Chapter IV
Achievement by the Project

Chapter IV
ACHIEVEMENT BY THE PROJECT

4.1 Achievement regarding Capacity Building to DRBFC

4.1.1 Road maintenance inventory

(1) Achievement in 1st Field Work

It was the first activities for Timorese to have road maintenance inventory and preparation of database which were required to clarify the present conditions of arterial roads or the location of damaged portions by the staff of DRBFC. In order to help the activity of road condition survey, the installation of Km posts was carried out by sub-contractor of CBRM. The activity to survey the road condition had been executed in the same period for the development of database system and the installation of km-post.

The following was achieved by CBRM in 1st Field Work as to road inventory:

- In order to have the road maintenance inventory, concrete Km posts were installed on respective arterial roads with an interval of 5 km in a total length of around 1,400 km. The Route Map was made by CBRM to summarize the information of Km posts installation.
- The road condition survey was mainly carried out by the staff of DRBFC so as to clarify and record the present conditions of the arterial roads. This was carried out under the seminar and on the job training (OJT) with the criteria of defect and inspection sheet prepared by CBRM.
- CBRM made the computerized database from surveyed data using by the system developed in 1st Field Work.

Computer database was completed middle of January 2006 and submitted to DRBFC. Training to the staff of DRBFC how to use the database was done also.

Details of achievement in 1st Field Work as to road maintenance inventory are summarized as below:

【Km posts and route map of arterial roads】

- Installation of Km-posts was executed by sub-contacting basis with local contractor under the supervision of CBRM. Distance was measured by trip meter of the particular vehicle checked its accuracy of trip meter with the comparison of tape measured 1 km. The discrepancy of trip meter has been set out less than 20m by actual 1km. Then the discrepancy was calculated and adjusted in each 5km distance.
- Activity of installation of Km-posts drew out the identification of the beginning point and ending point, the identification of the disconnection of route, the identification of the name of place or junction and the identification of the distance between the connection and the others on arterial roads in East Timor. The Route Map was made by CBRM to summarize the reported information trough the installation of Km- posts.

【Condition survey of arterial roads】

- The condition survey for the establishment of road maintenance inventory was executed based on the route map. CBRM prepared the inspection sheet and the criteria for inspection, and then went to the regional offices to have a seminar and train the regional staff of DRBFC on the actual roads. Training was executed with the following procedures:

  a) Text book for seminar; inspection sheets, criteria and inventory sheets were used. Presentation tool for technology transfer seminar was also used to transfer the idea why the database was necessary. Seminars were done at respective regional offices for understanding the importance of inspection activity before starting the inspection of actual road conditions.

  b) Training on the roads; after having the seminar, the training was carried out on arterial roads. Trainees were requested to execute the inspection with the inspection sheet in the following three steps.

     i) The first step; to understand the items required to fill in the sheet, and how to record the surveyed data.

     ii) The second step; execution of inspection by trainees at the area where was selected by CBRM expert. A comparison of judgment with CBRM expert had been done at the site and instructed by the expert.

     iii) The third step; finding the defect and/or the subject by trainees themselves, and executing the inspection.

  c) Training in the office; after having the training on the road, trainees were requested to record the inspected data on the inventory sheet.

【Database establishment from condition inventory】

- In order to have a database from the road maintenance inventory, CBRM use “Windows” as OS and “File Maker Pro 8” as software to produce the function to control the data by the file of each arterial road. The following policy was adopted for preparation of the database in order to develop the capability of DRBFC.

Standardization:	Set up the criteria of defect, classify the defect, put the priority for countermeasure.
Speedy:	Put importance for “speed” of operation rather than “accuracy” for technology. It was observed that defect finding and defect surveying was critical subjects.
Simple:	Do not expect many functions in database and minimize the function for database. Easy operation and clear outputs were also important requirements.
Actual:	Suitable for the actual capacity of DRBFC and actual demand. It would be important factor to continuance by DRBFC.

(2) Achievement in 2nd Field Work, Phase 2

CBRM continued to revise and developing the system of database in 2nd Field Work. The

inspection sheet was modified so as to be able to apply to same format of input screen of computer. It was required to standardize the hard ware of computer for each regional office to make the system working. The standardization for their computer was positively helped by CBRM.

CBRM added another function such as estimation of the amount of repairing and showing the summery of the amount in the database screen. In central office of DRBFC, in order to make this function apply to budgeting work, the discussion as "Engineers Meeting" was started. Chief of Operation and Regional Engineers had discussed about "unit price", "criteria of road classification", "typical design of road based on road category", "combination of inventory and budget" and etc. with the support of CBRM expert.

CBRM decided to limit the area for activity where to move by vehicle in round trip within one day like the area covered by Dili regional office due to security condition in East Timor. In order to keep the activities to other regional offices, CBRM held several times of seminars, meetings and "Engineering Meeting" for the purpose to communicate with engineers, supervisors and assistant supervisors of other regional offices. They carried out the updating of database by themselves. Updating of database was finished and submitted in July 2007 to DRBFC. Details are mentioned in the following:

【Road condition survey for updating the road maintenance database】

- By using Km posts, route map and results of road maintenance inventory survey in 1st Field Work, updating of road maintenance inventory and road condition survey were started firstly on arterial roads covered by Dili regional office. Staffs of other regions were arranged to attend the seminar at Dili, then to update of road maintenance inventory by themselves. In order to accelerate the speed of activity, CBRM local staff joined to help the updating in Baucau, Same, Oecussi and Maliana region.

【Road maintenance database 】

- The database for road maintenance inventory prepared in 1st Field Work of CBRM was modified in order to realize more easy operation in 2nd Field Work, Phase 2. It was improved to have more function to calculate and summarize the cost for repairing work at defect portions automatically in it. It was also revised the item and criteria to suite the function.
- Supervisor and/or assistant supervisor in each regional office were requested to put the result of survey into their computer by using the system which was revised by CBRM. Therefore, under the revised system, the regional office became a responsible organization not only for to correct the data but also to banking the data. The central office was requested to focus to banking the all data and to consider how to use the information.
- The activity of database updating was started from carrying out the seminar to explain the revised database and training for the inspection with the staff of Dili regional office of DRBFC on January 2007. Road condition survey and updating of database in all arterial roads were finished by July 2007.

(3) Achievement in 3rd Field Work

Road condition data and database done in 2nd Field Work were checked, sorted and summarized for the information so as to be convenient for budget planning. The condition data was the combination of the first survey in 2005 and the second survey in 2007. The demonstration of summary was advised to DRBFC in October 2007. DRBFC clearly understood the summary of information in the database. The database was a help for their budgeting work. The database was revised with the target so as to describe the defects by the cost and to summarize the road condition for the purpose of budget planning clearly.

Due to the success of technical transfer for the road maintenance database, DRBFC strongly expected to have new database only for bridge inventory/maintenance. DRBFC also expected that the description of summary of cost in the database would be improved according to the budget item of DRBFC such as “routine maintenance” and “periodic maintenance”.

In order to comply with their expects, CBRM revised the database system for, i) function of summary, ii) description of summary, iii) change of criteria for condition item, iv) separation of condition item for “road maintenance database” and “bridge maintenance database”, v) change of description for evaluation and vi) unit cost. CBRM also produced the database special for bridge maintenance in 3rd Field Work.

Two technical staffs form planning and design section of DRBFC were trained with OJT to revise the database and to produce the new database special for bridge maintenance. The OJT was continued to input the surveyed data to the revised road maintenance database. The database was finally submitted with guideline and instruction books to DRBFC in February 2008. Summarization for achievement in 3rd Field Work is shown below:

【Road maintenance database】

- The database for road maintenance inventory was prepared in 1st Field Work of CBRM. CBRM added another function such as estimation of the repairing amount of defect places and showed the summery of the amount in the database screen in 2nd Field Work. In 3rd Field Work, the database was improved by revising the function of the defect repairing cost with the order control of number, inspection item, etc. It was improved also to summarize the repairing cost in it with the budget item of routine maintenance item and periodic maintenance item.

【Database for bridge maintenance】

- The database special for bridge maintenance was produced according to the expectation of DRBFC. This was prepared with discussion of a bridge engineer in planning and design section of DRBFC. This was based on the road maintenance database. CBRM expert produced this with technical staff of Planning and Design section as OJT activities. Seminar and trial for the bridge maintenance database was held on December 2007. Introduction of this to regional engineers was done at the engineers meeting held on January 2008. The bridge maintenance database system was handed to DRBFC in February 2008. Instruction and guide books for the road maintenance database and the bridge maintenance database were also submitted to DRBFC at the same period.

【Database guideline and instruction book】

- On the mean time of revision of the road maintenance database and production of bridge maintenance database newly, CBRM prepared guideline book which explained the database soft-ware system and instruction book which explained meaning of the contents of database. The engineering idea were mentioned and explained in the instruction book.

(4) Evaluation of activities and achievement of road maintenance inventory

CBRM had executed the activities to support establish the system to maintain the assets by DRBFC themselves. Evaluation of activities and achievements by the Project (CBRM) are summarized below:

a) DRBFC is responsible to manage the maintenance, rehabilitation, improvement and new construction for all roads and bridges (national, district, rural roads with around 6,300km in total) in East-Timor. Only about 40 of technical staffs of DRBFC, which is present number of technical staff in DRBFC, are no need to discuss that it is not enough for keeping their duty. However, it is necessary to continue to find the solution so that they can execute the maintenance work systematically and appropriately with the limited staff. The road maintenance and bridge maintenance database was very timely activities as the one of the solution to meet the needs of DRBFC.

b) Supervisors and /or assistant supervisors could execute road condition survey without having any confusion and could handle the database system. In order to make the road condition survey as the routine work, it would be necessary to pay more attention to administration and top-down management in DRBFC and MOI. Through activities in 1st Field Work and 2nd Field Work, it was required for the road condition survey two(2) to three(3) working days for the roads covered by one district supervisor. Therefore, it could be estimated that ten (10) working days (equivalent 2 weeks) would be enough for the road condition survey by the arrangement of only one vehicle in the each regional office. Road condition survey is a fundamental issue to execute the systematic and proper road maintenance work for arterial roads in East Timor.

c) The regional engineer meeting was born by the necessity from the activity of establishment of database system and the activity for the connection between the staff in regional offices and the central office. The meetings were held by the chief of Operation section of DRBFC and it was one of proof that DRBFC had begun to solve the problem by themselves. Activities of CBRM have been established in DRBFC.

d) Database has been identified as the important information to connect the central office and regional offices through the activity to keep the road maintenance inventory. This idea is also presented to DRBFC by “Road Maintenance Plan” and “Manual for Reporting system” that were prepared by CBRM as the basic idea to execute the maintenance work systematically.

e) DRBFC staff who attended the activities of road maintenance inventory by CBRM is summarized in below Table 4.1:

Table 4.1 Number of DRBFC Staff who attend Activities of Road Maintenance Inventory

1st Field Work		2nd Field Work		3rd Field Work	
Activities & Seminar	**Man-days**	**Activities & Seminar**	**Man-days**	**Activities & Seminar**	**Man-days**
Seminar for road maintenance inventory	26	Road condition survey ,OJT	12	Bridge maintenance inventory database seminar	9
Seminar for road condition survey	23	Road maintenance inventory database input, OJT	25	Bridge maintenance inventory database , OJT	20
OJT for road condition survey	40	Seminar for cost data	28	Input of data for road maintenance database , OJT	31
Seminar for data-input for database	15			Road maintenance database , OJT	20
				Seminar for Bridge condition survey	4
Total man-days	104	Total man-days	65	Total man-days	84
Total man-months	3.47	Total man-months	2.17	Total man-months	2.63
Total (1st, 2nd , 3rd) : 253man-days, 8.44man-months					

Source: Drat from CBRM

4.1.2 Road Maintenance Plan

Draft "Road Maintenance Plan" was prepared by CBRM in 1st Field Work. This was explained to C/P agencies, DRBFC, IGE and MPW (old Ministry) and submitted to them for their review during the absence of CBRM experts between 1st Field Work and 2nd Field Work. In 2nd Field Work, executive summary for this draft report was prepared and translated to Tetum language so as to make public relations to all staff of C/P agencies. CBRM submitted 50 sets of Tetum version and 15 sets of English version of executive summary to C/P agencies for their review and understand of "Road Maintenance Plan". Draft "Road Maintenance Plan" was finalized after two times of discussion with DRBFC, IGE and MPW (old Ministry) held on June 2007 in 2nd Field Work. In 3rd Field Work, finalized "Road Maintenance Plan" was summarized again to executive summary. This executive summary was translated to Tetum language and distributed all regional offices at the regional engineers meeting for making public relations to all staff of regional offices.

This "Road Maintenance Plan" describes for fundamental subject to execute the maintenance works on arterial roads in East Timor properly and systematically. Brief contents of "Road Maintenance Plan" are summarized as bellow:

【Outline of "Road Maintenance Plan" on arterial roads in East Timor】

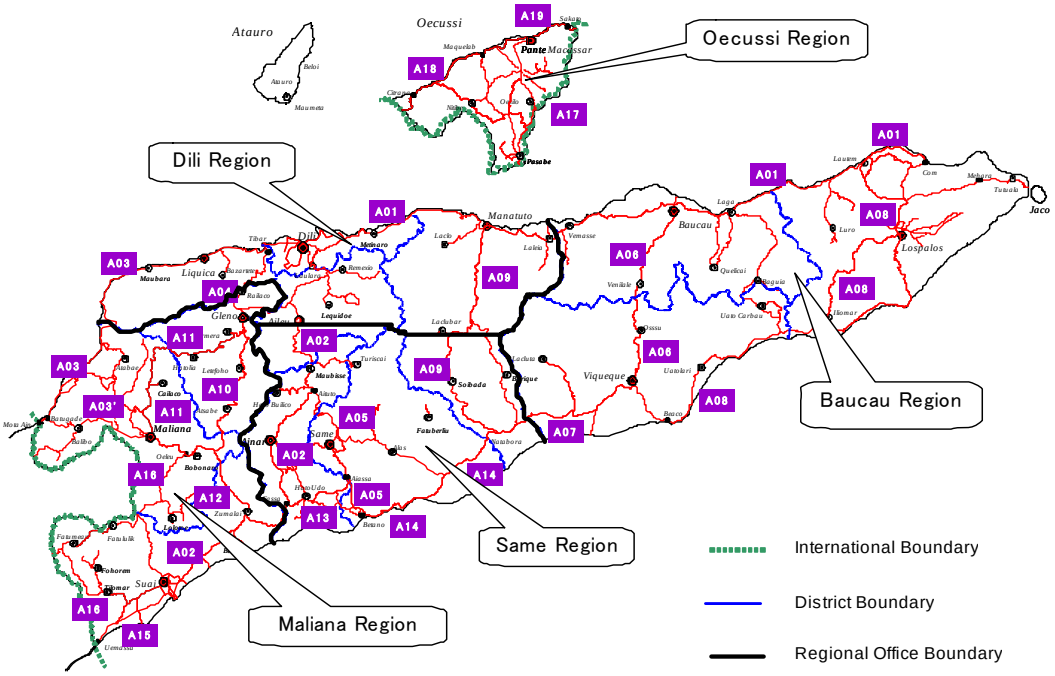
Composition of the Report		Contents
Chapter I Introduction		
1.1	Agency for Road Maintenance Works	- Responsible agency
1.2	Arterial Roads in East Timor	- Outline of arterial roads in Timor Lese
1.3	Objective of Maintenance Works for Arterial Roads	- Why necessary of maintenance works
1.4	Maintenance Works	- What is maintenance works
1.5	Purpose of Maintenance and Repair Plan	- Why necessary to prepare the report
Chapter II Road Maintenance Inventory Survey		
2.1	General Description	- Background, kind of the work, objective for

		maintenance inventory survey
2.2	Inspection Method and Criteria for Road Maintenance Inventory Survey	- Inspection item, inspection method and inspection criteria
2.3	Installation of Km Posts for Road Maintenance on the Arterial Roads	- Installation method and shape of Km posts, etc.
2.4	Results of the Survey	- Inspection on the arterial roads, installation of Km posts and preparation of database
2.5	Updating of Road Maintenance Survey	- Importance for updating of road maintenance inventory survey in every year, at least once a year
Chapter III Present Condition of Road Maintenance for Arterial Roads		
3.1	Responsible Agency for Road Maintenance	- Present responsible agency for road maintenance
3.2	Kinds of Maintenance Works	- Routine, periodic and emergency maintenance, ete. which are presently executed
3.3	Implementation Procedure for Maintenance Works	- Present implementation procedure f
3.4	Achievement of Maintenance Works on the Arterial Roads	- Achieve maintenance works
Chapter IV Existing Rehabilitation Plan for Arterial Roads in East Timor		
4.1	General	- What kinds of rehabilitation plan exist in East Timor for arterial roads
4.2	Rehabilitation Plan on the Arterial Roads in East Timor	- Existing rehabilitation plan
4.3	Maintenance Plan on the Arterial Roads which have a Rehabilitation Plan	- Maintenance plan for the roads that exists a rehabilitation plan
Chapter V Road Maintenance Plan		
5.1	Results of Road Maintenance Inventory Survey	- What kind of results are there in the road maintenance inventory survey
5.2	Classification between Road Rehabilitation and Road Maintenance	- Proposed definite classification between road maintenance and rehabilitation works
5.3	Priority Level of Respective Arterial Roads in East Timor	- Priority level of respective arterial roads for road maintenance taking into considerations of traffic volume, populations along the roads, natural conditions of the roads, etc.
5.4	Existing Road Rehabilitation Plan on the Arterial Roads	- Which arterial roads have a rehabilitation plan in East Timor
5.5	Procedure for Road Maintenance Plan on the Arterial Roads	- Application of road maintenance inventory survey results - Priority of road maintenance works - Selection methods of road maintenance work
5.6	Road Maintenance Plan on the Arterial Roads in East Timor	- Short term maintenance plan - Medium and long term maintenance plan
5.7	Emergency Maintenance Works	- Proposed procedure for emergency maintenance works
Chapter VI Recommendation		

Source: Data of CBRM

4.1.3 Manual for Reporting System in normal condition

There are five (5) Regional offices such as Dili, Baucau, Same, Maliana and Oecussi, covering whole area of the country under DRBFC of MPW. Regional offices are governed by Operation section of DRBFC. Locations of regional offices and their covering areas are sketched out in following Figure 4.1.



Source : Data from DRBFC

Figure 4.1 Covering Area of Regironal Offices

Maintenance works for all arterial (national) roads are covered by the respective regional offices concerned. In addition to the above arterial (national) roads, respective regional offices cover also the district, urban, and rural roads in the area concerned. Total length of all road networks including urban/district / rural roads reaches around 6,030 km in East Timor.

The reporting system between central office and regional offices of DRBFC during processing of road maintenance works was not cleared. In order to carry out the systematic road maintenance works by DRBFC themselves, it had been required that some reporting system between the central office and regional offices would be established in DRBFC.

For standardization and establishment of reporting system between the central office and regional offices, draft "Manual for Reporting System in Normal Condition" was prepared and explained to DRBFC, MPW (old Ministry) during 1st Field Work. This draft Manual was submitted to them in 1st Field Work for their review during absence of CBRM experts between 1st and 2nd Field Work. During 2nd Field Work, the executive summary for this was prepared and translated to Tetum language for making public relations in DRBFC, MPW (old Ministry). CBRM submitted 50 sets of Tetum version and 15 sets of English version of executive summary to DRBFC and MPW (old Ministry) to get any comments from staff of C/P agencies about this Draft Manual In order to finalize the draft, two times of meeting in DRBFC and MPW (old Ministry) was held in June 2008. According to the results of meetings, this draft was finalized and submitted to C/P agencies. In 3rd Field Work, executive summary based on the final one was prepared and translated in Tetum language. This finalized executive summary in Tetum version and English version was distributed to all regional offices at the

regional engineers meeting so as to make understand this and keep the reporting system properly between the central office and regional offices.

This "Manual for Reporting System in normal condition" was mentioned the fundamental issues for executing proper and systematic reporting between the central office and regional offices. It would be expected to keep the reporting system based on this Manual in DRBFC as possible as they can. Contents of this Manual are briefly summarized as below:

【Outline of "Manual of Reporting System in normal condition"】

Composition of the Report	Contents
Chapter I Introduction	
1.1 Agency of Road Maintenance Work	- Responsible agency
1.2 Arterial Roads in East Timor	- Outline of arterial roads in East Timor
1.3 Regional Offices for Road Maintenance	- Outline of regional offices of DRBFC
1.4 Purpose of Manual for Reporting System	- Why necessary to prepare the manual of reporting system
Chapter II Present Reporting System	
2.1 Duty of Central Office	- What kind of works should be cared by the central office of DRBFC
2.2 Duty of Regional Offices	- What kind of works should be cared by regional offices of DRBFC
2.3 Present Reporting System between Central and Regional Offices	- What kind of reporting system is established at present
Chapter III Manual for Reporting System	
3.1 Duty of Central Office	- Proposed duty of the central office for road maintenance on arterial roads
3.2 Duty of Regional Offices	- Proposed duty of the regional office for road maintenance on arterial roads
3.3 Inspection Stage	- Road maintenance inventory survey - Reporting system during inspection stage
3.4 Planning Stage	- Planning of road maintenance on arterial roads - Reporting system during planning stage
3.5 Implementation Stage	- Implementation of road maintenance - Reporting system of road maintenance
3.6 Completion Stage	- Completion of road maintenance works - Reporting system at completion of the works
Chapter IV Recommendation of Reporting System	

Sauce: Data of CBRM

4.1.4 Manual for Reporting System in disaster condition

Since recovery works at damaged places caused by disaster like heavy rains, flooding, landslides and etc. would be required urgently so as to secure the traffic safely in East Timor, special manual for reporting system in disaster condition would be required. Draft "Manual for Reporting System in disaster condition" between the central office and regional offices of DRBFC was prepared in 1st Field Work. This draft was explained to C/P agencies and submitted to them for their review during absence of CBRM experts between 1st and 2nd Field Work of CBRM. In 2nd Field Work, executive summary for this draft was prepared and translated to Tetum language. Fifty (50) sets of Tetum version and fifteen (15) sets of English version for this executive summary were submitted to make their understanding for the contents of this and get any comments against this. Two times of meetings were held to finalize this draft manual in June 2008. Taking into considerations of the results of meetings, the draft was finalized in 2nd Field Work and submitted to C/P agencies and MPW (old

Ministry). In 3rd Field Work, executive summary for final one was prepared and translated to Tetum language. This executive summary was distributed to all regional offices at the regional engineers meeting held in 3rd Field Work so as to make public relations to all staff of DRBFC and keep the reporting system in disaster condition based on this Manual between the central office and regional offices against recovering works at the damaged places caused by disaster. Contents of this Manual are briefly summarized as below:

【Outline of "Manual of Reporting System in disaster condition"】

Composition of the Report		Contents
Chapter I Introduction		
1.1	Agency of Emergency Road Maintenance Work by Disaster	- Responsible agency for emergency maintenance works
1.2	Arterial Roads in East Timor	- Outline of arterial roads in East Timor
1.3	Regional Offices for Road Maintenance in Emergency Case	- Outline of regional offices of DRBFC in case of emergency maintenance works
1.4	Purpose of Manual for Reporting System in Emergency Case	- Why necessary to prepare the manual of reporting system in emergency case by disaster
Chapter II Present Reporting System in Emergency Case by Disaster		
2.1	Duty of Central Office in Emergency Repairing Work	- What kind of works should be cared by the central office of DRBFC for emergency repairing works by disaster
2.2	Duty of Regional Offices in Emergency Repairing Works	- What kind of works should be cared by regional offices of DRBFC in case of emergency repairing works by disaster
2.3	Present Reporting System between Central and Regional Offices in case of Emergency Cases	- What kind of reporting system is established at present in case of emergency works by disaster to be required.
Chapter III Manual for Reporting System in Emergency Case by Disaster		
3.1	Emergency Maintenance Work by Disaster	- What kinds of emergency maintenance work there are, and priority of emergency maintenance work.
3.2	Duty of Central Office in Emergency Case by Disaster	- Job description to be required on the central office of DRBFC in emergency case by disaster
3.3	Duty of Regional Office in Emergency Case by Disaster	- Job description to be required on regional offices of DRBFC in emergency case by Disaster
3.4	Inspection and Arrangement Stage for Emergency Repairing Works	- How to inspect and arrangement works for repairing works at the damaged portions by disaster in emergency case - Reporting system during inspection stage and arrangement stage for repairing works at the damaged place by disaster in emergency case
3.5	Implementation Stage of Recovery /Countermeasure Work	- What kinds of implementation stage there are - Reporting system during implementation stage for recovery/countermeasure works at damaged place by disaster
3.5	Completion Stage of Recovery /Countermeasure Work	- What kinds of works are required after completion of recovery /countermeasure works. - Reporting system after completion of recovery /countermeasure works.

Sauce : Data of CBRM

4.1.5 Capacity building to staff of DRBFC

CBRM had put the effort to make assistance activities so that activities would be executed repeatedly in the routine work with various approaches. The numbers of staff of DRBFC who attended activities of CBRM are summarized in below Table 4.2.

Table 4.2 Number of DRBFC Staff who attend the CBRM Activities

1st Field Work		2nd Field Work		The 3rd field work	
Activities & Seminar	**Man-days**	**Activities & Seminar**	**Man-days**	**Activities & Seminar**	**Man-days**
Seminar for road maintenance inventory	26	OJT for road condition survey	12	Seminar for bridge maintenance inventory	9
Seminar for road condition survey	23	OJT for road maintenance inventory database data-input	25	OJT for bridge maintenance database production	20
OJT for road condition survey	40	Seminar for cost data	28	OJT for road maintenance database revision	20
Site seminar on the Grant Aid Project by JAPAN	20	Site seminar in the case study	26	OJT for road maintenance database data-input	31
Seminar for data-input	15	Regional engineer meeting	28	Seminar for bridge condition survey	4
		Case study phase 1 and 2	108	Regional engineer meeting	13
				Case study	77
Total man-days	124	Total man-days	227	Total man-days	174
Total man-months	4.14	Total man-months	7.57	Total man-months	5.80
1st 2nd, 3rd total : 525man-days, 17.5man-months					

Source: Data of CBRM

(1) Achievement in 1st Field Work

Capacity building to staff of DRBFC in 1st Field Work was started firstly the communication with engineers and managers for the support by administration matters in DRBFC. There were no items and estimations of design cost and supervising cost in the capital development in the budget. They included behind in the amount of the item of good and service. Accordingly, when the CBRM started its activity, it was found that DRBFC staff did not get enough support for transportation, fuel and business trip allowance. In 2007, DRBFC had already mobilized the vehicles and motor cycles by themselves. It was found that budget items had been increased and actual cash-flow had been improved. Training at actual construction site in 1st Field Work is mentioned as below:

【Training at actual construction site】

Training at actual construction site, which was the Project for Improvement of Roads between Dili and Casa financed by Japanese Grant Aid, was carried out with understanding and corporation of the project engineer and the contractor. That project was the period to busy for road surface treatment to finish in 2005 fiscal year. It was good opportunity that trainees from DRBFC learned the hot mix pavement. Training was carried out with the following procedures:

- The seminar was held from November 14th to November 18th, 4days period, at Ainaro where the contractor maintained the camp. The trainees were limited as 4 to5 persons because of transportation and accommodation arrangement at the site by DRBFC. They were supervisors from Dili, Baucau, Maliana and Same regional offices. Training was programmed consisting of seminar of technical knowledge, site visiting, discussion for trainee‘s problem.

- Text for seminar was prepared to transfer the knowledge of paving works and to show some example of supervision work.
- Actual training was 4days duration. It was enough to study the project works. It was the advantage to have the educational opportunity on the site that every trainee could express his carrier, experience and problems what he was facing. Based on the discussions in the training, it was found that trainees from DRBFC were very positive to join the training at actual construction site.
- Through the training, it was clear that trainees learned the importance of quality management established by proper mobilization of equipment and facilities (including site camp and site laboratory), proper organization for construction works and proper documentation management.

(2) Achievement in 2nd Field Work

Through revising activities for the database to facilitate the cost data, the cost estimation system for the construction work in DRBFC was inspected and assisted to staff of DRBFC. As for the cost and standardization of roads works, CBRM supported to DRBFC staff with engineers meetings between regional engineers and the central office of DRBFC.

【Mobilization and maintain the regional engineer meeting】

- There are the information in the road maintenance database such as evaluation and quantity of defect portions of roads. Therefore, the maintenance cost of each defect can be calculated when the data of construction cost is prepared in the database system. The construction cost was studied and examined at the meeting mobilized as the "Engineers Meeting" organized by the chief of Operation Section and regional engineers of DRBFC. The establishing of the typical construction cost was discussed starting from why it would need. And then, it was expanded to standardization of road structure, design procedure of the road structure, comparison and analysis of the unit price for estimation work and understanding of database system.
- The summary of subjects of engineers meetings is shown as below Table 4.3.

