

3.2.3 Achievement of the Outputs 3. "Data management software is to be developed by PHIVOLCS."

Indicator of the Output 3: "Developed software regarding data management and processed data"

Two (2) kinds of data handling software have been developed under the Project. Name of developed data handling softwares are "Nano" program and "Hypo" program.

Nano is a program for converting the ATLAS phase readings (data from unmanned stations) into PHIVOLCS phase format reading. By converting data, integration of phase reading from manned seismic stations and unmanned seismic stations can be done.

Hypo is a program to read and collect all the hypocenter parameters (i.e. source, year, hour, minute, seconds, latitude, longitude, depth, number of stations, magnitude, error, intensity report, etc.) and consolidate those into a single file. This file is used for final updating catalogue. (Catalogue is simplified list of earthquake events together with computed parameters such as locations, magnitude, depth, and intensity etc.)

A flowchart of "Data seismic analysis" and "Data handling softwares" is shown in Annex 11.

3.2.4 Achievement of Output 4. "Data analysis software is to be developed by PHIVOLCS."

Indicator of the Output 4: "Developed software regarding data analysis and processed data."

Development and testing of a software regarding data analysis, which name is "PHILWAVE" originally developed by Japan Meteorological Agency (JMA) for the use of PHIVOLCS, was started from December 2004 for location determination, magnitude calculation and data archiving. PHILWAVE is being utilized at present for phase 1 data only. ATLAS and EQPlotter are primary analysis software at present for near real time data processing. Improvement of PHILWAVE is under way. PHILWAVE is not yet extensively used for quick data processing because it could not yet read directly phase 2 data. Capability for reading of phase 2 data in PHILWAVE is not yet completed and it is still being developed. PHIVOLCS plans to use PHILWAVE as the final integration software for phase 1 and phase 2 for seismological data processing of the seismology division, once sufficient improvement is made.

Because of implementation of different phase of project and different kind of system and equipment, method of data processing is complicating.

PHIVOLCS has commitment to further improve PHILWAVE software and make it official data processing software of the seismological division.





### 3.2.5 Number of trained staff to improve and develop software.

Two (2) staff were received counterpart training in Japan for improvement and development of software.

Additional staff members underwent training in Japan related to the Project. Around 20 staff of the Seismology division attended the lectures on digital data processing by the short-term experts under the Project, particularly 6 staff members of them had received intensive training in the Philippines.

### 3.3 Achievement of the Project Purpose

The Project Purpose is "Data-processing and data-analysis programs are to be developed by PHIVOLCS to issue prompt and proper earthquake/ volcano information in accordance with observation data differences on quality and quantity."

#### (1) Indicator 1: "Detected data volume and quantity"

The number of recorded earthquakes, the number of plotted earthquakes and percentage of plotted earthquakes within recorded earthquakes from the year 1999 to 2005 are as follows.

Year	Number of the recorded earthquakes (A)	Number of the plotted earthquakes (B)	Percentage of the plotted earthquakes (%) (B÷A)
1999	14,453	1,196	8.3
2000	12,412	1,061	8.5
2001	12,392	1,293	10.4
2002	12,046	1,078	8.9
2003	9,585	1,000	10.4
2004	11,731	1,662	14.2
2005	7,877	2,226	28.3

Remarks: plotted earthquake means earthquake that PHIVOLCS traced its hypocenter (center of earthquake) through analysis of detected data.

Percentages of the plotted earthquakes from 1999 to 2003 were in a range of 8% to 11%, and was increased to 14.2% in 2004. This was mainly because of the installation and operation of new unmanned observatory stations under the phase 2 project in 2003. In 2005, the percentage of the plotted earthquakes was improved significantly (28.3%).

Cause of this improvement are results of installation of equipment and conduct of staff training under the phase 2, the trainings conducted by the short-term experts under the Project, the training conducted by the staff of PHIVOLCS, and also familiarization with the new system.

(2) Indicator 2: "Number of issued earthquake/ volcano information"

PHIVOLCS issues earthquake bulletins to government agencies, NGOs and Media when PHIVOLCS detects felt earthquake. Monthly data on the issued earthquake bulletin (= felt earthquake) is as follows.

Data on monthly recorded felt earthquake from 2003 to 2005

	2003	2004	2005
January	8	15	6
February	20	10	11
March	11	16	11
April	17	4	8
May	13	12	7
June	18	7	8
July	18	12	8
August	9	7	9
September	10	8	8
October	9	7	6
November	12	5	11
December	12	10	6
Total	157	113	99

Number of earthquake could not be an appropriate indicator, because it depends on the events of earthquake. The number of earthquake event in the year 2003 is higher than the number in the year 2004 and 2005, because there was strong earthquake in Masbate that resulted many felt earthquakes. On the other side in the year 2004 and 2005, these years were relatively quiet compared to the year 2003, because there were fewer big events that can cause swarms of felt events.

