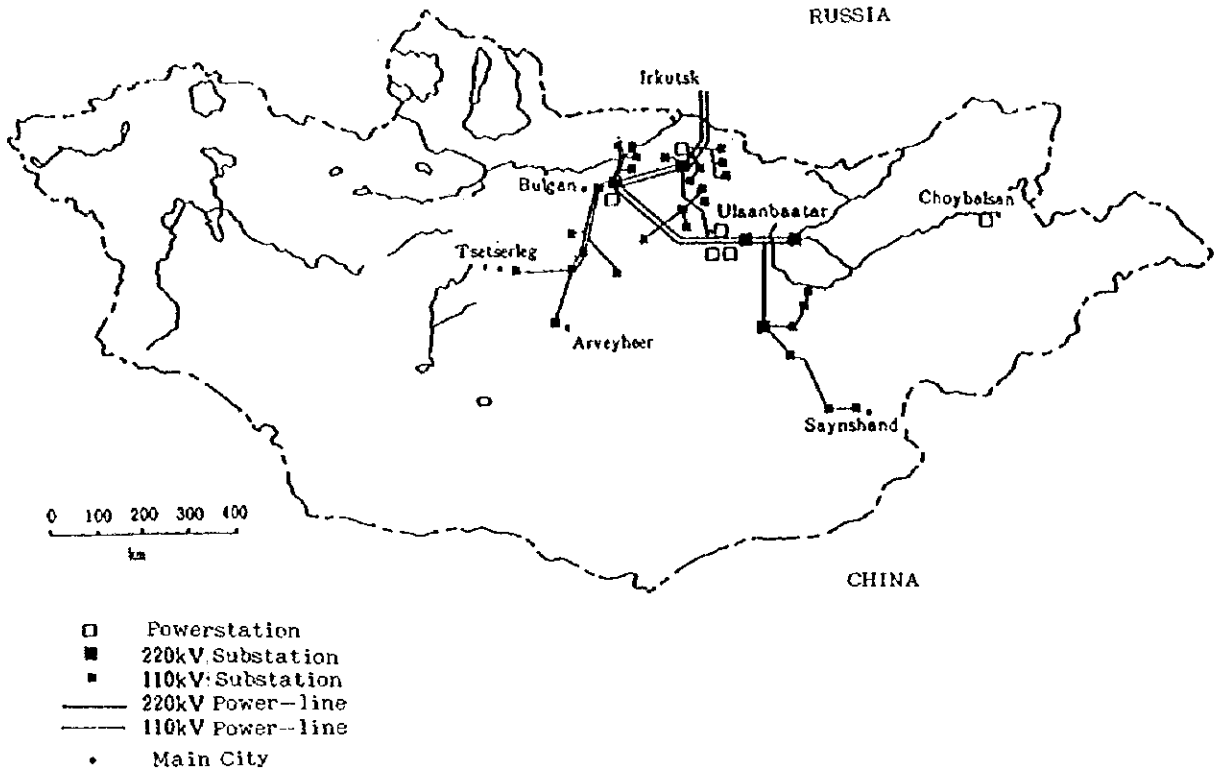
Hentii
21. Batshireet
22. Binden
23. Bayanadrga
24. Norovlin
25. Dadal

Table of Contents

Chapter 1 Background of the Project

Electric power supply in the country of Mongolia (hereafter called Mongolia) is divided into three sections composed of the western area, the eastern area known as Choybalsan which has its own power generating facilities, and the central area which includes Ulaanbaatar city. Stable power is being supplied from the thermal power generating facilities in each area (6 places) and also via power lines from Russia. However, of the total of 314 sums in Mongolia, only 116 are presently capable of using the power supply system. The present state is such that the remaining 198 sums depend on small diesel generators of 60Kw to 100Kw for their power. These diesel generators are all old Soviet-made products with some being installed in the 1970s. They are rapidly becoming superannuated with the number in use diminishing because of the unavailability of spare parts after the break up of the Soviet Union. As a result, stable supply of power is no longer possible and problems have developed concerning public facilities such as schools and hospitals being forced to close, thus stopping the social functions of the sums. The standard of living of the people is dropping, depopulation is becoming a growing problem and the economy of the area is becoming stagnant.

Although the areas are planning to switch to other power generating systems such as diesel generators, thermal generators using coal as fuel, hydraulic generators or wind power generators and there is a plan to extend the existing power transmission lines, implementation is difficult due to lack of budget and the scattered population. The present state of electric power in Mongolia is as shown in Fig. 1 and Table 1.



Source:Asian Development Bank

Fig.1 Electric power transmission system in Mongolia

Table 1 Total electric power generation in 1996

Type	Amount (Gwh)
Produced domestically	2,046.7
Thermal power generation (coal)	1,925.2
Diesel power generation	121.5
Purchased from Russia	374.8
Total	2,421.5

Source:Ministry of Infrastructure Development

Improvement of the infrastructure of the field of electric power is considered one of the most important objects of the Government of Mongolia in reforming the economy. The Government is being pressed with the immediate necessity of supplying electric power on a stable basis, particularly to sums that cannot be supplied by power transmission lines.

Under these circumstances, the Ministry of Infrastructure Development is establishing plans to carry out repairs on diesel electric power generators of 74 sums which are in the worst state of electric power generation of the total of 198 sums using diesel power generating facilities. These sums are located a great distance from the existing central power generating facilities, road conditions are poor and use of other substitute energy is difficult. These areas make up 25% of the area of the country and 20% of the population and are essential not only for industrial development but also for economic development of the country. The 25 sums in 5 aimags that are covered by this project are areas in which the state of electric power is especially poor.

Due to these conditions, the Government of Mongolia requested a grant aid cooperation of the Government of Japan for the purchase of diesel power generators for effective implementation of the project for the rehabilitation ofpower plants of sum centers.

Chapter 2 Contents of the Project

2-1 Objectives of the Project

The object of this project is to improve the livelihood of the sum residents with priority initially being given to the 25 sums with the worst state of power supply of the 74 sums requiring improvement. This project will be based on the project for the rehabilitation of diesel power plants of sums centers established by the Ministry of Infrastructure Development by purchasing the required diesel power generating equipment.