Table 4.3 Summary of Engineers Meetings

No/Date		Subject
No.1	March 12, 07	- Issues to discuss - Explanation of the database soft-ware - Use the database in regional office and example in Dili regional office
No.2	March 26, 07	- How to use the database - What idea and data is requested by database
No.3	April 3, 07	- Decision of criteria of roads and typical design of roads - Design and plan of the road - Issues to discuss about estimation system
No.4	May 3, 07	- Proposal of the typical construction cost for the database - Report from the activity of the Vase Study
No.5	May 8, 07	- Acceptance of beginning point of the typical construction cost including the contingency consideration

Source: Date of CBRM

(3) Achievement in 3rd Field Work

In 3rd Field Work, capacity building to DRBFC was carried out to Director of DRBFC to support the firm establishment of the road maintenance database by showing the example of the summary of database. This information would be useful for the budget planning for 2008 fiscal year and 5-years budget planning for road maintenance works of arterial roads in East Timor.

【Support assistance based on the road maintenance database】

- Planning the budget in DRBFC has been carried out by the planning engineer in the design and planning section at central office based on the request and the plan by regional offices. The document is prepared by the planning engineer and submitted to upper management for approval. When the budget amount would be very small compared with the necessity to be repaired at site, the budget would be allocated without complicated consideration. However, when the budget would be getting big and allowed to execute many works, the information brought by the staff of regional offices manually would not be enough in quality and quantity for the planning of budget within the limited staff of DRBFC. The budget would be necessary to be planned with some systematic methods.
- The demonstration of cost summary of database for routine maintenance and periodic maintenance works was presented to Director of DRBFC as the support information to plan the budget. The demonstration drew out discussions between engineers in the central office and regional engineers of DRBFC regarding to strategic planning of road maintenance in East Timor. Director of DRBFC announced to mobilize to maintain database activities including road condition survey as the routine work of DRBFC.

(4) Evaluation of achievement

【Meeting】

- Joint meetings between DRBFC and IGE and regional engineer meetings which were started in 2nd Field Work are very useful for DRBFC to execute systematic road maintenance work by DRBFC itself.

【Encouragement of regional office】

- By “Maintenance Plan” and “Manual for Reporting System in Normal Condition and Disaster Condition” which were presented by CBRM, regional offices and the central office would be enforced and encouraged already for road maintenance works on arterial roads in East Timor. It would be also encouragement results that the road condition survey and the execution of periodic updating of database would be carried out as the routine work of DRBFC.
- DRBFC was motivated clearly by the database to enforce the organization of the two sections (functions) of DRBFC such as “planning & design section” and “operation section”. It would be planned that these two sections should be expanded to the three sections (functions) such as ”planning section“, “design section” and “operation section”. Since DRBFC has two kinds of database such as the road maintenance database and the

bridge maintenance database, management control by using the database would be presented for their duty as showing below Table 4.4:

Table 4.4 Control System by using the Database

Planning section Strategic planning		**Operation section**				
		Baucau	Dili	Same	Maliana	Oecussi
Design section	Roads	Road Maintenance Database				
	Bridges	Bridge Maintenance Database				

Source: Data of CBRM

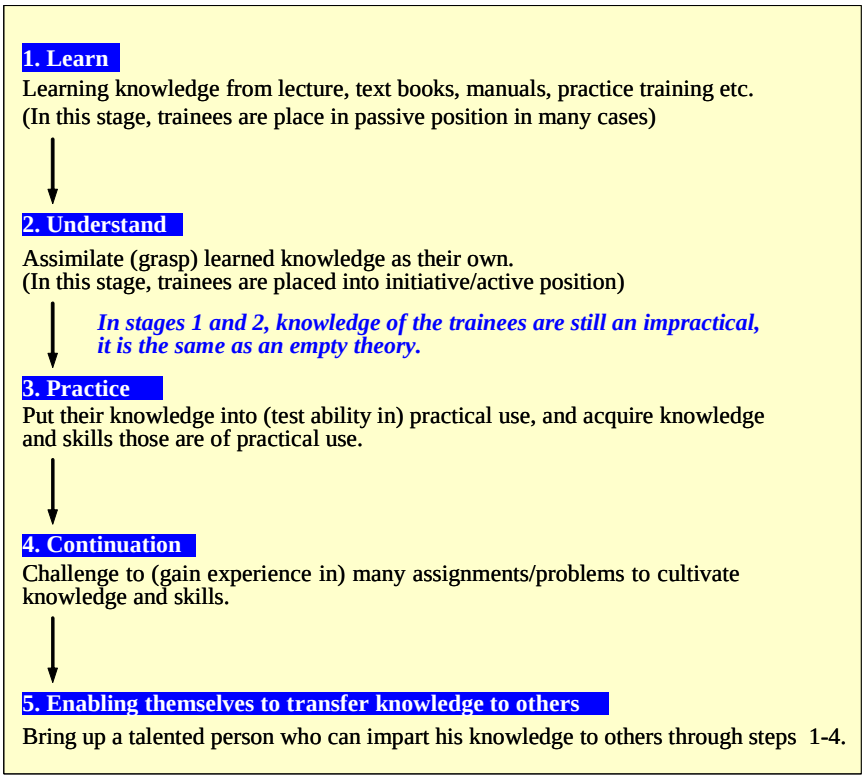
- DRBFC had the system to get the information for budget planning by the database. This would be expected to encourage the staff of DRBFC for executing maintenance works systematically and properly.

4.2 Achievement regarding Capacity Building to IGE

4.2.1 Outline of capacity building to IGE

At the time when CBRM project had started, it was no exaggeration to say that IGE staff had no experience and known practically nothing about operation, maintenance, and management of construction equipment. However, despite under such difficult circumstances, IGE had to advance its operation of managing equipment and it was urgently necessary to capacitate its personnel to perform their tasks at the same time. For this reason, on the job training (OJT) that can be carried out without interrupting IGE's daily operation had been chosen as a main means for supporting the capacity building to IGE personnel. Lecture and workshop had also been adopted as a subsidiary measure for training IGE personnel. OJT had been carried out based on the process as shown in Figure 4.2.

Regarding the operator training, basic training had been carried out in the first place and then operators had been dispatched to the construction sites located in all quarters of the country for OJT in order of who had learned to operate machine. Basic training and brush-up had been carried out at the training field located behind IGE head office.



Source: Data of CBRM

Figure 4.2 Process of OJT in IGE

4.2.2 Technical assistance on equipment management system for IGE

(1) General

Technical assistance to develop equipment management system had aimed at enabling IGE to manage construction machines effectively and systematically. Table 4.5 shows a main construction machines under control of IGE.

At the time when the Project had started, IGE had just started its operation and established neither its organization nor equipment management system yet. In constructing equipment management system, basal conditions was set with the subjects like i) equipment management system had to be a practical system and adaptable to the realities of IGE, ii) the system should be a simple structure, iii) its operation to be facilitate by introducing database, and iv) function of IGE should be boosted by clearly defining the duties of each section.

Technical assistance to develop equipment management system for IGE was carried out for administrative staff (Section Chiefs) of IGE as C/P, in parallel with OJT to train other IGE staff who took part on operation of the system. Technical assistance was planed that formation of equipment management system to be completed in 1st Field Work, and improving its operation and making it be firmly established in IGE by 2nd and 3rd Field Work.

1st Field Work	2nd and 3rd Field Work
To develop equipment management system	→ To operate and firmly establish equipment management system in IGE

Table 4.5 Main Equipment under Cotrol of IGE

as of Feb. 2008

Type of the Machine	Make/Mdel	Q'ty	Remarks
Bulldozer	Mitsubishi H. Industry /BD2J	9	Engine trouble (1)
Bulldozer	Komatsu / D41E	5	Under repair (1)
Bulldozer	Komatsu / D65E	3	
Bulldozer	Samsung /SD20	1	
Hydraulic Excavator (Crawler)	Hitachi Const. Machinery / ZX120	3	Under repair (1)
Hydraulic Excavator (Crawler)	KOBELCO / SK200	2	
Hydraulic Excavator (Wheel)	Komatsu / PW200	4	Under repair (1)
Motor Grader	Mitsubishi H. Industry /MG330E	4	
Wheel Loader	Kawasaki H. Industry / 6DJ1	4	Badly damaged (1)
Wheel Loader	Caterpillar /938G	1	
Crawler Dump	Morooka / MST600VD	9	
Mobile Crane	KOBELCO / RK250	5	
Vibration Roller	Komatsu / JV40CW5	5	
Vibration Roller	Samsung /ROKS22	1	
Asphalt Distributor	Nissan:LK252 EH / Hanta:DS-35ETD (S)	2	
Asphalt Kettle	Hanta/AK-30D	2	
Earth Auger Truck	Isuzu:NKR71E / Aichi : NKCISC (D-50A)	2	Badly damaged (1)
Mobile Crushing Unit	Komatsu / BR100JG-2	2	
Mobile Crushing Unit	Nakayama / MC240G	2	
Equipment Carrier	Mitsubishi Motor / FS50MTZ	13	Under repair (1)
Generator	Denyo / DC-150SPK(DB-1651K)	8	Transferd to MOI(1)
Generator	Denyo/TSN-701	11	
Flatbed Truck	Isuzu / FSS33H4	9	Under repair (2)
Flatbed Truck	Isuzu / NPS72L	10	Under repair (1)
Flatbed Truck	Hino / JHDFT1JHL	10	All are being lent out
Flatbed Truck	Mitsubishi Motor /JMFFK617	10	
Forklift	Toyota / FDT25	4	
	Total	141	

Source: Data from IGE

(2) Outline of the equipment management system

The equipment management system for IGE was designed for its structure and operation to be simple as much as possible, in order to enable IGE to carry out equipment management operation easily and efficiently. In constructing equipment management system, CBRM team and Timorese C/Ps had a series of discussion with respect to how and what sort of measures to be taken for forming a practical equipment management system for IGE, and the following fundamental conditions were confirmed.

a) All equipments should be centralized and managed by IGE head office, until equipment management system is established.

b) In order to facilitate operation of equipment management system, the database should be introduced into the system, and inventories or logbooks, which are necessary to manage

equipments, should be prepared as a form of database.

c) Should define responsibilities and division of duties for each section of IGE

d) The procedures and rules and regulations in equipment management should be clearly notified to all IGE personnel and make sure that the orders are thoroughly enforced.

e) IGE should hold a regular managerial meeting in order to operate management system smoothly.

Equipment management system of IGE is formed as a combined work of all the sections of IGE as shown Figure. 4.3.

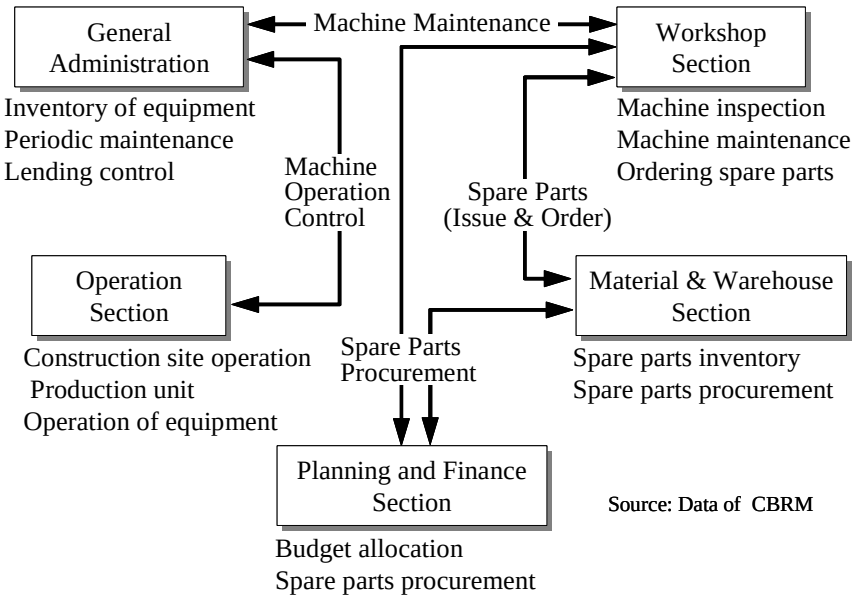


Figure 4.3 Outline of Equipment Management System

The database for equipment management system is composed of several databases as on the Figure 4.4. These databases can be used separately as an independent database according to the assignment of each section of IGE or combined as a one system. Table 4.6 shows the contents of database for equipment management.

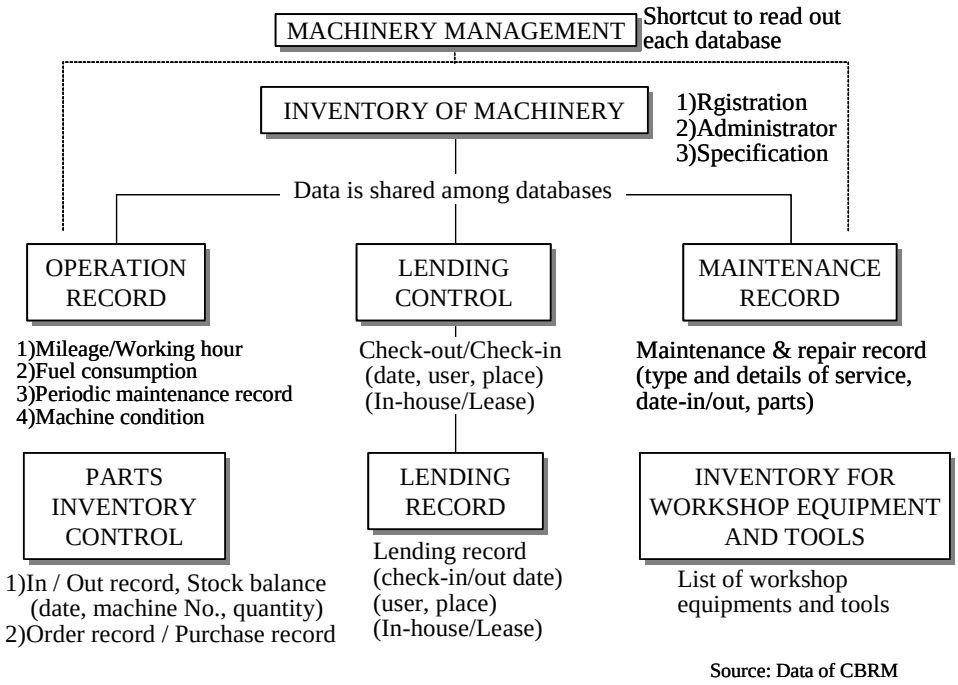


Figure 4.4 Outline of the Database for Equipment Management

Table 4.6 Contents for Equipment Management Database

	Database	Contents
1	Machinery Management	Shortcut of the databases 2、3、4、5、6
2	Inventory of Machinery	Machines' specification, details of registration, Report forms (Reg. No. Make, Model, Serial No.
3	Operation Record	Machines' Operation Record, Control of Periodical Maintenance, Report forms (Machine Condition, Mileage/Working Hour, Fuel Consumption etc)
4	Maintenance Record	Maintenance and Repair Record (trouble, details of service, spare parts, lubricants)
5	Lending Control	Lending record book, Report form (date, user, place of deployment)
6	Lending Record	Lending record, Report form
7	Parts Inventory Control	In and Out Record, Purchase order record, Receipt Record, Report form
8	Inventory of Workshop Equipment and tools	List of workshop equipments and tools (name、quantity)

Source: Data of CBRM

(3) Implementation of technical assistance on equipment management

The formation of equipment management system had started from making C/Ps to understand "how to manage equipment" and contents of management work such as tasks among sections of IGE, lending control of machines, operation of repair workshop and spare parts management. Confirmation of contents and procedure of the management work, formalization on division of duties among sections of IGE, drawing up of rules and regulations, and preparation of database program were carried out to complete the formation

of equipment management system in 1st Field Work.

Second (2nd) and 3rd Field Work aimed at improving equipment management operation that IGE personnel learned to carry out machine management independently and efficiently, and made the system to be firmly established in IGE. Technical assistance on equipment management had taken a step forward and carried out on how to operate equipment management system such as how to lend out machines, collection of machines, operation data, how to use/updating database (inventory of equipment, lending control, maintenance record, parts inventory, and how to apply database to equipment management by OJT. The betterment of database program and equipment management system had also been carried out as a continuous operation. In 3rd Field Work, an intensive training on how to make good use of database in machine management was conducted for four (4) months for seven (7) IGE staff selected as a database operator/manager.

In addition to the above, the Project had also strived to make machine users understand IGE's machine management system such as sharing of maintenance expense and operation cost through workshop and seminar. At the Case Study (joint road maintenance practice of IGE and DRBFC) which was carried out in 2nd and 3rd Field Work, a series of OJT such as planning of project operation, preparation of lease agreement, site management, fuel supply, and collection of lease charges have been put into practice.

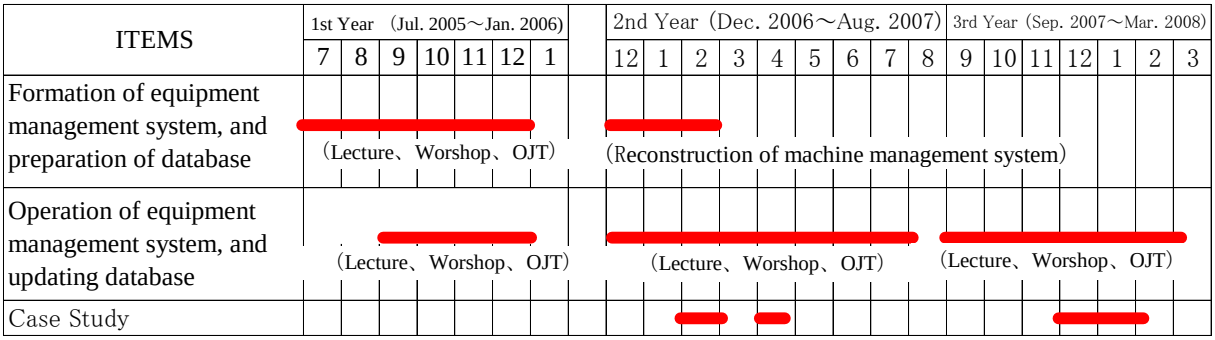
With regard to technical training on spare parts procurement, lectures and seminars had been carried out on outline of the international trade such as import/export procedure, the technical terms in trade, how to read shipping documents and how to convert/calculate the price of the imported spare parts. In OJT, IGE personnel had practiced in receiving spare parts those had been ordered from Japan, such as negotiation with local shipping agent, preparation of documents for custom clearance, clearing spare parts (container), delivery inspection and updating the parts inventory in the database.

In the midst of disturbance in 2006, IGE had removed license plates form equipments and vehicles as a safety measure against an attack on the official vehicles by mob. Although license plates had been returned to the machines later, it was found that in a state of confusion, the license plates were redistributed wrongly without checking with the inventory. In order to rectify this error, accumulation of basic data for the all IGE machines that had already been completed in 1st Field Work was carried out again in 2nd Field Work. IGE introduced a five-digit identity code number to distinguish each machine and painted on the machine body to prevent such accident. Man-months to receive the technical transfer activity of CBRM are summarized in Table 4.7 and implementation process of technical assistance for equipment management system is sketched in Figure 4.5.

Table 4.7 Summary of Technical Transfer Activity on Equipment Management

	1st Year	2nd Year	3rd Year	Total M/M
Man Months	40	56	46	142

Source: Data of CBRM



Source: Data of CBRM

Figure 4.5 Implementation Process of Technical Transfer Activity on Equipment Management

(4) Achievement

【Formation of equipment management system】

- Although there are some points for improvement, IGE formed its own equipment management system such as lending control of machines, movement control of machines, maintenance of machines, and parts store control successfully through the technical assistance of CBRM. Timorese C/Ps had acquired enough knowledge to grasp and operate the equipment management system through its developing processes.
- The technical knowledge of C/Ps on equipment management had been drastically improved. At the time when CBRM had started, the maintenance cost had been ignored by IGE and Timorese authorities concerned and there had been no expenditure appropriated for purchasing spare parts and lubricants at all. However, IGE and Timorese authorities concerned have already recognized the necessity of maintenance cost, and that is now common knowledge among them. This was evident in the IGE budget that the Government had started allocating budget for consumables for the first time in 2006/2007 fiscal year of East Timor.

【Operation of equipment management system】

- IGE staffs have already familiarized themselves with operation of equipment management system. They now can perform daily operation of IGE such as check-out/check-in of the equipments, issuing of spare parts, check-in/check-out of the machine to/from the workshop and procurement of spare parts according to the procedure of equipment management system, though there are some area which should be improved.
- Regarding the familiarization of database for equipment management, selected IGE staffs who take charge of database management have learned how to operate database program. However, in order to make full use of the database in equipment management, there are some areas need a further improvement such as accumulation of machines' operation data, communication between each section of IGE, and on analysis of data.
- Although it cannot be denied that the degree of acquisition of the technology and the

knowledge of individual C/Ps varies, and there are inadequate points that IGE should improve further, CBRM team and Timorese C/Ps have mutually acknowledged that the capability of IGE as the organization have been improved drastically through CBRM activities.

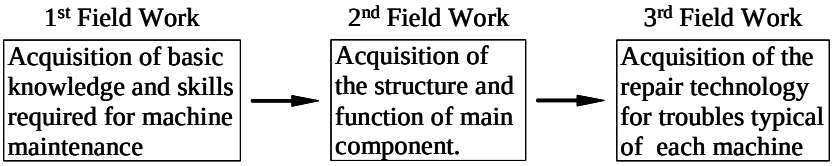
(5) Tasks towards sustainable development

In among the factors that hide the IGE's operation of equipment management, there are external factors concerning the equipment users and internal factors resulting from the inside of IGE. Internal problems of IGE such as capacity building of staff and strengthening of its organization have been improved through this project and at the same time, it have enabled IGE themselves to tackle with these internal matters in the future. On the other hand, concerning the issues resulting from the equipment users, it has been a struggle trying to find a way of coping with this issue for IGE, and it will be a problem awaiting solution in the future.

Sorting out the problems with the equipment users is a part of the tasks that IGE has to deal with and it is a most weak area of IGE. While improving the capacity of its staff, how to strengthen the public-relations activity to improve the service to the machine users is the task toward the sustainable development of IGE.

4.2.3 Mechanic training

Technical training for IGE's mechanics was designed as shown figure below. In 1st Field Work, mechanics should acquire basic knowledge that needed to perform their duties. In 2nd Field Work, the training was concentrated on improving their knowledge in the structure and function of the machines, and making them to build up their experience in maintaining/ repairing of actual machines. In 3rd Field Work it was put emphasis on acquisition of the repair technology and the knowledge on failures typical of the specific machines and follow-up of 2nd Field Work.



(1) Implementation of mechanic training course

CBRM expert had taken charge of overall management and operation of mechanic training along with preparation of training materials and lecture, while two (2) senior mechanics had played as assistants to CBRM expert for supervising workshop practice. On the job training (OJT) was adopted as a main method of workshop practice and lecture class was conducted with the animated teaching aids and textbooks prepared by CBRM expert.

Initially, training course was conducted during working hour in parallel to routine operation of IGE in 1st Field Work. However, for carrying out a lecture in parallel to the routine operation of IGE, there was many interruption of a class. For this reason, the training hours were

altered that practice (OJT) to be carried out during office hour and a lecture to be conducted after office hour. In 2nd and 3rd Field Work, lecture was conducted on every Saturday for about five (5) hours. Because of giving equal opportunity to receive training and to learn basic knowledge that is necessary to perform their work as mechanic, all IGE mechanics were enrolled in the lecture and practice course in 1st Field Work. In 2nd and 3rd Field Work, trainees were separated into two groups, one who can read and write and the other who cannot read and write in order to conduct training course efficiently. Such trainees who cannot follow a lecture were treated at liberty to attend or not attend the lecture.

Practice (OJT) has included not only maintenance of vehicles and construction machines but also installation and maintenance of workshop equipments and IGE's facilities. All electric installations of IGE were modified for enabling IGE to use equipment and tolls of both Timorese and Japanese standard as OJT for mechanics.

Man-moths to receive the technical transfer activity of CBRM on mechanic trainings are summarized in Table 4.8 and implementation process of technical assistance for mechanic training is sketched in Figure 4.6.

Table 4.8 Summary of Mechanic Training in Men-moth

	1st Year	2nd Year	3rd Year	Total M/M
Man Month	68	90	95	253

Source: Data of CBRM

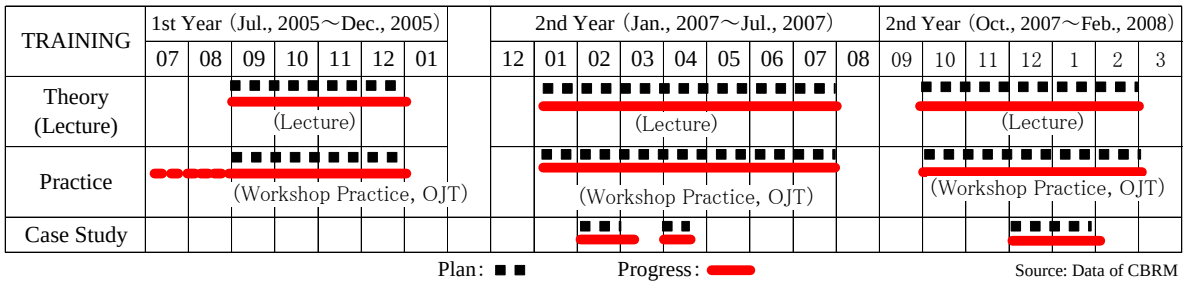


Figure 4.6 Implementation Process of Mechanic Training for IGE

【Training curriculum】

- In 1st Field Work, mechanic training was put emphasis on trainees to acquire a basic knowledge such as safety in work operation, the four rules of arithmetic, structure of vehicles and construction machines, and periodic maintenance necessary to perform their duties. In 2nd Field Work, mechanic-training curriculum was concentrated on trainees to improve their understanding of the structure and the function of main construction equipment, and to acquire experiences in repairing actual machines. In 3rd Field Work, mechanic training was put emphasis on improving technical skills and knowledge of the trainees in machine repairing, particularly on the machine failures typical of each machine that was expected to occur in near future as machine ages, along with the follow-up

training of 2nd Field Work.

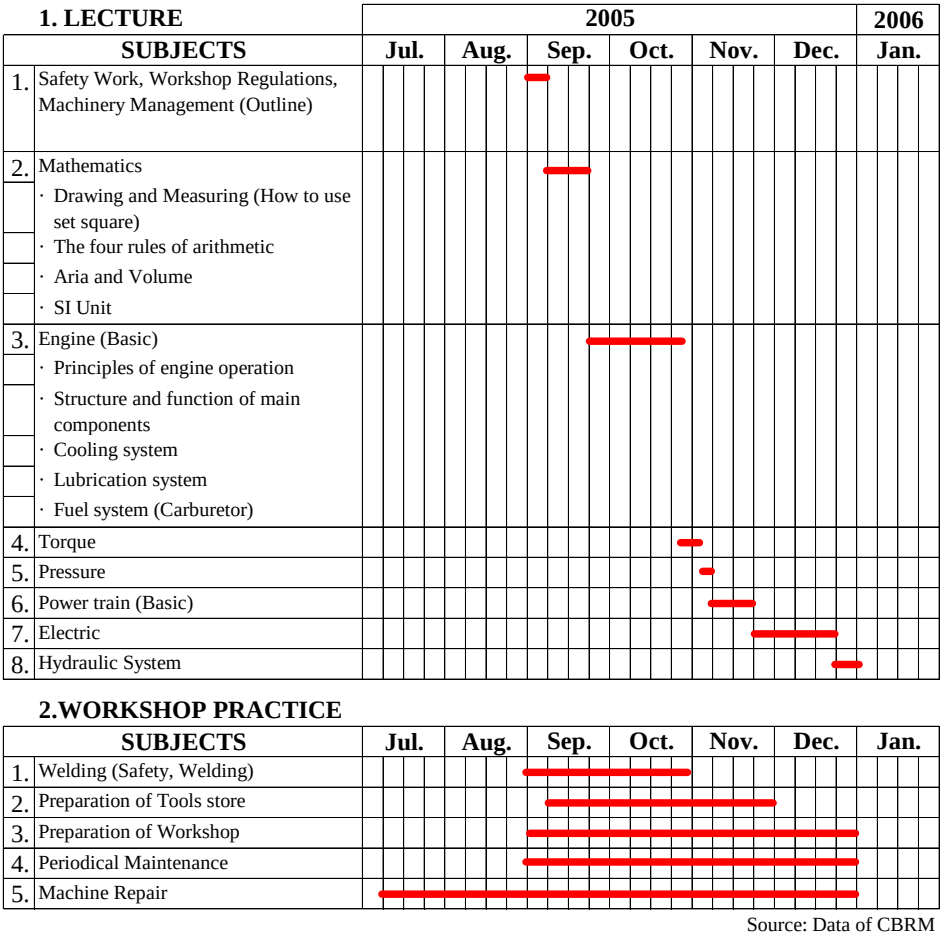
- The ratio of training hours between theory and practice was distributed about five (5) for practice to one (1) for theory. Table 4.9 shows the outline of the contents of mechanic training.