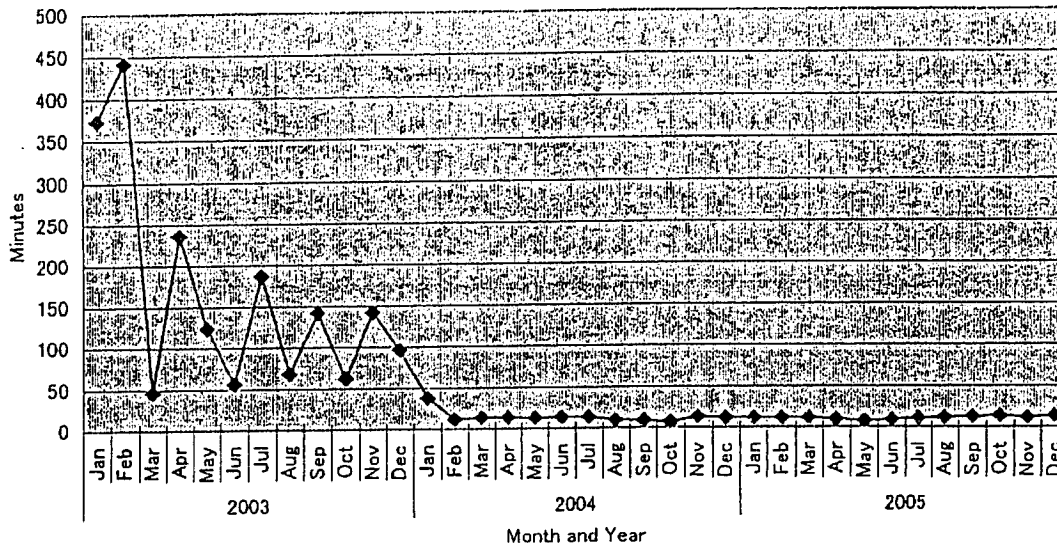
(3) Indicator 3: "Average needed time for issue of earthquake/ volcano information"

Target of average needed time for issuing earthquake bulletin is 10 -15 minutes. Average needed times from 2003 to 2005 are as follows.

Year	Number of issued first bulletin	Average needed time for issue of first bulletin (minute)
2003	160	177.4
2004	118	15.4
2005	99	11.6



Monthly average needed time for issue of first bulletin



The average needed time for issue of first bulletin in the year 2003 was 177.4 minutes (around 3 hours from the occurrence of earthquake). There are several reasons. In case that earthquakes were not felt by staff of PHIVOLCS but people living near the epicenter felt earthquake, reporting of event to central office was delayed. Even such cases, PHIVOLCS still needs to process events for purpose of completeness. This usually happens when the earthquake located outside of the network and the magnitude is not large enough to be felt by PHIVOLCS station personnel. Excepting those cases, average needed time was from 30 to 50 minutes.

After the installation and operation of new unmanned observatory stations under the second phase of project in 2003 (formal operation started in 2004), using new network, PHIVOLCS can determine earthquake parameters. And it became possible for PHIVOLCS to know whether people living nearby the hypocenter felt the earthquake and then PHIVOLCS immediately check it (felt the earthquake or not). PHIVOLCS also developed a system to predict possible intensity, so it serves as a guide where to make inquiries.

Average needed time in 2004 was improved drastically to 15.4 minutes. Average needed time in 2005 was improved further to 11.6 minutes. Trainings conducted by the short-term experts under the Project have contributed to enhancement of the capability on this aspect.

Simulation of intensity distribution using software (REDAS: rapid earthquake damage assessment system) developed by PHIVOLCS help the institute to identify possible impact of earthquake especially within epicenter area. (Development of REDAS was started in 2002 and it has been used since early 2004.)

(4) Indicator 4: "Available trained staff for management of earthquake/ volcano information"

During the project period, 7 PHIVOLCS personnel have been studied in Japan. Those data are indicated in Annex 4. There are 3 or 4 staff members assigned in processing and management of seismic data. Seismology division assigned in total 20 staff in central office of PHIVOLCS related with data processing and management of earthquake, but they also do activities such as research and development on seismic hazard assessment, tsunami hazard modeling and conduction of earthquake drills and hazard awareness promotion. 20 staff also render night duties, weekend and holiday duties. Considering assigned tasks, number of staff of the division is not sufficient. In case the automatic system is improved sufficiently, 20 staff will be appropriate number.

