ANNEXES

(1) The Japanese side

<Experts>

1	Dr. Yasuo SATO	Leader/Numerical Weather Prediction/Climate Change Projection
2	Mr. Yoshihisa UCHIDA	Deputy Leader/Weather Services Planning/DSS Monitoring System Installation and Supervision Planning
3	Dr. Masato SHINODA	Drought/Dzud Early Warning System
4	Mr. Soshi IWATA	Use of Weather Information
5	Mr. Takehiro YOSHIDA	Operation and Maintenance of Weather Radar
6	Mr. Shinya SHIMODA	Computer Networking
7	Dr. Ichiro MATSUI	Operation and Maintenance of DSS Network/Possessing and Sharing data on DSS monitoring
8	Dr. Nobuo SUGIMOTO	Equipment Planning of DSS Monitoring System

(2) The Mongolian side

<Officials of NAMHEM ,MNET>

1	Dr. D. Dagvadorj	Director, Administration and International Cooperation Division
2	Mr. Enkhtuvshin Sevjid	Project Director, Director-General
3	Dr. Erdenebat Eldev-Ochir	Project Manager, Director, International Cooperation Division
4	Mr. P.Gomboluudev	Head of Forecast Research Laboratory, Weather Forecast Section, IMH
5	Ms. B. Erdenetsetseg	Engineer Technologist, Agro-meteorological Section, IMH
6	Mr. Ts. Tsogt	Head of Weather Forecasting Section, IMH
7	Mr. Kh. Enkhbayar	Chief Engineer, Morin-Uul Radar Station, Aviation Meteorological Center
8	Ms. D. Erdenetsetseg	Network Administrator, Information and Computing Center (ICC)
9	Dr. D. Jugder	Science Secretary, Institute of Meteorology and Hydrology(IMH)

< Dundgobi Province>

1	Ms. Y.Majaasuren	Chief of the Dundgobi Aimag Center of NAMHEM
2	Ms. E.Azjargal	Engineer, the Dundgobi Aimag Center of NAMHEM
3	Ms. G. Dashmaa	Engineer, the Dundgobi Aimag Center of NAMHEM
4	Mr. T. Jiivaa	Prefectural Official in charge of Agricultures
5	Mr. U. Luvsandorj	Participant of Workshop, Nomad

< Khentii Province >

1	Mr. T. Vaatarsukh	Prefectural Official in charge of Natural Environment
2	Ms. G. Munkhzul	NEMA provincial office
3	Mr.L. Chuluun	Chief of the Dundgobi Aimag Center of NAMHEM
4	Ms. M. Enkhtsetseg	Engineer, the Dundgobi Aimag Center of NAMHEM
5	Ms. A Ganchineg	Engineer, the Dundgobi Aimag Center of NAMHEM

< Zamiin-Uud Province>

1	Ms.T. Enkhbayar	Chief of the Zamiin-Uud Meteorological Station

The Project for Development of Human Capacity for Weather Forecasting and Data Analysis in Mongolia Evaluation Grid

1. ACHIEVEMENT

Topics	Main-question	Objectives and Outputs /Sub-Questions	Information/data to be collected	Data Source	Means
ACHIEVEMENT	Likelihood of the achievement of the Overall Goal	Weather information is utilized for natural disaster management and climate change impact assessment in Mongolia.	【indicators】 Work plans of natural disaster management and climate change impact assessment of Mongolia are established and implemented.	*Experts, *counterparts Research studies for use of weather information	*Questionnaire, Interview
	Achievement of the Project Purposes	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.	【indicators】 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. b. Information on climate change projection over Mongolia is publicized once before the end of the project period. c. Information on drought/dzud is provided annually (at the end of August). d. DSS monitoring data is provided for 300 days in a year. e. Satisfaction level of users (public administrators, nomads, etc.) on the available weather forecast	*Project document *Experts, counterparts	* Document review * Questionnaire, Interview
	Achievement of the Output	Output1: Operational numerical weather prediction using a regional model around Mongolia is implemented.	【indicators】 1.1. Regional numerical weather prediction system originated by NAMHEM is commenced in the daily operation 1.2. Four (4) staffs are capable of operational numerical weather prediction (NWP)	*Project document *Experts, counterparts, Forecast Operation Room	*Document review *Questionnaire, Interview
		Output2: Climate change projection due to global warming using a climate model is implemented.	2.1. Information on climate change due to global warming over Mongolia is publicized 2.2. Two (2) staffs are capable of climate change projection	*Project document, Bulletin of Institute of Meteorology and Hydrology (IMH) of NAMHEM	*Document review *Questionnaire, Interview