2-2 Basic Concept of the Project

Of the total of 74 sums, the object of this project will be the 25 sums in 5 aimags with the worst state of electric power. The existing superannuated diesel generators will be removed from the existing buildings and new diesel generators will be installed in their place.

The basic concept will be according to the following policy

1) Policy relative to natural conditions: Since Mongolia is about 1,600m above sea level on the average, the design shall take into consideration usage at high elevations. Cold weather measures will also be required since it becomes extremely cold in winter.

2) Policy relative to maintenance and management capability of the implementing organization: Although each sum has several technicians, it cannot be said that they all have high maintenance and management skills. The same model machines will therefore be installed in each sum to simplify maintenance and management. It will also be necessary to give thorough technical guidance at time of delivery.

3) Policy relative to model and grade of the generator installed: Basically, the same class machines as the existing ones will be selected taking into consideration the power generating facilities and the power requirements.

4) Policy relative to term of work: Although the equipment procured will be installed in each sum, it will be necessary to implement installation speedily before winter (November) sets in as transportation and installation will become difficult in winter. Delivery deadline (from contract with agent to delivery) will therefore be within 5 to 6 months with care given to smooth implementation of procurement. Smooth landing and customs clearance will be required since the equipment will be landed in China and shipped by rail to Ulaanbaatar.

As will be explained later, it was confirmed that securing of technicians relative to the equipment procured, raising of funds for fuel and budgets for the necessary funds were implemented with no problem.

In implementing this plan, studies were conducted on the outline of this plan and it was decided to implement the basic plan on the assumption that the effects of the foregoing study, the practicability, implementation capability of the country concerned were confirmed and that the effectiveness of this plan matches Japan's grant aid system.

2-3 Basic Design

2-3-1 Design Concept

Method of studying the necessary equipment and the configuration and quantity are according to the following concepts.

(Method of studying the equipment)

The diesel power generators to be procured were the 60kW and 100kW class equivalents to those presently in use. Taking into consideration technical problems in maintenance if different capacity equipment were to be operated in parallel, the same capacity equipment was decided for each sum. The natural conditions in each sum, state of usage of electric power, state of electric power generators, state of operation of local equipment and experience in use of the equipment were taken into consideration when studying the specifications of each piece of equipment.

(Configuration and quantity of necessary equipment)

The necessary equipment and quantity will be decided so as to cover the present maximum amount of electric power required.

Furthermore, since the maximum amount of power consumption differs by time of day for general households, public organs (hospitals, etc.) and private companies, general households and other facilities with high total power consumption were used. (Public organs, other than hospitals, and private companies generally operate from 9:30 to 17:00 whereas the use of electric power in general households is highest after 18:00.)

The electric power requirements by object of use are shown in Tables 2 to 6 for each sum.

Table 2 Power consumption by object of use for 4 sums in HOVD

(Unit : Kwt)

Aimag	Hovd			
Name of Sum	Chandmani	Zereg	Must	Dariv
Number of generators required	60Kwt x 2	60Kwt x 2 100Kwt x 1	60Kwt x 2 100Kwt x 1	100Kwt x 3
1. General Households	77	105	185	105
2-1. Public facilities	61.5	59	107	71
public offices	2	5	10	2
Schools	5	15	33.5	15
Kindergartens	5	2	6	5
Hospitals	5.5	3	5	10
Veterinary hospitals	4	2	3	including in hospitals
Communications	1	3	8	5
Heating	30	15	15	20
Cooperatives	3	-	-	10
Gasoline stands	3	2	9	1
Cultural centers	2	2	4.5	2
Banks	1	10	10	1
Public libraries	-	-	3	-
2-2. Private facilities	40	18	68	115
Private factories (including hotels)	40	-	68	115
Others	-	18	-	-
2.Total including public facilities (2-1+2-2)	101.5	77	175	186
Principal amount of electric power used	101.5	105	185	186
Number of generators decided	60Kwt x 2	60Kwt x 2	100Kwt x 2	100Kwt x 2

Table 3 Power consumption by object of use for 2 sums in UMNEGOBI

(Unit : Kwt)

Aimag	UMNEGOBI	
Name of Sum	Serewi	Mandal-Ovoo
Number of generators required	60Kwt x 3	100Kwt x 1 60Kwt x 1
1. General Households	80	85
2-1. Public facilities	102	74.6
public offices	2	1.3
Schools	30	18
Kindergartens	5	2
Hospitals	15	7.4
Veterinary hospitals	10	7.1
Communications	-	1.5
Heating	30	30
Cooperatives	5	3
Gasoline stands	2	2
Cultural centers	2	2
Banks	1	0.3
Public libraries	-	-
2-2. Private facilities	5	38
Private factories (including hotels)	5	38
Others	-	-
2.Total including public facilities (2-1+2-2)	107	112.6
Principal amount of electric power used	107	112.6
Number of generators decided	60Kwt x 2	60Kwt x 2

Table 4 Power consumption by object of use for 7 sums in BAYANHONGOR

(Unit : Kwt)

Aimag	BYNHONGOR						
Name of Sum	Galuut	Jargalant	Bayanbulag	Hureemaral	Baatsagaan	Bayanlig	Shinejinst
Number of generators required	60Kwt x 3	100Kwt x 4	60Kwt x 3	60Kwt x 3	100Kwt x 1 60Kwt x 1	60Kwt x 2	100Kwt x 1 60Kwt x 1
1. General Households	175	119	78	109	65	110	62
2-1. Public facilities	44.5	145.6	93.5	108	146	100	91
public offices	4.5	7.4	8	10	-	10	4
Schools	6.8	-	10	5	30	10	12
Kindergartens	1.1	14	-	-	16	5	5
Hospitals	4.8	27.8	5.5	20	20	5	8
Veterinary hospitals	-	2.8	-	-	16	3	3
Communications	0.5	3.5	25	1	-	2	9
Heating	25	60	18	15	38	30	22
Cooperatives	-	-	20	45	-	20	1
Gasoline stands	1.6	12	2	2	3	2	22
Cultural centers	-	4.6	5	10	3	13	5
Banks	0.2	1.5	-	Included in Cooperatives	Included in Cooperatives	Included in Cultural centers	Included in Public offices
Public libraries	-	-	-	-	-	-	-
Sanitary facilities	-	12	-	-	-	-	-
Well	-	-	-	-	20	-	-
2-2. Private facilities	50	10.8	15	60	17	10	10
Private factories (including hotels)	50	-	15	-	17	10	10
Others	-	10.8	-	(60)	-	-	-
2-3.transmit to other Sum	-	24Household 2Sum(110Kwt)	-	-	-	-	-
2.Total including public facilities (2-1+2-2+2-3)	94.5	266.4	108.5	168	163	110	101
Principal amount of electric power used	175	266.4	108.5	168	163	110	101
Number of generators decided	60Kwt x 3	100Kwt x 3	60Kwt x 2	60Kwt x 3	60Kwt x 3	60Kwt x 2	60Kwt x 2