For volcano monitoring an average of 4 persons are assigned for data processing at each volcano observatory. Most of them have undertaken in-house training (one week training, once a year) organized by the PHIVOLCS head office.

### 3.4 Achievability of the Overall Goal

The Overall Goal is "Detection capability and accuracy on seismic and volcanic activities in and around the Philippines are to be improved, and a management system for issuing prompt earthquake/ volcano information is to be established."

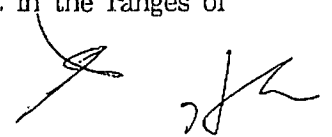
There are 2 kinds of data that indicate improvement of detection capability and accuracy on seismic as follows.

#### (1) Seismic data volume of PHIVOLCS and detection capability

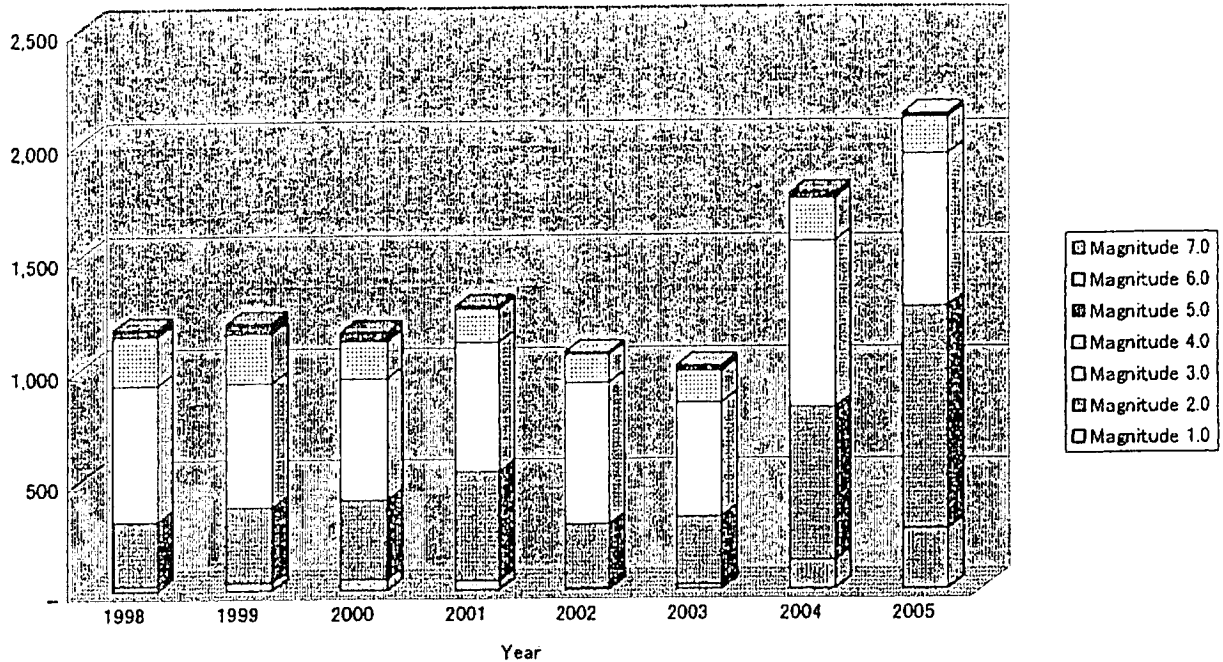
Number of detected seismic event by range of magnitude from the year 1998 to 2005 is as follows.

Magnitude Range	1998	1999	2000	2001	2002	2003	2004	2005
1.0	22	34	49	42	4	19	128	271
2.0	293	344	360	494	293	311	694	1,001
3.0	616	560	548	580	638	513	740	671
4.0	214	221	166	147	123	138	185	159
5.0	33	39	39	15	13	25	24	19
6.0	3	6	2	1	1	5	3	2
7.0	2	2	1	1	-	-	1	-
Total	1,183	1,206	1,165	1,280	1,072	1,011	1,775	2,123

The seismic data volume of 1998 and 1999 are from the 29 analog PHIVOLCS seismic network. The seismic data volume from 2000 to 2002 are from the seismic stations where analog equipment were replaced into digital equipment by the phase 1 project. The seismic data volume from 2003 to 2005 are from the seismic stations of phase 1 and phase 2 projects. The total number of the seismic stations for the Philippines seismic network is 64 at present. Thus PHIVOLCS can now resolve more events with lower magnitudes (i.e., Magnitude 1.2 and 3) with confidence as shown in the table above. Especially, the numbers of event in the ranges of magnitude 1.0 and 2.0 are increasing considerably from 2004.