		Output3: Short/middle/long-term weather forecasts based on NWP outputs are issued.	【indicators】 3.1. Short/middle-term forecasts for scale smaller than province (aimag) is implemented 3.2. Long-term forecast for scale similar to the province (aimag) is implemented 3.3. Five (5) staffs are capable of advanced weather analysis using data from NWP models	*Project document, Record files of forecasts *Experts, counterparts, Forecast Operation Room	*Document review *Questionnaire, Interview
		Output 4 : Drought/dzud early warning system (DDEWS) is established.	【indicators】 4.1. Maps of pasture biomass and plant height on the village (bag) scale are developed 4.2. Guideline of warning and advisory messages is implemented in the operation 4.3. Four (4) staffs are capable of early warning using GIS data	*Project document *Experts, counterparts	*Document review *Questionnaire, Interview
		Output 5 : Knowledge and understandings about weather and climate information in central/local governments, related organizations/agencies and end-users including nomads and general public in Mongolia are deepened	【indicators】 5.1. Six Hundred and Forty (640) users are receiving explanation on use of weather information	*Project document, Questionnaire survey *Experts, counterparts	*Document review *Questionnaire, Interview
		Output 6 : Weather observation and forecasting systems especially weather radar and computer network are stably operated.	【indicators】 6.1. Appropriate operating rates of weather radar are maintained 6.2. Three (3) staffs are capable of maintenance of radar 6.3. System problems of computer networks in NAMHEM are properly managed 6.4. More than two (2) staffs are capable of maintenance of computer networks	*Project document *Experts, counterparts	*Document review *Questionnaire, Interview *Site visit
		Output 7 : Information on monitoring of DSS issued.	【indicators】 7.1. Analyzed DSS monitoring information is developed 7.2. Four (4) staffs are capable of DSS monitoring	*Project document *Experts, counterparts	*Document review *Interview *Site visit
	Achievement of the 'Input'	Have the Japanese experts, the equipment and supplies and the training activities in Japan which provided by JICA Project been carried out as	Input record	*Experts, counterparts	*Questionnaire, Interview
		Have the assignment of personnel, buildings, facilities and expenses which provided by the Mongolian government been carried out as planned?	Input record	*Experts, counterparts	*Questionnaire, Interview

2 . IMPLEMENTATION PROCESS

Topics	Main-question	Sub-Questions	Information/data to be collected	Data Source	Means
	Activities	Have the "Activities" of the Project been implemented as planned throughout the Project period? ?	Progress of the "Activities", contributing and impeding factors	*Project document *Experts, counterparts	*Document review *Interview

IMPLEMENTATION PROCESS	Project Management	Was there any problem in the project management system ?	Monitoring system, process of decision making, communication in the Project team, communication with external stakeholders, challenges in project	*Project document *Experts, counterparts	*Document review *Questionnaire, Interview
	Transfer of Technology	Was there any problem in the process of transfer of technology from Japanese experts?	Process and contents of transferred technology, communication between Experts and CPs	*Experts, counterparts	*Document review *Questionnaire, Interview
	Ownership	Extent of ownership by Mongolian side(CP,relevant organization in the pilot sites)	CPs' Contribution, Degree of Participation and Trend of behavior	*Experts, counterparts,	*Questionnaire, Interview
	Other	Was there any other problem/ contributing factors in the implementation process?	Relationship among Related agencies	*Project document *Experts, counterparts	*Document review *Questionnaire, Interview

3.RELEVANCE

Topics	Main-question	Sub-Questions	Information/data to be collected	Data Source	Means
RELEVANCE	Needs	Do the Project objectives match the needs of Mongolia?	Needs of meteorology sector in Mongolia	*Project document *CP	*Document review *Interview
		Do the Project objectives match the needs of target group?	Needs of the target group	*Project document *Target group	*Document review *Interview
	Priority	Is the Project relevant with the development policy of the Mongolian government ?	Development policy/plan of the Mongolian government	*Action Plan of the Government of Mongolia 2004-2008	*Document review
		Is the Project relevant to the Japan's country assistance policy for the Mongolian government ?	Japan's assistance policy	Document of MOFA,JICA	*Document review
	Relevance as a Means	Were the selection of the target groups/ implementation agency right?	Selection process of the target groups	*Project document *Experts, counterparts	*Document review *Questionnaire, Interview
		Does Japan has comparative advantage in this technical area?	History and achievement of JICA's assistance in similar areas	*Project document *Experts	*Document review *Questionnaire, Interview