Table 5 Power consumption by object of use for 7 sums in HUBSGUL

(Unit : Kwt)

Aimag	Hubsgul						
Name of Sum	Arbulag	Bayanzurh	Ulaan-Uul	Chandmani-Under	Shineider	Jargalant	Galt
Number of generators required	60Kwt x 2	60Kwt x 2	100Kwt x 1 60Kwt x 1	100Kwt x 1 60Kwt x 1	60Kwt x 3	60Kwt x 3	60Kwt x 3
1. General Households	88	105	94	89	95	137	84
2-1. Public facilities	83	56	54	96	129	52	41.2
public offices	3	2	5	5	5	8	9
Schools	15	3	15	25	38	10	5
Kindergartens	4	3	10	5	-	12	10
Hospitals	7	3	5	20	35	5	1.4
Veterinary hospitals	4	3	3	5	4	1	0.3
Communications	1	1	2	2	3	1	0.5
Heating	26	25	-	20	25	-	-
Cooperatives	10	10	5	10	13	10	10
Gasoline stands	2	2	3	2	2	2	2
Cultural centers	10	3	5	2	3	2	2
Banks	1	1	1	-	1	1	1
Public libraries	-	-	-	-	-	-	-
2-2. Private facilities	25	42	48	20	30	51	60
Private factories (including hotels)	25	42	48	20	30	51	60
Others	-	-	-	-	-	-	-
2.Total including public facilities (2-1+2-2)	108	98	102	116	159	103	101.2
Principal amount of electric power used	108	105	102	116	159	137	101.2
Number of generators decided	60Kwt x 2	60Kwt x 2	60Kwt x 2	60Kwt x 2	60Kwt x 3	60Kwt x 3	60Kwt x 2

Table 6 Power consumption by object of use for 5 sums in HENTII

(Unit : Kwt)

Aimag	Hentii				
Name of Sum	Batshireet	Binden	Bayandrga	Dadal	Norovlin
Number of generators required	60Kwt x 4	100Kwt x 3	100Kwt x 1 60Kwt x 1	100Kwt x 3	60Kwt x 2
1. General Households	81	75	105	280	103
2-1. Public facilities	114.1	150.65	110.4	227.5	100
public offices	1.8	1.85	3.2	1.5	1.5
Schools	8.5	16.5	22	6.5	6.5
Kindergartens	1	-	0.5	3	3.5
Hospitals	10.8	15.8	3.5	10	7
Veterinary hospitals	0.6	0.6	1.4	2.5	2
Communications	1	1	0.8	-	-
Heating	-	-	-	-	4
Cooperatives	79.5	102.6	75	150	70
Gasoline stands	5.5	5.5	0.5	45	-
Cultural centers	5.4	5.4	3	1	4.5
Banks	-	-	0.5	-	1
Public libraries	-	-	-	1	-
Police	-	1.4	-	7	-
2-2. Private facilities	80	0	1	45	8
Private factories (including hotels)	80	-	1	45	8
Others	-	-	-	-	-
2.Total including public facilities (2-1+2-2)	194.1	150.65	111.4	272.5	108
Principal amount of electric power used	194.1	150.65	114.4	280	106
Number of generators decided	100Kwt x 2	60Kwt x 3	60Kwt x 2	100Kwt x 3	60Kwt x 2

2-3-2 Basic Design

The principal specifications, number of units, and object of use relative to the equipment planned for purchase in this project are shown in the following table.

Table 7 Details of equipment

No.	Name of equipment	Specifications	Quantity	Purpose of use
1	Diesel generators	60Kwt, 50Hz, 3 phase 380V/single phase 220V	46	Electric power to sums
2	Diesel generators	100Kwt, 50Hz, 3 Phase 380V/single phase 220V	12	Electric power to sums

Table 4 Power consumption by object of use for 7 sums in BAYANHONGOR

(Unit : Kwt)

Aimag	BYNHONGOR						
Name of Sum	Galuut	Jargalant	Bayanbulag	Hureemaral	Baatsagaan	Bayanlig	Shinejinst
Number of generators required	60Kwt x 3	100Kwt x 4	60Kwt x 3	60Kwt x 3	100Kwt x 1 60Kwt x 1	60Kwt x 2	100Kwt x 1 60Kwt x 1
1. General Households	175	119	78	109	65	110	62
2-1. Public facilities	44.5	145.6	93.5	108	146	100	91
public offices	4.5	7.4	8	10	-	10	4
Schools	6.8	-	10	5	30	10	12
Kindergartens	1.1	14	-	-	16	5	5
Hospitals	4.8	27.8	5.5	20	20	5	8
Veterinary hospitals	-	2.8	-	-	16	3	3
Communications	0.5	3.5	25	1	-	2	9
Heating	25	60	18	15	38	30	22
Cooperatives	-	-	20	45	-	20	1
Gasoline stands	1.6	12	2	2	3	2	22
Cultural centers	-	4.6	5	10	3	13	5
Banks	0.2	1.5	-	Included in Cooperatives	Included in Cooperatives	Included in Cultural centers	Included in Public offices
Public libraries	-	-	-	-	-	-	-
Sanitary facilities	-	12	-	-	-	-	-
Well	-	-	-	-	20	-	-
2-2 Private facilities	50	10.8	15	60	17	10	10
Private factories (including hotels)	50	-	15	-	17	10	10
Others	-	10.8	-	(60)	-	-	-
2-3 transmit to other Sum	-	24household 25sum(10Kwt)	-	-	-	-	-
2 Total including public facilities (2-1+2-2+2-3)	94.5	266.4	108.5	168	163	110	101
Total amount of electric power used	175	266.4	108.5	168	163	110	101
Number of generators decided	60Kwt x 3	100Kwt x 3	60Kwt x 2	60Kwt x 3	60Kwt x 3	60Kwt x 2	60Kwt x 2