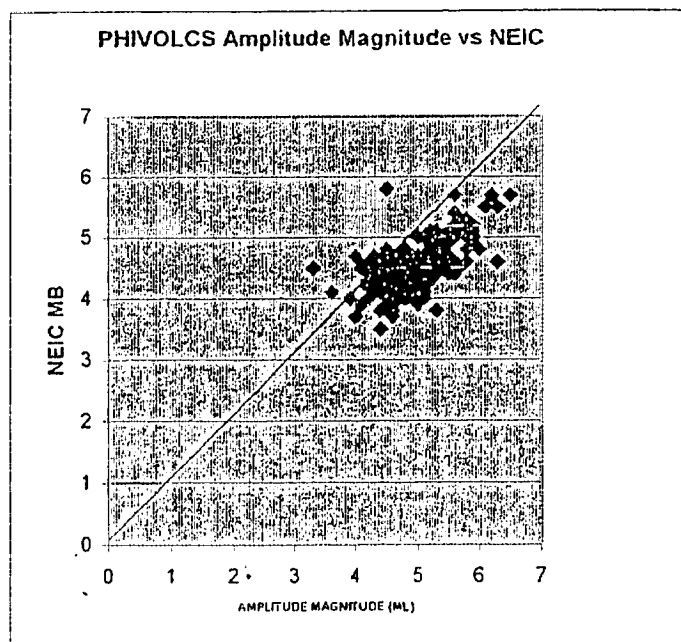


### Magnitude Distribution from 1998 to 2005



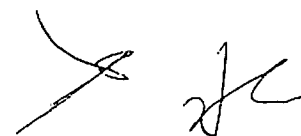
(2) Amplitude magnitude comparison with the data observed by PHIVOLCS in the Philippines and NEIC (National Earthquake Information Center) of USGS (US Geology Survey) in the United State.

Accuracy of detected earthquake can be analyze by comparing data observed by PHIVOLCS and NEIC in case that amplitude magnitude of earthquake is bigger than 5. Comparison of amplitude magnitude observed by PHIVOLCS and NEIC is shown in the following figure.



There is no big difference with data of PHIVOLCS and NEIC. This means good accuracy of magnitude observed by PHIVOLCS.

(Remark: PHIVOLCS observed magnitude ML (local magnitude scale). NEIC is MB (body wave magnitude scale) there is slight difference between two scales. MB is slightly higher for magnitude range between 5 and 7.)

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## 4. RESULT OF THE EVALUATION

### 4.1 Relevance

#### (1) Consistency with the National Development Plan of the Philippines

There are 5 major thrusts for the Environmental and Natural Resources Sector in the Medium-Term Philippine Development Plan 2004-2010. One of those thrusts is "mitigate the occurrence of natural disasters to prevent the loss of lives and properties". One of the priority areas of the Science and Technology development stipulated the National Science and Technology Plan 2002-2020 is natural disaster mitigation. Considering the priority aspects in the plans mentioned above, the Project Goal is in conformity with the Medium-Term Philippine Development Plan 2004-2010 and the National Science and Technology Plan 2002-2020.

#### (2) Consistency with the Official Development Assistance (ODA) policy of Japan

The assistance policy of Japan for the Philippines is under revision. However, in the previous assistance policy of Japan, one of the priority areas was "Environmental conservation and disaster management". With regards to disaster management, assistance for natural disaster mitigation (flood, earthquake and volcanic disaster etc.) is a priority issue. Therefore, this project is in conformity with the priority assistance subjects of the ODA policy of Japan.

#### (3) Conformity of the contents of cooperation by the Project with needs of PHIVOLCS.

Monitoring system on earthquake and volcano were improved through replacement and installation of new equipment and facilities with grant aid of Japanese government (phase 1 and phase 2 projects). Although those projects provided large improvement on equipment, capacity development on data processing and analysis etc. were necessary. Equipment and software provided under phase 1 and phase 2 projects for data processing were different and there was need for integration.

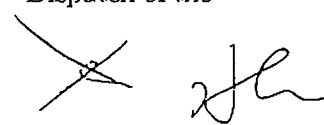
Therefore, enhancement of the function of process, analysis and management of observation data was a priority needs for PHIVOLCS. The Project focuses development and improvement of data processing and data analysis programs, therefore the Project is in conformity with the needs of PHIVOLCS.

