

1. Dispatch records of Japanese Experts

Name	Field	Period of Dispatch	Organization/Company Name
Yasuo SATO	Numerical Weather Prediction	11 Oct. 2004 - 01 Nov. 2004 19 Feb. 2005 - 05 Mar. 2005 08 May 2005 - 24 Jul. 2005 20 Aug. 2005 - 08 Nov. 2005 09 Jan. 2006 - 06 Mar. 2006 29 May 2006 - (26 Aug. 2006)	Japan Weather Association
Hiroaki MIZUKAMI	Weather Services Planning	11 Oct. 2004 - 01 Nov. 2004 19 Feb. 2005 - 13 Mar. 2005 08 May 2005 - 28 May 2005 20 Aug. 2005 - 03 Sep. 2005 18 Feb. 2006 - 04 Mar. 2006 05 Aug. 2006 - (26 Aug. 2006)	Japan Weather Association
Takehiko FURUKAWA	Weather Forecasting	11 Oct. 2004 - 01 Nov. 2004 19 Feb. 2005 - 05 Mar. 2005 08 May 2005 - 24 Jul. 2005 20 Aug. 2005 - 08 Nov. 2005 09 Jan. 2006 - 06 Mar. 2006 29 May 2006 - (26 Aug. 2006)	Japan Weather Association (JP Tech Engineering)
Ritsuko SASAKI	Weather Interpretation Method	20 Aug. 2005 - 17 Sep. 2005	Japan Weather Association
Hideshige IIDA	Weather Radar Analysis	01 Jun. 2005 - 30 Jun. 2005 11 Jun. 2006 - 10 Jul. 2006	Japan Weather Association
Masato SHINODA	Drought/Dzud Early Warning System	11 Oct. 2004 - 01 Nov. 2004 21 Feb. 2005 - 01 Mar. 2005 02 May 2005 - 08 May 2005 23 Jan. 2006 - 28 Jan. 2006 18 Aug. 2006 - 24 Aug. 2006	Japan Weather Association (Tokyo Metropolitan University -> Tottori University)
Kaoru TACHIIRI	GIS Technique	20 Feb. 2005 - 04 Mar. 2005 02 May 2005 - 31 May 2005 18 Aug. 2005 - 17 Sep. 2005 10 Jan. 2006 - 28 Jan. 2006 14 Aug. 2006 - (02 Sep., 2006)	Japan Weather Association (University of British Columbia)
Yuki MORINAGA	Zoo-meteorology	03 Aug. 2005 - 22 Aug. 2005	Japan Weather Association (Meiji University)
Soshi IWATA	Use of Weather Information	19 Feb. 2005 - 05 Mar. 2005 08 May 2005 - 06 Jun. 2005 20 Jul. 2005 - 08 Sep. 2005 29 May 2006 - 23 Jun. 2006	Japan Weather Association
Takehiro YOSHIDA	Operation and Maintenance of Weather Radar	08 May 2005 - 06 Jun. 2005 12 Aug. 2006 - (29 Aug. 2006)	Japan Weather Association
Shinya SHIMODA	Computer Networking	08 May 2005 - 31 May 2005 09 Aug. 2006 - (26 Aug. 2006)	Japan Weather Association
Nobuo SUGIMOTO	Equipment Planning of DSS Monitoring System	18 May 2005 - 28 May 2005	Japan Weather Association (National Institute for Environmental Studies)

2. Record of Counterpart Training in Japan

Name of Trainee	Field	Period of Training	Contents and Places	Occupation during Training	Present Occupation, Time of Leaving Since Training
Ms. L. Oyunjargal	Weather Forecasting / Numerical Weather Prediction	2005/11/27~2005/12/10	Weather Forecasting Using Observation, Numerical Weather Prediction and Its Outputs Japan Meteorological Agency, Japan Weather Association, etc.	Researcher, Forecast Research Laboratory, Forecast Section, Institute of Meteorology and Hydrology (IMH), National Agency for Meteorology, Hydrology and Environment Monitoring (NAMHEM)	
Mr. G. Bayasgalan	Numerical Weather Prediction / Weather Forecasting				
Ms. B. Tsatsral	Weather Forecasting				
Mr. B. Buyantogtokh	Numerical Weather Prediction / Weather Forecasting				
Mr. PUREVJAV Gomboluudev	Numerical Weather Prediction / Climate Change Projection	2005/11/23~2005/12/23	Regional Climate Projection Study using Regional Climate Models Meteorological Research Institute of Japan	Head, Forecast Research Laboratory, Forecast Section,IMH, NAMHEM	