Table 5 Power consumption by object of use for 7 sums in HUBSGUL

(Unit : Kwt)

Aimag	Hubsgul						
Name of Sum	Arbulag	Bayanzurh	Ulaan-Uul	Chandmani-Under	Shinelder	Jargalant	Galt
Number of generators required	60Kwt x 2	60Kwt x 2	100Kwt x 1 60Kwt x 1	100Kwt x 1 60Kwt x 1	60Kwt x 3	60Kwt x 3	60Kwt x 3
1. General Households	88	105	94	89	95	137	84
2-1. Public facilities	83	56	54	96	129	52	41.2
public offices	3	2	5	5	5	8	9
Schools	15	3	15	25	38	10	5
Kindergartens	4	3	10	5	-	12	10
Hospitals	7	3	5	20	35	5	1.4
Veterinary hospitals	4	3	3	5	4	1	0.3
Communications	1	1	2	2	3	1	0.5
Heating	26	25	-	20	25	-	-
Cooperatives	10	10	5	10	13	10	10
Gasoline stands	2	2	3	2	2	2	2
Cultural centers	10	3	5	2	3	2	2
Banks	1	1	1	-	1	1	1
Public libraries	-	-	-	-	-	-	-
2-2. Private facilities	25	42	48	20	30	51	60
Private factories (including hotels)	25	42	48	20	30	51	60
Others	-	-	-	-	-	-	-
2 Total including public facilities (2-1+2-2)	103	98	102	116	159	103	101.2
Total amount of electric power used	103	105	102	116	159	137	101.2
Number of generators decided	60Kwt x 2	60Kwt x 2	60Kwt x 2	60Kwt x 2	60Kwt x 3	60Kwt x 3	60Kwt x 2

Table 6 Power consumption by object of use for 5 sums in HENTII

(Unit : Kwt)

Aimag	Hentii				
Name of Sum	Batshireet	Binden	Bayandrga	Dadal	Norovlin
Number of generators required	60Kwt x 4	100Kwt x 3	100Kwt x 1 60Kwt x 1	100Kwt x 3	60Kwt x 2
1. General Households	81	75	105	280	103
2-1. Public facilities	114.1	150.65	110.4	227.5	100
public offices	1.8	1.85	3.2	1.5	1.5
Schools	8.5	16.5	22	6.5	6.5
Kindergartens	1	-	0.5	3	3.5
Hospitals	10.8	15.8	3.5	10	7
Veterinary hospitals	0.6	0.6	1.4	2.5	2
Communications	1	1	0.8	-	-
Heating	-	-	-	-	4
Cooperatives	79.5	102.6	75	150	70
Gasoline stands	5.5	5.5	0.5	45	-
Cultural centers	5.4	5.4	3	1	4.5
Banks	-	-	0.5	-	1
Public libraries	-	-	-	1	-
Police	-	1.4	-	7	-
2-2. Private facilities	80	0	1	45	8
Private factories (including hotels)	80	-	1	45	8
Others	-	-	-	-	-
2. Total including public facilities (2-1+2-2)	194.1	150.65	111.4	272.5	108
Principal amount of electric power used	194.1	150.65	114.4	280	108
Number of generators decided	100Kwt x 2	60Kwt x 3	60Kwt x 2	100Kwt x 3	60Kwt x 2

2-3-2 Basic Design

The principal specifications, number of units, and object of use relative to the equipment planned for purchase in this project are shown in the following table.

Table 7 Details of equipment

No.	Name of equipment	Specifications	Quantity	Purpose of use
1	Diesel generators	60Kwt, 50Hz, 3 phase 380V/single phase 220V	46	Electric power to sums
2	Diesel generators	100Kwt, 50Hz, 3 Phase 380V/single phase 220V	12	Electric power to sums

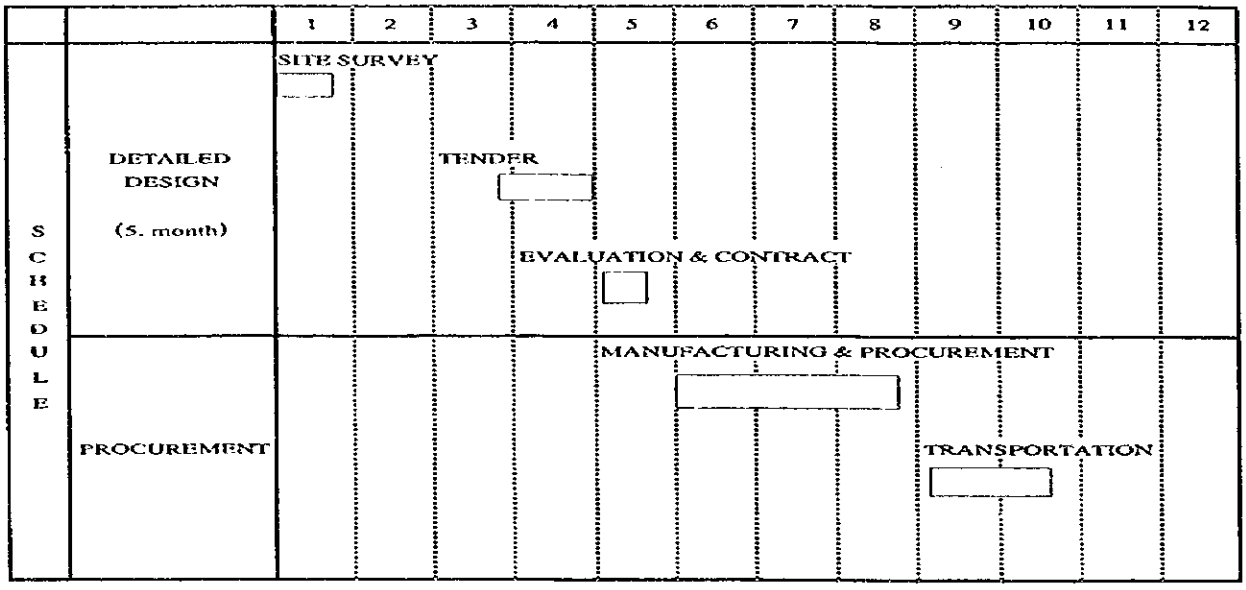
Chapter 3 Implementation Plan

3-1 Implementation Plan

3-1-1 Implementation Schedule

The project will be implemented in a period of 10 months as detailed in table-8

Table-8: Project implementation schedule



3-1-2. Obligations of Recipient Country

The recipient country is required to take necessary measures as follows:

1) Bank arrangements (B/A)

To open an account with an authorized foreign exchange bank in Japan and issue an A/P (authority to pay). The recipient country will also bear fees related to these arrangements.