Table 4.9 Outline of the Contents of Mechanic Training

1st Field Work	
Theory	Safety work, Four rules of arithmetic, Measurement, SI Units, Structure and function of const. machines, Principles of engine, Principles of power train, Torque, Pressure, Basic electric
Practice	Safety work, Preparation of workshop, Periodic maintenance, Welding, Repairing machine
2nd Field Work	
Theory	Diesel engine fuel system, Electric system (Motor, Alternator), Electric wiring diagram, Power train (Const. equipment), Hydraulic system
Practice	Modification of IGE's electric installation, Periodical maintenance, Repair, Disassembly and assembly (Engine, Power train, Brake system, Steering system, Hydraulic system), Comprehensive training by the case study project
3rd Field Work	
Theory	Diesel engine fuel system (details), How to read electric wiring diagram, Power train (details), Hydraulic system (details)
Practice	Periodical maintenance, Repair, Disassembly and assembly (Engine, Power train, Brake system, Steering system, Hydraulic system)(repeated training), Comprehensive training in the case study project

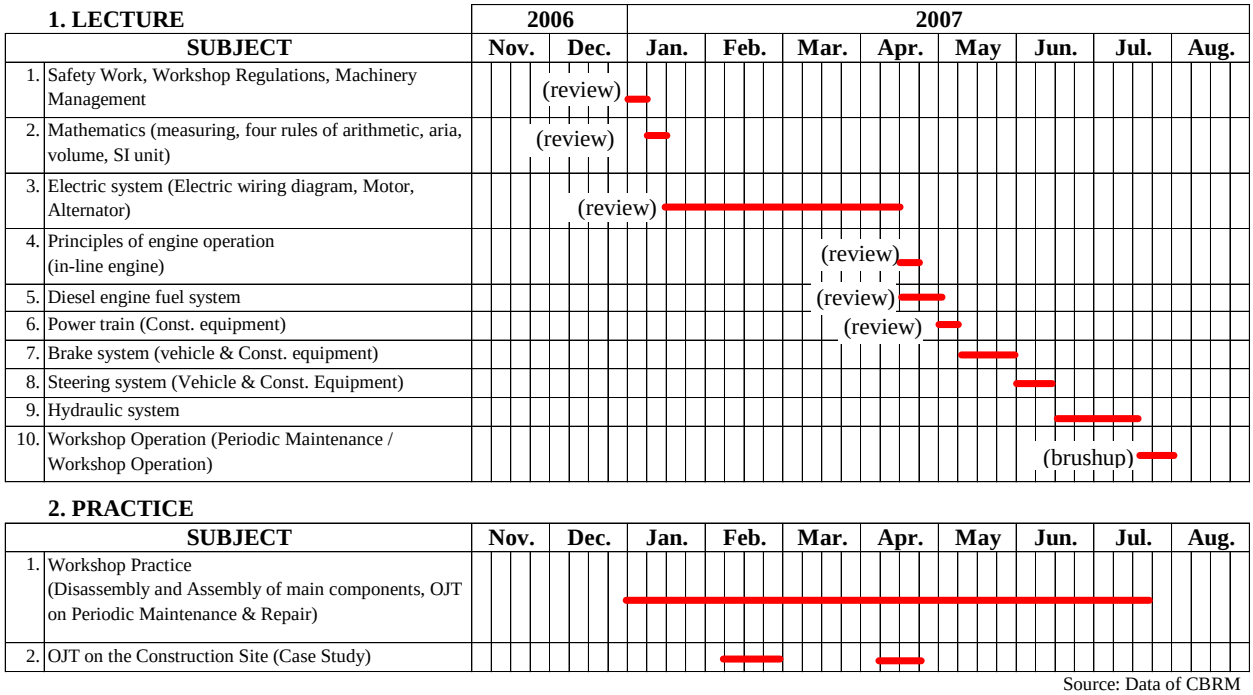
Source: Data of CBRM

- Curriculums for the mechanic training course in 1st, 2nd and 3rd Field Works are shown on Figure 4.7, Figure 4.8, and Figure 4.9, respectively.



Source: Data of CBRM

Figure 4.7 Curriculum for Mechanic Training in 1st Field Work



Source: Data of CBRM

Figure 4.8 Curriculum for Mechanic Training in 2nd Field Work

1. LECTURE

	SUBJECT	2007 Sep.	Oct.	Nov.	Dec.	2008 Jan.	Feb.	Mar.
1.	Reviewing the 1st/2nd year Lessons							
2.	Structure and function of main components							
1)	Fuel Injection Pump (Diesel Engine)							
2)	Transmission (Bulldozer)							
3)	Steering Clutch & Brake (Bulldozer)							
4)	Air Brake (Equipment Carrier)							
5)	Hydraulic System (repeat)							
6)	Starting/Charging/Ignition System (repeat)							
3.	Workshop Management (brush-up)							

2. PRACTICE

	SUBJECT	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1.	Workshop Practice (Disassembly and Assembly of main components, OJT on Periodic Maintenance & Repair)							
2.	OJT on the Construction Site (Case Study)							

Source: Data of CBRM

Figure 4.9 Curriculum for Mechanic Training in 3rd Field Work

【Training materials】

- In principle, mechanic training had been conducted by utilizing locally available tools, equipment and materials. Some training equipments those could not be prepared by Timorese side and English version of workshop (repair) manuals for construction equipment were provided by the Project.
- Two (2) sorts of training materials, textbook for trainees and teaching aid for lecturer had been prepared. Textbooks for trainees were written in Tetum language as much as possible. In order to facilitate trainees' understanding, teaching aids for lecturer were prepared as a form of slide (PC presentation) containing animated presentations that corresponds to the trainees' textbooks. Training aids for experiments on the electric devices had also been prepared by using locally available materials.

(2) Achievement

IGE's mechanics already familiarized with a process of their work such as preparation of documents for repairing machines, procedure of issuing spare parts. In their technical knowledge and skills, IGE mechanics learned to cope with the machine troubles those could be visually diagnosed the failures through the training. Incidentally, at the time when the Project had stated, they had barely managed to carry out a simple job such as changing oils, greasing and etc. Moreover, although it was limited to the specific failure on specific machines, they also learned to cope with the failure of the high-tech devises those they experienced through OJT.

Although the degree of acquisition of technical knowledge and skills of each mechanic varies, and there are many areas that need to be improved further (trouble diagnosis etc.), technical skills of IGE's mechanics have come up to the level that can manage to cope with the general rapier and maintenance of the machines independently if considered them as a team.

(3) Tasks towards sustainable development

Since majority of IGE's mechanics cannot read or write, they have acquired most part of the technical knowledge and skills mainly through experience (OJT). Because of this reason, IGE's mechanics have the strong tendency toward drawing on their experience and intuition for diagnosing failure of the machines or repairing the machines before analyzing it logically.

In order to cope with complicated and a various kinds of machines' failures which are expected to occur in near future as machines become old, IGE's mechanics need to improve their capability in repairing the machines further. IGE should make a continuous effort to train mechanics to improve their capability.

4.2.4 Operator training

The operator training had been carried out with the method that all operators were trained in the basic and applied course first, and then dispatched to the construction site for OJT to acquire experience in actual construction work. They had attained skills and knowledge to operate the machine independently and safely through the above activities. The basic and applied training was conducted at the training field located behind the IGE head office.

Operator training was put emphasis on the operation of four (4) types of machines, Bulldozer, Excavator, Wheel Loader and Motor Grader those were much in demand. All trainees had received training on main four (4) machines, and training on special type machines such as Mobile Crusher, Mobile Crane and Asphalt Distributor was conducted for selected trainees.

In order to evaluate the level of the trainees' technical skill objectively, technical skill level of each trainee was expressed numerically based on the skill level check sheet which defined evaluation criteria and marks for each type of machine. The technical skill level was classified into five grades of "A", "B", "C", "D", "E" in descending order according to the total marks that trainees had obtained as shown on Table 4.10 below. Operator training had aimed at upgrading an average of trainees' technical skill level to "B" on main four (4) machines at the end of the Project. Moreover, the completion certificate was awarded to the trainees at the end of each Field Work (1st, 2nd, and 3rd) in order to enhance motivation of the trainees.

Table 4.10 Valuation Standard of Equipment Operation skills

Level	Description of Level
A	He can perform the work as an equipment operator in any kinds and conditions of actual construction sites.
B	He can perform the work as an equipment operator in limited kinds and conditions of actual construction sites.
C	He can operate the equipment only for simple works in the actual construction sites.
D	He can operate the equipment only as an assistant operator.
E	He cannot operate the equipment properly.

Source: Data of CBRM

Table 4.11 shows an example of the technical level check sheet for operator training.

Table 4.11 Sample of Technical Level Check Sheet

Name of operator: (**Luis Mendonca**)

TECHNICAL LEVEL: A: 100-85(%), B: 84-70(%), C: 69-55(%), D: 54-40(%), E: Below 39(%)

	Machine	View Point	Allocation of Marks	Received Points	Technical Level	Remarks
1	**BULLDOZER**	Dozing and leveling on normal soil	15	10	**C**	powerful
2		Digging and dozing on normal soil	15	13		shoe slip
3		Side cutting on soft rock	15	10		useless power
4		Ripping	10	3		Shank depth
5		Counter steering on steep down hill	5	2		
6		Daily maintenance	15	10		
7		Daily check sheet	5	3		
8		Safety mind	20	15		
		Total	**100**	**66**		

Source: Data of CBRM

(1) Implementation of operator training

In 1st Field Work, operator training was carried out for twenty (20) trainees for five (5) months on main four (4) machines and mobile crusher. Training contained the safety work based on KYT (Kiken Yochi Training = provision against danger), how to read meters and gauges, structure of the construction equipment, daily inspection, basic operation of machines (start, stop, drive, operation of work equipment) and execution of construction work (pushing, digging, side cut, bank cut, loading, levering, ditching etc). Machine operation training was conducted at the training field located behind the IGE head office.

In 2nd Field Work, operator training aimed at improving trainees' technical skills on main four (4) machines to level "C" on average. Training on safety work, daily inspection, and practice on main four (4) machines was reiterated in addition to the training on Asphalt Kettle and Asphalt Distributor. On Asphalt Kettle and Asphalt Distributor, an intensive training was conducted for five (5) selected trainees for six (6) weeks. In the Case Study, comprehensive trainings that included transporting equipments, safety measures, daily inspection, provision of fuel, and executing various kinds of construction works such as dredging of the riverbed, quarry work, and asphalt work by using various types of equipments were carried out.

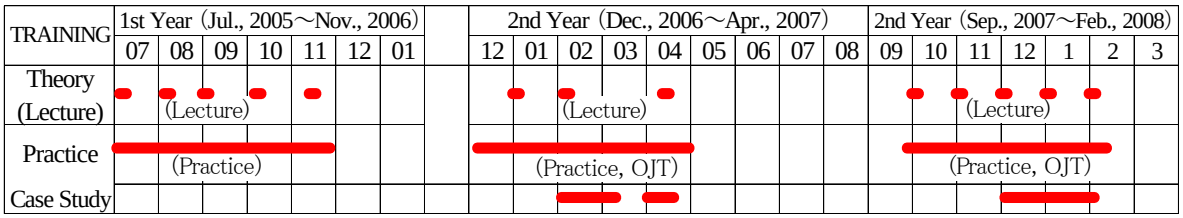
In 3rd Field Work, operator training aimed at improving average of trainees' operation skills on operation of main four (4) machines up to "B" level. Training on crane operation, how to evaluate machine operation skills, and advanced training for selected trainees as a prospective instructor for operator training also were carried out.

Training on the main four (4) machines was conducted for selected ten (10) trainees who were graded technical level "C" at the end of 2nd Filed Work. A site preparation work (OJT) for a building plot for scheduled new IGE head office was carried out as an applied training for main four (4) machines. Crane operation training was conducted on two (2) different capacity cranes (lifting capacity: 2.9 ton and 20 ton) for selected six (6) IGE's operators. Crane operation training included not only crane operation but also sling work, hand signal, safety work, daily inspection, and structure and function of mobile crane.

Evaluation of technical skills in machine operation for IGE operators was carried out based on

the criteria and guideline set by CBRM expert. Operators' skills and technique in machine operation was evaluated through their performances in the test on daily inspection, reading meters/gauges, driving at the test course, operation of work equipment and execution of construction work. Since almost all IGE's operators were not able to write and read, the written examination was excluded from the means of evaluation.

An advanced training for a prospective instructor was conducted for selected two (2) IGE's operators by means of OJT. These two (2) trainees were assigned as an assistant to CBRM expert for supervising training such as preparation of machines, provision of fuel, assisting other trainees to carry out daily inspection, planning of training schedule, conducting practice, and training under the instruction of CBRM expert. Summary of implementation for operator training and number of trainee for operator training are shown in Figure 4.10 and Table 4.12 below:



Source: Data of CBRM

Figure 4.10 Summary of Implementation for Operator Training

Table 4.12 Number of Trainee for Operator Training

	No of Trainees	Period	Equipment
1st Year	20	Aug., 2005-Nov., 2005 (5months)	Main 4 types + Crusher
2nd Year	20	Dec.,2006-Apr., 2007 (5months)	Main 4 types + ASD
3rd Year	16	Sep., 2007-Feb., 2008 (5months)	Main 4 types + Crane

*Main 4 types:Bulldozer, Excavator, Wheel Loader, Motor Grader
*ASD: Asphalt Distributor

Source: Data of CBRM

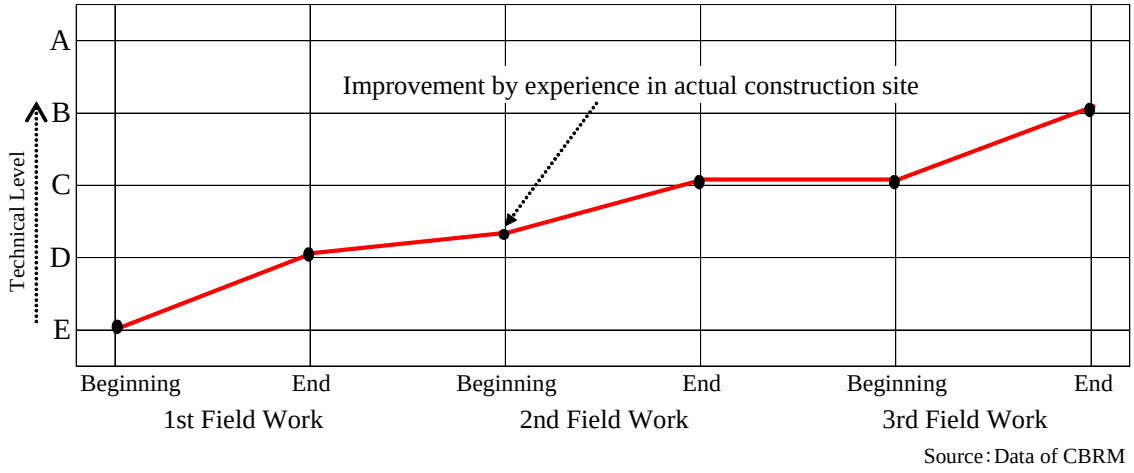
(2) Achievement

Operators who had been trained continuously since CETRAP period, a previous technical cooperation program of JICA, have already been deployed to the various construction sites and some of them have learned to operate two or more type of machines. Operators who were enrolled in the training at the time when CBRM had started as trainees, who had never known the construction machines before, learned to operate at least one type of machine through technical training by CBRM. In addition to the above, an average technical skill level of IGE's operators on main four (4) machines of Bulldozer, Excavator, Wheel Loader and Motor Grader, has come up to the mark of level "B" finally.

Concerning the training on Asphalt Distributor and Asphalt Kettle, their technical skills through the actual asphalt work in the Case Study for five (5) operators who were trained on

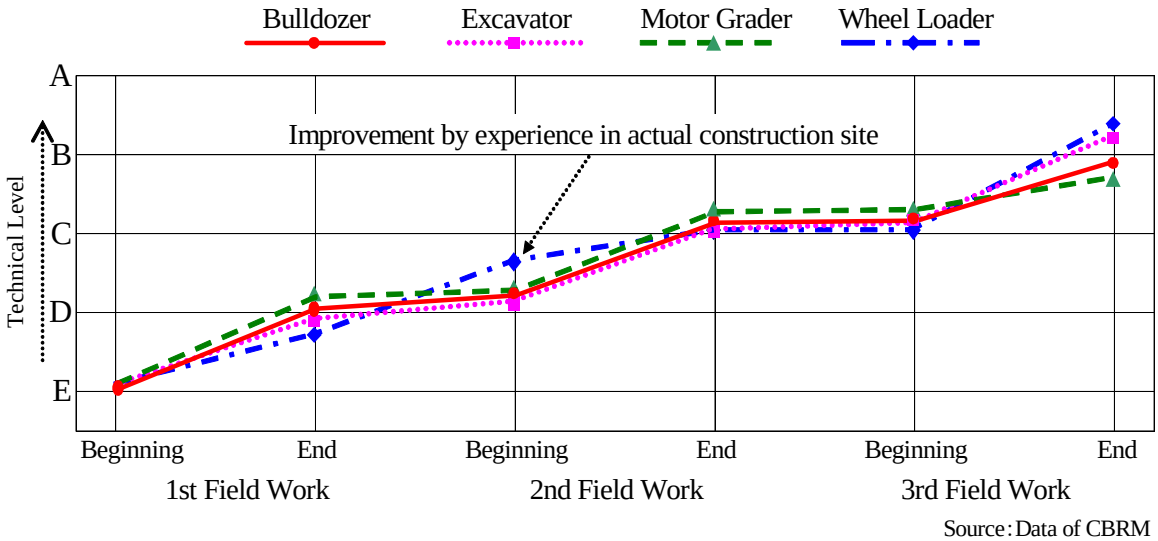
Asphalt Distributor/ Asphalt Kettle were improved from level "E" to "C" that they all can manage to operate these two machines and carry out asphalt work. The training on Mobile Crane was carried out for one and half (1.5) months, and trainees technical skill level in crane operation marked level "A" for one (1) operator and level "B" for other five (5) operators.

Figure 4.11 and Figure 4.12 below show the progress of the average technical skill level of trainees on four (4) machines.



Source : Data of CBRM

Figure 4.11 Progress of Average Technical Level on Main Four(4) Machines



Source : Data of CBRM

Figure 4.12 Progress of Technical Level on Respective Four(4) Machines

(3) Tasks towards sustainable development

A sensuous technique, which cannot be expressed by words or description, accounts for many part of the operation skill of the construction equipment. Nobody can teach these techniques or skills, since it is sort of skill that each operator have to acquire himself as only his own technique, and repeated practice is of the first importance to get skillful in machine operation. In order for IGE's operators to win recognition as a professional construction equipment operator, it is essential that they should work hard to acquire more skills in machine operation and wider knowledge in construction work themselves.

A knowledge needed to construction equipment operator is not only in machine operation skills but also in capability to deal with machine trouble. Carrying out daily inspection thoroughly and taking prompt action against machine trouble will lead to reduce machines' maintenance cost and extend the machine life. It is hoped that IGE would make a continuous effort to improve operators' awareness of daily inspection and machine troubles, even after the completion of this project.

4.3 Capacity Building through the Case Study

4.3.1 Selection of work field

Selection of the site for the Case Study was executed on arterial (national) roads to be required the maintenance and/or repairing works for the defects on the road. Investigation of the suitable location was done in December 2006 for 2nd Field Work and September 2007 for 3rd Field Work by CBRM expert and DRBFC staff with consideration of the following issues:

- Site that is planned to be implemented the maintenance works by DRBFC on the arterial road.
- Site that land acquisition for the site is not required.
- Site that the maintenance works to be implemented through the activity of the Case Study shall be expected sorts of effects as the model case for maintenance works and demonstration.
- Site that maintenance works to be carried out by the activity of Case Study shall bring the advantages directly and immediately for beneficiaries after completion of construction works.
- The location shall be relatively near from the regional office, especially in this period, the site should be decided taking into considerations of the safety and security and social situation of East Timor so far.

Taking into considerations of the above, the suitable places for the activity of the Case Study were selected in 2nd Field Work at A03, 28 km point from Dili, Aipelu Village, near Liquica Town, where is the junction on arterial road and district road. The sites in 3rd Field Work were from 6km to 14km points from Dili on A01, form Fatu Ahi to Hera.

The selected sites for the activity of the Case Study were very good enough for training the staff of DRBFC & IGE, since there were many kinds of maintenance and repairing works like;

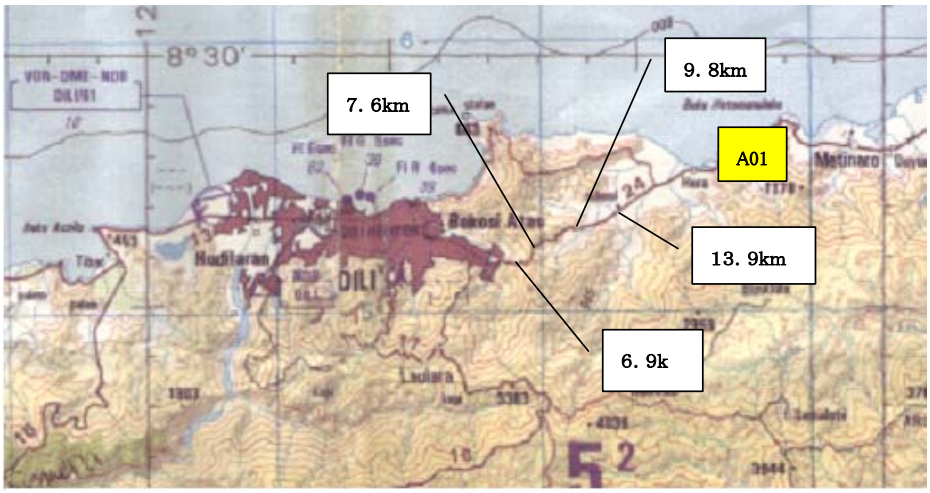
- To include repairing works for main body, road bed and land sliding area.
- To include repairing works for sub-grade course and base course of road.
- To include repairing works for bitumen surface treatment work (including macadam penetration method).
- To include repairing and improvement of drainage works (side ditches and culvert).
- To include up-grading works at the junction of national road and district road.
- There is a river bed, where is required to remove the sand and stone for flood control near the construction site (within 5 km) and easy to get stone, coarse and fine aggregates as the construction materials. It is planned that staff of DRBFC and IGE have a training to get the construction materials from the quarry site.
- Not so far form Dili Town for attending by the staff of DRBFC and IGE.

Selected location for the Case Study was advised in writing to C/P agencies, and they accepted our advice without any objections to execute the maintenance works as the Case Study.

Locations for the Case Study are figured out as below:

Location of case study in 2nd Field Work (Phase 1 and 2)

Location of case study in 3rd Field Work



4.3.2 Preparation of work in DRBFC and IGE

Several kinds of preparatory work are required to execute repairing works at damaged places on the roads. The preparatory work is the important factor for the quality control, progress control and safety control. Guideline of preparatory work for the Case Study was prepared by CBRM not only for the announcement of the purpose and the concept, but also the textbook for the capacity building to the staffs of DRBFC and IGE. CBRM paid the effort to follow up the guideline with C/P agencies. Assistance activities for the staff of DRBFC and IGE before the commencement of actual repairing works are summarized in below:

【Preparation work for the Case Study】

Item	Contents
1) Principal/ objective	- Self –establishment - Review training - Trial of collaboration with other JICA project
2) Selection of site	- The site on the national road to realize the in- house construction by DRBFC and IGE. Consideration with following subjects: a) Repair work on the list of DRBFC

	b) Free from the land acquisition c) Expectation as demonstration and standardization d Repair work for public benefit c) Easy to approach, near the regional office, Close to Dili Town with the consideration of social security
3) Work planning for DRBFC and IGE	- In-house construction project is unavoidable in the case of emergency by disaster. Therefore the corporation between DRBFC and IGE is highly expected. The plan shall be shared by the both parties. - The rental agreement to lease the equipment from IGE should be followed. - The work in the Case Study, which is requested for DRBFC and IGE, is listed in below. （DRBFC） a) Reconnaissance survey b) Construction plan（basic design, construction method, construction period, quantity estimation, estimation of cost）、control cost and documentation c) Equipment list for construction works d) Confirmation with IGE about equipment to be required at the site e) Coordination, negotiation and agreement with IGE by lease contract f) Detail design and quantity survey g) Construction supervision (assignment of personal for responsible engineer, supervisor, test treatment, schedule, supply of materials and man power, safety activity） h) Completion report （quantity, progress） （IGE） a) Condition settlement for lease contract (payment schedule, advance payment, etc.) b) Preparation of equipment based on the list of requirement from DRBFC c) Maintenance of the equipment and record of it d) Arrangement of the mechanics and operators in responsible e) Maintenance work during the Case Study f) Supply of lubrication g) Preparation for mobilization of equipment h) Completion report (record of working day and time) i) Preparation of invoice and request of payment
4) Site plan, management plan, construction method	- Site plan, management plan and construction method shall be established by DRBFC and IGE, and executed by themselves. Items to be considered are as follows: (DRBFC) - Based on the construction method, a) Schedule：based on the item of construction, quantity, numbers of equipment, should establish the schedule chart and control the activity to follow the schedule. b) Quality：based on the specification for soil, concrete, gravel and stone, should establish the quality control and manage the construction. c) Measurement：measurement of work done, comparison with drawing, and control the quantity. d) Cost：monitoring of unit price and control of work amount. e) Man-power：arrange and control of engineers, supervisors, workers. f) Procurement：materials(cement, gravel, sand, stone, hot mix, etc.) and quantity. (IGE) - Based on the management plan, a) Man-power: arrange and control of operators and mechanics. b) Maintenance: daily, periodic check and repair. c) Running record: report and record. d) Security for the equipment on the site and mobilization and demobilization of equipment.

5) Assignment and scope of work	- Assignment and scope of work shall declare in the Case Study and establish the management system on the site. （DRBFC） - Demarcation of central office and regional office, engineer and supervisor. （IGE） - Scope of work for IGE main office - Scope of work for mechanics - Scope of work for operators - Scope of work for equipment manager
6) Plan and activity for safety by DRBFC	- DRBFC shall take initiative and responsible with the cooperation of IGE on the site in the safety measure. - Expected safety measure necessary to execute a) Make sure the safety identification during the operation b) Make sure the safety identification when start the engine and machine c) Confirmation of safety of the work d) Machine check after finish the work - Establish the management in the point of prevention of accident - Considered safety materials a) Warning board to show “under the construction” b) Hand flag for signing to traffic c) Whistle and helmet
7) Mobilization by IGE	- Mobilization of equipment shall be responsible by IGE. - Preparation of equipment for mobilization and maintenance - Mobilization on the required date - Security measure during the work on the site - Demobilization shall be responsible by IGE. - Report and Record of working day and time and input to the database

Source: Data of CBRM

4.3.3 Execution of work

Construction was executed from February 5th 2007 until March 14th 2007 as Phase1 in 2nd Field Work, mainly for course material production and drainage construction. Unfortunately seven (7) working days were disturbed by the evacuation from demonstration. Another construction was executed from April 2nd until 25th as Phase2 of the Case Study in 2nd Field Work, for road construction. Three (3) working days were disturbed by the election campaign in East Timor.

Staff of Dili region and CBRM expert had the time of meeting and communication and instruction on the site. Because of execution of the training for operators of IGE, actual working hours was almost 7 hours per day and 5 working days in the week. Therefore, five (5) weeks duration in original plan was extended to nine (9) weeks including the 10 days disturbance by social movement in 2nd Field Work. This was evaluated as “fair” in the working hour calculation bases as shown in below:

【Duration of construction for the Case Study in 2nd Field Work】

1) Plan :	8hours*6days*5weeks=240hours
2) Actual:	7hours*(5days*9weeks-10days) =245hours

Source: Data of CBRM

【Site management information for the Case Study in 2nd Field Work】

Subject	Description
1) Assignment	- Dili regional office chief : Jose Cornelio: engineer - Dili district responsible : Davi Emanuel: supervisor

	-	Site responsible: Jorge Tiago: assistant supervisor
2) Quality control	-	Following activities were executed. a) Proof rolling test to secure the sub-grade and sub-base course b) Laboratory test for sub-base and base course materials with staff of DRD c) Site check for the stone material and water content control for course construction d) Survey and measure for placing the pipe culvert and masonry works and road excavation e) Water , aggregates and cement content controls for concrete production
3) Progress control	-	Training for operator was programmed and prioritized.
	-	Weekly check of arrangement of equipment
4) Quantity survey	-	Confirmation of quantity with the plan approved by DRBFC
	-	Measurement of quantity by the area
5) Cost control	-	Summarized the site expense and the office expense in Dili regional after phase 2 finished and compared with planned and actual
	-	Additional work of Hot Mix treatment is scheduled by DRBFC central office
6) Man-power control	-	Hiring of common labors from Aipelu village near the site
	-	Skilled worker also hired form village but they had a problem of capability
	-	Equipment operators were supplied from IGE
7) Materials	-	Sub-base and base course, stone, sand materials came form river bed.
	-	Cement, pipe and other materials were prepared by DRBFC.
	-	Bitumen was supplied from DRBFC

Source: Data of CBRM

For the Case Study in 3rd Field Work, after the preparatory work, construction works were started in December 2007 and finished in February 2008. The work was forced to stop from 22nd December to 6th January because of holidays and bad weather. The construction was successfully finished under the advice from CBRM expert. Achieved assistance activities through the Case Study executed in 3rd Field Work are summarized below briefly.