3. Equipment List provided under the Project

No.	Time of Arrival at Site	Name of Equipment (Model Number, Name of Manufacturer)	Price	Using Section	Installation Site	Current Working Situation
1	02 Mar. 2005	GPS (Garmin Geko101)	165,000Tg	NAMHEM Aimag Centers	NAMHEM Head Office and Aimag Centers	in Use
2	02 Mar. 2005	Dry Cell Battery for GPS (AAA 8 batteries in 1 set)	11,000Tg	ditto	ditto	in Use
3	02 Mar. 2005	GPS (Garmin 101)	13,500Japanese Yen	ditto	ditto	in Use
4	20 Jul. 2005	Electric Scale (NEW-3000)	11,174,400Tg	Agrometeorology Section of NAMHEM Head Office and Aimag Centers	ditto	in Use
5	20 Jul. 2005	Weighing Instrument (500kg) (RP-500)	562,600Tg	Agrometeorology Section of NAMHEM Head Office and Aimag Centers and Herders	Herders	in Use
6	20 Jul. 2005	Weighing Instrument (100kg) (RP-100)	1,241,600Tg	ditto	ditto	in Use
7	20 Jul. 2005	5Kg Weight	582,000Tg	ditto	ditto	in Use
8	20 Jul. 2005	5Kg Weight	(free)	ditto	ditto	in Use
9	30 Aug. 2005	Desktop PC (DELL Optiplex Gx170L)	1434.78USD *1	Forecast Research Laboratory, Agrometeorology Section, Database and Remote Sensing Center	Forecast Research Laboratory, Agrometeorology Section, Project Office, Database and Remote Sensing Center	in Use
10	30 Aug. 2005	LCD Monitor (DELL 17" LCD)	(included in *1)	ditto	ditto	in Use
11	30 Aug. 2005	CD-RW (700MB)	0.87USD	Forecast Research Laboratory, etc.	Forecast Research Laboratory, etc.	in Use
12	30 Aug. 2005	MS-WindowsXP Professional (Microsoft)	(included in *1)	Forecast Research Laboratory, Agrometeorology Section, Database and Remote Sensing Center	Forecast Research Laboratory, Agrometeorology Section, Project Office, Database and Remote Sensing Center	in Use
13	30 Aug. 2005	MS-Office 2003 Professional (Microsoft)	(included in *1)	ditto	ditto	in Use
14	30 Aug. 2005	Linux OS (Freeware)	(freeware)	ditto	ditto	in Use
15	30 Aug. 2005	Net CDF (Freeware)	(freeware)	ditto	ditto	in Use
16	30 Aug. 2005	NCARG (Freeware)	(freeware)	Forecast Research Laboratory	Forecast Research Laboratory, Project Office	in Use
17	30 Aug. 2005	UPS (MGE Premium)	347.83USD	Forecast Research Laboratory, Agrometeorology Section, Database and Remote Sensing Center	Forecast Research Laboratory, Agrometeorology Section, Project Office, Database and Remote Sensing Center	in Use
18	30 Aug. 2005	Inkjet Printer (Canon i6100)	286.96USD	Forecast Research Laboratory	Forecast Research Laboratory	in Use

3. Equipment List provided under the Project

No.	Time of Arrival at Site	Name of Equipment (Model Number, Name of Manufacturer)	Price	Using Section	Installation Site	Current Working Situation
19	30 Aug. 2005	Ink Cartridge for Canon i6100 Printer	34.78USD	ditto	Forecast Research Laboratory	in Use
20	30 Aug. 2005	Ethernet Switch (D-Link)	46.96USD	Forecast Research Laboratory, Agrometeorology Section, Database and Remote Sensing Center	Forecast Research Laboratory, Agrometeorology Section, Project Office, Database and Remote Sensing Center	in Use
21	30 Aug. 2005	UTP Cable (No brand)	0.35USD	Information and Computer Center (ICC)	Information and Computer Center (ICC)	in Use
22	30 Aug. 2005	RJ-45 Connector (No brand)	0.35USD	ditto	ditto	in Use
23	30 Aug. 2005	Power Extension Cable (MGE Pulsar 5)	17.39USD	Forecast Research Laboratory, Agrometeorology Section, Database and Remote Sensing Center	Forecast Research Laboratory, Agrometeorology Section, Project Office, Database and Remote Sensing Center	in Use
24	30 Aug. 2005	PC Workstation (DELL Precision 380 N)	5,321.74USD *2	Forecast Research Laboratory	Forecast Research Laboratory	in Use
25	30 Aug. 2005	Server (DELL PowerEdge 800)	6,608.70USD	ditto	Forecast Research Laboratory	in Use
26	30 Aug. 2005	Linux OS (Red Hat Enterprize)	(included in *2)	ditto	Forecast Research Laboratory	in Use
27	30 Aug. 2005	Tape Cartridge (20/40GB DDS4)	17.39USD	ditto	Forecast Research Laboratory	in Use
28	30 Aug. 2005	Fortran Software (PGI(1user))	852.78USD	ditto	Forecast Research Laboratory, Project Office	in Use
29	30 Aug. 2005	Fortran Software (PGI(10user))	6,341.56USD	ditto	Forecast Research Laboratory, Project Office	in Use
30	30 Aug. 2005	GIS Software (ArcGIS9.1(ArcView+Spatial Analyst))	1,990.00USD	Agrometeorology Section, Database and Remote Sensing Center	Agrometeorology Section, Database and Remote Sensing Center	in Use
31	30 Aug. 2005	Remote Sensing Software (Erdas Imagine 8.7)	9,005.00USD	ditto	ditto	in Use
32	30 Aug. 2005	Projector (HP VP6121)	2,347.83USD	Forecasting Section	Project Office	in Use
33	30 Aug. 2005	Carrying Case for Projector (HP)	156.52USD	ditto	ditto	in Use
34	30 Aug. 2005	Lamp for Projector (HP)	556.52USD	ditto	ditto	in Use
35	30 Aug. 2005	Laser Pointer (No brand)	8.70USD	ditto	ditto	in Use
36	30 Aug. 2005	Laptop PC (DELL Latitude D510)	2,359.13USD *3	ditto	ditto	in Use