2) To ensure prompt customs clearance of the equipment to be procured under the grant aid.

3) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imposed in Mongolia with respect to the products and services provided under the verified contracts.

4) To accord Japanese nationals, whose services are to be provided under the verified contracts, such facilities as may be necessary for their entry into Mongolia and stay therein for the performance of their work.

5) To properly and effectively maintain and operate the equipment to be procured under the grant aid and secure the necessary personnel for the implementation of the project. The recipient country will also bear all the expenses for maintenance and management needed for the implementation of the project other than those covered under the grant aid.

3-2 Operation and Maintenance Plan

The equipment purchased in this project will be installed in the diesel power generating facilities of each sum. As a basic rule, maintenance and management of the equipment will be carried out by the sums. One to three power generator-related technicians are posted in each sum and are carrying out routine check and repair of existing equipment. Fuel (light oil, engine oil) is being purchased separately by each sum from the Mongolia Oil Corporation (gasoline station in the sum).

Each sum also has a Mongolia Oil Corporation fuel tank with a capacity of over 1 year supply of fuel. Fuel and oil appropriate for the season (temperature) is also being used. However, since adequate repairs are no longer possible because of the unavailability of spare parts after break up of the USSR, the equipment is becoming superannuated and the number in operation decreasing. There is no

is no problem related to knowledge of the present equipment but adequate technical training will be required of the technicians in each sum when procuring equipment for this project.

Power generation related maintenance and management costs for each sum are provided for by monthly payments of electric bills from households and payments from public organizations. Increase in maintenance and management costs from additional equipment will be covered to a certain extent by income from factories currently closed from lack of electricity that will be reopened and from an increase in households using electricity. In the case of deficits, aid will be provided by the federal government through the provincial governments. Furthermore, with procurement of new models (fuel consumption, 14 liters/h) of the same type as the present model with extremely poor efficiency (fuel consumption 20, liters per hour), fuel consumption costs (1 liter = 40 yen) which make up 90% of the maintenance and management cost will be reduced by 30%. For effective use of the equipment procured, the Ministry of Infrastructure Development and each aimag plan to dispatch technicians in charge of energy to each sum on a periodic basis (every 6 month) to keep up to date on the present state of operation of the equipment procured and also to provide technical guidance.

Chapter 4 Project Evaluation and Recommendation

4-1 Project Effect

1) This project will permit supply of electric power to the sums on a stable basis for 24 hours a day as opposed to approximately 4 hours a day which is the present situation.

2) Realization of stable power supply will enable facilities such as schools and hospitals to operate and factories presently closed to reopen, the social functions of the sums to recover, and the people to enjoy a normal, stable life. It will also activate the economy, prevent depopulation and contribute to industrial development.

3) By procuring the equipment in this project, it is anticipated that fuel consumption will be greatly improved as compared to the antiquated old Soviet equipment and that maintenance costs will be reduced.

It was also confirmed that adequate budget is available for the necessary expenses for maintenance, management and operation of the equipment procured in this project, and that independent operation of the equipment procured in this project was possible since there would be no problem in procuring personnel. It is therefore judged that this project is an appropriate grant aid cooperation by Japan.

4-2 Recommendation

Since this project will contribute greatly to improving the BHN of the people in addition to the anticipated major effects as explained above, it is judged that the appropriateness of implementing this plan on a grant aid basis is appropriate. It is

also believed that this plan can be executed smoothly and effectively if the following points are corrected and improved.

1) Although appropriate equipment maintenance and management is being carried out relative to existing equipment, knowledge is lacking on the new equipment planned for procurement in this project. Technical guidance relative to the appropriate methods of use, maintenance and management of the equipment will be carried out for the technicians of each sum. This will be carried out periodically by the Ministry of Infrastructure Development or with the cooperation of the manufacturer.

2) Although operation, maintenance and management of the equipment will be under the control of each sum, the related organs of the Ministry of Infrastructure Development and the Ministry of Finance will cooperate relative to the personnel and budget required for maintenance and management to implement this project.

3) Manuals for use during operation and technical guidance shall be in the Mongolian language as much as possible.