### 4.2 Effectiveness

As described in section 3.2, though there are needs of continuation of improvement of some softwares, most of the Outputs are achieved satisfactorily. The Project Purpose, which is "Data-processing and data-analysis programs are to be developed by PHIVOLCS to issue prompt and proper earthquake/ volcano information in accordance with observation data differences on quality and quantity", is being achieved satisfactorily together with the effects of the Japanese grant aid project phase 1 and phase 2. Knowledge and skills of the staff concerned with data processing and data analysis have strengthened further under the Project. It is concluded that the effectiveness of the Project is good in general.

### 4.3 Efficiency

Most of Inputs to the Project were generally well utilized in the project activities and contributed to the achievement of the Outputs. The efficiency of the Project is satisfactory. Dispatch of the





Japanese short-term experts was implemented 3 times as planned, however, it might be better if the duration of dispatches were longer. (The duration of dispatch was 0.9 month each.)

#### 4.4 Impacts

##### (1) Expectation of achievement of Overall Goal

Detection capability and accuracy on seismic and volcanic activities in and around the Philippines are significantly improved through improvement of monitoring system with the equipment and facilities provided under the Japanese grant aid projects (phase 1 and 2), and this technical cooperation. To achieve the Overall Goal, there are several subjects that PHIVOLCS has to make efforts, such as continuous improvement of the softwares for data processing and management, further capacity development of staff, budget allocation for appropriate operation and maintenance of the equipment and facilities, etc. If PHIVOLCS can tackle these issues appropriately, the Overall Goal will be achieved in near future.

##### (2) Other impacts

Now PHIVOLCS can produce quality data on seismology that can be used for collaborative studies with international scientists (i.e. exchange of seismic data with neighboring countries).

With regards to volcanology, there are on going collaborative projects i.e. Japanese, French and American scientists to better define volcanic activities.

#### 4.5 Sustainability

##### (1) Political aspect

In view of the recent spate of natural calamities, the need for increased public awareness and involvement in measures being put in place by the government for disaster preparedness, the Four Point Action Plan for Disaster Preparedness was issued by the National Disaster Coordinating Council (NDCC) in January 2005. The first in the Action Plan is "Upgrading of the forecasting capabilities of PAGASA and PHIVOLCS". Therefore, the importance of strengthening the capability of PHIVOLCS with regards to detection capability and accuracy on seismic and volcanic activities in and around the Philippines will remain a high priority in the political agenda of the government.

##### (2) Organizational aspect

It is thought that PHIVOLCS has good capacity on operation and management for issuing prompt earthquake and volcano information. However, still in regard to staff number of the manned seismic observation stations is not sufficient because of 24 hours operation. To solve this issue, there are 2 measures. One is to increase number of staff of the observation stations and another is to introduce automatic system for sending observation data from the stations to the central office of PHIVOLCS. There is difficulty with increasing staff number, because of the rationalization policy of the National Government. Therefore, PHIVOLCS is going to introduce automatic system for manned stations using internet access.

(3) Financial aspect

As of budget in the years ahead, there is expectation that PHIVOLCS will have more budgetary support from the National Government, because one of the priority agenda of the Four Point Action Plan is upgrading of forecasting capability of PHIVOLCS.

In case that the budget of PHIVOLCS for the year 2006, which is under discussion in the Congress, is approved as proposed, the budget will be increased compared to previous year. 2.5 million pesos as the regular budget for operation and maintenance and 1.5 million pesos as additional budget for maintenance are included in the proposed budget. If some donor agencies provide financial support to the research activities of PHIVOLCS, PHIVOLCS is able to allocate more amount of budget for maintenance purpose from the regular budget.

Anyhow, allocation of appropriate budget for operation and maintenance is basis for accurate and prompt detection of earthquake and volcano activity. It is desirable PHIVOLCS to have appropriate budget for maintenance of equipment and stock of spare parts in consideration of increasing needs of maintenance and spare parts for several years ahead. Because with passage of years and deterioration of equipment, maintenance costs will increase.

(4) Technical aspect

Capability on data processing and analysis of earthquake has been improved though the technical transfer by the short-term experts and the training in Japan. Considering the limited duration for the technical transfer by the short-term experts and also limited period of the Project (2 years), degree of strengthening of capability on data processing and analysis is satisfactory.

It is also desirable that more staff is to be assigned for the task of improvement of data processing and management software, because number of staffs who are engaged in data processing and management is not sufficient yet at present. At least assignment of one more computer specialized personnel is necessary.