3. Equipment List provided under the Project

No.	Time of Arrival at Site	Name of Equipment (Model Number, Name of Manufacturer)	Price	Using Section	Installation Site	Current Working Situation
37	30 Aug. 2005	USB Memory (256MB)	46.96USD	ditto	ditto	in Use
38	30 Aug. 2005	Mouse for Laptop PC (Optical)	(included in *3)	ditto	ditto	in Use
39	30 Aug. 2005	Color Copier (Canon iRC3100)	8,034.78USD	ditto	ditto	in Use
40	30 Aug. 2005	Printer Unit for Copier (Canon E1)	3,913.04USD	ditto	ditto	in Use
41	30 Aug. 2005	Toner Cartridge for Copier (Canon Cy.Ma.Ye.B)	121.74USD,71.30(B)	ditto	ditto	in Use
42	30 Aug. 2005	Copy Paper (No brand, 500 sheets)	3.48USD	ditto	ditto	in Use
43	07 Nov. 2005	Auto Sheet Feeder for Copier (Canon)	950.40USD	ditto	ditto	in Use
44	07 Nov. 2005	Finisher for Copier (Canon)	1080.00USD	ditto	ditto	in Use
45	20 Mar. 2006	Drying Instruments	1000.00USD	NAMHEM Aimag Centers	NAMHEM Aimag Centers	in Use
46	21 Aug. 2006	Broadband Gateway (D-Link DI-808HV)	440.00USD	ICC of NAMHEM and Aviation Meteorological Center	ICC of NAMHEM and Aviation Meteorological Center at Chinggis Khan	in Use
47	21 Aug. 2006	Router (Cisco 1811/K9)	2700.00USD	ICC of NAMHEM	ICC of NAMHEM	in Use
48	21 Aug. 2006	Switch (D-Link DES-1008D)	100.00USD	ICC of NAMHEM	ICC of NAMHEM	in Use
49	21 Aug. 2006	Desktop PC (DELL Optiplex Gx210L)	2318.00USD	Agrometeorology Section, Database and Remote Sensing Center	Agrometeorology Section, Database and Remote Sensing Center	in Use
50	21 Aug. 2006	Office 2003 Professional (Microsoft)	817.00USD	Agrometeorology Section, Database and Remote Sensing Center	Agrometeorology Section, Database and Remote Sensing Center	in Use
51	21 Aug. 2006	UPS (APC 1500VA)	783.00USD	Agrometeorology Section, Database and Remote Sensing Center	Agrometeorology Section, Database and Remote Sensing Center	in Use
52	21 Aug. 2006	Switch (D-Link DES-1008D)	50.00USD	Agrometeorology Section, Database and Remote Sensing Center	Agrometeorology Section, Database and Remote Sensing Center	in Use
53	21 Aug. 2006	GIS Extension (ESRI ArcGIS 3D Analyst)	6510.00USD	Agrometeorology Section, Database and Remote Sensing Center	Agrometeorology Section, Database and Remote Sensing Center	in Use
54	21 Aug. 2006	GIS Extension (ESRI ArcGIS Geostatistical	6510.00USD	Agrometeorology Section, Database and Remote Sensing Center	Agrometeorology Section, Database and Remote Sensing Center	in Use

4. Budgetary Allocations for the Project by the Japanese Side

(Unit Price: Japanese Yen)

Item	FY2005	FY2006 (in progress)	Total	Remarks
Travel Expense	345,093	328,947	674,040	Air Fare for Ulaanbaatar - Gobi Altai, round trip, 2 persons Accommodation Fee for C/P Participating Workshops Transportation Fee for Workshop Participants Accommodation Fee for Workshop Participants
Communications Costs	536,750	0	536,750	Internet Connection Charge Used for Acquiring Data Outside
Renting Costs	9,000	0	9,000	Rental Fee for Seminar Place
Total	890,843	328,947	1,219,790	

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5. Counterparts List

Name	Occupation	Field	Period of Assignment	Name of Japanese Experts Who Provided	Time of Leaving and Current Position/Occupation if He/She Left Original Position
Mr. P.Gomboluudev	Science Secretary, Institute of Meteorology and Hydrology (IMH) (- March 2005). Head of Forecast Research Laboratory, Weather Forecast Section, IMH(April 2005 -)	Numerical Weather Prediction / Climate Change Projection	1 April 2005 - Present	Yasuo SATO	
Ms. L.Oyunjargal	Head of Weather Forecasting Section, IMH(- March 2005) . Researcher in Forecast Research Laboratory, IMH(- April 2005)	Weather Forecasting	1 April 2005 - Present	Takehiko FURUKAWA	
Ms. B. Erdenetsetseg	Engineer Technologist, Agrometeorological Section, IMH	Drought/Dzud Early Warning System	1 April 2005 - Present	Masato SHINODA	
Dr. D. Dagvadorj	Director, Administration and International Cooperation Division, National Agency for Meteorology, Hydrology and Environment Monitoring (NAMHEM)	Use of Weather Information	1 April 2005 - 26 June 2006	Soshi IWATA	Director, Division of Information, Monitoring and Evaluation, Ministry of Nature and Environment, June 2006
Mr. Ts. Tsogt	Head of Weather Forecasting Section, IMH	Use of Weather Information	27 June 2006 - Present	Soshi IWATA	
Mr. Kh. Enkhbayar	Chief Engineer, Morin Uul Radar Station, Aviation Meteorological Center	Operation and Maintenance of Weather Radar	1 April 2005 - Present	Takehiro YOSHIDA	
Ms. D. Erdenetsetseg	Network Administrator, Information and Computing Center (ICC)	Computer Networking	1 April 2005 - Present	Shinya SHIMODA	
Dr. D. Jugder	Science Secretary, Institute of Meteorology and Hydrology(IMH)	Analysis, Processing and Sharing of DSS Monitoring Data	1 April 2005 - Present		

6. Budgetary Allocation for the Project by the Mongolian Side

(Unit Price: Million Tugrig)

Item	FY2005	FY2006	Total	Remarks
(Personnel Expenses)				
Salaries, etc. for Mongolian Counterpart Personnel	22.9	23.1	46.0	Salaries, travel expenses including transportation fee for Mongolian Counterpart Personnel
(Operation Cost)				
Electricity, Water Supply, Gasoline, etc.	0.6	0.6	1.2	Electricity charge and heating expense
Rooms for Training for Numerical Weather Prediction/Climate Change Projection and Guidance	11.5	11.5	23.0	2 Rooms (62.3m ² and 85m ²)
Seminar Rooms at NAMHEM Head Office and 3 Aimag Centers	0	2.5	2.5	Seminar rooms at 3 sites
Rooms for Equipment Installation	11.5	12.5	24.0	Size of space: 75.3m ²
Furniture, Electricity, Water Supply and Air Conditioning Facility	0.6	0.6	1.2	Purchased furniture
Equipment Repairing Cost	0	0	0.0	will be prepared as necessary
(Investment Cost)				
Project Office	4.4	4.4	8.8	Room size: 46.2m ²
Tax Exemption, Storing and Domestic Delivery for Equipment Provided by Japanese Side	0.4	0.8	1.2	All tax for equipment procurement is exempted
Other relevant contingency	0	0	0.0	will be prepared as necessary
Total	51.9	56.0	107.9	