1.Member List of the Survey Team

1. Hiroshi Manabe
   Leader
   Ministry of Foreign affairs
   Bureau of Economic Cooperation
   Grant Aid Division

2. Kazuo Shimura
   Equipment Planning
   Grant Aid Management Department
   Japan International Corporation System

3. Masahiro Tanaka
   Socio-Economic
   Grant Aid Management Department
   Japan International Corporation System

4. Toshiyuki Handa
   Interpreter
   Japan International Cooperation Center

2. Survey Schedule

No.	Date		Mr.Manabe	Mr.Shimura, Mr.Tanaka , Mr.Handa	Stay
1	11. 23	(Thu)	Tokyo (JL781) → Beijing		Beijing
2	24	(Fri)	Beijing (CA901) → Ulaanbaatar , Courtesy call to Ministry of Infrastructure Development ,Embassy and JICA		Ulaanbaatar
3	25	(Sat)	Ulaanbaatar → Hovd		Hovd
4	26	(Sun)	Site Survey		Hovd
5	27	(Mon)	Site Survey		Altai
6	28	(Tue)	Site Survey, Altai → Ulaanbaatar		Ulaanbaatar
7	29	(Wed)	Courtesy call to Ministry of Finance		Ulaanbaatar
8	30	(Thu)	Discussion with MID		Ulaanbaatar
9	31	(Fri)	Courtesy call to Ministry of External Relations , Discussion with MID		Ulaanbaatar
10	11.1	(Sat)	Signing of Minutes of Discussion		Ulaanbaatar
11	2	(Sun)	Date Collection		Ulaanbaatar
12	3	(Mon)	Ulaanbaatar (OM223) → Beijing (JL782) → Tokyo	Ulaanbaatar → Dalandzadgad	Dalandzadgad
13	4	(Tue)		Suit Survey, Dalandzadgad → Bayanhongor	Bayanhongor
14	5	(Wed)		Suit Survey	Bayanhongor
15	6	(Thu)		Suit Survey	Bayanhongor
16	7	(Fri)		Suit Survey, Bayanhongor → Mulun	Mulun
17	8	(Sat)		Suit Survey	Mulun
18	9	(Sun)		Suit Survey	Mulun
19	10	(Mon)		Suit Survey, Mulun → Ulaanbaatar	Ulaanbaatar
20	11	(Tue)		Suit Survey, Ulaanbaatar → Ondorhaan	Ondorhaan
21	12	(Wed)		Suit Survey, Ondorhaan → Ulaanbaatar	Ulaanbaatar
22	13	(Thu)		Report to EOJ, Discussion with MID	Ulaanbaatar
23	14	(Fri)		Discussion with MID	Ulaanbaatar
24	15	(Sat)		Discussion with MID	Ulaanbaatar
25	16	(Sun)		Date collection	Ulaanbaatar
26	17	(Mon)		Ulaanbaatar (OM223) → Beijing (JL782) → Tokyo	

3.List of Party Concerned in the Recipient Country

1. Prime Minister

2.Ministry of infrastructure development

Mr.G.Nyamdavaa	Minister
Mr.G.Yondongombo	Director

3.Ministry of Finance

Mr.Tsagaan	Minister

4.Ministry of external relations

Mr.L.Dawagiv	Director

5.Governor

Mr.L.Galbadrah	Hovd
Mr.B.Tsedensamba	Umuegobi
Mr.B.Bayarsaikhan	Bayankhongor
Mr.L.Batsuur	Huvsgul
Mr.N.Janchivdorj	Gobialtai

MINUTES OF DISCUSSIONS

THE PROJECT FOR THE REHABILITATION OF DIESEL POWER PLANTS

OF SUMS CENTERS

IN MONGOLIA

In response to a request from the Government of Mongolia, the Government of Japan decided to conduct a Study for the Project for the Rehabilitation of Diesel Power Plants of Sums Centers in Mongolia (herein after referred to "the Project") and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Mongolia a study team headed by Mr. Hiroshi Manabe, Ministry of Foreign Affairs, and is scheduled to stay in the country from October 23 to November 1, 1997.

The team held discussions with the officials concerned to the Project of the Government of Mongolia and conducted a field survey at the study area.

In the course of discussions and survey, both parties have confirmed the main items described on the attached sheets. The team will proceed to further works and prepare the Study report

Ulaanbaatar, October 31, 1997

Mr.Hiroshi Manabe
Leader
Study Team
Ministry of Foreign Affairs

Mr.Gendensuren Yondongombo
Director General
Energy Department
Ministry of Infrastructure
Development

ATTACHMENT

1. Objective

The objective of the Project is to improve the electric supply condition in Sums of Mongolia by procurement of necessary equipment.

2. Project Sites proposed by Mongolian side

The Project sites are located inside of Mongolia. The locations of the Project sites requested by Mongolian side are shown in Annex- I

3.Responsible and Implementing Agencies

(1)Responsible Agency of the Project
Ministry of Infrastructure Development
(2)Implementing Agencies of the Project
Ministry of Infrastructure Development, Energy Department

4.Items requested by the Mongolia side.

After discussions with the Study Team, the items requested by Mongolian side for the realization of the Project were confirmed, as shown in Annex- II. However, the final items, quantity and specifications to be procured under Japan's Grant Aid will be decided after further studies in Japan, taking account of,

-conditions and specifications of existing power plants.
-condition of electric supply in the Sums
-electric consumption in the Sums
-operation and maintenance capability
-financial and administrative viability

5.Japan's Grant Aid system

(1)The Government of Mongolia has understood the system of Japanese Grant Aid, described in Annex- III, explained by the team.
(2)The Government of Mongolia will take the necessary measures, described in Annex- IV, for smooth implementation of the Project on condition that the Grant Aid assistance by the Government of Japan is extended to the Project.

6.Schedule of the study

(1)The consultants will proceed to future studies in Mongolia until November 17.
(2)JICA will complete the final report and send it to the Government of Mongolia by the end of February, 1998

7.Monitoring of the Project

The Implementation Agency has the responsibility for monitoring and reporting to JICA the progress of all phases of the Project such as allocation of funds,

personnel training, maintenance and operation of the diesel plants procured by the Project in the form of annual report.

8.Other Relevant Issues

(1)The Japanese side mentioned the current financial situation of Japan, in particular very severe situation surrounding Japanese ODA and further explained that under such a circumstance the project under Japan's Grant Aid cannot be failed in order to achieve the expected purpose. The Mongolian side understood the local situation of Japan and pledged to exert every possible efforts to develop this project sustainable and successful.

(2)In order to develop the project successful Japanese side emphasized , that the key importance of the project is the allocation of sufficient funds from the Mongolian side for the maintenance and operation of the equipment such as procurement of diesel oil,engine oil,spare parts and other necessary items and assign enough technicians, if necessary recruit additional ones on the project sites. The Mongolian side fully recognized the importance of these two items.