4.EFFECTIVENESS

Topics	Main-question	Sub-Questions	Information/data to be collected	Data Source	Means
EFFECTIVENESS	Achievement of the Project Purpose	Is the "Project Purposes "achieved by the end of the Project?	Degree of achievement of the Project Purposes	*Project document *Experts	*Document review *Interview
	Causality	Will the achievement of the project purpose based on the inputs, outputs and the progress of the activities?	Relationship between the Project purposes and Output	*Experts, counterparts	*Questionnaire, Interview
		Is there any influence of important assumptions observed on the attainment of the project purpose?	Important Assamption / Another Influence	*Experts, counterparts	*Questionnaire, Interview
		Are there any hindering/contributing factors for achievement of Project purposes?	Views on the hindering/contributing factors in attaining results.	*Experts, counterparts	*Questionnaire, Interview

5.EFFICIENCY

Topics	Main-question	Sub-Questions	Information/data to be collected	Data Source	Means
	Achievement of Output	Were the seven Outputs achieved appropriate?	Degree of achievement of the output	*Project document *Experts, counterparts	*Document review *Interview, Questionnaire
		Are there any hindering/contributing factors for achievement of output?	Degree of achievement of the output	*Experts, counterparts	*Questionnaire, Interview

EFFICIENCY	Causality	Were the "Activities" adequate for the achievement the "Outputs"?	Record of Activities and achievement of the Outputs	*Experts, counterparts	*Interview, Questionnaire
		Is there any influence of important assumptions observed on the attainment of the output?	Record of Activities and achievement of the Outputs, Input record, influence of Important assumption	*Experts, counterparts	*Questionnaire, Interview
	Timing	Are the size/quantity and the quality of inputs provided by both Mongolian and Japanese side appropriate to implement activities as planned?	Input record, Record of Activities	*Project document *Experts, counterparts	*Document review *Questionnaire, Interview

6.IMPACT

Topics	Main-question	Sub-Questions	Information/data to be collected	Data Source	Means
IMPACT	Likelihood of the achievement of the Project Purposes	Will the Overall Goal be achieved ?	Project achievement	*Experts, counterparts	*Questionnaire, Interview
		Are there any hindering/contributing factors for achievement of the Overall Goal?		*Experts, counterparts	*Questionnaire, Interview
	Causality	Would the achievement of the Overall Goal result from the Project Purpose?	Achievement, Effect of Important Assumptions, contributing and impeding factors	*Experts, counterparts	*Questionnaire, Interview
	Positive or negative impacts	Are there any positive and negative impacts except for the Overall Goals?	Examples	*Experts, counterparts	*Questionnaire, Interview
		Are there any positive and negative impacts except for the Overall Goals?	Examples	*Experts, counterparts	*Questionnaire, Interview

7. SUSTANABILITY

Topics	Main-question	Sub-Questions	Information/data to be collected	Data Source	Means
SUSTAINABILITY	Policy/Institution Political and institutional aspects	Will the political support by the Mongolian government in the meteorology sector continue after the end of the Project?	Policy and strategy of the Mongolian government	*Government policy on meteorology sector *Experts, counterparts	*Document review *Questionnaire, Interview
		Are there any concrete plan to extend activities at pilot site to other area?	Regional policy on the meteorology	*Government policy on meteorology sector *Counterparts	*Document review *Questionnaire, Interview
	Organizational aspects	Does the NAMHEM has capacity to continue its activities after the Project?	NAMHEM's mission and position, staffing, network with related agencies	*Experts, counterparts	*Questionnaire, Interview
	Financial aspects	Will sufficient budget measures be taken by the Government to NAMHEM?	Budget allocation for the NAMHEM	*Financial Report	*Questionnaire, Interview
	Technical aspects	Are the introduced technology being accepted for the NAMHEM staff?	Utilization status and perception of introduced methods. Technology and manuals	*Experts, counterparts	*Document review *Questionnaire, Interview
		Are the equipment provided by the Project actively utilized and maintained?	Utilization status and maintenance of the equipment	*Experts, counterparts, observatory staff	*Questionnaire, Interview *Site visit
	Others	Are there any negative influences on sustainability ?	Examples	*Experts, counterparts	*Questionnaire, Interview