## 5. CONCLUSION

The Project is in conformity with the development policy of the government of the Philippines, ODA policy of Japan, needs of PHIVOLCS. Relevance of the Project is high. With regards to effectiveness, although there are needs of continuation of improvement of software for data processing and analysis, the Project Purpose is being achieved satisfactorily with the synergetic effects of the phase 1 and phase 2 projects, and therefore the effectiveness of the Project is good. Most of Inputs to the Project were generally well utilized in the project activities and contributed to the achievement of the Outputs. The efficiency of the Project is satisfactory. As regards impact, there are positive impacts on research activities with international scientists and neighboring countries. Sustainability of the Project is expected to be assured in term of political, organizational, financial and technical aspects.

Based of a series of discussion with the counterparts as well as the results of discussion by the Joint Evaluation Team, the Team evaluates that the project performance is satisfactory.

## 6. RECOMMENDATIONS

### (1) Further improvement of the data processing and analysis program

PHIVOLCS is continuing the further improvement of software on data processing and analysis (PHILWAVE). It is recommended that PHIVOLCS provide further training of staff who are engaged in the data processing and management. It may be desirable that PHIVOLCS will employ new professional person on computer programming for helping the existing staff in charge of improvement of PHILWAVE, because number of staff in charge is not sufficient.

It is also desirable that Japanese side will provide necessary technical assistance for the improvement of PHILWAVE as the need arises.

### (2) Allocation of necessary budget and stock of spare parts for good operation and maintenance of equipment and facilities.

Allocation of appropriate budget for the operation and maintenance of equipment is important. Particularly, amount of stock of spare parts for the equipment, that provided under the phase 2 project, was very limited. For the moment, because equipment is new, necessary expenses for maintenance and replacement of defective spare parts is minimal. However, with the passage of time equipment will become older, necessary expenses for maintenance and spare parts will be increased. The section in charge of instrument is recording data about exchange of spare parts, and such data will be utilized for estimation of necessary budget for the succeeding year. It is important to continue this kind of maintenance activities for assuring allocation of necessary budget and keeping spare parts for good operation and maintenance of equipment and facilities.



## Annex 1 Schedule of the Evaluation

(from January 23 to February 10, 2006)

Date		Time	Schedule for PAGASA project	Schedule for PHIVOLCS project	Venue
Jan. 23	Mon	9:00		Courtesy call to PHIVOLCS	PHIVOLCS
		14:00		Interview with C/Ps	DOST
Jan. 24	Tue	9:00-17:00		Interview with C/Ps and data collection	PHIVOLCS
Jan. 25	Wed	(all day)		Filed survey (Tagaytay)	Tagaytay
Jan. 26	Thu	9:00-17:00		Data collection	
Jan. 27	Fri	9:00-17:00	Data collection		PAGASA
Jan. 28	Sat			Preparation of draft evaluation report	
Jan. 29	Sun		Preparation of draft evaluation report	Preparation of draft evaluation report	
Jan. 30	Mon	9:00	Joint Evaluation		PAGASA
		10:00	JOMC (Joint Operation & management Committee)		ditto
		14:00	Courtesy call to the Department of Science and Technology		ditto
Jan. 31	Tue	9:00-17:00	Joint Evaluation		PAGASA
Feb. 1	Wed	9:00	Joint Evaluation		PAGASA
		13:30	Joint Evaluation (Explanation to Officer-in-charge of PAGASA)		ditto
		14:30	Joint Evaluation		ditto
Feb. 2	Thu	9:00	Joint Evaluation		PAGASA
		11:00	Registration for JCCM		ditto
		13:00	JCCM for PAGASA project, signing of Minutes of Meetings		ditto
Feb. 3	Fri	9:00-17:00		Data collection at PHIVOLCS	PHIVOLCS
Feb. 4	Sat			Preparation of draft evaluation report	
Feb. 5	Sun			Preparation of draft evaluation report	
Feb. 6	Mon	9:00-17:00		Joint Evaluation	PHIVOLCS
Feb. 7	Tue	9:00		Joint Evaluation	PHIVOLCS
		15:00		Meeting among Japanese Evaluation Team	JICA office
Feb. 8	Wed	11:00		Joint Evaluation	PHIVOLCS
Feb. 9	Thu	10:00		Signing of Minutes of Meetings	PHIVOLCS
Feb. 10	Fri		Report to JICA Philippine office		




Annex 2 PDM (Project Design Matrix original)

Project Name: Project for Improvement of Earthquake and Volcano Monitoring System      Date: March 3, 2004

Implementing Agency: Philippine Institute of Volcanology and Seismology (PHIVOLCS)      Duration: March 30, 2004 – March 29, 2006 (2 years)