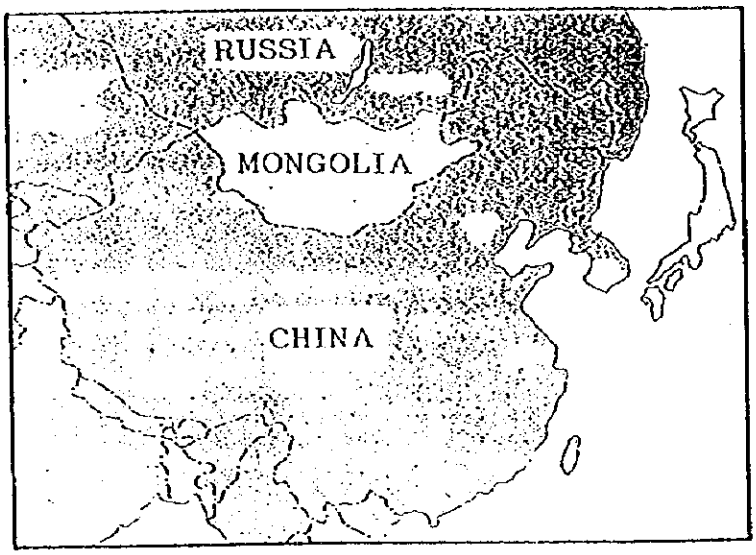
(3)Mongolian side confirmed it is able to allocate the fund sufficient enough to cover the cost of maintenance of the equipment to be provided by the Japanese grant assistance. In case of the requests from the villages for the required additional budget for maintenance and operation, The Mongolian implementation agency will take prompt measures to meet their requests. In this regard the Japanese side requested the Mongolian side to consider issue of the letter of Finance Minister in which the minister guarantees allocation of necessary budget for maintenance and operation of the equipment covering the costs for procurement of diesel oil,etc.

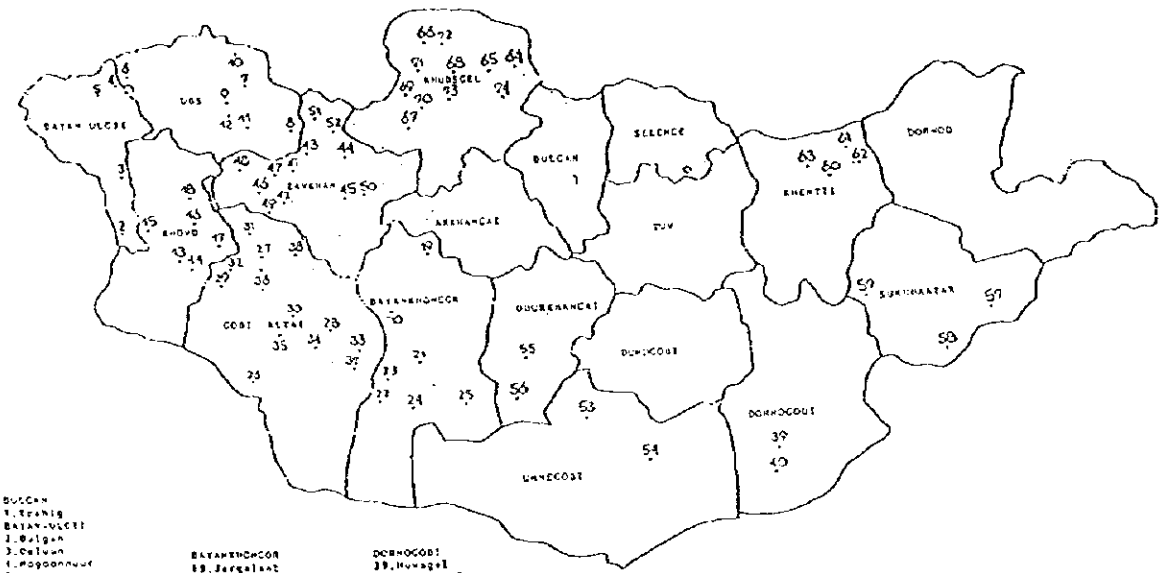
(4)In terms of training of the Mongolian technicians, the Japanese side would investigate the possibility of organizing the training workshop of Mongolian stuff on operation of new equipment procured under the grant aid. The details of the workshop will be discussed later on by between both sides. The suitable place for such a workshop is Ulaanbatar and/or capital town of aimags. The Mongolian side will take necessary measures to allow the technicians of sums involved in the

project to participate in the training workshop.

(5)The Mongolian side explained that the diesel generator in remote villages are in critical conditions,due to the deterioration of the equipment and lack of spare parts most of which are out of operation. Therefore, the equipment of remaining 50 villages which are not included in the current survey also have to be renewed as soon as possible. The Japanese side explained to the Mongolian side that they could conduct the field survey only for 25 villages at this time, however, it understood the situation of Mongolian side and promised to convey their request to Government of Japan.

Annex- I Project Site





BULGAN
1.Tsenig
BAYAN-ULGIY
2.Bulgan
3.Galuun
4.Nogoonnuur
5.Tsagaannuur
UVS
6.Baharchan
7.Zuungobi
8.Zuunkhangai
9.Naichin
10.Tes
11.Tsagaankhairkhan
12.Uyanga
HOVD
13.Must
14.Tsetsegs
15.Munkhkhairkhan
16.Ikemj
17.Darvi
18.Chandmani
BAYANKHONGOR
19.Jargalant
20.Buutsagaan
21.Bayankongor
22.Bayan-Undur
23.Bayantsagaan
24.Shinejinst
25.Baganuur
GOBI-ALTAI
26.Altai
27.Bayan-Uul
28.Sigar
29.Tonhil
30.Haliun
31.Khukhmorit
32.Darvi
33.Chandmani
34.Tsogt
35.Tseel
36.Shargy
37.Erdene
38.Jirgalant
DORNOGOBI
39.Huvsgal
40.Khatanbulag
ZAVKHAN
41.Yaatsagan-Uul
42.Erdenekhairkhan
43.Songino
44.Munkhag
45.Tarvag
46.Sevkhanwandal
47.Santmargalt
48.Ugtaal
49.Gurvelsiin
50.Eder
51.Tes
52.Ragat
UMNEGOBI
53.Mandal-Ovoo
54.Tsogttsetsii
UVURKHANGAI
55.Guchin-Us
56.Gogo
SUKHBAATAR
57.Erdenetsagaan
58.Naran
59.Tuvshinshiree
KHENTII
60.Bayan-Adraga
61.Dadal
62.Norovlin
63.Binder
KHUVSGEL
64.Tsagaan-Uur
65.Chandmani-Undur
66.Tsagaannuur
67.Tsagaan-Uul
68.Khatgal
69.Baganuur
70.Renchinlhumbe
71.Alag-Erdene
72.Erdenebulgan

H. An

Annex-II Items Requested by the Government of Mongolia

items	capacity	quantity
Diesel Plant	60kwt	102
	100kwt	89

Annex-III JAPAN'S GRANT AID PROGRAM

1. Japan's Grant Aid Procedures

(1) The Japan's Grant Aid Program is executed by the following procedures.