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Revised PROJECT DESIGN MATRIX (PDM)

Narrative Summary	Objectively Verifiable Indicator	Means of Verification	Important Assumption
<p>Overall Goal Weather information is utilized for natural disaster management and climate change impact assessment in Mongolia.</p>	<p>Work plans of natural disaster management and climate change impact assessment of Mongolia are established and implemented.</p>	<p>Research studies for use of weather information</p>	
<p>Project Purpose To provide more reliable, useful and timely weather information including dust storms and yellow sand (DSS) data through developing the capacity of the weather service staff and related environmental experts</p>	<p>a. Times of provision of short/middle/long-range weather forecasts using regional numerical weather prediction and new weather analysis methods b. Times of provision of information on climate change projection over Mongolia c. Times of provision of information on drought/dzud d. Number of days for the transfer of DSS monitoring data</p>	<p>a. Final Report of the Project b. Final Report of the Project c. Final Report of the Project</p>	<p>State policy on weather services for natural disaster management and climate change impact assessment remains unchanged.</p>
<p>Outputs</p> <ol style="list-style-type: none"> 1. Operational numerical weather prediction using a regional model around Mongolia is implemented. 2. Climate change projection due to global warming using a climate model is implemented. 3. Short/middle/long-term weather forecasts based on NWP outputs are issued. 4. Drought/dzud early warning system (DDEWS) is established. 5. Knowledge and understandings about weather and climate information in central/local governments, related organizations/agencies and end-users including herders and general public in Mongolia are deepened. 6. Weather observation and forecasting systems especially weather radar and computer network are stably operated. 7. Information on monitoring of DSS is issued. 	<ol style="list-style-type: none"> 1.1. Commencement of operation of regional numerical weather prediction system originated by NAMHEM 1.2. 5 staff capable of operational numerical weather prediction (NWP) 2. Publication of information on climate change due to global warming over Mongolia 3.1. Short/middle-term forecasts for scale smaller than province (aimag) 3.2. Use of a ensemble method for long-term forecast 3.3. 5 staff capable of advanced weather analysis using data from NWP models 4.1. Maps of pasture biomass and plant height on the village (bag) scale 4.2. 4 staff capable of early warning using GIS data 5. Number of persons who receive explanation on use of weather information 6. Operating rates of weather observation and forecasting system (weather radar and computer network) 7. Analyzed DSS monitoring information 	<ol style="list-style-type: none"> 1.1. Forecast Operation Room 1.2. Final Report of the Project 2. Bulletin of Institute of Meteorology and Hydrology (IMH) of NAMHEM 3.1. Record files of forecasts 3.2. Forecast Operation Room 3.3. Final Report of the Project 4. Agrometeorological and Environmental Bulletin 4.2. Final Report of the Project 5. Final Report of the Project 6. Records of system failure 7. Central Monitoring System in Ulaanbaatar 	

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<p>Activities</p> <ol style="list-style-type: none"> 1.1. To conduct training/seminars on numerical weather prediction (NWP) 1.2. To establish operational 5 to 7-day NWP system and assess its result in comparison with the existing operational forecast 1.3. To procure and set up equipment for training on numerical weather prediction 2.1. To conduct training on climate change projection using a climate model 2.2. To implement climate change projection such as surface temperature, humidity, precipitation, snowfall and wind 2.3. To procure and set up equipment for climate change projection 3.1. To conduct training on interpretation of NWP outputs including ensemble forecasting technique 3.2. To develop operational guidance for forecasting 3.3. To develop a computer-aided case study handbook on typical and unusual phenomena 3.4. To develop new concepts of forecast such as precipitation probability forecast 3.5. To conduct training on very short-range forecast using weather radar data 3.6. To procure and set up equipment for operational forecasting work 4.1. To conduct training on conceptual framework of a combined drought/dzud early warning system (DDEWS) 4.2. To conduct training of database and GIS technique in the framework of the DDEWS 4.3. To revise the present zoo-meteorological observation programme and manual 4.4. To produce guidelines of warning and advisory messages 4.5. To produce pasture condition maps on the village (bag) scale 4.6. To procure and set up equipment for agro/zoo-meteorology and GIS 	<p>Inputs (Japanese Side)</p> <ol style="list-style-type: none"> 1. Dispatch of experts <ul style="list-style-type: none"> <Long-term experts> - 1 Numerical weather prediction (Leader) - 1 Weather forecasting <Short-term experts> - 1 Weather services planning (Deputy leader) - 1 Weather interpretation method - 1 GIS technique - 1 Weather radar analysis - 1 Drought/dzud early warning system - 1 Zoo-meteorology - 1 Use of weather information - 1 Operation and maintenance of weather radar - 1 Computer networking - 1 Analysis, processing and sharing of DSS data - 1 Operation and maintenance of DSS monitoring network - 1 Equipment planning of DSS monitoring system 2. Equipment supply 3. Provision of training in Japan 	<p>(Mongolian Side)</p> <ol style="list-style-type: none"> 1. Provision of project office and places for equipment to be supplied 2. Setting up of working groups 3. Allocation of counterpart personnel 4. Security of offices or places to be used for the Project 5. Provision of financial sources for on-site project management 	<p>Trained staff continues to work at their positions.</p>
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- 5.1. To conduct seminars in Ulaanbaatar both for the project launching and wrapping-up
- 5.2. To conduct workshops in Ulaanbaatar on use of weather information targeted to government organizations/agencies
- 5.3. To conduct seminars/workshops in pilot aimags (Hentii, Dondogobi, Gobi-Altai) on use of weather information targeted to local government (aimag/soum) and end users including herders and general public
- 5.4. To procure and set up equipment for seminars/workshops
- 6.1. To produce operation and maintenance manual of weather radar system
- 6.2. To conduct training on operation and maintenance of weather radar system
- 6.3. To make overall plan of computer network in NAMHEM
- 6.4. To conduct training on computer networking
- 7.1. To procure and set up DSS monitoring system
- 7.2. To conduct training on operation and maintenance of DSS monitoring network and data analysis