【Implementation for the Case Study in 3rd Field Work】

- Kick off meeting was held on September 26, 2007 for the Case Study in 3rd Field Work. Document submission for approval to treasury in MOF was on October 23 after the completion by DRBFC for the plan of Case Study with cost estimation. Preparation of document was required one month in DRBFC. The document was approved and returned from treasury of MOF on November 7 and it was required 2 weeks. DRBFC sent the document to Secretary of State (SE) for Public Work of MOI for approval. The document traveled from SE to treasury again to request the check for execution of work. Dili regional office received the check for execution of the work for the Case Study on November 27. Two month after the kick off meeting, Dili regional office received the budget for executing the works.

- IGE had troubles with the returning of equipment leased to other agencies in order to keep the system to manage the equipment properly. IGE announced their request to return the equipment to Taci Tole, central office of IGE. DRBFC showed their positive attitude to cooperate the system of IGE. However, there was not welcome to the regional office to return the equipment in rainy season. They thought that some sorts of equipment should be kept in regional office for emergency case. It took one month of time to return the equipment from DRBFC to IGE for maintenance of equipment, having some coordination meetings by CBRM between DRBFC and IGE.

【Duration of construction of the Case Study in 3rd Field Work】

- Plan of DRBFC: 8hours.＊6 working day＊5weeks＝240working hour
- Actual construction: 6 hours (9:00 to 17:00, 1 hour for lunch, 1 hour for moving) ＊ 26 working day = 156 hours for road work
- Remark: The construction period was not including the road surface works which were contracted by private sector and stone masonry works which were disturbed by the lack of cement in the market.

【Site management in 3rd Field Work】

Subject	Description
1) Assignment	- Dili Regional office acting chief : Joao Pedro Amanal: engineer - Dili District responsible : Alexio de Cruz :supervisor - Site responsible: Mouzinho Tilman :assistant supervisor
2) Quality control	- Following activity were executed a) Proof rolling test to secure the sub-grade and sub-base course. b) Laboratory test for sub-base and base course materials with DRD c) Site check for the stone material, and water content control for course construction d) Water content control, cement aggregate content for concrete production.
3) Progress control	- Not worked caused by rainy season - Weekly check of arrangement of equipment
4) Quantity survey	- Confirmation of quantity with the plan approved by DRBFC - Measurement of quantity by the area.
5) Cost control	- Summarized and reported in completion report
6) Man-power control	- Labors were supplied from village peoples near the site. - Operators of equipment were supplied from IGE
7) Materials	- Sub-base material came form river bed - Cement and other materials were prepared by DRBFC. - Hot mix, stone masonry, base course were contracted with private sector.

Source: Data of CBRM

The collaboration with other Technical Cooperation Project of JICA was held in the construction activity on A01－7.6 km point of the Case Study in 3rd Field Work. The simulation (participant from university is also expected) of maintenance work at the damaged place caused by land sliding such as the work flow for emergency recovering, the methodology of investigation, method of design, etc. was executed. It was the good chance to let them know about whole of the work scheme of recovering works at the damaged place due to land sliding, which are often occurred in East Timor. The scenario for collaboration was shown as below:

a) The damage of the road due to land sliding shall be temporary rehabilitated as soon as possible for traffic safety.

b) In order to plan the permanent treatment for the damaged area, it is required to do some check work with investigation at damaged area.

c) Should decide the item and size of investigation taking into consideration of the causes of damaged portion due to land sliding.

d) Execution of investigation work with certain period.

e) Based on the investigation, should start to plan and design for permanent countermeasure works to that area.

f) Based on the plan and design, permanent treatment should start.

The above item a) and b) was carried out by CBRM through the Case Study, on the other hand, item c), d) and e) was handed by the team of "The Project for Capacity Development by Training and Preparation of Guidelines and Manuals for Roads".

4.3.4 Completion of work

After the site activity, in order to clear the item of budget and /or cash flow, it is necessary to summarize what work has been done, how the work has been done and how much work has been done. Therefore, CBRM presented the plan of completion report to be prepared by DRBFC through the Case Study. Completion report should be prepared by responsible person(s) for the construction site like regional engineer, supervisor(s) or assistant supervisor(s). It should be submitted to DRBFC and MOI and other agencies, describing the following issues:

【Contents of Completion Report】

Item	Contents of Item
1) Title of the maintenance works	- Title of the project / maintenance works indicating simply the kinds of works and its place
2) Site of the works	- Place of the works indicating of number of the arterial road and its Km point and name of District, name of village
3) Responsible agencies for the maintenance works	- Name of the Regional office of DRBFC, name of engineer, supervisor(s) and assistant supervisor(s) to have the responsibility for the works
4) Execution period	- Starting date and completion date of the construction works at site
5) Progress	- Achieved actual progress comparing with the original schedule of the works
6) Work quantities and cost	- Final work quantities and construction cost including lease amount of the equipment from IGE should be summarized with this report comparing with scheduled construction cost prepared in the stage of construction plan. - Construction equipment used at site should be clearly mentioned regarding the numbers of equipment and kinds of equipment and the used period.
7) Manpower and supplier	- Used numbers of common labors and skilled labors/technicians at the site excluding operators and mechanics supplied from IGE with IGE's construction equipment. - Suppliers of materials should be summarized with name of suppliers and kinds of materials which was supplied to the site.
8) Others	- When it is considered to summarize in the completion report, like problems during construction time, etc. should be clearly reported in the completion report.

4.3.5 Achievement and evaluation of activities through the Case Study

Through activities of the Case Study, CBRM mobilized site seminars, meetings and presentation of the report. CBRM pursued an establishment of the self operation and maintenance system in both organizations of DRBFC and IGE and capacity building to technical staff of them.

Achievement, evaluation and advice from the case study activities are summarized in below:

- Civil technicians took the leader-ship during the construction in the Case Study. DRBFC watches the private sector to execute the road works with increased budget. On the other hand, IGE watches the self standing by leasing of the equipment of IGE. Taking into the consideration of the above, CBRM presented the good example for their development through the Case Study.
- In the beginning of CBRM, the objective of the Case Study was just as "to learn the construction technology". Therefore, CBRM started the Case Study to measure the capability situation of staff of C/P agencies. After measurement of their capability, it was found that CBRM should transfer mainly to the staff of C/P agencies the knowledge for the road maintenance works to execute properly and systematically. The Case Study showed the example how to use the equipment of IGE for the road maintenance work, even the equipments of IGE are not so suitable for the small construction works. It also showed how to cooperate between DRBFC and IGE each other in the situation under the different organization. It was convinced that those presentations were surly encouraged C/P agencies to execute their obligations.
- The construction equipments used in the Case Study were provided by IGE with lease method. After completion of the case study operation, IGE sent an invoice for hire charges of the equipment to DRBFC for final payment based on mutual consent between IGE and DRBFC with the lease agreement. The payment should be made in conformity with regulation and procedure of the Government of East Timor. It is convinced that this procedure can be useful for the In-house project and emergency construction by disaster.
- Trough the Case Study, staff of DRBFC understood that it was important to carry out preparatory work properly before starting actual construction works. And they learned that the maintenance works should be planned based on the typical standards or sections for the kinds of roads such as arterial (national) roads, district roads, etc. They should be clearly distinguished or decided by DRBFC.
- Through the Case Study, staffs of DRBFC were understood that proper construction of base course and sub-base course is very important to secure the roads safely. They also learned the quarry method for base course material and sub-base course material from river bed. Importance of proper construction of drainage facilities to protect the roads from local flood by heavy rain was also recognized by the staff of DRBFC through the Case Study.
- Regional staffs of DRBFC and operators, mechanics of IGE were participated in the Case Study positively so that they could take the style of the execution in own budget of DRBFC. Regional staffs that were responsible for the Case Study had experiences for road construction works at site more than expected. They executed a realistic solution on the site.
- CBRM promoted the joint meeting between DRBFC and IGE to set the monitoring of cash-flow and document-flow. CBRM encouraged the construction management/

administration rather than engineering matters through the Case Study because that insufficient management of both agencies for road maintenance works was observed.

- In the project management through the Case Study, it is recognized that there is an unbalance between the capability of construction management and the other management such as documentation management, quality management by using the laboratory (relation with DRD), capacity of organization for design, administration coordinated with MOF for using the budget, etc. These will be closed up as the subject for capacity building in near future.
- All equipments, which had been donated by Japan after completion of PKO, had been selected for the construction of heavy earth works, especially in the emergency recovery works by disaster. Therefore, in case of only the maintenance work, the equipment is not suitable to use fully in efficient condition. All equipments have already been 5 years including activities of PKO, but they had showed short working hours compared with the usual condition of equipment with 6 years of depreciation. Therefore, it might be expected the equipment would be able to continue to contribute under the well maintenance with appropriate capacity and number of staffs and enough budget for purchasing of spare parts.
- DRBFC has been kept the equipment of IGE such as Loader, Excavator, Bulldozer and Motor-grader by the reason that they are useful in many cases. DRBFC has kept operators by themselves and equipments have been used for the road works. On the regulation, DRBFC can ask mechanics of IGE when the repair of equipments is required, but the management of DRBFC is not for the prevention of break down. In regional offices of DRBFC, there have been supplied many instruments and tools for the construction works. However many of them are not ready to use because of lost, breakdown, less management and less knowledge of how to use including the survey instruments. These situations should be improved for efficient use of equipment and tools near future.

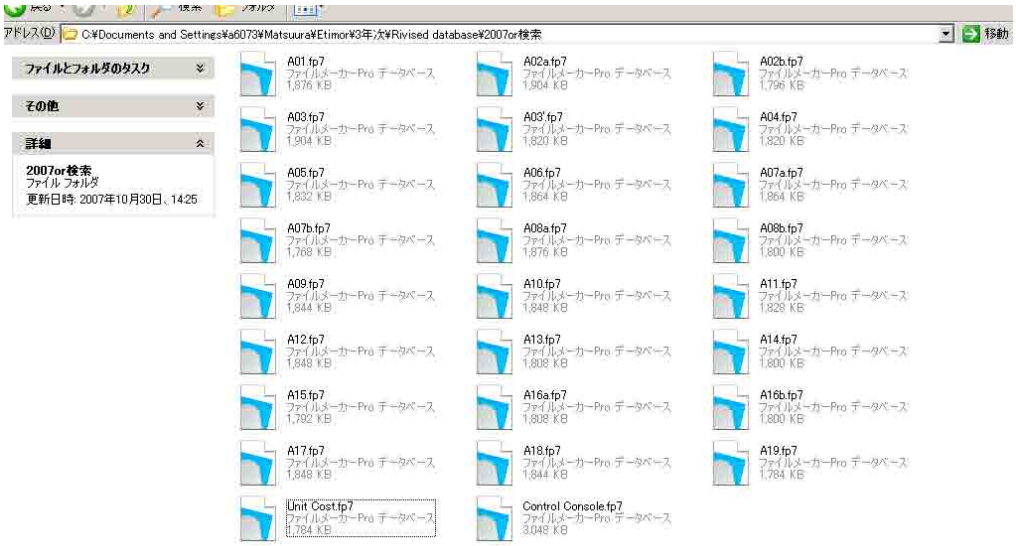
4.4 Products by the Project (CBRM)

4.4.1 Road maintenance inventory database

Two kinds of road maintenance database were prepared such as the road maintenance database and the bridge maintenance database. Former was prepared and improved in 1st, 2nd and 3rd Field Work of CBRM and inputted the data with updated inventory survey results for all arterial roads in East Timor. On the other hand, the latter was prepared in 3rd Field Work according to the desire of DRBFC, which was specially prepared for only bridge maintenance and is now gathering inventory data by DRBFC. The road maintenance database was submitted to DRBFC in January 2006 and July 2007 which is the end of 1st and 2nd Field Work. Final ones including the bridge maintenance database were submitted to DRBFC in February 2008 with instruction book and guideline of the database with software. The database system is briefly introduced as below:

【Road and Bridge Maintenance Database system】

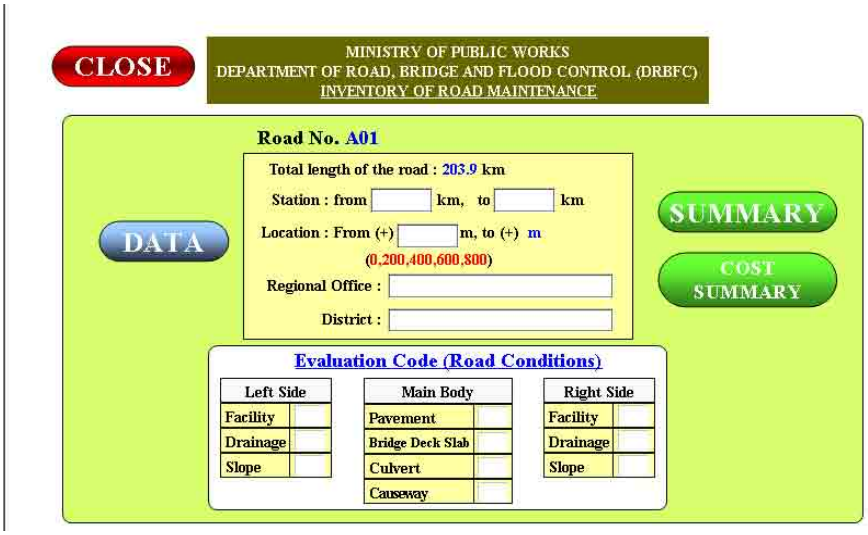
“Road Maintenance” folder and “Bridge Maintenance” folder consist of respective arterial (national) road file, from A01 to A19 and unit cost file.



The national road files have following 6 types of browse page. In case of the bridge maintenance database, 3 types of browse page are prepared.

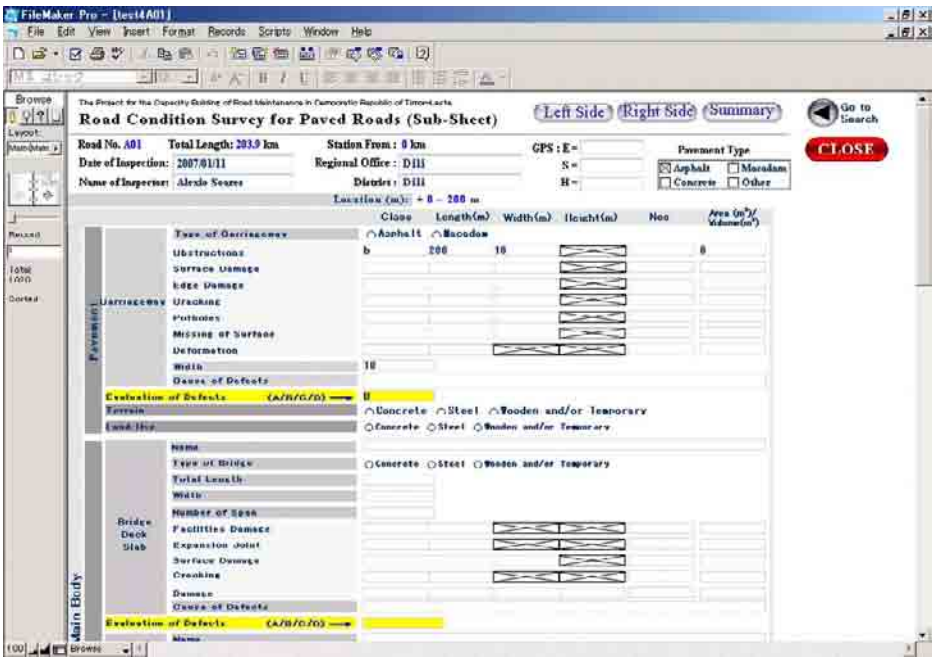
①Search page (for Roads and Bridges)

This page shows the original data, summary of evaluation of defects and summary of cost information based on location or evaluation code.



②Original data page (for Roads and Bridges)

This page shows the input data on the appropriate boxes according to the result of inspection.



③Detail cost information page (for Roads and Bridges)

The page indicates the estimation of defect cost with the quantity data from original data page and unit cost from unit cost file.

④Summary of cost information page (for Roads)

⑤Summary of defects page (for Roads)

⑥Summary of cost information by level of defects page (for Roads and Bridges)

These pages are linked each other and showing 3 types of summary of cost. The grade of defects and the bases of evaluation can be followed by the understanding of criteria of the condition survey for roads and bridges as shown below Table 4.13.

Table 4.13 List of Criteria for Condition Survey of Roads and Bridges

Database	Inspection place	Defect Grade	Description of Defect Grade
Road maintenance database	Facilities, Foot Path, Kerbed Stone, Safety protection	A	Routine inspection shall be continued.
	Drainage, Lined Ditch, Crossing Pipe, Pit	B	Routine Maintenance such as supply contract can be complied.
	Slope, Slope, Protection Structure, Shoulder	C	Periodic Maintenance such as project contract can be complied.
	Pavement, Asphalt Concrete, Macadam, Dart	D	Urgent action is required.
	Bridge Deck, Culvert, Causeway		
Bridge maintenance database	Superstructure, Truss, Girder	A	Routine inspection shall be continued.
	Substructure, Abut, Pier	B	Routine Maintenance such as supply contract can be complied.
	Accessory, Rip Rap, Ground Sill, Wing Wall	C	Periodic Maintenance such as project contract can be complied.
		D	Urgent action is required.

Source: Data of CBRM

4.4.2 Road Maintenance Plan

"Road Maintenance Plan" was drafted in 1st Field Work and submitted to C/P agencies in January 2006. In this time it was explained and discussed with C/P agencies. In 2nd Field Work, executive summary for this draft one was prepared and translated in Tetum language and distributed 15 sets of English version and 50 sets of Tetum version to C/P agencies so as to make public relations in DRBFC, IGE, MPW (old Ministry) and get their comments. This was finalized and submitted after discussion with C/P agencies in July 2007. Executive summary for final one was prepared again in 3rd Field Work and translated in Tetum language and distributed for all regional offices of DRBFC to enlighten their consideration about road maintenance works on arterial roads. Outline of this report is summarized in Section 4.1.2 hereinbefore.

4.4.3 Manual for Reporting System in Normal Condition

"Manual for Reporting System in Normal Condition between the Central Office and Region Offices for Road Maintenance on Arterial Roads" was drafted in January 2006 with due discussion with C/P agencies in 1st Field Work. It was explained to C/P agencies and submitted for their review. In 2nd Field Work, executive summary of this draft was prepared and translated in Tetum language. Executive summary was submitted to C/P agencies with fifteen (15) sets of English version and fifty (50) sets of Tetum version to make public relations to all staff of C/Ps and get some comments for the draft one. Draft Manual in Normal Condition was finalized and submitted in July 2007 after discussion with C/P agencies. In 3rd Field Work, executive summary for final one was prepared and translated in Tetum language. This was distributed to all regional offices of DRBFC to enlighten the staff of DRBFC regarding the reporting system between central office and regional offices for road maintenance works of arterial roads in East Timor. Outlines of this Manual are summarized in Section 4.1.3 hereinbefore.

4.4.4 Manual for Reporting System in Emergency Case by Disaster

"Manual for Reporting System in Emergency Case by Disaster" was drafted in January 2006, 1st Field Work. This was explained and submitted to C/P agencies for their review in that time. In 2nd Field Work, executive summary was prepared and translated in Tetum language. Fifteen (15) sets of English version and 50 sets of Tetum of this executive summary were submitted to C/P agencies so as to make public relations and to get their comments. Draft Manual in Emergency Case by Disaster was finalized and submitted in July 2007 after discussion with C/P agencies. In 3rd Field Work, executive summary for final one was prepared and translated in Tetum language again. This was distributed to regional offices to enlighten their consciousness regarding reporting system between the central office and regional office in 3rd Field Work. Outline of this manual is summarized in Section 4.1.4 hereinbefore.

4.4.5 Equipment management database

As of February 2008, IGE manages the total number of around 170 machines (construction equipments, vehicles, generators, construction attachments for construction equipment etc.). In order to facilitate the management work and operate it efficiently, inventory of these machines was prepared as a form of database. Composition and contents of equipment management database are mentioned in Item 2 of Section 4.2.2 hereinbefore.

Inventory contains the basic data for each machine such as machines' specifications (make, model, serial number etc.) and registration data (registration number, management code number etc.), and theses basic data are shared with other database. Final database for the equipment management database as of February 2008 was submitted to IGE in February 2008 including software.

4.4.6 Training material and textbook

Several kinds of training materials and textbook for capacity building to the staff of C/P agencies had been prepared during the Project, 1st, 2nd and 3rd Field Work. Lists of training materials and texts prepared and used during capacity building to the staff of C/P agencies by CBRM were summarized in Table 4.14 to Table 4.17

Table 4.14 Materials and Textbooks for Training to DRBFC staff

Training Material		Contents
1	The Road Maintenance Database	- Arterial (national) road file from A01to A19 and unit cost file. - The national road files have 6 types of browse page.
2	The Bridge Maintenance Database	- National road file from A01to A19 and unit cost file. - The national road files have 3 types of browse page.
3	The Road Maintenance Plan and Executive Summary in English and Tetum language	- Results of road maintenance inventory survey - Classification between road maintenance and road rehabilitation - Priority of arterial roads for road maintenance - Existing road maintenance plan on arterial roads - Procedure for road maintenance plan on arterial roads - Road maintenance plan on arterial roads - Emergency maintenance work
4	Manual for Reporting System and executive summary in English and	- Duty of central office - Duty of regional office - Inspection stage

	Tetum language	- Planning stage - Implementation stage
5	Manual for Reporting System in Emergency Case by Disaster and executive summary in English and Tetum language	- Emergency maintenance work - Duty of central 0ffice - Duty of regional office - Inspection and arrangement stage - Implementation stage of recovery work - Completion stage
6	Instruction Book for the maintenance database in English and Tetum	- How to establish the database - How to operate the database - How to use the database
7	Guideline for the maintenance database in English and Tetum	- Operation of the database for road maintenance - Operation of the database for bridge maintenance - Trouble -shooting
8	Preliminary Study for the Case Study	- Selection of the site and preliminary study for the case study - Formulation of management plan of DRBFC and IGE - Formulation of site management plan - Definition of job description and capacity building program - Formulation of safety training program
9	Data for T/T Seminar, September 2005 in English and Tetum	- Objective of the Project - Policy of the Project - Definition of maintenance work
10	Data for T/T Seminar, September 2005 in English and Tetum language	- Objective of road maintenance inventory survey - Introduce the road maintenance inventory - Explanation of the concepts of road maintenance inventory - Explanation of the activities for road maintenance inventory
11	Data on Site Seminar in Dili/Case Road Rehabilitation Project, November 2005	- Objective of seminar - Introduction of the project - Explanation of the work on progress - Explanation of the quality control management - Explanation of the test on situ - Organization and equipment
12	Data for T/T seminar, December 2005	- Instruction of road condition survey - Methodology of road condition survey - Results of road condition survey
13	Data for T/T seminar, December 2005 in English and Tetum	- Objective of CBRM activities - Reference to Manual for Reporting System - Reference to Road Maintenance Plan
14	Data of Workshop, March 2007	- Introduction of CBRM activities - Schedule of CBRM activities
15	Data of Workshop, March 2007	- Objective of the road maintenance database - Introduction of the road maintenance database - Explanation of the condition survey
16	Data of Workshop, March 2007	- Explanation of quality control management in the Case Study - Explanation of the test on situ in the Case Study - Organization and equipment in the Case Study
17	Data for T/T seminar, May 2007	- Database for the road maintenance work - Case study
18	Data for Workshop, December 2007	- Introduction of the database for road maintenance - Introduction of the database for bridge maintenance - Explanation of the concepts and revision - Explanation of the operation
19	Data for Workshop December 2007	- Objective of the Case Study - Presentation of the work with available equipments - Explanation of technical subjects - Explanation of the quality control management - Explanation of the test on situ - Organization and equipment management

Source: Data of CBRM

Table 4.15 List of Texts for Training on Equipment Management

	Training Materials	Contents
1	Machinery Management	Outline and procedure of the machine management (Slide and
2	Parts procurement procedure	Outline of spare parts procurement procedure (Slide presentation)
3	Machinery Management (database)	Database for equipment management
4	Equipment/Vehicle Operation Record	Machine operation record (used in actual operation for gathering
5	Machine Operation Cost	Machines' operation cost, maintenance cost
6	Parts Order Form	Parts order form (used in actual operation)
7	Work Order Form	Work order sheet (used in actual operation)
8	How to operate database (set)	Manuals for database
9	Equipment Catalogue	Introduction of equipment and Vehicles under control of IGE
10	Machinery Management System	How to operate IGE's equipment management system
11	Lending Control	Check-out & Check-in procedure
12	Procurement procedure	Parts procurement procedure
13	Repair management	Workshop operation procedure
14	Workshop operation	Workshop operation procedure
15	International trade	Outline of the import procedure
16	Training materials for Case Study	Training program, operation plan, sample of lease agreement , etc.

Source: Data of CBRM

Table 4.16 List of Texts for Mechanic Training

	Training Matetials	Remarks
1	Safety Work (textbook/slide presentation)	Tetum/English
2	Workshop Regulations (textbook)	Tetum/English
3	Mathematics (textbook/slide and animated presentation)	Tetum/English
4	Weight and Measure Conversion Table	English
5	Motor vehicle Engineering (slide presentation)	Figures
6	Principles of Engine (textbook/slide and animated presentation)	Tetum/English
7	Fuel system (textbook/slide and animated presentation)	Tetum/English
8	Torque (textbook/slide and animated presentation)	Tetum/English
9	Pressure (textbook/slide and animated presentation)	Tetum/English
10	Power Train (textbook/slide and animated presentation)	Tetum/English
11	Electric (textbook/slide and animated presentation)	Tetum/English
12	Hydraulic System (textbook/slide and animated presentation)	Tetum/English
13	Periodical Maintenance Record (Maintenance Manual)	Tetum
14	Toyota Prado Diagnosis (Repair Manual)	Tetum/English
15	Magnetism (textbook/slide and animated presentation)	Tetum/English
16	Motor & Alternator (textbook/slide and animated presentation)	Tetum/English
17	Gas Welding (Safety) (textbook/slide presentation)	Tetum/English
18	Lubricants (textbook/slide presentation)	Tetum/English
19	Wheel & Tire (textbook/slide presentation)	Tetum/English
20	Steering System (textbook/slide and animated presentation)	Tetum/English
21	Brake System (textbook/slide and animated presentation)	Tetum/English
22	Hydraulic System (textbook/slide and animated presentation)	Tetum/English
23	Diesel Engine Basic (animated presentation)	English
24	Inline Engine (animated presentation)	English
25	Power Train (Const Machine) (slide presentation)	English
26	D65, D41 Bulldozer Safety Switch (Repair Manual)	Tetum/English
27	KOBELCO SK200 Excavator S Motor Circuit (Repair Manual)	Tetum/English
28	IGE Power Supply (electric wiring diagram)	English
29	D65, Bulldozer Charging Circuit (animated presentation)	English
30	Training Aid for Electric System	
31	Fuel Injection Pump (textbook/slide and animated presentation)	Tetum/English
32	Planetary Gearing (textbook/slide and animated presentation)	Tetum/English
33	BD2J, Bulldozer Brake & Steering Clutch (Repair Manual)	Tetum/English
34	Bulldozer Power Train (textbook/slide and animated presentation)	Tetum/English
35	D41, D65 Bulldozer Power Train (Repair Manual)	Tetum/English
36	Equipment Carrier Brake System (textbook/slide and animated presentation)	Tetum/English
37	Motor Grader Brake System (textbook/slide and animated presentation)	Tetum/English
38	Starting & Charging Circuit, Komatsu KOBELCO, Hitachi, Kawasaki, Mitsubishi (Repair Manual)	Tetum/English
39	Engine Trouble Diagnosis ISUZU FS33H4 (Repair Manual)	Tetum/English
40	Engine Trouble Diagnosis ISUZU NPS (Repair Manual)	Tetum/English
41	KOBELCO SK200 Safety Circuit (Repair Manual)	Tetum/English

Source: Data of CBRM

Table 4.17 List of Texts for Operator Training

	Training Material	Remarks
1	KYT texts (slide presentation)	
2	Construction work execution procedure	Tetum/English
3	Daily inspection sheet	Tetum/English
4	Procedure of machine operation technical skill test	Tetum/English
5	Handouts	Tetum/English

Source: Data of CBRM

4.4.7 Other reports submitted by CBRM

(1) Report on Preliminary Study for the Case Study

In order to enlighten the staff of C/P agencies, reports on "Preliminary Study for the Case Study was submitted in January 2007, 2nd Field Work. This report mentioned what kind of work to be required for the Case Study and general road maintenance works. This report was composed i) introduction, ii) selection of the site and preliminary study for the Case Study, iii) formulation of management plan of DRBFC and IGE, iv) formulation of site management plan, v) definition of job description and capacity building program for the staff of C/P agencies and vi) formulation of safety training program.