Annex-3 Project Design Matrix (PDM2)

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumption
Overall Goal Weather information is utilized for natural disaster management and climate change impact assessment in Mongolia.	Work plans of natural disaster management and climate change impact assessment of Mongolia are established and implemented.	Research studies for use of weather information	
Project Purpose 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.	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. b. Information on climate change projection over Mongolia is publicized once before the end of the project period. c. Information on drought/dzud is provided annually (at the end of August). d. DSS monitoring data is provided for 300 days in a year. e. Satisfaction level of users (public administrators, nomads, etc.) on the available weather forecast information is improved.	a. Final report of the Project b. Final report of the Project c. Final report of the Project d. Final report of the Project *1 e. Surveys and interviews	State policy on weather services for natural disaster management and climate change impact assessment remains unchanged.
Outputs 1. Operational numerical weather prediction using a regional model around Mongolia is implemented.	1.1. Regional numerical weather prediction system originated by NAMHEM is commenced in the daily operation 1.2. Four (4) staff are capable of operational numerical weather prediction (NWP)	1.1. Forecast Operation Room 1.2. Final report of the Project	Sufficient budgets will be allocated to NAMHEM in a timely manner.
2. Climate change projection due to global warming using a climate model is implemented.	2.1. Information on climate change due to global warming over Mongolia is publicized 2.2. Two (2) staff are capable of climate change projection	2.1. Bulletin of Institute of Meteorology and Hydrology (IMH) of NAMHEM 2.2. Final report of the Project
3. Short/middle/long-term weather forecasts based on NWP outputs are issued.	3.1. Short/middle-term forecasts for scale smaller than province (aimag) is implemented 3.2. Long-term forecast for scale similar to the province (aimag) is implemented 3.3. Five (5) staff are capable of advanced weather analysis using data from NWP models	3.1. Record files of forecasts 3.2. Forecast Operation Room 3.3. Final report of the Project

*1: This phrase is not seen on PDM (1st Revision).

4. Drought/dzud early warning system (DDEWS) is established.	4.1. Maps of pasture biomass and plant height on the village (bag) scale are developed 4.2. Guideline of warning and advisory messages is implemented in the operation 4.3. Four (4) staff are capable of early warning using GIS data	4.1. Agrometeorological and environmental Bulletin 4.2. Final report of the Project 4.3. Final report of the Project	
5. Knowledge and understandings about weather and climate information in central/local governments, related organizations/agencies and end-users including nomads and general public in Mongolia are deepened.	5.1. Six Hundred and Forty (640) users are receiving explanation on use of weather information	5.1. Final report of the Project	
6. Weather observation and forecasting systems especially weather radar and computer network are stably operated.	6.1. Appropriate operating rates of weather radar are maintained 6.2. Three (3) staff are capable of maintenance of radar 6.3. System problems of computer networks in NAMHEM are properly managed 6.4. More than two (2) staff are capable of maintenance of computer networks	6.1. Records of system failure 6.2. Final report of the Project 6.3. Records of system failure 6.4. Final report of the Project	
7. Information on monitoring of DSS issued.	7.1. Analyzed DSS monitoring information is developed 7.2. Four (4) staff are capable of DSS monitoring	7.1. Central monitoring system in Ulaanbaatar 7.2. Final report of the Project	

Activities	Inputs		
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	(Japanese Side) 1. Dispatch of experts <Long-term experts> Numerical weather prediction (Leader) Weather forecasting <Short-term experts> Weather services 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 DSS monitoring system installation and supervision planning *2 Installation supervision and support of Mongolian scope of work on DSS monitoring system *3 2. Equipment Supply 3. Provision of training in Japan (Mongolian Side) 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 *2 *3: These experts were added after mid-term evaluation.	Trained staff continues to work at their positions. Sufficient budget on equipment maintenance will be allocated to NAMHEM.

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 5.3. 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 5.4. 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		**Pre-conditions** To be able to obtain cooperation of organizations/agencies related to natural disaster management
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		