Pre-conditions

To be able to obtain cooperation of organizations/agencies related to natural disaster management

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Project Design Matrix (PDM2)

Project Title: The Project for Development of Human Capacity for Weather Forecasting and Data Analysis in Mongolia

Implementing Agency: NAMHEM

Target Group: Staff of NAMHEM

Duration: Jan. 2005~Oct. 2008

Revised on : Aug. 25, 2006

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
<p align="center">Overall Goal</p> <p>Weather information is utilized for natural disaster management and climate change impact assessment in Mongolia.</p>	Work plans of natural disaster management and climate change impact assessment of Mongolia are established and implemented.	Research studies for use of weather information	
<p align="center">Project Purpose</p> <p>More reliable, useful and timely weather information including dust storms and yellow sand (DSS) data is provided through developing the capacity of the weather service staff and related environmental experts.</p>	<p>a Weather forecasts using regional numerical weather prediction and new weather analysis methods are provided twice a day for Short-term / once a day for Middle-term / once a month for Long-term.</p> <p>b Information on climate change projection over Mongolia is publicized once before the end of the project period.</p> <p>c Information on drought/dzud is provided annually (at the end of August)</p> <p>d DSS monitoring data is provided for 300 days in a year</p> <p>e Satisfaction level of users (public administrators, nomads, etc.) on the available weather forecast information is improved.</p>	<p>Final report of the Project</p> <p>Final report of the Project</p> <p>Final report of the Project</p> <p>Surveys and interviews</p>	State policy on weather services for natural disaster management and climate change impact assessment remains unchanged.
<p align="center">OUTPUTS</p> <p>1 Operational numerical weather prediction using a regional model around Mongolia is implemented.</p> <p>2 Climate change projection due to global warming using a climate model is implemented.</p> <p>3 Short/middle/long-term weather forecasts based on NWP outputs are issued.</p> <p>4 Drought/dzud early warning system(DDEWS) is established.</p> <p>5 Knowledge and understandings about weather and climate information in central/local governments, related organizations/agencies and end-users including nomads and general</p> <p>6 Weather observation and forecasting systems especially weather radar and computer network are stably operated.</p> <p>7 Information on monitoring of DSS is issued.</p>	<p>1-1 Regional numerical weather prediction system originated by NAMHEM is commenced in the daily operation</p> <p>1-2 Four (4) staffs are capable of operational numerical weather prediction (NWP)</p> <p>2-1 Information on climate change due to global warming over Mongolia is publicized</p> <p>2-2 Two (2) staffs are capable of climate change projection</p> <p>3-1 Short/middle-term forecasts for scale smaller than province(aimag) is implemented</p> <p>3-2 Long-term forecast for scale similar to the province (aimag) is implemented</p> <p>3-3 Five (5) staffs are capable of advanced weather analysis using data from NWP models</p> <p>4-1 Maps of pasture biomass and plant height on the village (bag)scale are developed</p> <p>4-2 Guideline of warning and advisory messages is implemented in the operation</p> <p>4-3 Four (4) staffs are capable of early warning using GIS data</p> <p>5-1 Six Hundred and Forty (640) users are receiving explanation on use of weather information</p> <p>6-1 Appropriate operating rates of weather radar are maintained</p> <p>6-2 Three (3) staffs are capable of maintenance of radar</p> <p>6-3 System problems of computer networks in NAMHEM are properly managed</p> <p>6-4 More than two(2) staffs are capable of maintenance of computer networks</p> <p>7-1 Analyzed DSS monitoring information is developed</p> <p>7-2 Four (4) staffs are capable of DSS monitoring</p>	<p>1-1 Forecast Operation Room</p> <p>1-2 Final report of the Project</p> <p>2-1 Bulletin of Institute of Meteorology and Hydrology (IMH) of NAMHEM</p> <p>2-2 Final report of the Project</p> <p>3-1 Record files of forecasts</p> <p>3-2 Forecast Operation Room</p> <p>3-3 Final report of the Project</p> <p>4-1 Agrometeorological and environmental Bulletin</p> <p>4-2 Final report of the Project</p> <p>4-3 Final report of the Project</p> <p>5-1 Final report of the Project</p> <p>6-1 Records of system failure</p> <p>6-2 Final report of the Project</p> <p>6-3 Records of system failure</p> <p>6-4 Final report of the Project</p> <p>7-1 Central monitoring system in Ulaanbaatar</p> <p>7-2 Final report of the Project</p>	Sufficient budgets will be allocated to NAMHEM in a timely manner.