(2) Guideline of the Road Maintenance Database and the Bridge Maintenance Database

Guideline for road maintenance database was prepared in "Version 1" in 2nd Field Work so as to train and instruct to staff of DRBFC how to use the road maintenance data base. In 3rd Field Work, according to modification of the road maintenance database and adding the bridge maintenance data base in 3rd Field Work, guideline of the road maintenance database and the bridge maintenance database "Version 2" was prepared and submitted to DRBFC in February 2008 mentioning how to use the database. Training how to use the database had been continuously executed to the staff of DRBF in 1st, 2nd and 3rd Field Work. Brief contents of this guideline are shown below:.

【Outline of Guideline】

Composition of the Guideline	Contents
1. Introduction	- General description - System requirement - Installation of File Maker (Soft ware of database)
2. Operation of the road maintenance database	- Outline of the road maintenance database system - Input the data - Operation of the road maintenance database system
3. Operation of the bridge maintenance database	- Outline of the bridge maintenance database - Input the data - Operation of the bridge maintenance database
4. Trouble shooting	- Results of searching doesn't appear - Cost information doesn't appear

Sauce: Data of CBRM

(3) Instruction Book for the Road Maintenance and the Bridge Maintenance Database

Instruction book for the road maintenance database and the bridge maintenance database was prepared and submitted to C/P agency in February 2008, 3rd Field Work. This was prepared so as to make the staff of DRBFC understand the composition of the databases, contents of the databases and principal theory of the database including how to estimate the repairing cost in the database at defect places. The following shows the outline of Instruction Book:

【Outline of Instruction Book】

Composition of the Instruction Book	Contents
1. Introduction	- Purpose of instruction book
2. How to establish the database system	- Survey of Km posts and route map - Establishment of the inventory (condition survey) - Proposal of typical construction cost
3. The database system	- As mentioned in Guideline
4. How to use the database system	- Maintain the Km post system - Asset condition survey - Update of cost data - Support system for bridge planning

Sauce: Data of CBRM

Chapter V
Project Evaluation

Chapter V

PROJECT EVALUATION

5.1 Summary of Achievements

Project achievements are summarized as below comparing to PDM.

【Summary of Achievements】

Narrative Summary（PDM）	Objectively Verifiable Indicators（PDM）	Summary of Achievements	Important Assumptions（PDM）
Project Purpose: Capabilities on daily and periodic maintenance/ repair of arterial roads and restoration against road disaster areas on arterial roads are strengthened.	1. Quality and renewal frequency of road inventory 2. Quality of maintenance and repair works 3. Quality and renewal frequency of inventory of construction equipment and repair equipment/tools 4. Number of training participants	- Database for road maintenance had been prepared and used for the budget planning by DRBFC. - Maintenance and repairing works had been trained through the Case Study and popularized in C/P. - Database for equipment management system had been prepared and had been trained to staff of IGE so as to use by IGE itself for proper management. - Participants for training on DRBFC were 525 man-days through the Project. - CBRM trained continuously to 6 ~ 8 persons for equipment management system, 20~30 persons for mechanics and operators of IGE continuously through 1st ~ 3rd Field Work.	Number of vehicles in East Timor does not increase drastically.
Outputs: 1 Appropriate works for maintenance and repair of arterial roads are planned by DRBFC.	1-1 Preparation of an road inventory 1-2 Updated the road inventory 1-3. Preparation of report on maintenance and repair plan	- Road maintenance database had been arranged and used in DRBFC. - Database was improved so as to estimate the maintenance cost in it and updating was executed. Budget planning for DRBFC was done by using the database as to road maintenance works. - "Maintenance Plan for Arterial Roads in East Timor" had been prepared. After discussion with C/P, it was finalized and submitted to C/P.	Trained staff remains and continue to work for the Project. Budgets for road maintenance / repair programs and maintenance of equipment/ tools are provided continuously
2. Road management system, which central and regional road offices cooperate each other, is formulated.	2-1 Preparation of manual for reporting system on road. 2-2 .Preparation of disaster manual for reporting system on road management between central and regional road offices.	- Manual for Reporting System in Normal Condition had been prepared. After discussion with C/P, it was finalized and submitted to C/P. - Manual for Reporting System in Disaster Condition had been prepared. After discussion with C/P, it was finalized and submitted to C/P.	
3. The staff	3-1. Number of road	- Staffs of DRBFC are not distinguished	

members of DRBFC and IGE, who are responsible for the maintenance and repair works of arterial roads, are trained.	maintenance management engineers who acquired specified technologies 3-2. Number of road construction management engineers who acquired specified technologies 3-3. Number of equipment/tools management engineers who acquired specified technologies 3-4. Number of mechanics who acquired specified technologies 3-5. Number of operators who acquired specified technologies	between road maintenance engineer and construction supervision engineer. - One of the capacity buildings to DRBFC was the road maintenance database so as to make a systematic road maintenance plan by using the database by DRBFC itself. - As a result of the support of CBRM, DRBFC prepared their budget planning for the road maintenance in arterial roads by using the database. - Capacity building for construction supervision had been done through the Case Study at actual construction sites. - Around 40 technical staff including engineers, supervisors and assistant supervisors of DRBFC in total acquired the technology for the repairing/ maintenance works through the Project directly or indirectly. - As for technical transfer of equipment management system for IGE, nice (9) staffs of manager class in charge of IGE had been trained. - Seven (7) staff was concentrated in training so as to manage the database by IGE itself. - Nineteen (19) mechanics had been trained through 1st ~ 3rd Field Work. Results of training for mechanics of IGE had been gotten. - Operators of IGE had been trained in 15-20 operators. As a result of training, almost all operators who couldn't operate at initial stage had been able to work at construction site by using the heavy equipment.	
4. The case studies of management plan on the maintenance and repair works of arterial roads are appropriately planned, designed and implemented by DRBFC & IGE.	4-1 Formulation of maintenance management plan (formulation of process control, construction method, quality control, work progress control, cost management systems). 4-2. Formulation of site management plan (formulation of equipment management, safety management, environment management, by-product management	- Through the Case Study, capacity building to DRBFC had been executed by preparation of the report regarding construction plan/ site management plan and executed by explanation of it. - The Case Study had been executed by using the budget of DRBFC at the site to be required the repairing works. - Lease system for the construction equipment of IGE had been trained between DRBFC and IGE as to contract agreement and equipment management system, etc. through the Case Study. - Safety trainings had been done at every time to equipment operators during operators' training with lecture and site. - Two (2) times of the Case Study were executed by 1st Phase (Feb.5 – Mar.14, 2007) and 2nd Phase (Apr.02 – Apr.25, 2007) in 2nd Field Work of CBRM. - In 3rd Field Work, the Case Study was	

	systems) 4-3. Number of safety training programs 4-4. Condition of practical training	executed up to February 2008 according to the progress achieved by DRBFC. - Two (2) times of the site seminar were done at the site of Case Study in order to inform the technology to the staff of DRBFC widely.	
5. The operation system for construction equipment and repair equipment / tools is appropriately maintained and managed by IGE	5-1 Preparation of inventory of construction equipment and repair equipment/tools 5-2 Updated inventory of construction equipment and repair equipment/tools 5-3 Establishment of maintenance management system for construction equipment and repair equipment/tools (formulation and operation systems for i)lending, ii)procurement planning for parts, iii)operation record, iv)trouble shooting record, v)periodic maintenance plan, vi)repair ordering plan) 5-4 Formulation of management plan for construction equipment and repair equipment/tools necessitated in the regional offices	- The database for construction equipment management system was prepared in 1st Field Work. - Updating of the database had been done at any time when required. - It is the most important that IGE should manage the equipment by IGE itself. Training for management system had been continuously executed by CBRM to the staff of IGE. - In order to manage properly by IGE, systematic data collection, equipment allocation plan and arrangement plan, etc. would be strongly required. Regulation for equipment allocation should be required and kept strongly so as not to request directly with irregular method by high persons or organizations of IGE. - Regional offices are controlled by DRBFC. IGE intends that the equipment of IGE should be controlled by central office of IGE, Taci Tolu, Dili so as to maintain them properly. Permanent or semi-permanent allocation of the equipment to regional office is not considered by IGE. If the equipment would lease permanently or semi-permanently to borrowers, the equipment would be left without any maintenance at the site remaining the trouble condition of them. - Maintenance work for the equipment is to be done at central office of IGE, Taci Tolu, and they are to allocate at required places, agencies and etc.	

Source: Data of CBRM

Activities:

1-1 Prepare a road inventory
1-2 Update the road inventory
1-3 Prepare the maintenance and repair plan for each arterial road, based on each development level.

2-1 Prepare a manual for reporting system on road management between central and regional road offices.
2-2. Prepare a manual for reporting system on road management in the case of disasters between central and regional road offices.

3-1 Formulate and implement training program for the following personnel in collaboration with DRBFC and IGE.
(1) Road maintenance management engineer
(2) Road construction management engineer
(3) Equipment/tools management engineer
(4) Mechanic
(5) Operator

4-1 Formulate a maintenance management plan.
4-2. Formulate a site management plan.
4-3. Define job description of the duties of staff members concerned.
4-4. Formulate a safety training program concerning the works on the maintenance and repair of arterial roads.
4-5. Implement the safety training program.
4-6 Implement case studies-concerning road maintenance and repair of arterial roads appropriately in MPW's project.

5-1 Prepare an inventory of construction equipment and repair equipment/tools and establish its management system.
5-2. Update the inventory of construction equipment and repair equipment/tools.
5-3. Formulate a management plan for construction equipment and repair equipment/tools in the regional road offices.
5-4. Establish a maintenance system of construction equipment and repair equipment/tools in IGE.
5-5. Operate construction equipment and repair equipment/tools appropriately.

Inputs (Japanese Government)

Long-Term Experts
- Team leader/road management engineer : 1 person
- Road construction management engineer : 1 person
- Equipment/tool management engineer 1 (procurement/management) : 1 person
- Equipment/tool management engineer 2 (mechanic training) : 1 person
- Training for equipment operators : 1 person

Short-Term Experts
None

Equipment
- JFY 2005 (1st Year) : 10,228 Thousand J Yen (89, 121 US$)
- JFY 2006 (2nd Year) None
- JFY 2007 (3rd Year) None

Budget for field activities
- JFY 2005 (1st Year) 14,837 Thousand J Yen (Actual; including equipment and sub-contrator expense)
- JFY 2006 (2nd Year) 9,053 Thousand J Yen (Actual)
- JFY 2007 (3rd Year) 8,897 Thousand J.Yen (Anticipated)

Counterpart Training in Japan
- JFY 2005 : One person
- JFY 2006 : None
- JFY 2007 : None

Inputs (East Timor Government)

Counterparts
(DRBFC)
Arranged as required
(IGE)
Arranged as required

Trainees
(DRBFC)
Arranged as required
(IGE)
Arranged as required

Facilities
- 2 Project offices at DRBFC（Dili） and IGE (Taci Tolu)

Counterpart Budget
There was no planning for special budget to CBRM. Construction cost for the Case Study at the site to be required maintenance works was spent by DRBFC budget as below:
JFY 2006 (2nd Year) : 48,958 US $ (applox. 5,630 Thousand J Yen)
JFY 2007 (3rd Year) 97,916US$ (applox. 10,771 Thousand J Yen）

Note: Detailed data for the input are available in the 'Input data sheet' attached as annex.

Source: Data of CBRM

5.2 Relevance

The relevance of the Project would be found as summarized below:

【Project Relevance】

(1) Relevance of overall goal - Is the overall goal consistent with needs of beneficiaries? - Is the overall goal consistent with development policy?	- Since the budget for road works has been increased in East Timor, the overall goal has been consistent with need of beneficiaries. - The overall goal has been consistent with development policy in East Timor since it is considered that the road maintenance and improvement works is one of the most important development policies in East Timor.
(2) Relevance of Project Purpose - Is the project purpose consistent with the overall goal? - Is the project purpose consistent with needs of implementing agencies?	- In order to achieve the overall goal, project purpose is directly relevant and consistent with the overall goal. - Direct responsible agency for road maintenance is DRBFC, which makes efforts to implement the systematic maintenance works within the limited numbers of staff. The project purpose has been consistent with needs of implementing agency, DRBFC. - IGE has taken over the equipment transferred mainly from Japan, which had been used by Japan Engineering Group (JEG) on Peace Keep Operation (PKO) activities. Those many numbers of equipment have been fully used in East Timor by supporting of CBRM activities. Since the equipment is fully and widely used in East Timor, CBRM activities would be appreciated in the country. Though the equipment is rather big to execute minor repairing works of the roads, they are highly necessary for recovery works on damaged road by disaster. - Though IGE has young organization, which was established in 2004, IGE makes their earnest efforts to systematic management of equipment of IGE. The project purpose has been consistent with needs of implementation agency, IGE.
(3) Relevance of project design (Setting of project purpose, mutual relations between project purpose, outputs and inputs, implementation plan)	- Though the project was interrupted during 2nd Year due to disturbance of East Timor, it was not necessary to change the project purpose and implementation plan except that implementation period was changed. Initially, the Project was scheduled to complete in November 2007, but after interruption, to complete in March 2008. - Ministries of upper organization for DRBFC and IGE that are C/P agencies of CBRM were re-structured two times during project implementation period. However, since DRBFC and IGE themselves have not any changed, it was not necessary to change activities of CBRM.
(4) Factors lowered relevance (With view points of grasping needs, designing project, implementing organizations, supporting system in Japan, etc.)	- There was no factor lowered relevance during CBRM activities through 1st, 2nd and 3rd Field Work except interruption (6 months) of the project activities in 2nd Year due to disturbance of East Timor.

Source: Data of CBRM

5.3 Effectiveness

Degree of output produced by the Project contributes to the Project Purposes and Activity contributes to the Output as shown below:

【To what extent each Output contributes to Project Purpose】

Outputs	
Output 1(PDM) : Appropriate works for maintenance and repair of arterial roads are planned by DRBFC.	- Budget plan from 2008 and future five years was done by DRBFC itself using the database for road maintenance prepared by CBRM. - DRBFC now recognizes the importance for the database including road condition survey in order to make systematic maintenance plan and works as results of CBRM activities. - It is generalized in DRBFC that staff of DRBFC are pointed by road number and Km points at damaged places as results of installation of Km posts on all arterial roads by CBRM. - Prioritization for road maintenance works, rehabilitation works and improvement works on several arterial roads are made on the planning for road works by utilizing the road maintenance database prepared and trained by CBRM. "Road Maintenance Plan" prepared by CBRM with due discussions with C/P are described how to prioritize of road maintenance works including rehabilitation, improvement and new construction of roads.
Output 2 (PDM): Road management system, which central and regional road offices cooperate in each other, is formulated.	- Verbal reporting between central and regional offices had been usually done when required. - Due to deficit of staff numbers of DRBFC, close cooperation of central office and regional offices had been required in order to carry out road works smoothly. - Management for road maintenance works is now executed in DRBFC based on the road maintenance database arranged and trained by CBRM. - Reporting Manuals between central office and regional office (normal and disaster conditions) were prepared based on the discussion with C/P. Executive summary for them were translated in Tetum language so as to make public relations in all staff of DRBFC about the reporting between the central office and regional offices.
Output 3 (PDM) : The staff members of DRBFC and IGE, who are responsible for the maintenance and repair works of arterial roads, are trained.	- Road maintenance database has been taken roots for planning of road maintenance works among the staff of DRBFC. - The system has been established so as to find defect places to be maintained on the road by using the road maintenance database and road maintenance inventory survey trained by CBRM. Maintenance/ repairing works for these defect points are planned and executed by using the national budget. Recently, repairing works by using the national budget are increased due to enlightenment activities by CBRM. - Several points to be noticed for execution of road maintenance works have been generalized in the staff of DRBFC through CBRM activities and the Case Study. - Mechanics and operators of IGE have participated in the road maintenance works at several places with their equipment. - In 2nd Field Work, IGE operator, who had been trained by CBRM, trained to operators of "Manatsuto Irrigation Project (ICRM)" during around one week at Manatsuto. Results of CBRM activities are now being expanded in East Timor. - Around 40 technical staffs of DRBFC were trained by CBRM activities during the project implementation. On the other hand, 9 staffs of manager class of IGE were trained as to equipment management system.

	Nineteen (19) mechanics were trained through the project implementation period. Fifteen (15) to twenty (20) operators were trained in 1st, 2nd and 3rd Field Work of CBRM, respectively.
Output 4 (PDM) : The case studies of management plan on the maintenance and repair works of arterial roads are appropriately planned, designed and implemented by DRBFC & IGE.	- Two times of the Case Study were executed in Phase 1 and Phase 2 during 2nd Field Work. - Methods of joint operation with DRBFC and IGE were trained through the Case Study. Methods of joint operation done through the Case Study have been some good example in East Timor for road works by using the equipment of IGE. - Through the Case Study, importance of proper construction for drainage facilities and base/sub-base course of roads was pointed out. These are directly affected to capacity development for the staff of DRBFC. -- The Case Study in 3rd Field Work was carried out in different kinds of road maintenance works in the study of 2nd Field Work. Through the Case Study in 3rd Field Work, staff of DRBFC was understood for repairing works at the damaged place due to landslide area and surface damaged area located in mountain area. Equipment of IGE was also fully used for the Case Study. - Cooperation with JICA other T/A projects were done with using the Case Study in 3rd Field Work.
Output 5 (PDM) : The operation system for construction equipment and repair equipment / tools is appropriately maintained and managed by IGE.	- The database for equipment management prepared by CBRM is a foundation to establish the equipment management system. - Staff of IGE has been continuously trained how to use the database. - Central control of the equipment of IGE by using the database has being made roots in IGE. - The equipment of IGE has been widely used in East Timor. IGE has a trouble that upper persons like Ministers of other Ministries, member of parliament, etc. request directly to IGE for usage of the equipment irregularly. - Strengthening of IGE organization is the important factor so as to manage the equipment properly by IGE itself. Some strong regulations will be also required in order to prevent direct request from upper persons in East Timor.

Source: Data of CBRM

【To what extent each Activity contributes to Output】

Activities	
Act. 1-1 Prepare a road inventory	- Km Posts were established on all arterial roads of around 1,400 km in East Timor in 1st Field Work of CBRM. - Based on the established Km posts, staff of regional offices did the road condition survey to prepare the road maintenance database in cooperation with CBRM. - The database had been improved in 2nd Field Work so as to estimate the rough repairing cost for budget planning. Updating of database was done based on the improved database in 2nd Field Work. - In 3rd Field Work, the database had been fully used for 5 years' budget planning from 2008 as to road maintenance on arterial roads by DRBFC itself. - Additional training for making roots as to road maintenance database had been done to the staff of DRBFC through the up-dating of database. - And, according to the request from DRBFC, the database for bridge maintenance had been additionally prepared separating to the road maintenance database. Method of use of it had been trained to the staff of DRBFC by CBRM.
Act. 1-2 Update the	- Updating work in 2nd Field Work was done at first in Dili regional area in cooperation with staff of Dili regional office and CBRM.

road inventory	- Other roads governed by other regional offices except Dili were up-dated by staff of other regional offices with assistance of CBRM after receiving of seminar hold by CBRM. - The database prepared in 1st Field Work was improved in 2nd Field Work so that rough cost for repairing works can be estimated in the database. - In 3rd Field Work, capacity building to DRBFC had being done continuously so that DRBFC itself could update the database. - Capacity building was executed that the budget for road maintenance was planned by using the database. - Periodic road condition survey was one of key factors in order that systematic road maintenance works were executed properly. Enlighten activities for the above had been continuously executed. - Improvement for the database so as to estimate the rough cost by it were enlighten to the standardization of road condition survey.
Act. 1-3 Prepare the maintenance and repair plan for each arterial road, based on each development level.	- Draft maintenance plan was prepared and explained, submitted to C/P in 1st Field Work. - Executive summary was prepared and it was translated in Tetum language. Fifty (50) sets of Tetum version and 15 sets of English version for executive summary were submitted to C/P in order to make public relations for the report in C/P. Maintenance plan had been finalized in 2nd Field Work after discussion with C/P. - This Maintenance Plan describes the fundamental issue as to road maintenance works, especially in East Timor. - Based on the Maintenance Plan, the knowledge for road maintenance had been developed in DRBFC. DRBFC had tried to make budget planning based on the Maintenance Plan by using the road maintenance database. Generalization for this report in the staff of DRBFC is important.
Act. 2-1 Prepare a manual for reporting system on road management between central and regional road offices	- Draft Manual was prepared, explained and submitted to C/P in 1st Field Work. - In 2nd Field Work, executive summary for Manual was prepared and translated in Tetum language. Fifty (50) sets of Tetum version and 15 sets of English version were distributed in DRBFC so as to make some public relations for the Manual. After discussion with DRBFC, Reporting Manual in Normal Condition was finalized and submitted to C/P. - This Manual describes some fundamental issues so that proper reporting system between central office and regional offices of DRBFC would be established. Based on the executive summary, it had been tried that more generalization for this manual would be made in DRBFC.
Act. 2-2 Prepare a manual for reporting system on road management in the case of disasters.	- Draft Manual was prepared, explained and submitted to C/P in 1st Field Work. - In 2nd Field Work, executive summary for Manual was prepared and translated in Tetum language. Fifty (50) sets of Tetum version and 15 sets of English version had been distributed in DRBFC so as to make some public relations for the Manual. After discussion with DRBFC, Reporting Manual in Disaster Condition was finalized and submitted to C/P. - This Manual describes some fundamental issues so that proper reporting system between the central office and regional offices in case of disaster on arterial roads would be established. Based on the executive summary, it had been tried that more generalization for this manual would be made in DRBFC.
Act. 3-1 Formulate and implement training program for the following personnel in collaboration with DRBFC	【Road Maintenance and Management Engineer】 - Training for road condition survey was executed in respective regional offices of DRBFC in 1st Field Work. - Eighteen (18) staff of regional offices of DRBFC was learned so as to execute the road condition survey by themselves. It was generalized in DRBFC that places on the roads were shown by Km based on the Km posts set in 1st Field Work. - In 2nd Field Work, training for input method the surveyed data to the database of road maintenance was executed. The database was improved so that rough cost for maintenance works could be estimated in the database. Training for maintenance

and IGE (1) Road maintenance management engineer (2) Road construction management engineer (3)Equipment / tools management engineer (4) Mechanic (5) Operator	plan based on the database had been done also in 2nd Field Work. Total man-day trained by CBRM is mentioned in the following item. - In 3rd Field Work, more training continuously had been carried out so as to make the road maintenance systematically by DRBFC itself. - Through the budget planning by using the database, capacity building to DRBFC had been continued. 【Road Construction Management Engineer】 - There is no definite distinction in DRBFC between road maintenance engineer and road construction engineer. Usually, construction supervision is done by the staff of regional offices. - In 1st Field Work, site training for 4 persons of regional staff (Dili, Same, Baucau, Maliana) was carried out during 4 days at the construction site for Dili - Casa Road (A02) Improvement Project, which was financed by Japanese Grant Aid. - In 2nd Field Work, through the Case Study, training for construction supervision was carried out during around three (3) months as OJT to staff of Dili regional office mainly. - They were trained also as to preparatory work to be required for construction works. Report for preparatory works for the Case Study were prepared and submitted to C/P so as to make public relations in DRBFC. Two times of site seminar at the construction site of the Case Study were held so as to inform the techniques of road works to all staff in DRBFC. - In 1st, 2nd and 3rd Field Work, persons, who were received and participated to the Technical Transfer Seminal and Project activities of CBRM, are 525 man-days and 17.50 man-months. CBRM activities have taken roots in DRBFC. - Capacity building to the staff of DRBFC as to road construction management had been also done through the Case Study also in 3rd Field Work. 【Equipment/tools Management Engineer】 - In 1st Field Work, in parallel with transfer of technology as to equipment management system to key persons (section chief of IGE), the database for equipment was prepared. - In 2nd Field Work, methods of usage for the equipment management database and methods of updating of database, etc. had been trained to 3 staff of IGE who was recommended by IGE so as to use the database efficiently by IGE itself. - In 3rd Field Work, based on the results of activities in 1st and 2nd Field Work, the following activities had been done: a) In order to take roots the equipment management system in IGE and operate by IGE itself, CBRM confirmed the operation condition of IGE and reviewed the system when required. b) Technical support had been continuously carried out so as to promote the use of database efficiently in IGE. Training of usage method for the database had been carried out to seven (7) staff selected newly in IGE. c) Through the Case Study in 3rd Field Work, equipment management system like the system for private equipment lease company had been carried out with approval of C/P. 【Mechanic】 - In 1st Field Work, seventeen (17) mechanics had been trained. In addition to the above mechanics, 3 students from the Timor University, Engineering Course, joined the training course, which was requested by Director of IGE. After training, mechanics developed to be able to do periodic maintenance work for construction equipment and cars. - Though degree of acquirement of technical issue was different person to person, mechanic team of IGE could get the fundamental technical knowledge for equipment. - In 2nd Field Work, eighteen (18) mechanics of IGE had been trained so as to get more technical knowledge continuously. - In 2nd Field Work, especially, training regarding structure and function of several parts

	of the equipment had been executed through OJT and lecture. According to increase the operation hour of equipment, it had been required to change the parts and repair the defect portions of equipment. Their technical knowledge was leveled up to change the cutting edge and bucket picks by them. - In 3rd Field Work, nineteen (19) mechanics had been trained through OJT and lecture by repeating the technical knowledge acquired in 2nd Field Work and aiming at more acquisition of technical knowledge. Changing method of parts and repairing method for defect points due to increase of operation hour of the equipment had been mainly trained. 【Operator】 - In 1st Field Work, twenty (20) operators had been trained for operation of Bulldozer, Backhoe, Mobile Crasher, Vibration Roller, Crawler Truck. - Technical levels for operators were evaluated in 5-Levels. In spite that technical levels for respective operators were different, operators of Level-D, E, who were the lowest technical level and could not work at actual site, were developed up to Level-C, who could work at site as an assistant operator. - In 2nd Field Work, ten (10) operators had been trained except trainees who worked and stayed at site. Through the Case Study, operators were trained at actual construction woks and site. Five (5) operators were trained to use the Asphalt Distributor of IGE. - Through operator's training executed in 1st and 2nd Field Work, technical levels of operators of IGE were certainly developed. Operators who didn't have any experiences of construction equipment operation were developed to Level-C, which operators could work at construction site for a simple work. - In 3rd Field Work, the operator training had been executed with the following aims: a) More level up for 4 kinds of main construction equipment such as Bulldozer, Backhoe, Motor grader, Wheel loader (10 operators). b) Evaluation of technical level of all operators of IGE (around 40 operators). c) Training for operation of Mobile Crane (6 operators) d) Advanced training for instructors of operation training (2 operators)
Act. 4-1 Formulate a maintenance management plan.	- In 2nd Field Work, the case study site was selected at 28 km points of the arterial road A03 near Dili. - Construction plan was prepared by DRBFC and execution procedures for using budget were also carried out by DRBFC. After approval of MOF to execution of budget, the construction works were started on early February 2007. - Joint meetings between DRBFC and IGE were periodically held at once in two weeks. At the meeting, problems for joint operation so as to operate smoothly between DRBFC and IGE were discussed. Contract agreement as to lease for the equipment of IGE was signed in the end of January 2007 between DRBFC and IGE for the Case Study. According to the lease agreement, lease charge of equipment was paid to IGE from DRBFC during the Case Study. - In 3rd Field Work, the case study site was selected at the damaged places on A01 from 6.6 km to 13.9 km to be required the repairing works. - Since kinds of repairing works on the rods were different between the Case Studies in 2nd and 3rd Field Work, more capacity building to the staff of DRBFC could be expected. - Construction plan was prepared by DRBFC with support of CBRM. - Joint Meeting between DRBFC and IGE was continued in 3rd Field Work.
Act. 4-2 Formulate a site management plan. **Act. 4-3**	- As for the site management plan, it was prepared by DRBFC and IGE under guidance of CBRM before implementation of the works. - Job descriptions for the staff of DRBFC and IGE were cleared before execution of the Case Study. - Construction supervisors, construction equipment operators, mechanics, equipment management officers were trained at the Case Study site through OJT so as to keep the management plan.