Narrative Summary	Objective/Verifiable Indicators	Means of Verification	Important Assumption			
<p><b>Overall Goal</b></p> <p>Detection capability and accuracy on seismic and volcanic activities in and around the Philippines are to be improved, and a management system for issuing prompt earthquake/ volcano information is to be established.</p>	<p>Assorted earthquake/ volcano information. Management system for continuous evaluation and update on various formula, software, procedure for processing observation data.</p>	<p>PHIVOLCS annual report</p>	<p>The role of PHIVOLCS remains unchanged in Philippines.</p>			
<p><b>Project Purpose</b></p> <p>Data processing and data analysis programs are to be developed by PHIVOLCS to issue prompt and proper earthquake/ volcano information in accordance with observation data differences on quality and quantity.</p>	<ol style="list-style-type: none"> <li>1. Detected data volume and quantity</li> <li>2. Number of issued earthquake/ volcano information</li> <li>3. Average needed time for issue of earthquake/ volcano information</li> <li>4. Available trained staff for management of earthquake/ volcano information</li> </ol>	<ol style="list-style-type: none"> <li>1. Data difference analysis</li> <li>2. Issued information record</li> <li>3. Training record/ report for the staff</li> </ol>	<p>Software and processed data are reviewed continuously in PHIVOLCS. Necessary hardware and spare parts are provided properly.</p>			
<p><b>Outputs</b></p> <ol style="list-style-type: none"> <li>1. The magnitude formula with maximum amplitudes of seismic wave data is to be developed.</li> <li>2. Existing data-analysis software is to be improved by PHIVOLCS.</li> <li>3. Data management software is to be developed by PHIVOLCS.</li> <li>4. Data analysis software is to be developed by PHIVOLCS.</li> </ol>	<ol style="list-style-type: none"> <li>1. Developed magnitude formula and processed data</li> <li>2. Improved software regarding data analysis processed data</li> <li>3. Developed software regarding data management and processed data</li> <li>4. Developed software regarding data analysis and processed data.</li> <li>5. Number of trained staff to improve and develop software.</li> </ol>	<ol style="list-style-type: none"> <li>1. Magnitude formula used in the seismological division</li> <li>2. Software used in the seismological division</li> <li>3. Processed data record</li> <li>4. Counterpart staff list</li> </ol>	<p>Majority of trained staff who is in charge of data process/ analysis remains in the same position. Necessary budget for maintenance and procurement of spare parts is allocated.</p>			
<p><b>Activities</b></p> <ol style="list-style-type: none"> <li>1-1 To recognize change of products (hypocenter/ magnitude) caused by observation data differences on quality and quantity.</li> <li>1-2 To conduct studies to develop magnitude formula with maximum amplitudes.</li> <li>1-3 To modify other formulas than magnitude formula</li> <li>2-1 To acquire and disseminate know-how on usage of existing data analysis software.</li> <li>2-2 To modify existing data-analysis software for proper operation in PHIVOLCS.</li> <li>3-1 To understand the process flow of seismic data centralized at PHIVOLCS main office</li> <li>3-2 To understand data-processing systems including operating systems.</li> <li>3-3 To disseminate JMA's experiences and knowledge on computer programs and management of observation data.</li> <li>3-4 To conduct studies to develop software to manage observation data in PHIVOLCS.</li> <li>4-1 To hold seminar on seismology needed for data analysis.</li> <li>4-2 To disseminate JMA's experiences and knowledge on development of data analysis software and related know-how to design programs.</li> <li>4-3 To conduct studies for the processing and analysis of geodetic data gathered by PHIVOLCS.</li> <li>4-4 To conduct studies to develop software to analyze seismic data in PHIVOLCS.</li> </ol>	<p align="center"><b>Input</b></p> <table border="1"> <tr> <td data-bbox="890 801 940 1451">&lt;Japan side&gt;</td> <td data-bbox="940 801 1403 1451">&lt;Philippine side&gt;</td> </tr> <tr> <td data-bbox="890 801 940 1451"> <ol style="list-style-type: none"> <li>1. Dispatch of short-term experts                             <ul style="list-style-type: none"> <li>- Seismology</li> <li>- Volcanology</li> </ul> </li> <li>2. Acceptance of counterpart training                             <ul style="list-style-type: none"> <li>- Seismic data processing</li> <li>- Applied seismology</li> </ul> </li> <li>3. Provision of equipment</li> </ol> </td> <td data-bbox="940 801 1403 1451"> <ol style="list-style-type: none"> <li>1. Counterpart personnel</li> <li>2. Provision of facilities                             <ul style="list-style-type: none"> <li>- Office space for experts</li> </ul> </li> <li>3. Local cost                             <ul style="list-style-type: none"> <li>- Running expenses necessary for implementation of the Project</li> </ul> </li> </ol> </td> </tr> </table>	<Japan side>	<Philippine side>	<ol style="list-style-type: none"> <li>1. Dispatch of short-term experts                             <ul style="list-style-type: none"> <li>- Seismology</li> <li>- Volcanology</li> </ul> </li> <li>2. Acceptance of counterpart training                             <ul style="list-style-type: none"> <li>- Seismic data processing</li> <li>- Applied seismology</li> </ul> </li> <li>3. Provision of equipment</li> </ol>	<ol style="list-style-type: none"> <li>1. Counterpart personnel</li> <li>2. Provision of facilities                             <ul style="list-style-type: none"> <li>- Office space for experts</li> </ul> </li> <li>3. Local cost                             <ul style="list-style-type: none"> <li>- Running expenses necessary for implementation of the Project</li> </ul> </li> </ol>	<p>Activities on designed subject are followed continuously. E-mail communication for question/ clarification with experts in Japan are followed continuously. Pre-condition Policy on administration/ management of observation network in PHIVOLCS does not change largely.</p>
<Japan side>	<Philippine side>					
<ol style="list-style-type: none"> <li>1. Dispatch of short-term experts                             <ul style="list-style-type: none"> <li>- Seismology</li> <li>- Volcanology</li> </ul> </li> <li>2. Acceptance of counterpart training                             <ul style="list-style-type: none"> <li>- Seismic data processing</li> <li>- Applied seismology</li> </ul> </li> <li>3. Provision of equipment</li> </ol>	<ol style="list-style-type: none"> <li>1. Counterpart personnel</li> <li>2. Provision of facilities                             <ul style="list-style-type: none"> <li>- Office space for experts</li> </ul> </li> <li>3. Local cost                             <ul style="list-style-type: none"> <li>- Running expenses necessary for implementation of the Project</li> </ul> </li> </ol>					