Activities	Inputs		
	Japanese Side	Mongolian Side	
1 Operational numerical weather prediction using a regional model around Mongolia is implemented. 1-1 To conduct training/seminars on numerical weather prediction (NWP) 1-2 To establish operational 5 to 7-day NWP system and assess its result in comparison with the existing operational forecast. 1-3 To procure and set up equipment for training on numerical weather prediction 2 Climate change projection due to global warming using a climate model is implemented. 2-1 To conduct training on climate change projection using a climate model 2-2 To implement climate change projection such as surface temperature, humidity, precipitation, snowfall and wind. 2-3 To procure and set up equipment for climate change projection 3 Short/middle/long-term weather forecasts based on NWP outputs are issued. 3-1 To conduct training on interpretation of NWP outputs including ensemble forecasting technique 3-2 To develop operational guidance for forecasting 3-3 To develop a computer-aided case study handbook on typical and unusual phenomena 3-4 To develop new concepts of forecast such as precipitation probability forecast 3-5 To conduct training on very short-range forecast using weather radar data 3-6 To procure and set up equipment for operational forecasting work 4 Drought/dzud early warning system(DDEWS) is established. 4-1 To conduct training on conceptual framework of a combined drought/dzud early warning system (DDEWS) 4-2 To conduct training of database and GIS technique in the framework of the DDEWS 4-3 To revise the present zoo-meteorological observation programme and manual 4-4 To produce guidelines of warning and advisory messages 4-5 To produce pasture condition maps on the village (bag) scale 4-6 To procure and set up equipment for agro/zoo-meteorology and GIS 5 Knowledge and understandings about weather and climate information in central/local governments, related organizations/agencies and end-users including nomads and general republic in Mongolia are deepened. 5-1 To conduct seminars in Ulaanbaatar both for the project launching and wrapping-up 5-2 To conduct workshops targeted to government organizations/agencies To conduct seminars/workshops in pilot aimags (Hentii, Dondogobi, GobiAltai) on use of weather information targeted to local government (aimag/soum) and end users including herders and general public 5-3 5-4 To procure and set up equipment for seminars/workshops 5-5 To conduct surveys to assess the needs of weather information and level of understandings for end-users (public administrators, nomads, etc.) 5-6 To analyze the survey results and provide feedback to the related project activities 6 Weather observation and forecasting systems especially weather radar and computer network are stably operated. 6-1 To produce operation and maintenance manual of weather radar system 6-2 To conduct training on operation and maintenance of weather radar system 6-3 To make overall plan of computer network in NAMHEM 6-4 To conduct training on computer networking 7 Information on monitoring of DSS is issued. 7-1 To procure and set up DSS monitoring system 7-2 To conduct training on operation and maintenance of DSS monitoring network and data analysis	1 Dispatch of experts <Long-term experts> Numerical weather prediction (Leader) Weather forecasting <Short-term experts> Weather service planning (Deputy Leader) Weather interpretation method GIS technique Weather radar analysis Drought/dzud early warning system Zoo-meteorology Use of weather information Operation and maintenance of weather radar Computer networking Analysis, processing and sharing of DSS data Operation and maintenance of DSS monitoring network Equipment planning of DSS monitoring system 2 Equipment Supply 3 Provision of training in Japan	1 Provision of project office and places for equipment to be supplied 2 Setting up of working groups 3 Allocation of counterpart personnel 4 Security of offices or places to be used for the Project 5 Provision of financial sources for on-site project management	Trained staff continues to work at their positions. Sufficient budget on equipment maintenance will be allocated to NAMHEM.
			Pre-Conditions
			To be able to obtain cooperation of organizations/agencies related to natural disaster management

Establishment of the Committee/Meeting for the Project

1. Joint Coordinating Committee/Meeting

For the effective and successful implementation of the Project, a Joint Coordinating Committee/Meeting will be established to make decisions relevant to the Project. The Joint Coordinating Committee/Meeting will meet at least once a year and whenever necessity arises.

【Functions】

- (1) To authorize an annual work plan of the Project based on the Plan of Operations within the framework of the R/D.
- (2) To monitor and evaluate the progress of the Project and the results of the annual work plan, and
- (3) To discuss and advise on major issues those arise during the implementation period of the Project.

【Composition】

The Joint Coordinating Committee/Meeting will be composed of a chairperson, members and observers. The rules and guidelines for the management of the Committee/Meeting will be determined at the initial stage of the Project.

Based on the above, the proposed composition of the Joint Coordinating Committee/Meeting for the Project is as follows;

【Proposed composition of the Joint Coordinating Committee】

Chairperson: State Secretary, Ministry of Nature and Environment (MNE)

Members:

Mongolian Side:

(MNE)

Director, Policy Implementation and Coordination Department

Director General, Department of Economic Cooperation Policy and Coordination

Official, International Cooperation Department

(NAMHEM)

Director General

Director, International Cooperation Department

※ Relevant Personnel appointed by Chairperson, if necessary

Japanese Side:

Resident Representative, JICA Mongolia Office

JICA Experts of the Project

※ Relevant Personnel appointed by JICA, if necessary



2. Project Implementation Committee

To ensure the smooth implementation of the activities, a Project Implementation Committee will be organized. The Project Implementation Committee will meet every one month and whenever necessity arises to

【Functions】

- (1) The Project Implementation Committee shall coordinate the management of the project activities, in terms of planning, implementation, monitoring and other necessary matters to bring about the best results of each output.
- (2) The Project Implementation Committee shall prepare the operational plans, reports of progress and monitoring that will be endorsed by the Joint Coordinating Committee/Meeting.

【Composition】

The Project Implementation Committee will be composed of a chairperson, members and observers. The rules and guidelines for the management of the Committee will be determined at the initial stage of the Project.