Define job description	- The Case Study in 3rd Field Work had been done based on the results on the study in 2nd Field Work.
Act. 4-4 Formulate a safety training program **Act. 4-5** Implement the safety training program.	- In 1st Field Work, construction equipment operators, who were mostly necessary to be trained the safety works, had been done by the lecture during 10 days. Safety training for operators had been done always at training site during operation training. - Before implementation of the Case Study in 2nd Field Work, safety training on lecture was done to DRBFC construction supervisors and IGE staff. - During the construction works as the Case Study, guide board, flags for traffic control, whistle, etc. were prepared and safety construction had been guided. - Safety operation had been also trained at every time in 3rd Field Work during operators training course. - In 3rd Field Work, guide board, flag for traffic control, whistle, etc. were prepared and safety construction works were guided.
Act. 4-6 Implement case studies concerning road maintenance and repair of arterial roads appropriately in DRBFC project.	- The Case Study in 2nd Field Work was implemented two times, Phase 1 (Feb.05 ~ Mar.14, 2007) and Phase 2 (Apr.02 ~ 25, 2007). - Phase 1 and Phase 2 were implemented with different kinds of works at same place (A03, 28 km). - In Phase 1, extraction of base course material from river bed and construction of drainage facilities and in Phase 2, construction of road base course and surface treatment were done. Through these construction works, capacity building to staff of DRBFC and IGE had been executed. - In 3rd Field Work, one time of the Case Study is originally planed during around 20 days. However, considering of quantity and kind of construction works selected in 3rd Field Work, it would be not necessary to be strained by period of 20 days. The Case Study had been scheduled up to February 2008. - Repairing works on the road as the Case Study in 3rd Field Work, CBRM would support to self action of DRBFC and IGE for the construction works. CBRM would support and train the staff as required during the construction works.
Act. 5-1 Prepare an inventory of construction equipment and establish management system.	- Equipment management database, which is indispensable for systematic management of the equipment of IGE, had been arranged through CBRM activities. - Collection of the data, periodic maintenance management, operation management, parts management, etc. is required for operation of the system. Through CBRM activities, IGE staff had been trained to get the operation method for the system. - Continuous training had been done so that the management system would be operated by IGE itself.
Act. 5-2 Update the inventory of construction equipment	- Equipment management database, which is indispensable for systematic management of the equipment of IGE, had been arranged. - The Management System (Database) requires the collection of equipment data, periodic maintenance management, operation management, parts management, etc. Training for management system had been done continuously through CBRM by OJT.
Act 5-3 Formulate a management plan for construction equipment in the regional road offices.	- IGE intends to manage the equipment of IGE by central control at Taci Tolu with due consideration of importance of equipment maintenance, effective use of equipment. - In order to achieve the above aim, IGE makes efforts to collect all equipment to the central office after completion of the leasing period. Once collect the equipment, and they are maintained properly and then lease again as required. - IGE is now negotiating with agencies at several places to collect the equipment to IGE workshop. - CBRM supported to the above intention of IGE.
Act. 5-4 Establish a	- As informed in the above item 5-1, database for equipment management system was already formulated. Through updating of database, OJT had been executed.

maintenance system of construction equipment in IGE	- In early stage of 2nd Field Work, IGE looked like unstable condition since Taci Tolu, where is the location of IGE office and around 10 km from Dili, was the special disturbance place in 2006. However, IGE has been stable from middle of 2nd Field Work and activities of IGE got back on the track. Continuous training by OJT had been done so that the management system could be operated by IGE itself.
Act. 5-5 Operate construction equipment and repair equipment/ tools appropriately	- In late July 2005, Ministry of Transportation, Communications and Public Works (MTCPW) were restructured to divide three Ministries such as Ministry of Transportation and Communications (MTC), Ministry of Public Works (MPW) and Ministry of Natural Resources, Mineral and Energy (MNRME). DRBFC was under MPW and IGE was under MTC. And again those Ministries were combined into Ministry of Infrastructure (MOI) in late September 2007. - Regional offices have been under DRBFC. Because of restructures, it hadn't been planned to allocate the equipment of IGE to respective regional offices. - IGE has aims to control the equipment at central office of IGE. After construction works by using the equipment of IGE would be finished, those would be collected to IGE central office and maintained at central office of IGE. After maintenance for the equipment would be completed, those would be re-allocated as required.

Source: Data of CBRM

5.4 Efficiency

In order to grasp the degree of achievement of project outputs generated by project inputs and to investigate its means, method, expense and duration, project efficiency is summarized as below:

【Project Efficiency】

(1) Relevance of timing of Inputs (Japanese side) - Dispatch of Experts - Provision of equipment - Acceptance of counterpart trainees **(East Timor side)** - Facilities and equipment - Assignment of counterparts - Local cost - Others	**Inputs by Japanese side:** - In 2nd Year, the Project was interrupted during around 6 months due to disturbance of East Timor just after starting of 2nd Year Field Work. It had been planned in original schedule that 2nd Field Work of the Project was started May 2006 and completed in Febraury2007 during around 10 months. Third (3rd) Field Works had been planned originally during 6.5 months from May to November 2007. - After calmness of disturbance, the Project (CBRM) for 2nd Field Works was resumed in December 2007 to early August 2008 during around 8 moths. Third (3rd) Field Work of the Project was started in middle of September and was completed in middle of March 2008 during 6 months. - The Project was implemented except above interruption of the Project in 2nd Year without any problems. - Equipment was provided in 1st Year as scheduled. However, due to disturbance of East Timor in 2nd Year, it was found at the time of resuming the 2nd Field Work that some equipment like maintenance tool kit had been stolen. - Trainees in Japan by the Project was done one person (DRBFC staff), however, due to shortage of the budget for the Project, from 2nd Year, training program in Japan by the Project had been stopped. In 2nd Year, three (3) DRBFC engineers participated in JICA Group Training Course in JFY 2007/08. **Inputs by East Timor side:** - Project offices for CBRM were set in DRBFC office and IGE office, respectively. - As for allocation of C/P, C/P personnel had been allocated timely as required by CBRM. There are no problems as to inputs by East Timor side. Staffs of

	DRBFC and IGE have routine work to run and manage daily work of DRBFC and IGE. Therefore, capacity building activities to DRBFC and IGE had been mainly executed through OJT except training of equipment operators of IGE. In East Timor, it is considered that OJT is the most effective capacity development method through actual/ daily activities of DRBFC and IGE. - It was planned in the Project that there weren't any local costs born by the Government of East Timor. However, the repairing works for the Case Study site were executed by using the budget of DRBFC (local budget).
(2) Relations between Inputs and Outputs (Relevance between quantity/ quality of Inputs and Outputs) - Dispatch of experts - Provision of equipment - Acceptance of counterpart trainees - Arrangement on land, facilities, equipment - Assignment of counterparts - Local cost	- Dispatch of experts was appropriate as to quantity and quality. - Equipments provided in 1st Field Work to IGE were maintenance kits, transformer, etc. and those have been fully used in IGE. Some maintenance kits were stolen during disturbance of East Timor in 2nd Year. - One engineer trained in Japan in 1st Year is working now in DRBFC and participating CBRM activities. Three (3) engineers participated in JICA group training course in Japan are staff of DRBFC, and are working for road works including road maintenance in East Timor. - C/P personnel had been allocated without any problems. C/P personnel are staff of DRBFC and IGE, and they have daily/ routine work in offices. Therefore, capacity building had been done mainly by OJT methods. - Though local costs born by East Timor for the Project was not planned, expenditures for the Case Study had been done by the national budget of DRBFC.
(3) Linkage between other types of cooperation such as Grant-aid /linkage with other donors	- Training at construction site was done in 1st Field Work at the construction site carried out on the arterial road, A02, "Dili-Casa Road Improvement Project", financed by Japan's Grant Aid. That training was done 4 days at Ainaro. Participants were limited 4 regional staffs from Dili, Same, Baucau, Maliana due to lodging conditions at Ainaro. - In 2nd Field Work, according to request from "Manatuto Irrigation and Rice Cultivation Project", their equipment operators (4 operators) were trained in 3 days of lecture by CBRM expert and 7days at site, Manatuto by CBRM trainee. - In 3rd Field Work, joint operation for study of land sliding area at the case study site with "The Project for Capacity Development by Training and Preparation of Guidelines and Manuals for Roads" was carried out. - Teaching staff of "The Project for Capacity Development of Teaching Staff in the Faculty of Engineering, UNTL" inspected activities of CBRM at the case study site. - Workshops and Technical Transfer Seminars held on CBRM were joined with ADB staff and EU staff (GTZ). CBRM had made efforts to make public relations of activities of CBRM. Linkage of other donors has been done through Director of DRBFC.

Source: Data of CBRM

5.5 Impact

Direct and indirect impacts to C/P agencies and East Timor, which are supposed through the Project, are summarized as below:

【Project Impact】

Impacts	Contents of Impacts (Institutional, technical, economical, socio-cultural, environmental)
(1) Direct impacts (To Project Purpose)	a) It is very important for DRBFC to implement the maintenance works systematically in order to carry out the periodical maintenance activities on the roads. Almost all staffs of DRBFC have experiences of road woks before independent of East Timor. However, it looks lack in DRBFC to plan and carry out the road maintenance works systematically for all area in East Timor. In order to improve the above defects of DRBFC, CBRM prepared the road maintenance database and popularized it to staff of DRBFC. DRBFC had used the database for planning of road maintenance budget on 2008 and 5 years from 2008. b) It would be impacts by CBRM activities that the staff of DRBFC has consciousness of importance for road condition survey and use the database for budget planning. And, it would be impact by CBRM that the staff of DRBFC indicates the places of the arterial roads with the number of roads and Km, since Km posts have been established in all arterial roads in East Timor. It is very important factor to plan and execute maintenance works systematically, totally and strategically in all arterial roads of East Timor. c) Budget for DRBFC against the road works has been increased (around 4 times, budgets of 2006/07 from 2005/06). It would be one of impacts from CBRM enlightenment activities. Many places in East Timor are now under repairing by using the national budget as Capital Project by using the national budget of East Timor. d) Construction equipment of IGE is rather big capacity to carry out minor repairing works. They are not suitable for minor maintenance works. However, they are indispensable to recover the defect places damaged by disaster. Through the Case Study of CBRM, some proper examples for lease system of equipment have been shown to DRBFC and IGE. e) In order to use the equipment as longer life as they can, arrangement of spare parts is indispensable. Due to enlightenment activities of CBRM, budget of IGE to buy the spare parts was at first approved and capitalized in 2006/07. This likely looks impact of CBRM activities. f) Through training activities of CBRM for mechanics and operators of IGE, technical capabilities for them have certainly developed. Many numbers of equipment of IGE have been used widely in many places in East Timor with trained operators and mechanics of IGE. These are effective for maintenance and construction of infrastructures in East Timor. g) Through the Case Study carried out in 2nd Field Work, staff of DRBFC had studied the preliminary works to be required, repairing works at the junction points of the arterial road and district/rural road. Since district/rural roads form hilly side connect to arterial roads with lack of drainage facilities along district/rural roads and arterial roads, there are many damaged places at junction places of arterial roads due to rained flood from hilly side. Staff of DRBFC recognized that proper construction of drainage facilities is one of the most important factors to prevent the damages of roads due to local flood by heavy rainfall. It looks impacts of CBRM that there are many places under construction of drainage facilities in East Timor h) And, they had studied through the Case Study that proper construction of

	sub-base and base course of road is very important to repairing the damaged roads. Staff of DRBFC had studied also how to get the material of sub-base and base course of the road from the river bed. These would be very useful experience for the staff of DRBFC to execute the road works from now on. i) Through the Case Study in 3rd Field Work of CBRM, staff of DRBFC had learned methods how to repair the damaged place with temporary countermeasure due to land sliding and necessity to continue the investigation for progress of land sliding. i) Road Maintenance Plan and Reporting Manual in Normal and Disaster Condition, which were prepared by CBRM in discussion with C/Ps, would be enlightened to staff of C/Ps so as to pass the traffic safely as quickly as possible at the damaged places by disaster. Damaged places by disaster are now recovered with temporary measures as mentioned in the above reports so as to keep the traffic as quickly as possible by DRBFC according to the Manual. Prioritization for repairing works of arterial roads has been planned by DRBFC according to Road Maintenance Plan.
(2) Indirect impacts (To Overall Purpose)	a) In order to improve the road maintenance plan on overall arterial roads in East Timor and systematic management for DRBFC, the road maintenance database and the bridge maintenance database have been prepared. It would be hoped that the road would be maintained systematically by DRBFC by using databases and by doing the periodic road condition and bridge condition survey. b) Though construction equipment of IGE is rather large capacity to carry out minor repairing works for road maintenance, this equipment is widely used in many places in East Timor. It is indispensable to use this equipment for recovery works at damaged places by disaster. Through training for equipment management system and mechanics and operators of IGE by CBRM, their technical capability and equipment management have been developed surely. They are in full activities in all around of East Timor. It would be hoped that sustainable maintenance for arterial roads would be secured. c) Enlightenment activities have been carried out that systematic management is very important to do maintenance works on arterial roads in East Timor through “Maintenance Plan” and “Reporting Manual (Normal and Disaster Condition)” prepared by CBRM with discussion of C/Ps. And, “Road Maintenance Plan” has suggested the priority level of several kinds of road works and the priority level of respective arterial roads in East Timor. It would be hoped that budget planning for road works on arterial roads like maintenance works, rehabilitation, improvement and new construction works of roads in East Timor would be executed taking into considerations of priority level as mentioned in the report. d) The budget for road works increased drastically. It would be an indirect impact of CBRM’s enlightened activities and of realization of staff of DRBFC, MOI against importance of road works. e) According to increase of the road works in East Timor, private consultants and contractors in East Timor would be developed. These would connect closely between government staff and private staff for development of infrastructures in East Timor. f) As a result of development for capacity of road maintenance, it is useful for social stability in East Timor due to execute quick recovery works for the damaged places by disaster. Distribution of agricultural products and coffee, etc. would be developed in East Timor due to proper maintenance of roads in East Timor. Association of inhabitants between Dili and rural area

	would be also developed. These would be useful for social stability in East Timor. g) Job opportunity would be increased in rural area due to increase of the road works including maintenance works. This would be useful for social stability in East Timor.

Source: Data of CBRM

5.6 Sustainability

Project sustainability would be prospected as summarized below focusing on factors necessary to enhance sustainability:

【Project Sustainability】

(1) Institutional aspect (With viewpoints of supportive policies, assignment and rooting of staff, collaboration with similar organizations, management capacity, etc.)	a) The Government of East Timor keenly realizes a necessity of improvement of road conditions and importance of road maintenance works as a policy of East Timor. National budget for the road works has been increased. b) Budget of DRBFC, which is responsible agency for the road works, is increased. Certainly it would be recognized that the attitude of the Government of East Timor against the road works would be progressed. c) Staff numbers of DRBFC, which around 100 persons including administrative staff, would be limited to manage the all roads in East Timor (arterial roads; around 1400 km, all roads including district/ urban/ rural roads; around 6,000 km). d) Only increase of staff numbers for DRBFC wouldn't be solved the problems, since proper system for management of the works would be required. It would be necessary to increase the staff numbers gradually. e) In order to cover the increased work in DRBFC, the increase of the works to the private consultant, contractor would be remarkable in DRBFC. However, taking into consideration of capability of Timorese private consultants and contractors, almost all works would be done by foreign consultants and contractors. These are not useful for capacity development of Timorese engineers. Even when the works would hand over to the private company, staff of DRBFC would be requested to control them as to planning, design, supervising and quality control. f) It is planned for IGE to be public corporation. However, in order to independent financially and technically as a public corporation, present capability of IGE would be more required to develop their capacity for staff technology and strength of management system. g) As there are lacks of construction equipment in East Timor, equipment of IGE, which were mainly transferred by Japan, have been fully used in East Timor. Due to technical cooperation of CBRM, capacity of IGE has been developed and equipment has been fully/widely used in East Timor. Equipment of IGE has been used more than 5 years. Taking into considerations of machine life, it is subjects how to make the development of IGE in future. h) Capabilities of equipment management, mechanics and operators of IGE have been certainly developed due to CBRM activities.

	However, it looks having no certain Government policy how IGE would be developed in future. i) As for the problems for purchasing of spare parts or direct usage request from high position of the Government, CBRM supports to IGE through the Case Study and the Technical Transfer Seminar. Borrowers of equipment should understand the lease system of IGE. As a results of enlighten activities of CBRM, purchasing budget of spare parts of equipment has been approved at first time in 2006/07 budget.
(2) Financial aspect (With viewpoints of financial resources for necessary expenses, existence of public subsidies, independent resources, accounting performance, etc.)	a) Taking into considerations of increase of the budget of DRBFC for road works, the Government plans that the road works would be the most important public works in East Timor. There are many deteriorated arterial roads in East Timor, which are not an arterial roads but like a mountain rough roads and beyond the road maintenance works. The Government is forcing now to develop the district/ rural roads to connect the arterial (national) roads with some kinds of political reasons. b) Since rehabilitation, improvement works on arterial roads have been mainly done under finance of foreign donors, it has been prospected that the Government, DRBFC, have left to foreign donors for road works on the arterial roads. However, maintenance works should be done by the Government itself. c) From now on, technical cooperation how to use the increased budget by limited staff of DRBFC on the road works would be required. And, since DRBFC staff has been lack of experiences for planning, design and overall managing of the road work, technical cooperation to strengthen these would be required. d) Since the IGE organization is established only in 2004 with inexperienced staff for equipment management, there looks weakness of systematic management for equipment. Helping equipment mechanics and operators, how to manage IGE are required points of future technical cooperation to IGE including financial aspects of IGE.
(3) Technical aspect (Rooting situation of transferred techniques, maintenance of facilities and equipment, consistency with local needs in techniques, etc.)	a) As results of activities of CBRM, operation of road maintenance database has been made roots in DRBFC and it is expected this operation would be done by DRBFC itself. b) Systematic road conditions survey is the most important activity to update the database. It would be required that the road condition survey would be done periodically, at least once a year, and systematically by DRBFC. c) Since almost all staff of DRBFC have experiences for road works before independent, they look understand the introduction of technical aspect of road works. The most important issues for DRBFC are how to manage systematically the road works. During the management would be carried out systematically, weakness points of technical matter for staff of DRBFC would be closed up step by step. d) Technical aspects of equipment mechanics and operators of IGE have been certainly developed as results of CBRM activities. IGE was un experienced group of equipment management including mechanics and operators when equipments had transferred to IGE, East Timor. e) From now on, in order to aim the more development of IGE, equipment management system should be more strengthened.

(4) Others	a) It would be expected that development of road works including road maintenance works would develop the distribution and connection for inhabitants between Dili and regional area in East Timor. And job opportunities would be increased by the public works. These activities would be indispensable for social stability in East Timor in future. b) Due to increase of road works in East Timor, more technical cooperation would be required so that proper use of the budget, proper planning and design would be managed systematically by DRBFC. c) Numbers of equipment of IGE transferred by Japan have passed in around 5 years. Hereafter, there would be more troubles of machines due to their long life usage of machine. Therefore it would be more important issues how to use and manage old machines as long as their useful life.

Source: Data of CBRM

Chapter VI
Conclusion, Recommendation and Lessons Learned

Chapter VI

CONCLUSION, RECOMMENDATIONS AND LESSONS LEARNED

6.1 Conclusion

Taking all evaluation results into consideration, it can be concluded that the Project achieved almost all indicators for project purpose and was in line of success. For instance, routine (daily) maintenance works are implemented by DRBFC and regional offices by themselves. The road inventory and its database as well as the reporting manual are effectively used for the process of these works. Moreover, it is recognized that the road inventory and its database were utilized for budget preparation for the next fiscal year of 2008 and for five years planning. Also, DRBFC has already decided to assign local staff at regional offices for maintenance works. These observed facts are the objective evidences telling that the institutional capacity of road maintenance management by DRBFC has been improved. It has also been observed in IGE that the technical skills of operators and mechanics were drastically enhanced and the management capacity of equipments/tools was also strengthened through the operation of equipment management system established by the Project.

On the other hand, the number of rehabilitation projects under DRBFC is growing because of sharp increase in the budget allocation to the road sector thanks to the oil and natural gas revenue. Degree of dependence on contracting-out for the projects including the periodical maintenance are now on the increase under the circumstance of difficulties in increasing the number of DRBFC staff, which leads to the necessity of strengthening management capacities with regard to contracting-out activities such as TOR preparation, design and cost estimation.

With regard to IGE, it is scheduled that the future institutional set-up is in the process of being discussed and the Government will decide at Council Minister Meeting to be held in near future. Since IGE is very young organization, which has been established in 2004 with a staff of no-experience of equipment management, it would be necessary that management of IGE including technical and distractive matter should be continuously strengthened.

6.2 Recommendations

Purposes of the Project for the Capacity Building of Road Maintenance in East Timor (CBRM) as a technical cooperation project by JICA were that capabilities on daily and periodic maintenance/repair and restoration against the road disaster on arterial roads are strengthened and equipments of IGE are maintained properly. For achievement of project purposes, CBRM pursued in establishment of the self operation and maintenance systems in both organizations of DRBFC and IGE. Remarkable achievements were found through CBRM activities in 1st, 2nd and 3rd Field Work as mentioned in the preceding Chapters hereinbefore.

Taking project purposes and project experiences through activities of CBRM into consideration, the followings are recommended to DRBFC and IGE so as to execute the road maintenance works more systematically and properly on arterial (national) roads in East Timor by themselves.

【Recommendations to DRBFC】

1) According to CBRM activities during 1st, 2nd and 3rd Field Work, importance for road maintenance inventory survey to make the maintenance plan has been recognized and familiarized in all staff of DRBFC. All staff of DRBFC should be more recognized that the periodical road maintenance inventory survey is the most important issue for proper road maintenance works.

2) DRBFC should make continuous efforts to do the periodic road maintenance inventory survey and to input the survey data to the databases and to use fully the database by themselves so as to carry out systematically the road maintenance works on arterial (national) roads in East Timor. Instruction book and guideline for the database, which were submitted to DRBFC, should be fully used in the staff of DRBFC. Some staffs were trained continuously in 2nd and 3rd Field Work of CBRM activities how to use the database.

3) Road maintenance Km posts set in 1st Field Work of CBRM on all arterial roads should be maintained by DRBFC, like re-painting, etc. If DRBFC would set another small Km posts with an interval of one (1) km between 5 Km interval Km posts set, road maintenance condition survey would be easier for indicating the location of defect places during survey period by the staff of regional offices.

4) It is recommended that DRBFC should act systematically the maintenance works on arterial roads (national roads) in East Timor, based on “Maintenance Plan” and “Manual for Reporting System in Normal Condition and Disaster Condition” which were presented and submitted by CBRM with due discussions of DRBFC. These plan and manuals are basic and fundamental issues to make the road maintenance plan and reporting system between the central office and regional offices of DRBFC.

5) Trough the implementation of the Case Study in 2nd Field Work, staff of DRBFC has been trained what kinds of preparatory works are required and how to execute remedial works at junction points between district roads and arterial (national) roads. Many junction points on arterial roads to the district roads are now damaged by rain flood due to shortage of drainage facilities from the district road to the arterial road. All staff of DRBFC should recognize that drainage facilities on the road are one of the key issues to prevent the damage of roads.

6) Trough the Case Study, staff of DRBFC understood that proper construction works for base, sub-base course and road bed is also one of the most important issues to repair the arterial (national) road. They also learned how to get the base course and sub-base course material from river bed. All technical staff of DRBFC should take careful attentions to repair the base, sub-base course and road bed for their maintenance works on the road in East Timor by using proof rolling test, which was presented during the Case Study and very simple method.

7) Through the Case Study in 3rd Field Work, counter measure works damaged by land sliding and investigation method for the progress of land sliding were presented. Arterial roads damaged by land sliding are found in many places in East Timor,

especially in mountain area. At first, temporary countermeasure should be taken for keeping traffic safety at the damaged place by land sliding. And, investigation should be continued by using the simple method presented in the Case Study. It would be recommended in this country that permanent countermeasure should be planned after settlement of land sliding. When land sliding would be progressed, temporary countermeasure with periodic maintenance works at the place should be considered continuously.

8) In the project management through the Case Study, especially in the engineering field, it has been recognized that there is an unbalance between capability of construction management and other management such as documentation management, quality control management by using the laboratory and design. These would be come out as the subject in near future.

【Recommendations to IGE】

1) So as to develop construction equipment management system more properly in IGE, it is recommended that IGE should manage construction equipment of IGE continuously, effectively and systematically with the following principles:

   a) All equipments should be centralized and managed by IGE head office so as to maintain the equipment of IGE periodically and properly by full responsibility of IGE staff. Equipment should be returned to IGE after lease period is completed to make periodic maintenance for the equipment. After equipment maintenance works is completed, the equipment should be leased again to users when and where they are required.

   b) Inventories and logbooks for those are essential materials to manage equipment to be prepared as a form of database to simplify the managerial works. The equipment management database should be fully and continuously used by IGE itself to manage the equipment of IGE properly and systematically. Some staff of IGE had been trained how to use the database and how to input the logbooks of equipment.

   c) The rules and regulations in equipment management should be clearly notified to all IGE personnel and making sure that the orders is thoroughly enforced.

2) Through CBRM training to mechanics of IGE, skills of mechanics have been drastically improved. However, in order to learn how to repair many and various machine troubles, it would be obviously sure that IGE mechanics will have need of further and continuous learning and acquiring more experience on machine repairing.

3) Skills of operators of IGE have been also improved drastically through CBRM activities. However operators of IGE should always recognize that skills to be required as a construction equipment operator are not only operation technique but also preventive maintenance ability and preventive operation ability. They must carry out daily check every morning and pay attention to machine condition all the time. Whenever machine trouble occurs, they must cope with trouble properly and swiftly. This is a very important role for operators. An investigation conducted by a construction machine

manufacturer in the past shows that the majority of machine trouble was caused by operators. It counted that around 60 % of machine failures was caused by insufficient daily check and poor operations by operators.

【Recommendation to both DRBFC and IGE】

1) Three times of the Case Study in close cooperation with DRBFC and IGE were carried out in 2nd and 3rd Field Work of CBRM. It is recommended that these experiences should be fully used in DRBFC so as to execute the road works as an In-house project or recovery works in emergency case by disaster, etc. by using the construction equipment of IGE in close cooperation with IGE.

2) It would be recommended that Joint Meeting between DRBFC and IGE would be continued to understand each other their present conditions, their requests, their problems and etc. for both organizations. It would be also recommended that the regional engineers meeting with all regional engineers and staff of the central office of DRBFC should be periodically held so as to discuss the problems and request between the central office and regional office of DRBFC. Meeting of section chiefs of IGE should be continued to hold regularly or whenever necessary.

3) It would be recommended that some maintenance unit with some equipment of IGE would be established specially for only maintenance works on roads in East Timor. Maintenance works are different to rehabilitation, improvement and new-construction works of roads. Maintenance works would be required quick action. When some pot holes or other defects points would be found newly in some places, immediate repairing/maintenance works should be carried out. Damaged places by disaster should be carried out by this maintenance unit immediately. When defect or damaged places would be repaired immediately, the reputation for DRBFC, IGE under MOI and the Government of East Timor would be more raised between peoples in East Timor, and social stability would be expected.

6.3 Lessons Learned

Several points were mainly taken notices during the implementation of the Project in order to make roots for the project activities in C/P agencies and to get the project achievements as possible as they can. Lessons learned during project implementation are summarized as below:

1) Staffs of C/P agencies both DRBFC and IGE carry out their daily and routine work for completing their obligations in East Timor. Numbers of staff in C/Ps are very limited. If many staffs of C/Ps would attend the seminars or lectures with long periods on CBRM, it would be difficult for C/Ps to carry out their daily and routine works. And also it would be very difficult for staff to attend the seminars or lectures with long periods. It would be also very difficult to gather trainees of C/Ps when the seminar would be long periods. Therefore, capacity building activities to staff of C/Ps had made efforts to execute by on the job training method (OJT) as possible as it could. Training of operators of IGE was required to train some long and concentrated training periods.

Operators that were selected by IGE had been trained with certain period.

2) In order that C/P agencies, DRBFC and IGE, would be able to maintain and repair arterial roads and to manage and maintain construction equipment systematically and properly by themselves, the database had been formulated for road maintenance and equipment management. Comprehensive capacity building to DRBFC and IGE had been tried to execute through databases for road maintenance and equipment management.