- **Application** (request made by a recipient country)
- **Study** (Preliminary Study / Basic Design Study conducted by JICA)
- **Appraisal & Approval** (Appraisal by the Government of Japan and Approval by the Cabinet of Japan)
- **Determination of Implementation** (Exchange of Notes between both Governments)
- **Implementation** (Implementation of the Project)

(2) Firstly, an application or a request for a project made by the recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to see whether or not it is suitable for Japan's Grand Aid. If the request is deemed suitable, the Government of Japan entrusts a study on the request to JICA (Japan International Cooperation Agency).

Secondly, JICA conducts the Study (Basic Design Study), using a Japanese consulting firm. If the background and objective of the requested project are not clear, a Preliminary Study is conducted prior to a Basic Design Study.

Thirdly, the Government of Japan appraises to see whether or not the Project is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA and the results are then submitted for approval by the Cabinet.

Fourthly, the Project approved by the Cabinet becomes official when pledged by the Exchange of Notes signed by both Governments.

Finally, for the implementation of the Project, JICA assists the recipient country in preparing contracts and so on.

2. Contents of the Study

(1) Contents of the Study

The purpose of the Study (Preliminary Study / Basic Design Study) conducted on a project requested by JICA is to provide a basic document necessary for appraisal of the project by the Japanese Government. The contents of the Study are as follows:

a) to confirm background, objectives, benefits of the project and also

N. Ch

institutional capacity of agencies concerned of the recipient country necessary for project implementation,

b) to evaluate appropriateness of the Project for the Grant Aid Scheme from a technical, social and economical point of view,

c) to confirm items agreed on by both parties concerning a basic concept of the project,

d) to prepare a basic design of the project,

e) to estimate cost involved in the project.

Final project components are subject to approval by the Government of Japan and therefore may differ from an original request.

Implementing the project, the Government of Japan requests the recipient country to take necessary measures involved which are itemized on Exchange of Notes.

(2) Selecting (a) Consulting Firm(s)

For smooth implementation of the study, JICA uses (a) consulting firm(s) registered. JICA selects (a) firm(s) through proposals submitted by firms which are interested. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference made by JICA.

The consulting firm(s) used for the study is(are) recommended by JICA to a recipient country after Exchange of Notes, in order to maintain technical consistency and also to avoid possible undue delay in implementation caused if a new selection process is repeated.

(3) Status of a Preliminary Study in the Grant Aid Program

A Preliminary Study is conducted during the second step of a project formulation & preparation as mentioned above.

A result of the study will be utilized in Japan to decide if the Project is to be suitable for a Basic Design Study.

Based on the result of the Basic Design Study, the Government would proceed to the stage of decision making process (appraisal and approval).

It is important to notice that at the stage of Preliminary Study, no commitment is made by the Japanese side concerning the realization of the Project in the scheme of Grant Aid Program.

3. Japan's Grant Aid Scheme

(1) What is Grant Aid?

The Grant Aid Program provides a recipient country with non reimbursable funds needed to procure facilities, equipment and services for economic and social development of the country under the following

N. Ch

principles in accordance with relevant laws and regulations of Japan. The Grant Aid is not in a form of donation or such.

(2) Exchange of Notes (E/N)

The Japan's Grant Aid is extended in accordance with the Exchange of Notes by both Governments, in which the objectives of the Project, period of execution, conditions and amount of the Grant, etc. are confirmed.

(3) "The period of the Grant Aid" means one Japanese fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedure such as Exchange of Notes, concluding a contract with (a) consulting firm(s) and (a) contractor(s) and a final payment to them must be completed.

(4) Under the Grant, in principle, products and services of origins of Japan or the recipient country are to be purchased.
When the two Governments deem it necessary, the Grant may be used for the purchase of products or services of a third country origin.
However the prime contractors, namely, consulting, contractor and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means Japanese physical persons or Japanese juridical persons controlled by Japanese physical persons.)

(5) Necessity of the "Verification"

The Government of the recipient country or its designated authority will conclude into contracts in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. The "Verification" is deemed necessary to secure accountability to Japanese tax payers.

(6) Undertakings required to the Government of the recipient country

In the implementation of the Grant Aid, the recipient country is required to undertake necessary measures such as the following:

a) to secure land necessary for the sites of the project and to clear and level the land prior to commencement of the construction work,
b) to provide facilities for distribution of electricity, water supply and drainage and other incidental facilities in and around the sites,
c) to secure buildings prior to the installation work in case the Project is providing equipment,
d) to ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid,
e) to exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with

H. Ch

3

respect to the supply of the products and services under the Verified Contracts,

f) to accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(7) Proper Use

The recipient country is required to maintain and use facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for their operation and maintenance as well as to bear all expenses other than those to be borne by the Grant Aid.

(8) Re-export

The products purchased under the Grant Aid shall not be re-exported from the recipient country.

(9) Banking Arrangement (B/A)

a) The Government of the recipient country or its designated authority shall open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by Government of the recipient country or its designated authority under the contracts verified.

b) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an Authorization to pay issued by the Government of the recipient country or its designated authority.

H. An

Annex-Ⅳ Necessary measures to be taken by the Government of Mongolia on condition that Japan's Grant Aid is extended.

1. To bear commissions to the Japanese Foreign exchange bank for the execution of the banking services based upon the banking arrangement.
2. To ensure prompt unloading and custom clearances at port of disembarkation in Mongolia and facilitate the internal transportation therein of the products purchased under the Grant.
3. To ensure the custom clearances at the port, and to bear the cost for bonded storage at the port.
4. To exempt the Japanese nationals of the project from the custom duties, internal taxes and other fiscal levies which may be imposed in Mongolia with respect to the supply of the products and services under the verified contracts, and to take the necessary measures for such a tax exemption.
5. To accord Japanese nationals, whose services may be required in connection with the supply of products and services under the verified contracts, such facilities as may be necessary for their entry into Mongolia and stay therein for the performance of their work.
6. To use and maintain properly and effectively all the equipment purchased under the Grant.
7. To bear all the expenses other than those covered by the Grant, necessary for the execution of the Project.
8. To provide necessary data and information for the execution of the project.
9. To assign the exclusive counterpart engineers and technicians for the Project.

H. Ch

JICA