Based on the above, the proposed composition of the Project Implementation Committee for the Project is as follows;

【Proposed composition of the Project Implementation Committee】

Chairperson: Director, International Cooperation Department (NAMHEM)

Members:

Mongolian Side: Counterpart Personnel of NAMHEM

Japanese Side: JICA Experts of the Project

Officers, JICA Mongolia Office

Relevant Personnel appointed by JICA, if necessary



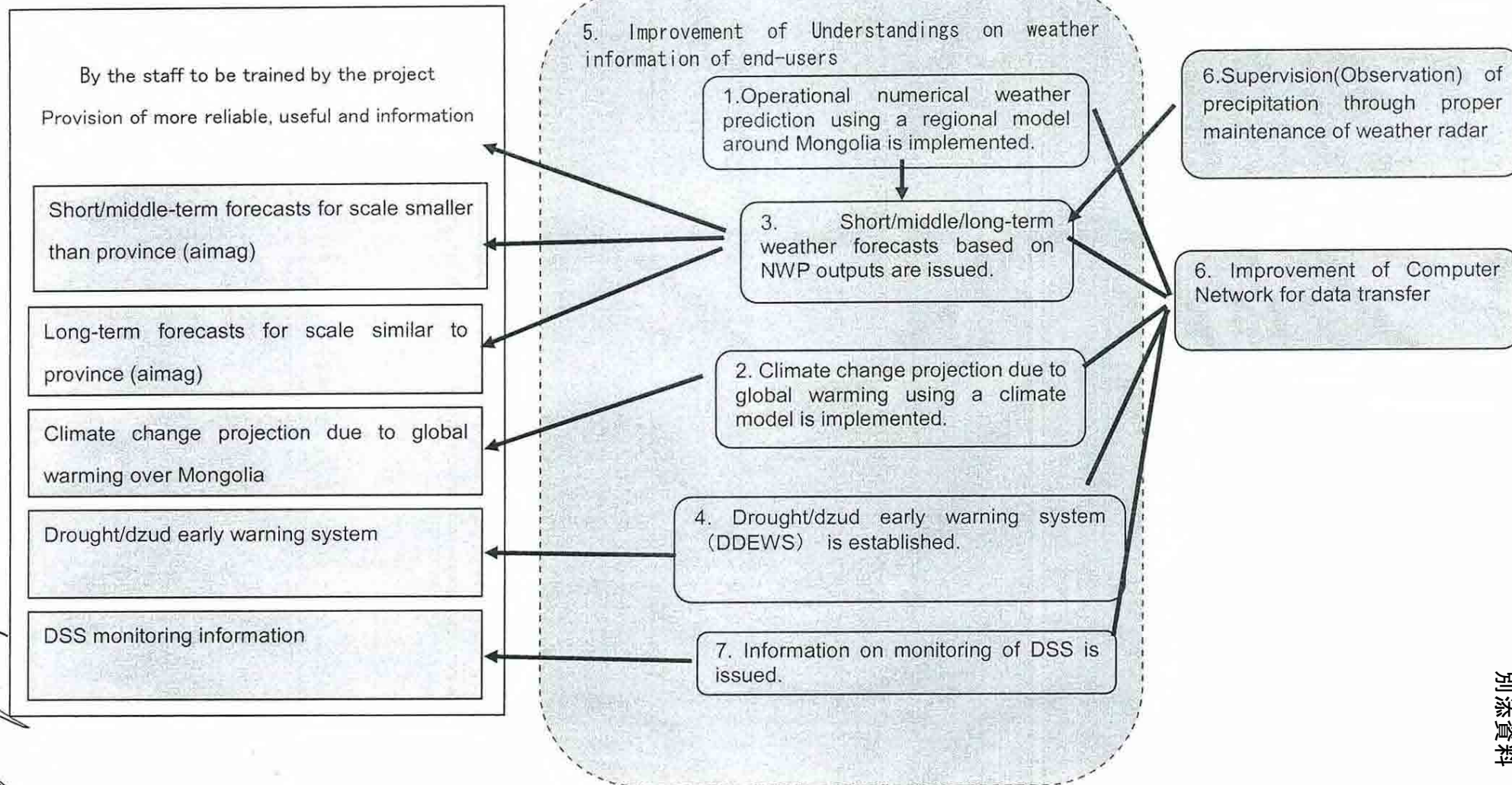
Diagram of the Project Outline

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プロジェクトデザインマトリックス(PDM2)