3) The Project prepared a tailor-made road inventory and its database which is indispensable for systematic road maintenance planning and implementation, as one of the key project components and as an approach to the level of DRBFC needs. The equipment management database was also prepared taking the above into consideration for IGE. This decision was completely different from that of other donors. It can be judged that the above approach was extremely effective for securing the sustainability of the Project on the ground that DRBFC is now utilizing the database not only for road maintenance works but for budgeting process and IGE is now using the database for equipment management by themselves.

4) It would be necessary to take technical cooperation with long periods for capacity building to staff of DRBFC and IGE. Training with repeats and training at actual work in daily and routine activities of DRBFC and IGE in East Timor would be important for their understanding and generalizing the management and the technical methods. Lectures and seminars, of course, would be important for capacity building activities, but it would be the most important that technical and management methods lectured and trained by technical cooperation would be actually used and taken roots in the organization and generalized in staffs

5) CBRM activities had been provided always taking into accounts how to achieve the issue mentioned in the above and what kinds of methods to be applied for capacity building of DRBFC and IGE so as to achieve above issues.

Attachment

Attachment 2.1
Project Design Matrix (PDM)

Attachment 2.1

Project Design Matrix (PDM)

Date: June 25, 2005

Project Name: The Project for the Capacity Building of Road Maintenance in the Democratic Republic of Timor-Leste
Duration: June 2005 – November 2007 (2.5 years)
Target Group: Staff of Directorates of Road, Bridge and Flood Control(DRBFC) and Equipment and Material (IGE)
Target Area: Whole Country

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal Arterial roads in Timor-Leste are always maintained.	1. Decrease of blockade points of arterial roads 2 Decrease of blockade terms of arterial roads 3. Utilization of manual for reporting system	1. Road inventory 2. Road inventory 3. Communication record of manual for reporting system	
Project Purpose Capabilities on daily and periodic maintenance/ repair of arterial roads and restoration against road disaster areas on the arterial roads are strengthened.	1. Quality and renewal frequency of road inventory 2. Quality of maintenance and repair works 3 Quality and renewal frequency of inventory of construction equipment and repair equipment/tools 4. Number of training participants	1. Road inventory 2. Inspection and construction management record of maintenance and repair works 3. Inventory of construction equipment and repair equipment/tools 4. Participants record of training program	- Number of vehicles in Timor-Leste does not increase drastically.
Outputs 1 Appropriate works for maintenance and repair of arterial roads are planned by DRBFC.	1-1. Preparation of an road inventory 1-2. Updated the road inventory 1-3. Preparation of report on maintenance and repair plan	1-1. .Road inventory 1-2. Road inventory 1-3. Road maintenance and repair plan	- Trained staff remains and continue to work for the Project.
2. Road management system, which central and regional road offices cooperate each other, is formulated.	2-1 Preparation of manual for reporting system on road. 2-2 .Preparation of disaster manual for reporting system on road management between central and regional road offices	2-1. Manual for reporting system 2-2. Disaster manual for reporting system	- Budgets for road maintenance/ repair programs and maintenance of equipment/ tools are provided continuously
3. The staff members of DRBFC and DTEM, who are responsible for the maintenance and repair works of arterial roads, are trained.	3-1. Number of road maintenance management engineers who acquired specified technologies 3-2. Number of road construction management engineers who acquired specified technologies 3-3. Number of equipment/tools management engineers who acquired specified technologies 3-4. Number of mechanics who acquired specified technologies 3-5. Number of operators who acquired specified technologies	3-1 Record of training program, text of road maintenance and repair works, evaluation result by trainees 3-2 Record of training program, text of road maintenance and repair works, evaluation result by trainees 3-3 Record of training program, text of road maintenance and repair works, evaluation result by trainees. 3-4. Record of training program, text of road maintenance and repair works, evaluation result by trainees 3-5. Record of training program, text of road maintenance and repair works, evaluation result by trainees	

Attachment 2.1

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
4. .The case studies of management plan on the maintenance and repair works of arterial roads are appropriately planned, designed and implemented by MPW &MTC.	4-1 Formulation of maintenance management plan (formulation of process control, construction method, quality control, work progress control, cost management systems). 4-2. Formulation of site management plan (formulation of equipment management, safety management, environment management, by-product management systems) 4-3. Number of safety training programs 4-4. Condition of practical training	4-1. Maintenance management plan 4-2 Site management plan 4-3. Implementation record of safety training 4-4 Maintenance and site management reports	
5. The operation system for construction equipment and repair equipment / tools is appropriately maintained and managed by MTC.	5-1. .Preparation of inventory of construction equipment and repair equipment/tools 5-2. Updated inventory of construction equipment and repair equipment/tools 5-3. Establishment of maintenance management system for construction equipment and repair equipment/tools (formulation and operation systems for i)lending, ii)procurement planning for parts, iii)operation record, iv)troubleshooting record, v)periodic maintenance plan, vi)repair ordering plan) 5-4. Formulation of management plan for construction equipment and repair equipment/tools necessitated in the MPW's regional offices	5-1. Inventory of construction equipment and repair equipment/tools 5-2. Inventory of construction equipment and repair equipment/tools 5-3. Inventory of construction equipment and repair equipment/tools 5-4. Report on management plan for construction equipment and repair equipment/tools necessitated in the MPW's regional offices	

Attachment 2.1

Activities	Input		Precondition
1-1 Prepare a road inventory 1-2 Update the road inventory 1-3 Prepare the maintenance and repair plan for each arterial road, based on each development level. 2-1 Prepare a manual for reporting system on road management between central and regional road offices. 2-2. Prepare a manual for reporting system on road management in the case of disasters between central and regional road offices. 3-1 Formulate and implement training program for the following personnel in collaboration with DRBFC and IGE. (1) Road maintenance management engineer (2) Road construction management engineer (3) Equipment/tools management engineer (4) Mechanic (5) Operator 4-1 Formulate a maintenance management plan. 4-2. Formulate a site management plan. 4-3. Define job description of the duties of staff members concerned. 4-4. Formulate a safety training program concerning the works on the maintenance and repair of arterial roads. 4-5. Implement the safety training program. 4-6 Implement case studies-concerning road maintenance and repair of arterial roads appropriately in MPW's project. 5-1 Prepare an inventory of construction equipment and repair equipment/tools and establish its management system. 5-2. Update the inventory of construction equipment and repair equipment/tools. 5-3. Formulate a management plan for construction equipment and repair equipment/tools in the regional road offices. 5-4. Establish a maintenance system of construction equipment and repair equipment/tools in collaboration with DRBFC and DTEM. 5-5. Operate construction equipment and repair equipment/tools appropriately.	**(Japan)** 1. Dispatch of JICA Experts - Road Maintenance Expert / Team Leader - Road Construction Management Expert - Construction Equipment Management and Procurement Expert 1 (System formation, procurement of materials, equipment and tools, operation management of equipment and tools) - Construction Equipment Management and Procurement Expert 2 (Management of equipment and tools, operation and maintenance) - Construction Equipment Operation Expert 2. C/P training in Japan (training for staff in charge of road maintenance and road construction management) 3. Other necessary equipment and materials	**(Timor-Leste)** 1. Arrangement of counterpart personnel(C/P):Staff of DRBFC and DEM) 2. Arrangement of trainees (road maintenance engineers, road construction management engineers, equipment/ tools management engineers, mechanics, and operators) 3. Provision of facilities for the Project implementation - Project office 4. Provision of equipment and tools - Equipment/ tools for maintenance of the arterial roads (equipment that was donated by the Japanese side) 5. Other necessary budget	- Staff trained in JICA-CETRAP remain active for the Project. - Equipment and tools prepared for the Project are ready to be utilized.

Attachment 2.2
Project Input

Attachment 2.2

(1) Project inputs
〈Japanese side〉

Name	Assignment	Period	Day	M/M	Office affiliated
First Year (1st Field Work)					
Koji NAITO	Team Leader/Road Maintenance	2005.06.21～2006.02.09	234	7.80	Nippon Koei Co., Ltd.
Nobuyuki KURIHARA	Road Construction	2005.07.03～2005.12.23	174	5.80	Nippon Koei Co., Ltd.
Etsuo HASHIGUCHI	Const.Equip. O&M 1(Proc./Utilizat.), Const.Equip. O&M 2(Maintenance)	2005.06.21～2006.01.10	204	6.80	Nippon Koei (VSO)
Mitsuo NAKAYAMA	Const.Equip. Operation Training	2005.07.03～2005.11.29	234	7.80	Nippon Koei (Individual)
Makoto YOKOTA	Coordinator/Comp.System Support	2005.07.03～2005.08.01	30	1.00	Nippon Koei Co., Ltd.
Second Year, Phase 1 (2nd Field Work, Phase 1)					
Koji NAITO	Team Leader/Road Maintenance	2006.05.10～2006.05.28	19	0.63	Nippon Koei Co., Ltd.
Etsuo HASHIGUCHI	Const.Equip. O&M 1(Proc./Utilizat.),	2006.05.10～2006.05.28	19	0.63	Nippon Koei (VSO)
Second Year, Phase 2 (2nd Field Work, Phase 2)					
Koji NAITO	Team Leader/Road Maintenance	2006.12.01～2007.08.07	250	8.33	Nippon Koei Co., Ltd.
Nobuyuki KURIHARA	Road Construction	2006.12.03～2007.01.10 2007.01.28～2007.05.19	39 111	1.30 3.70	Nippon Koei Co., Ltd.
Etsuo HASHIGUCHI	Const.Equip. O&M 1(Proc./Utilizat.), Const.Equip. O&M 2(Maintenance)	2006.12.01～2007.08.07	250	8.33	Nippon Koei (VSO)
Mitsuo NAKAYAMA	Const.Equip. Operation Training	2006.12.03～2007.05.01	150	5.00	Nippon Koei (Individual)
Natsuno MATSUURA	Coordinator/Comp.System Support	2006.12.17～2007.01.30	45	1.50	Nippon Koei Co., Ltd.
Third Year (3rd Field Work)					
Koji NAITO	Team Leader/Road Maintenance	2007.09.21～2008.03.18	180	6.00	Nippon Koei Co., Ltd.
Nobuyuki KURIHARA	Road Construction	2007.09.21～2008.03.18	180	6.00	Nippon Koei Co., Ltd.
Etsuo HASHIGUCHI	Const.Equip. O&M 1(Proc./Utilizat.), Const.Equip. O&M 2(Maintenance)	2007.09.21～2008.01.27	129	4.30	Nippon Koei (VSO)
Tetsumi NISHIDA	Const.Equip. Operation Training	2007.09.21～2008.03.18	180	6.00	Nippon Koei (OPC)
Natsuno MATSUURA	Coordinator/Comp.System Support	2007.10.23～2007.12.21	60	2.00	Nippon Koei Co., Ltd.

Source : Data of CBRM

(2) Counterpart Training in Japan

Name of C/P	Post when training	Present post	Period	Title	Contents and responsible organization
Mr. Abrao Viera	Chief of Same Regional Office, Division of Road, Bridge, Flood Control, Ministry of Public Works	Chief of Oecusi Regional Office, Department of Road･Bridge･Flood Control, Division of Public Works, Ministry of Infrastructure	2005.10.19～2005.12.22	Road Maintenance and Management	- Road Management Seminar (JICA Training Program) - Inspection of Bridge Construction Site (Kawada Industry, Kajima Corporation, Sumitomo Mitsui Construction, Bridge Maintenance Co., Ltd.) - Site Inspection of Bridge Repairing Works (Japan Highway, Hansin Public Corporation) - Road/Bridge Maintenance Works Lecture, Practice Training (Honshi Public Corporation) - National Road Maintenance Works Practice Training (Department of Road, Kinki Division, Ministry of Public Works and Transportation) - Discussion, Data Collection/Arrangement (Honshi Public Corporation, JICA Hyogo Center)

Source : Data of CBRM

(3) Equipment provision by Japanese side

1st Year (JFY 2005), There were no porvision in 2nd and 3rd Year of the Project

Puchase Site	Date	Main items	Cost (US$)	
Japan		No provision		
East Timor	【Equipment for Workshop】			
	Dec. 2005	Portable Gantry Crane with Manually Operated Chain Block, Geared Trolley and Caster Wheel (1No.)	2,548	
	Dec. 2005	Workbench (Wood Type) with Vise (3 Nos.)	3,750	
	Dec. 2005	Parts Cleaner (pouring type, 1No.)	1,217	
	Dec. 2005	Engine Stand (2 Nos.)	1,064	
	Dec. 2005	Solder-less Electric Terminal Kit (1set)	580	
	Dec. 2005	Drill Bit Set (2 sets)	1,109	
	Dec. 2005	Hydraulic Pressure Tester (1No.)	1,476	
	Dec. 2005	Hydraulic Press with manually operated hydraulic pump (1No.)	13,860	
	Dec. 2005	Mechanic Tool Sets for Construction Equipment (2sets)	9,974	
	Nov.2005	Puller Set for Automotive(1 set)	5,377	
	Nov.2005	Hydraulic Puller Set with manually operated hydraulic pump and accessories (1 set)	12,850	
	【Transformer】			
	Dec.2005	Transformer (outdoor, all weather type) with accessories, attachment and installation (1Lot)	35,316	
Total			**89,121**	US$
			10,228	JPY '000
			(1US$=114.77\)	

Source : Data of CBRM

(4) Ledger of Equipments provided by Japanese Side in the Project

Procured in East Timor in 1st Year of the Project (JFY 2005)

(US$1.0=￥114.77)

Date of Proc.	No	Items	Price (10^3JPY)	Price (USD)	Amt	Offices allocated	Use	Mng't	Remarks
2005/12/23	1)	Transformer (outdoor, all weather type) with accessories, attachment and installation	4,053	35,316	1	IGE Yard in Taci Tolu	A	A	
Procured in Timor Leste (JPY 100,000 to JPY 1,600,000) (USD 870 to USD 13,900)									
Date of Proc.	**No**	**Items**	**Price (10^3JPY)**	**Price (USD)**	**Amt**	**Offices allocated**	**Use**	**Mng't**	**Remarks**
2005/12/2	1)	Portable Gantry Crane with Manually Operated Chain Block, Geared Trolley and Caster Wheel	292	2,548	1	Workshop of IGE	A	A	
2005/12/2	2)	Workbench (Wood Type) with Vise	430	3,750	3	Workshop of IGE	A	A	
2005/12/2	3)	Parts Cleaner (pouring type)	140	1,217	1	Workshop of IGE	A	A	
2005/12/2	4)	Engine Stand	122	1,064	2	Workshop of IGE	A	A	
2005/12/2	5)	Solder-less Electric Terminal Kit	67	580	1	Workshop of IGE	A	A	(consumables)
2005/12/2	6)	Drill Bit Set	127	1,109	2	Workshop of IGE	A	A	(consumables)
2005/12/2	7)	Hydraulic Pressure Tester	169	1,476	1	Workshop of IGE	A	A	
2005/12/2	8)	Hydraulic Press with manually operated hydraulic pump	1,591	13,860	1	Workshop of IGE	A	A	
2005/12/2	9)	Mechanic Tool Sets for Construction Equipment	1,145	9,974	2	Workshop of IGE	A	A	90% of tools had been stolen at the time of disturbance in 2006.
2005/11/15	10)	Puller Set for Automotive	617	5,377	1	Workshop of IGE	A	A	90% of tools had been stolen at the time of disturbance in 2006.
2005/11/15	11)	Hydraulic Puller Set with manually operated hydraulic pump and accessories	1,475	12,850	1	Workshop of IGE	A	A	
Procured from Japan (over JPY 1,600,000 = USD 13,900)									
Date of Proc.	**No**	**Items**	**Price (10^3JPY)**	**Price (USD)**	**Amt**	**Offices allocated**	**Use**	**Mng't**	**Remarks**
		None							
Procured from Japan (JPY 100,000 to JPY 1,600,000) (USD 870 to USD 13,900)									
Date of Proc.	**No**	**Items**	**Price (10^3JPY)**	**Price (USD)**	**Amt**	**Offices allocated**	**Use**	**Mng't**	**Remarks**
		None							
Hand-carried equipment (over JPY 100,000 = USD 870); Procured in Timor Leste									
Date of Proc.	**No**	**Items**	**Price (10^3JPY)**	**Price (USD)**	**Amt**	**Offices allocated**	**Use**	**Mng't**	**Remarks**
2005/10/3	1）	Photo copy machine	447	3,892	1	DRBFC、CBRM Office	A	A	
2005/10/11	2）	Desktop Compute	230	2,000	2	DRBFC, CBRM Office（1No.）、IGE, CBRM Office（1No.）	A	A	
2005/10/11	3）	File Maker Pro 7	215	1,875	5	DRBFC, CBRM Office（3 Nos.）、IGE, CBRM Office（2 Nos.）	A	A	

Use condition
- A: Frequently (almost every day)
- B: Sometimes (1-3 a week)
- C: Use concentrated on particular period
- D: Rarely (1-3 times a year)
- E: No use due to particular reasons

Management condition
- A: Always possible to use with sufficient maintenance
- B: Almost no problem in use
- C: Possible to use if repaired
- D: Difficult to use

Source : Data of CBRM

Attachment 2.2

(5) Local Cost born by Japanese Side

(Unit: JPY '000)

Item	JFY 2005 【Actual】	JFY 2006 【Actual】	JFY 2007 【Anticipated】	Total
General activity budget				
Employment Expenses	1,203	1,941	1,748	**4,892**
Expenses for Consumables	708	778	692	**2,178**
Communication & Transportation	89	173	291	**553**
Expenses for Document Preparation	186	367	540	**1,093**
Rental Cost	1,741	3,082	3,307	**8,130**
Light and Heat Expenses	2,374	658	488	**3,520**
Maintenance Cost for Office	34	8	69	**111**
Expenses for Training of Technician	343	1,951	1,588	**3,882**
Others	73	95	174	**342**
Sub-total	**6,751**	**9,053**	**8,897**	**24,701**
Equipment Provision	10,517	0	0	**10,517**
Carried Equipment	1,262	0	0	**1,262**
Local Consultant	6,824	0	0	**6,824**
Total	**25,354**	**9,053**	**8,897**	**43,304**

Source : Data of CBRM

Attachment 2.2

(4) Local Cost born by Japanese Side

（Unit: JPY '000）

Item	JFY 2005 【Actual】	JFY 2006 【Actual】	JFY 2007 【Anticipated】	Total
General activity budget				
Employment Expenses	1,203	1,941	1,748	**4,892**
Expenses for Consumables	708	778	692	**2,178**
Communication & Transportation	89	173	291	**553**
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Others	73	95	174	**342**
Sub-total	**6,751**	**9,053**	**8,897**	**24,701**
Equipment Provision	10,517	0	0	**10,517**
Carried Equipment	1,262	0	0	**1,262**
Local Consultant	6,824	0	0	**6,824**
合計	**25,354**	**9,053**	**8,897**	**43,304**

Source : Data of CBRM

(6) Yearly Budget for DRBFC

Details for DRBFC	2002/03	2003/04	2004/05	2005/06	2006/07	2007	2008	Remarks (Unit：1,000 US$)
Personnel costs	152	163	167	185	190	0	248	Cabinet Planning in 2008
Management costs	698	21	510	1,000	0	0	151	from Jul. to Dec in 2007
Design costs							1,641	New
Construction supervision							1,025	New
Special Project							350	Dili Rain Drainage
Special Project							923	UNOPS5Bridge, DRBFC
Special Project							250	Telcom, Access road
Routine and office expense	2,298	2,249	2,831	2,836	2,002	0	2,216	
Periodic Maintenance	0	2,519	2,980	3,061	2,870	1,100	4,200	Include. Disaster Measure
Urban road maintenance	200	200	300	400	1,500	0	2,500	
Improvement	0	200	600	800	17,927	300	1,250	
Rural roads							4,875	New
Bridge	0	0	510	1,000	8,254	120	2,550	
Flood control	250	318	500	606	650	850	498	
Traffic safety	0	50	55	0	100	0	200	
Total	3,598	5,720	8,453	9,888	33,493	2,370	22,877	
【Case Sturdy】					49	98		

Source: Data from DRBFC

Attachment 2.2

(7) Yearly Budget for IGE

Item	FY 2005/06	FY 2006/07	2007 Jul.～Dec.	2008
	(,000 US$)	(,000 US$)	(,000 US$)	(,000 US$)
Salaries and Wages	71	241	120	228
Goods and Services	209	845	422	2,067
Minor Capital	100	100	0	25
(Transfer charge of IGE)				0
Total	380	1,186	542	2,320

Note: Fiscal year of Timor Leste has been changed from January to December on August 2007.
instead of from July to June. Therefore, the budget in 2007 is from July to December
as a transitional budget.

Source : Data from IGE

Attachment 2.3
Working Group List of C/P Personnel

Counterpart Personel 〈Input by Timor Leste side〉

(1) 1st Year Allocation of counterpart personnel (Working group member list)

		Name	Post	Assignment	Term	Training in Japan	Training subject
1st Year (2005 JFY)							
Capacity Building to DRBFC							
(DRBFC Central Office)							
1	1	Rui H. Guterres	Director		3years	None	Inventory Management
2	2	Joao Mario Gama	Engineer	Strategic Planning	3years	None	Inventory Management
3	3	Jose Augusto Freitas	Engineer	Road Design	3years	None	Inventory Management
4	4	Joao Pedoro Amaral	Chief of operation	Construction	2years	None	Inventory management /Road Condition Survey
(DRBFC Regional Offices)							
5	1	Jose Cornelio	Regional Engineer	Dili Region	2years	None	Inventory management /Road Condition Survey
6	2	Pedro Alexandre	Regional Engineer	Baucau Region	2years	None	Inventory management /Road Condition Survey
7	3	Nene Lobato	Regional Engineer	Same Region	2years	None	Inventory management /Road Condition Survey
8	4	Aniceto Andrade	Regional Engineer	Maliana Region	3years	None	Inventory management /Road Condition Survey
9	5	Abrao Viera	Regional Engineer	Oecussi Region	3years	JFY 2005	Inventory management /Road Condition Survey
10	6	Aleixo da Cruz	supervisor	Dili District	2years	None	Road Condition Survey
11	7	Mouzinho Tilman	assistant supervisor	Dili District	2years	None	Road Condition Survey
12	8	D. Emanuel	supervisor	Liquica District	2years	None	Road Condition Survey
13	9	Jeraldo Lemos	supervisor	Manatuto District North	2years	None	Road Condition Survey
14	10	Cleto Ximenes	assistant supervisor	Ailieu District North	2years	None	Road Condition Survey
15	11	Francisco de Gama	supervisor	Baucau District	2years	None	Road Condition Survey
16	12	Maitituho Mira	assistant supervisor	Baucau District	2years	None	Road Condition Survey
17	13	Gasper dos Santos	supervisor	Lautem District	2years	None	
18	14	Mario do Rego	supervisor	Viqueque District	2years	None	Road Condition Survey
19	15	Manuel A. Muno	assistant supervisor	Viqueque District	2years	None	Road Condition Survey
20	16	Joao Gregorio	supervisor	Ailiue/ Manatuto District South	2years	None	Road Condition Survey
21	17	Jose Marria da Costa	supervisor	Ainaro District	2years	None	Road Condition Survey
22	18	Antonio Soares	supervisor	Bobonaro District	2years	None	Road Condition Survey
23	19	Sertrio Pereira	supervisor	Ermera District	2years	None	Road Condition Survey
24	20	Domingos De J. Bareto	supervisor	Cova-Lima District	2years	None	Road Condition Survey
25	21	Cornelio Seran	assistant supervisor	Oecussi District	2years	None	Road Condition Survey
26	22	Angelo Maia	assistant supervisor	Oecussi District	2years	None	Road Condition Survey
Capacity Building to IGE							
(Equipment Management System)							
27	1	Joanico Goncalves	Director	IGE management	1year	None	
28	2	Jose Luis de Carvalho	Chief of Government Vehicle/Chief of Workshop	Registration and operation of Government Vehicles/Operation of workshop	1year	None	
29	3	Herclano Dos Santos	Chief of Equipment	Operation of construction equipment	1year	None	
30	4	Isau C.L. Costa Bosa	Chief of Planning &Operation/Chief of Construction	Planning /Quarry management	1year	None	
31	5	Luis Ximenes Do Carmo	Acting Chief of Workshop	Operation of workshop	1year	None	
32	6	Afonso Maria Lui	Chief of Material & Warehouse	Operation of warehouse	0.5year	None	
33	7	Filomeno Soares	Chief of Planning & Finance	Budget allocation & procurement	0.5year	None	
34	8	Secundino Freitas Moreira	Chief of Material & Warehouse	Operation of warehouse	1year	None	Resigned
	(Mechanics Training)(Trainees)						
35	1	Agostinho Boavida (1)	Mechanic	Machine maintenance	1year	None	Ex CETRAP Trainee
36	2	Agostinho Boavida (2)	Mechanic	Machine maintenance	1year	None	Ex CETRAP Trainee
37	3	Akinu Soares	Mechanic	Machine maintenance	1year	None	Ex CETRAP Trainee
38	4	Carlito Lopaes	Mechanic	Machine maintenance	1year	None	Ex CETRAP Trainee
39	5	Carlito De Fatima	Mechanic	Machine maintenance	1year	None	Ex CETRAP Trainee
40	6	Felix Soares	Mechanic	Machine maintenance	1year	None	Ex CETRAP Trainee
41	7	Francisco Carlus	Mechanic	Machine maintenance	1year	None	Ex CETRAP Trainee
42	8	Gil Borges De Araujo	Mechanic	Machine maintenance	1year	None	Ex CETRAP Trainee
43	9	Jose Antonio Da Cucha	Mechanic	Machine maintenance	1year	None	Ex CETRAP Trainee
44	10	Jose Mendonça	Mechanic	Machine maintenance	1year	None	Ex CETRAP Trainee
45	11	Luis Albano C.D. Duarte	Mechanic	Machine maintenance	1year	None	Ex CETRAP Trainee
46	12	Marcolino Ribeiro Afonso	Mechanic	Machine maintenance	1year	None	Ex CETRAP Trainee
47	13	Mateus Faria Gosmão	Mechanic	Machine maintenance	1year	None	Ex CETRAP Trainee
48	14	Nelson Da Silva Luy	Mechanic	Machine maintenance	1year	None	Ex CETRAP Trainee

49	15	Joao Baptista De Olivaira	Mechanic (Welder)	Machine maintenance	New	None	
50	16	Januario Lay	Mechanic	Machine maintenance	New	None	
51	17	Januario C. Sarmento	Mechanic (Welder)	Machine maintenance	New	None	
		Three (3) UNTL (Hera) students for industrial attachment			Sep. 2005~Dec. 2005	None	
		(Equipment Operators Training)(Trainees)					
52	1	Alexander Da Costa	Assistant Operator	Const. Machine operation	New	None	
53	2	Anisio D. Costa Bossa	Operator	Const. Machine operation	New	None	
54	3	Antonio Da Costa	Assistant Operator	Const. Machine operation	New	None	
55	4	Daniel F. Barros	Assistant Operator	Const. Machine operation	New	None	
56	5	Daniel Freitas	Operator	Const. Machine operation	New	None	
57	6	David Amaral de Carvalho	Operator	Const. Machine operation	1year	None	Ex CETRAP Trainee
58	7	Gregorio Guterres	Assistant Operator	Const. Machine operation	New	None	
59	8	Guido M. Freitas	Operator (Training Assistant)	Const. Machine operation	New	None	
60	9	Joao do Rego Martins	Assistant Operator	Const. Machine operation	New	None	
61	10	Jose Da Silva	Operator	Const. Machine operation	New	None	Ex CETRAP Trainee
62	11	Jose Gomes	Operator	Const. Machine operation	New	None	
63	12	Jose Soares	Operator	Const. Machine operation	1year	None	Ex CETRAP Trainee
64	13	Luis Mendonça	Assistant Operator	Const. Machine operation	New	None	
65	14	Lusiano Ximenes	Operator	Const. Machine operation	New	None	
66	15	Manuel De Jesus	Asistant Operator	Const. Machine operation	New	None	
67	16	Mateus Martins	Operator	Const. Machine operation	1year	None	Ex CETRAP Trainee
68	17	Noe Manuel B. De Assis	Operator	Const. Machine operation	New	None	
69	18	Paul Soares	Assistant Operator	Const. Machine operation	New	None	
70	19	Rogerio da CB Assis	Assistant Operator	Const. Machine operation	New		
71	20	Silvino da Silva Cardoso	Assistant Operator	Const. Machine operation	New		

Counterpart Personnel 〈Input by Timor Leste side〉

(2) 2nd Year Allocation of counterpart personnel (Working group member list)