### ANNEX-3 Dispatch of Japanese Experts

#### Short-term Japanese Experts

No.	Name of Expert	Field	Period of Assignment					
			From	To	M/M	2004	2005	2006
1	Mr. ARAI, Toshiro	Volcanology	Aug. 16, 2004	Sept. 11, 2004	0.9	▪		
2	Mr. UENO, Hiroshi	Seismology (3)	Jan. 31, 2005	Feb. 26, 2005	0.9		▪	
3	Mr. YOSHIMIJRA, Hiroshi	Seismology (4)	Jul. 31, 2005	Aug. 27, 2005	0.9			▪



#### Annex 4 Training of Counterpart Personnel in Japan

Project name: Project for Improvement of Earthquake and Volcano Monitoring System

No.	Name	Assignment to the Project	Field of training	Place of training	Period of training	
					From	To
1	Ms. Ma. Antonia V. BORNAS	Senior Science Research Specialist	Volcano Seismology	Hokkaido University	Apr/ 03	Oct/ 05
2	Ms. Kathleen PAPIONA	Science Research Assistant	Paleo Seismology	Tokyo Institute of Technology	Oct/ 03	
3	Ms. Esmeralda L. BANGANAN	Science Research Specialist II	Seismology (Data Management)	TIC (JICA), JMA, Hokkaido University,	Oct/19/04	Mar/12/05
4	Ms. Janila B. de OCAMPO	Science Research Specialist II	Seismic Microzonation and Loss Estimation due to Earthquake	Tokyo Institute of Technology	Mar/20/05	Mar/31/07
5	Dr. Baby Jane T. PUNONGBAYAN	Senior Science Research Specialist / Project Leader, Ground Shaking Hazard Assessment, RINA Project	Seismology (Seismic Data Processing)	TIC (JICA), JMA, Kyoto University,	Oct/1 1/05	Mar/25/06
6	Mr. Roberto B. TIGLAO	Science Research Assistant	Group Training Course in Mitigation Strategy for Mega-Urban Earthquake Disaster	HIC (JICA)	Oct/10/05	Nov/26/05
7	Ms. Myleen E. CARLOS	Science Research Specialist I	Group Training Course in Global Seismology	TBIC (JICA)	Oct/18/05	Dec/17/05

RINA: Real, Infanta, Nakar

JMA: Japan Meteorological Agency

TIC: Tokyo International Center

HIC: Hyogo International Center

TBIC: Tsukuba International Center