プロジェクト名:モンゴル国気象予測及びデータ解析のための人材育成

実施機関:気象水文環境監視庁

ターゲットグループ:気象水文環境監視庁の職員

プロジェクト期間:2005年2月~2008年10月

改訂日:2006年8月25日

プロジェクトの要約	指標	指標データ入手手段	外部条件
上位目標			
気象情報が自然災害管理や気候変化の影響評価に活用される	気象情報に基づいた自然災害管理計画や気候変化の影響評価が作成、実施される	気象情報利用度調査	
プロジェクト目標			
気象業務従事者及び環境専門家の人材育成を通じて、より信頼性の高い有用な気象情報(黄砂を含む)を適時に提供できる	a 領域数値予報や新しい気象解析手法による予報が、短期(1日2回)・中期(1日1回)・長期(月1回)提供される b モンゴル国の気候変化予測情報がプロジェクト終了までに1回提供される c 干ばつ/ゾドに係る情報が毎年1回(8月末に)提供される d 黄砂モニタリングデータが年間300日間、伝送される e 利用者(行政機関、牧畜民等)の気象情報提供に関する満足度が向上する	プロジェクト報告書 プロジェクト報告書 プロジェクト報告書 プロジェクト報告書 アンケート、聞き取り調査結果	モンゴル国の防災気象業務に係る政策に変更がない
アウトプット			
1 モンゴル国を対象にした領域モデルによる数値予報が現実化される	1-1 NAMHEMによる領域数値予報モデルが業務体制に活用される 1-2 数値予報モデルを開発できる技術者が4名育成される	1-1 予報室 1-2 プロジェクト報告書	モンゴル政府からNAMHEMに対して適切な予算が滞滞無く充当される
2 気候モデルを使った地球温暖化に伴うモンゴル域の気候変化予測が実施される	2-1 モンゴル国の気候変化予測情報が公表される 2-2 気候変化予測ができる技術者が2名育成される	2-1 NAMHEMの気象水文研究所(IMH)の紀要 2-2 プロジェクト報告書	
3 数値予報データに基づいた天気予報(短期、中期、長期)が作成される	3-1 県(アイマグ)レベル以下の地域細分による短期・中期予報が実施される 3-2 県(アイマグ)レベルでの長期予報が業務に活用される 3-3 新しい気象解析技術を有する技術者が5名育成される	3-1 予報原簿 3-2 予報室 3-3 プロジェクト報告書	
4 干ばつ/ゾドの早期警戒システムが構築される	4-1 村(バグ)スケールでの精度の高い牧草量と草丈地図が作成される 4-2 警戒情報のガイドラインが業務に活用される 4-3 GISによる早期警戒を行える技術者が4名育成される	4-1 GIS用コンピューター 4-2 プロジェクト報告書 4-3 プロジェクト報告書	
5 国、地方自治体、関係機関及び末端利用者(牧畜民や住民を含む)の気象情報の理解度が向上する	5-1 のべ640名の気象情報利用者が気象情報の利用に係る知見を得る	5-1 プロジェクト報告書	
6 気象観測、予報システム(気象レーダー及びコンピューターネットワーク)が安定して運用される	6-1 気象観測(気象レーダー)の稼働率が維持される 6-2 気象レーダシステムを運用維持管理できる技術者が3名育成される 6-3 NAMHEMのコンピューターネットワークの問題点が解決される 6-4 NAMHEMのコンピューターネットワークを運用維持管理できる技術者が2名以上育成される	6-1 システム障害記録 6-2 プロジェクト報告書 6-3 プロジェクト報告書 6-4 プロジェクト報告書	
7 黄砂観測情報が作成される	7-1 解析処理された黄砂情報が作成される 7-2 黄砂モニタリングに関する技術を習得した技術者が4名育成される	7-1 ウランバートルの中核監視システム 7-2 プロジェクト報告書	

活動	投入		
	日本側	モンゴル側	
1 モンゴル国を対象にした領域モデルによる数値予報が顕業化される 1-1 数値予報に係る研修・セミナーを実施する 1-2 5~7日先までの現業数値予報システムを構築しその結果を既存の現業予報と比較検証する 1-3 数値予報の研修のための機材を調達・設置する 2 気候モデルを使った地球温暖化に伴うモンゴル域の気候変化予測が実施される 2-1 気候モデルを使用した気候変化予測に係る研修を実施する 2-2 地上気温、湿度、降水量、降雪量及び風の気候変化予測を実施する 2-3 気候変化予測のための機材を調達・設置する 3 数値予報データに基づいた天気予報(短期、中期、長期)が作成される 3-1 アンサンブル予報技術を含む数値予報結果の天気翻訳に係る研修を実施する 3-2 現業向け予報ガイダンスを構築する 3-3 コンピューターによる典型的な天候や異常気象に係る事例集を作成する 3-4 降水確率予報等新しい予報概念を導入する 3-5 気象レーダデータを用いた短時間予測に係る研修を実施する 3-6 現業予報のための機材を調達・設置する 4 干ばつ/ノドの早期警戒システムが構築される 4-1 総合的な干ばつ/ノド早期警戒システム(DDEWS)の概念に係る研修を実施する 4-2 DDEWSの枠組みでのデータベース・GIS技術に係る研修を実施する 4-3 現有の牧畜気象観測プログラム及びマニュアルを改訂する 4-4 警戒情報のガイドラインを作成する 4-5 村(バグ)スケールでの牧草状態地図を作成する 4-6 農業気象/牧畜気象及びGISのための機材を調達・設置する 5 国、地方自治体、関係機関及び末端利用者(牧畜民や住民を含む)の気象情報の理解度が向上する 5-1 プロジェクト開始・終了時のセミナーをウランバートルで実施する 5-2 政府機関を対象として気象情報の利用に係るワークショップをウランバートルで実施する 5-3 パイロット県(ヘンティ、ドンドゴビ、ゴビアルタイ)で地方政府機関や牧畜民・住民などのエンドユーザー向けに気象情報の利用に係るセミナー/ワークショップを実施する 5-4 セミナー/ワークショップのための機材を調達・配置する 5-5 利用者(行政機関、牧畜民等)の理解度や気象情報に対するニーズを調査する 5-6 調査結果を分析し、関連の活動にフィードバックする 6 気象観測、予報システム(気象レーダー及びコンピューターネットワーク)が安定して運用される 6-1 気象レーダシステムの運用維持管理マニュアルを作成する 6-2 気象レーダシステムの運用維持管理に係る研修を実施する 6-3 NAMHEM内のコンピューターネットワークの全体計画を作成する 6-4 コンピューターネットワークに係る研修を実施する 7 黄砂観測情報が作成される 7-1 黄砂モニタリングシステムを調達・設置する 7-2 黄砂モニタリングネットワークの運用維持管理及びデータ解析に係る研修を実施する	1 専門家(分野・人数) <長期専門家> 総括/数値予報・1名、気象予報・1名 <短期専門家> 副総括/気象業務計画・1名、天気翻訳手法・1名、GIS技術・1名 レーダ画像解析・1名、干ばつ/ノド早期警戒システム・1名 牧畜気象・1名、気象サービス普及・1名 気象レーダ運用維持管理・1名 コンピューターネットワーク・1名 黄砂観測データ解析・処理・共有・1名 黄砂モニタリングネットワーク運用維持管理・1名 黄砂モニタリングシステム機材計画・1名 2 機材供与 3 研修員受け入れ	1 プロジェクトオフィスの提供 2 ワーキンググループ 3 カウンターパートの配置 4 施設設備の安全確保 5 運営維持経費	技術移転対象者が短期間で減少、交代しない 機材の維持管理にかかる予算が充当される
			前提条件
			自然災害管理に係る関係機関の協力が得られる