		Name	Post	Assignment	Term	Training in Japan	Training subject
2nd Year (2006 JFY)							
Capacity Building to DRBFC							
(DRBFC Central Office)							
1	1	Rui H. Guterres	Director		4years	None	Inventory Management /Case Study Project
2	2	Joao Mario Gama	Engineer	Strategic Planning	4years	None	Inventory Management
3	3	Jose Augusto Freitas	Engineer	Road Design	4years	None	Inventory Management
4	4	Joao Pedoro Amaral	Chief of operation	Construction	3years	None	Inventory management /Road Condition Survey /Case Study Project
(DRBFC Regional Offices)							
5	1	Jose Cornelio	Engineer	Dili Region	3years	07(JICA)	Inventory management /Road Condition Survey /Case Study Project
6	2	Pedro Alexandre	Engineer	Baucau Region	3years	None	Inventory management /Road Condition Survey
7	3	Nene Lobato	Engineer	Same Region	3years	None	Inventory management /Road Condition Survey
8	4	Aniceto Andrade	Engineer	Maliana Region	4years	None	Inventory management /Road Condition Survey
9	5	Abrao Viera	Engineer	Oecussi Region	4years	2005	Inventory management /Road Condition Survey
10	6	Aleixo da Cruz	supervisor	Dili District	3years	None	Inventory management /Road Condition Survey /Case Study Project
11	7	Mouzinho Tilman	assistant supervisor	Dili District	3years	None	Road Condition Survey
12	8	D. Emanuel	supervisor	Liquica District	3years	None	Inventory management /Road Condition Survey /Case Study Project
13	9	Jorge Tiago Ximenes	assistant supervisor	Liquica District	1years	None	Road Condition Survey /Case Study project
14	10	Jeraldo Lemos	supervisor	Manatuto District North	3years	None	Inventory management /Road Condition Survey /Case Study Project
15	11	Cleto Ximenes	assistant supervisor	Ailieu District North	3years	None	Road Condition Survey
16	12	Maitituho Mira	assistant supervisor	Baucau District	3years	None	Road Condition Survey
17	13	Albino Pinto	assistant supervisor	Lautem District	1years	None	Road Condition Survey
18	14	Mario do Rego	supervisor	Viqueque District	3years	None	Inventory management /Road Condition Survey
19	15	Joao Gregorio	supervisor	Ailiue/ Manatuto District South	3years	None	Inventory management /Road Condition Survey /Case Study Project
20	16	Jose Marria da Costa	supervisor	Ainaro District	3years	None	Inventory management /Road Condition Survey /Case Study Project
21	17	Pedro Cortereal	supervisor	Mamufahi District	1years	None	Inventory management /Road Condition Survey /Case Study Project
22	18	Antonio Soares	supervisor	Bobonaro District	3years	None	Inventory management /Road Condition Survey /Case Study Project
23	19	Sertrio Pereira	supervisor	Ermera District	3years	None	Inventory management /Road Condition Survey /Case Study Project
24	20	Domingos De J. Bareto	supervisor	Cova-Lima District	3years	None	Inventory management /Road Condition Survey /Case Study Project
Capacity Building to IGE							
(Equipment Management System)							
25	1	Joanico Goncalves	Director	IGE management	2 years		
26	2	Jose Luis de Carvalho	Chief of Government Vehicle/Chief of General Administration	Registration and operation of Government Vehicles/Operation of const. machines	2 years		
27	3	Herclano Dos Santos	Chief of Equipment	Operation of construction equipment	2 years		Transferred to MTC
28	4	Isau C.L. Costa Bosa	Chief of Operation	Quarry management	2 years		Transferred to MTC
29	5	Luis Ximenes Do Carmo	Acting Chief of Workshop	Operation of workshop	2 years		
30	6	Afonso Maria Lui	Chief of Material & Warehouse	Operation of warehouse	2 years		

31	7	Filomeno Soares	Chief of Planning & Finance	Budget allocation & procurement	1 year		
32	8	Egas C. de Lemos	Chief of Construction/Chief of Workshop	Construction site Operation/Workshop Operation	New		
(Mechanics Training)(Trainees)							
33	1	Agostinho Boavida (1)	Mechanic	Machine maintenance	2 years		Ex CETRAP Trainee
34	2	Agostinho Boavida (2)	Mechanic	Machine maintenance	2 years		Ex CETRAP Trainee
35	3	Akinu Soares	Mechanic	Machine maintenance	2 years		Ex CETRAP Trainee
36	4	Carlito De Fatima	Mechanic	Machine maintenance	2 years		Ex CETRAP Trainee
37	5	Felix Soares	Mechanic	Machine maintenance	2 years		Ex CETRAP Trainee
38	6	Francisco Carlus	Mechanic	Machine maintenance	2 years		Ex CETRAP Trainee
39	7	Jose Antonio Da Cucha	Mechanic	Machine maintenance	2 years		Ex CETRAP Trainee
40	8	Jose Mendonça	Mechanic	Machine maintenance	2 years		Ex CETRAP Trainee
41	9	Luis Albano C.D. Duarte	Mechanic	Machine maintenance	2 years		Ex CETRAP Trainee
42	10	Mateus Faria Gosmão	Mechanic	Machine maintenance	2 years		Ex CETRAP Trainee
43	11	Joao Baptista De Olivaira	Mechanic (Welder)	Machine maintenance	1 year		
44	12	Januario C. Sarmento	Mechanic (Welder)	Machine maintenance	1 year		
45	13	Jonatus C. Miniz Luy	Mechanic	Machine maintenance	New		
46	14	Alcino Magno	Mechanic	Machine maintenance	New		
47	15	Jhony Gomes	Mechanic	Machine maintenance	New		
48	16	Jefrianus N. K.. Un	Mechanic	Machine maintenance	New		
49	17	Jose Antonio P. Raul	Mechanic	Machine maintenance	New		
50	18	Carlito Lopaes	Mechanic	Machine maintenance	New		Ex CETRAP Trainee
		Nelson Da Silva Luy	Mechanic	Machine maintenance	2 years		Seconded to private company as a crane operator
		Simplicio da Silva	Chief Mechanic	Training Asistant	2 years		
(Equipment Operators Training)(Trainees)							
51	1	Armindo da S Nunes	Operator	Const. Machine operation	1 year		
52	2	Daniel F. Barros	Assistant Operator	Const. Machine operation	1 year		
53	3	David Amaral de Carvalho	Operator	Const. Machine operation	1 year		Ex CETRAP Trainee
54	4	Filomeno Gomes	Operator	Const. Machine operation	New		
55	5	Fransisco da Silva	Operator	Const. Machine operation	2 years		Ex CETRAP Trainee
56	6	Guido M. Freitas	Operator (Training Asistant)	Const. Machine operation	1 year		
57	7	Hermenegildo D. Tilman	Operator	Const. Machine operation	1 year		
58	8	Hermenegildo dos Santos	Operator	Const. Machine operation	2 years		Ex CETRAP Trainee
59	9	Luis Benevides	Operator	Const. Machine operation	2 years		Ex CETRAP Trainee
60	10	Luis Mendonça	Assistant Operator	Const. Machine operation	1 year		
61	11	Paulo Soares	Assistant Operator	Const. Machine operation	1 year		
62	12	Silvino da Silva Cardoso	Assistant Operator	Const. Machine operation	1 year		

Counterpart Personnel 〈Input by Timor Leste side〉

(3) 3rd Year Allocation of counterpart personnel (Working group member list), as of December 2007

		Name	Post	Assignment	Term	Training in Japan	Training subject
3rd Year (2007 JFY), as of December 2007							
Capacity Building to DRBFC							
(DRBFC Central Office)							
1	1	Rui H. Guterres	Director		5years	None	Inventory Management /Case Study Project
2	2	Joao Mario Gama	Engineer	Strategic Planning	5years	None	Inventory Management /Case Study Project
3	3	Jose Augusto Freitas	Engineer	Road Design	5years	None	Inventory Management
4	4	Nilton R. Mouteiro	Engineer	Bridge Design	2years	None	Inventory Management /Bridge Condition Servey
5	5	Joao Pedoro Amaral	Chief of operation	Construction	4years	07(JICA)	Inventory management /Case Study Project
(DRBFC Regional Offices)							
6	1	Pedro Alexandre	Engineer	Baucau Region	4years	None	Inventory Management /Bridge Condition Survey
7	2	Nene Lobato	Engineer	Same Region	4years	None	Inventory Management /Bridge Condition Survey
8	3	Aniceto Andrade	Engineer	Maliana Region	5years	None	Inventory Management /Bridge Condition Survey
9	4	Abrao Viera	Engineer	Oecussi Region	5years	05(CBRM)	Inventory Management /Bridge Condition Survey
10	5	Aleixo da Cruz	supervisor	Dili District	4years	07(JICA)	Inventory management /Bridge Condition Survey /Case Study Project
11	6	Mouzinho Tilman	assistant supervisor	Dili District	4years	None	Inventory management /Bridge Condition Survey /Case Study Project
12	7	D. Emanuel	supervisor	Liquica District	4years	None	Inventory management /Bridge Condition Survey /Case Study Project
13	8	Jorge Tiago Ximenes	assistant supervisor	Liquica District	2years	None	Inventory management /Bridge Condition Survey /Case Study Project
14	9	Jeraldo Lemos	supervisor	Manatuto District North	4years	None	Inventory management /Bridge Condition Survey /Case Study Project
15	10	Cleto Ximenes	assistant supervisor	Ailieu District North	4years	None	Inventory management /Bridge Condition Survey /Case Study Project
16	11	Maitituho Mira	assistant supervisor	Baucau District	4years	None	Inventory management /Bridge Condition Survey /Case Study Project
17	12	Albino Pinto	assistant supervisor	Lautem District	2years	None	Inventory management /Bridge Condition Survey /Case Study Project
18	13	Mario do Rego	supervisor	Viqueque District	4years	None	Inventory management /Bridge Condition Survey /Case Study Project
19	14	Joao Gregorio	supervisor	Ailiue/ Manatuto District South	4years	None	Inventory management /Bridge Condition Survey /Case Study Project
20	15	Jose Marria da Costa	supervisor	Ainaro District	4years	None	Inventory management /Bridge Condition Survey /Case Study Project
21	16	Pedro Cortereal	supervisor	Mamufahi District	2years	None	Inventory management /Bridge Condition Survey /Case Study Project
22	17	Antonio Soares	supervisor	Bobonaro District	4years	None	Inventory management /Bridge Condition Survey /Case Study Project
23	18	Sertrio Pereira	supervisor	Ermera District	4years	None	Inventory management /Bridge Condition Survey /Case Study Project
24	19	Domingos De J. Bareto	supervisor	Cova-Lima District	4years	None	Inventory management /Bridge Condition Survey /Case Study Project

Capacity Building to IGE							
(Equipment Management System)							
25	1	Joanico Goncalves	Director	Director of IGE	3 years		
26	2	Jose Luis de Carvalho	Chief of General Administration	Operation of const. machines	3 years		
27	3	Afonso Maria Lui	Chief of Material & Warehouse	Operation of workshop	2 years		
28	4	Filomeno Soares	Chief of Planning & Finance	Budget Allocation & Procurement	2 years		
29	5	Egas C. de Lemos	Chief of Construction/Chief of Workshop	Construction site Operation/Workshop Operation	1 year		
30	6	Luis Ximenes Do Carmo	Acting Chief of Workshop	Operation of workshop	3 years		
(Mechanics Training)(Trainees)							
31	1	Agostinho Boavida (1)	Mechanic	Machine maintenance	3 years		Ex CETRAP Trainee
32	2	Agostinho Boavida (2)	Mechanic	Machine maintenance	3 years		Ex CETRAP Trainee
33	3	Carlito De Fatima	Mechanic	Machine maintenance	3 years		Ex CETRAP Trainee
34	4	Felix Soares	Mechanic	Machine maintenance	3 years		Ex CETRAP Trainee
35	5	Francisco Carlus	Mechanic	Machine maintenance	3 years		Ex CETRAP Trainee
36	6	Jose Antonio Da Cucha	Mechanic	Machine maintenance	3 years		Ex CETRAP Trainee
37	7	Jose Mendonça	Mechanic	Machine maintenance	3 years		Ex CETRAP Trainee
38	8	Luis Albano C.D. Duarte	Mechanic	Machine maintenance	3 years		Ex CETRAP Trainee
39	9	Mateus Faria Gosmão	Mechanic	Machine maintenance	3 years		Ex CETRAP Trainee
40	10	Joao Baptista De Olivaira	Mechanic (Welder)	Machine maintenance	2 years		
41	11	Januario C. Sarmento	Mechanic (Welder)	Machine maintenance	2 years		
42	12	Jonatus C. Miniz Luy	Mechanic	Machine maintenance	1 year		
43	13	Alcino Magno	Mechanic	Machine maintenance	1 year		
44	14	Jhony Gomes	Mechanic	Machine maintenance	1 year		
45	15	Jefrianus N. K.. Un	Mechanic	Machine maintenance	1 year		
46	16	Jose Antonio P. Raul	Mechanic	Machine maintenance	1 year		
47	17	Carlito Lopaes	Mechanic	Machine maintenance	3 years		Ex CETRAP Trainee
48	18	Derto Da Silva Luy	Mechanic	Machine maintenance	New		
49	19	Hermrnigilda D.C.A. (Ms)	Mechanic	Machine maintenance	New		
		Nelson Da Silva Luy	Mechanic	Machine maintenance	2 years		Seconded to private company as a crane operator
		Simplicio da Silva	Chief Mechanic	Training Assistant	3 years		
		Six (6) STM (Lospalos) students for industrial attachment			Oct. ~ Dec.07		
(Equipment Operators Training)							
50	1	Alexandre da Costa	Assistant Oprator	Const. Machine operation	2 years		
51	2	Daniel Barros	Assistant Oprator	Const. Machine operation	2 years		
52	3	Deolindo Fernandes	Assistant Oprator	Const. Machine operation	2 years		
53	4	Filomeno Amaral	Operator (Training Asistant)	Const. Machine operation	3 years		Ex CETRAP Trainee
54	5	Frsnacisco da Silva	Assistant Oprator	Const. Machine ope. (Crane)	3 years		Ex CETRAP Trainee
55	6	Grigorio Gutteres	Assistant Oprator	Const. Machine operation	2 years		
56	7	Guido M. Freitas	Oprator	Const. Machine ope. (Crane)	2 years		
57	8	Jacinto Araujo	Oprator	Const. Machine ope. (Crane)	2 years		
58	9	Jose soares	Oprator	Const. Machine operation	3 years		Ex CETRAP Trainee
59	10	Lamberto Correia	Assistant Oprator	Const. Machine operation	2 years		
60	11	*Luis Albano*	Mechanic	Const. Machine ope. (Crane)	2 years		
61	12	Mateus Dos Reis	Oprator	Const. Machine ope. (Crane)	3 years		Ex CETRAP Trainee
62	13	Paul Soares	Assistant Oprator	Const. Machine operation	2 years		
63	14	Rogerio Da C.B Belo	Assistant Oprator	Const. Machine operation	2 years		
64	15	Tomas Soares	Operator (Training Asistant)	Const. Machine operation	2 years		

Attachment 2.4
Minutes of Meetings for Joint Steering Committee Meetings

MINUTES OF MEETINGS
OF
THE JOINT STEERING COMMITTEE MEETING
ON
THE INCEPTION REPORT
OF
THE PROJECT FOR THE CAPACITY BUILDING OF ROAD MAINTENANCE
IN
THE DEMOCRATIC REPUBLIC OF TIMOR-LESTE

Date & Time	:	29th June 2005. 10:00 – 12:00 P.M.
Place of Meeting	:	Conference Room. Division of Transport, Equipment and Material, Ministry of Transport, Communication and Public Works (MTCPW)
Participants	:	See attached participants list

The Joint Steering Committee Meeting was opened by the chairman Mr. João B.F. Alves, Secretary of State for Public Works. MTCPW at 10:00 A.M.

Mr. Koji Naito. Team Leader / Road Maintenance Expert and Mr. Etsuo Hashiguchi. Construction Equipment Management and Procurement Expert, explained outline of the Project for the Capacity Building of Road Maintenance in the Democratic Republic of Timor Leste (herein after referred to as "the Project"). The presentation was done by using the Project Design Matrix (PDM) and the Plan of Operation (PO) which was prepared by the JICA expert team based on the Record of Discussions (R/D) agreed on April 20. 2005 .

After questions and answers, the following matters pertaining to the implementation of the Project were duly approved by the Joint Steering Committee.

MATTERS DISCUSSED AND APPROVED BY THE JOINT STEERING COMMITTEE

1. The Project will be implemented in accordance with R/D agreed on April 20, 2005.

2. The Inception Report, PDM and PO prepared by the JICA Expert Team were duly approved by the Joint Steering Committee, provided that the implementation plan will be flexibly revised if necessity arises in the course of project implementation.

   The concrete plan of the Project will be shown in the technology transfer seminar to be scheduled on September, 2005.

3. It has been confirmed by the Joint Steering Committee that Counterpart Personnel, Administrative Personnel and Staff members of MTCPW to be trained in the Project will be assigned in the course of project implementation.

4. The JICA expert team for the Project will be assigned as per attached assignment schedule to implement the Project smoothly and successfully.

5. The Secretary of State for Public Works, MTCPW, as a Project Director, will bear overall responsibility for the administration and implementation of the Project. The Permanent Secretary of Public Works, MTCPW, as a Project Manager, will be responsible for the managerial and technical matters of the Project.

6. The modification of the members of the Joint Steering Committee should be notified to JICA accordingly.

7. In order to establish the effective management systems pertaining to the Road Maintenance, the counterpart personnel of Timor-Leste should play central role in planning and implementation of the Project form the initial stage of the project operation through technical assistance by the JICA expert team.

8 Staff members trained by JICA-CETRAP should be selected as participants of the Project.

9. Road construction equipment, tools and materials those are necessary for training of the Staff members of MTCPW should be provided timely by the Government of Timor-Leste in due course of project operation.

10. In order to implement the project effectively, MTCPW should take a necessary action to disseminate the effectiveness of the Project to the Timor-Leste authorities concerned to the Project.

After a constructive discussion and having a confirmation of cooperation to implement the Project smoothly and effectively, the Joint Steering Committee Meeting was closed at 12:00 P.M. on June 29. 2005.

Mr. João B.F. Alves
Secretary of State for Public Works,
Ministry of Transport, Communication and
Public Works
(Chairman of the Joint Steering Committee)

Mr. Koji Naito
Team Leader of the JICA Experts
The Project for Capacity Building of
Road Maintenance

(Witnessed by)

Mr. Yoshiro Kurashina
Leader
JICA Study Team

ANNEX I

Project Design Matrix (PDM)

Project Name: The Project for the Capacity Building in Road Maintenance in the Democratic Republic of Timor-Leste
Duration: June 2005 - November 2007 (2.5 years) Target Area: Whole Country
Target Group: Concerned Staff of Directorates of Road, Bridge and Flood Control (DRBFC) and Equipment and Material (DTEM), Secretary of State for Public Works, MTCPW

Narrative Summary	Objectively Verifiable Indicators	Means of Verification	Important Assumptions
Overall Goal Arterial roads in Timor-Leste are always maintained.	1.Decrease of blockade points of arterial roads 2.Decrease of blockade terms of arterial roads 3.Utilization of manual for reporting system	1.Road inventory 2.Road inventory 3.Communication record of manual for reporting system	
Project Purpose Capabilities on daily and periodic maintenance/ repair of arterial roads and restoration against road disaster areas on the arterial roads are strengthened.	1.Quality and renewal frequency of road inventory 2.Quality of maintenance and repair works 3.Quality and renewal frequency of inventory of construction equipment and repair equipment/tools 4. Number of training participants	1.Road inventory 2.Inspection and construction management record of maintenance and repair works 3.Inventory of construction equipment and repair equipment/tools 4. Participants record of training program	-Number of vehicles in Timor-Leste does not increase drastically.
Outputs 1.Appropriate works for maintenance and repair of arterial roads are planned by DRBFC. 2.Road management system, which central and regional road offices cooperate each other, is formulated. 3.The staff members of DRBFC and DTEM, who are responsible for the maintenance and repair works of arterial roads, are trained. 4.The case studies of management plan on the maintenance and repair works of arterial roads are appropriately planned, designed and implemented by MTCPW. 5.The operation system for construction equipment and repair equipment / tools is appropriately maintained and managed by MTCPW.	1-1.Preparation of an road inventory 1-2.Updated the road inventory 1-3.Preparation of report on maintenance and repair plan 2-1.Preparation of manual for reporting system on road management between central and regional road offices 2-2.Preparation of disaster manual for reporting system on road management between central and regional road offices 3-1.Number of road maintenance management engineers who acquired specified technologies 3-2.Number of road construction management engineers who acquired specified technologies 3-3.Number of equipment/tools management engineers who acquired specified technologies 3-4.Number of mechanics who acquired specified technologies 3-5.Number of operators who acquired specified technologies 4-1.Formulation of maintenance management plan (formulation of process control, construction method, quality control, work progress control, cost management systems) 4-2.Formulation of site management plan (formulation of equipment management, safety management, environment management, by-product management systems) 4-3.Number of safety training programs 4-4.Condition of practical training 5-1.Preparation of inventory of construction equipment and repair equipment/tools 5-2.Updated inventory of construction equipment and repair equipment/tools 5-3.Establishment of maintenance management system for construction equipment and repair equipment/tools	1-1.Road inventory 1-2.Road inventory 1-3.Road maintenance and repair plan 2-1.Manual for reporting system 2-2.Disaster manual for reporting system 3-1.Record of training program, text of road maintenance and repair works, evaluation result by trainees 3-2.Record of training program, text of road maintenance and repair works, evaluation result by trainees 3-3.Record of training program, text of road maintenance and repair works, evaluation result by trainees 3-4.Record of training program, text of road maintenance and repair works, evaluation result by trainees 3-5.Record of training program, text of road maintenance and repair works, evaluation result by trainees 4-1.Maintenance management plan 4-2.Site management plan 4-3.Impremention record of safety training 4-4.Maintenance and site management reports 5-1.Inventory of construction equipment and repair equipment/tools 5-2.Inventory of construction equipment and repair equipment/tools 5-3.Inventory of construction equipment and repair equipment/tools 5-4.Report on management plan for construction equipment and repair equipment/tools necessitated in the MTCPW's regional offices	-Trained staff remain and continue to work for the Project. -Budgets for road maintenance/ repair programs and maintenance of equipment/ tools are provided continuously.

	(formulation and operation systems for i)lending, ii)procurement planning for parts, iii)operation record, iv)troubleshooting record, v)periodic maintenance plan, vi)repair ordering plan) 5-4.Formulation of management plan for construction equipment and repair equipment/tools necessitated in the MTCPW's regional offices		
Activities 1-1.Prepare a road inventory 1-2.Update the road inventory 1-3.Prepare the maintenance and repair plan for each arterial road, based on each development level. 2-1.Prepare a manual for reporting system on road management between central and regional road offices. 2-2.Prepare a manual for reporting system on road management in the case of disasters between central and regional road offices. 3-1.Formulate and implement training program for the following personnel in collaboration with DRBFC and DTEM. (1)Road maintenance management engineer (2)Road construction management engineer (3)Equipment/tools management engineer (4)Mechanic (5)Operator 4-1.Formulate a maintenance management plan. 4-2.Formulate a site management plan. 4-3.Define job description of the duties of staff members concerned. 4-4.Formulate a safety training program concerning the works on the maintenance and repair of arterial roads. 4-5.Implement the safety training program. 4-6.Implement case studies-concerning road maintenance and repair of arterial roads appropriately in MTCPW's project. 5-1.Prepare an inventory of construction equipment and repair equipment/tools and establish its management system. 5-2.Update the inventory of construction equipment and repair equipment/tools. 5-3.Formulate a management plan for construction equipment and repair equipment/tools in the regional road offices. 5-4.Establish a maintenance system of construction equipment and repair equipment/tools in collaboration with DRBFC and DTEM. 5-5.Operate construction equipment and repair equipment/tools appropriately.	**Inputs** **(Japan)** 1.Dispatch of JICA Experts Experts' fields: -Road Maintenance Expert / Team Leader -Road Construction Management Expert -Construction Equipment Management and Procurement Expert 1 (System formation, procurement of materials, equipment and tools, operation management of equipment and tools) -Construction Equipment Management and Procurement Expert 2 (Management of equipment and tools, operation and maintenance) -Construction Equipment Operation Expert 2.C/P training in Japan (training for staff in charge of road maintenance and road construction management) 3.Other necessary equipment and materials	**(Timor-Leste)** 1.Arrangement of counterpart personnel(C/P):Staff of DRBFC and DEM) 2.Arrangement of trainees (road maintenance engineers, road construction management engineers, equipment/ tools management engineers, mechanics, and operators) 3.Provision of facilities for the Project implementation -Project office 4.Provision of equipment and tools -Equipment/ tools for maintenance of the arterial roads (equipment that was donated by the Japanese side) 5.Other necessary budget	**Preconditions** -Staff trained in JICA-CETRAP remain active for the Project. -Equipment and tools prepared for the Project are ready to be utilized.

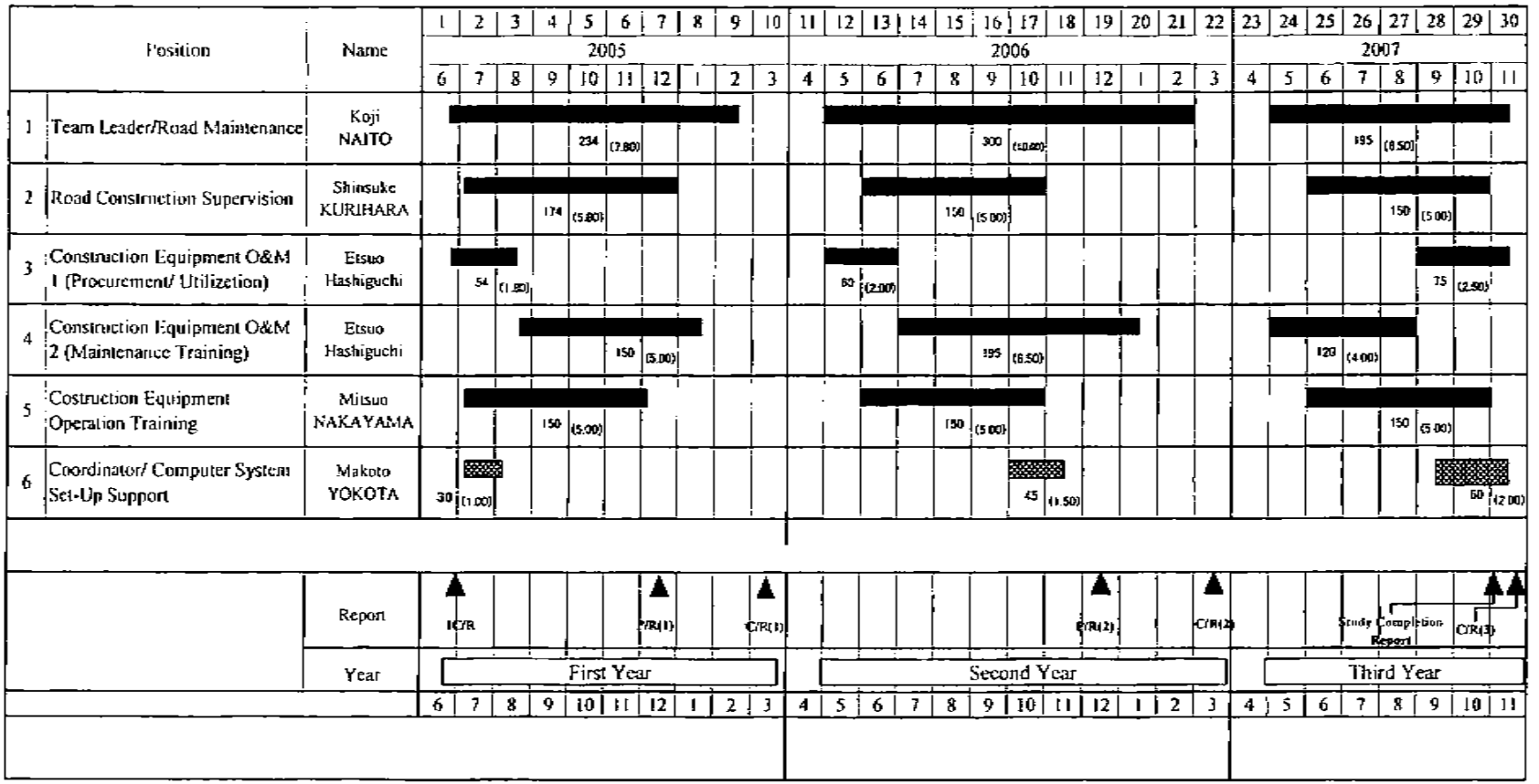
ANNEX II. Plan of Operation (PO)/Tentative Schedule

Activities	2005							2006											2007											Person in Charge (Japanese Experts)	Implementer (DRBFC or DTEM)
	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11		
(Output 1.Appropriate works for maintenance and repair of arterial roads are planned by DRBFC.)																																
1-1. Prepare road inventory																															RM	DRBFC
1-2. Update road inventory																															RM	DRBFC
1-3. Prepare maintenance and repair plan for each arterial road, based on each development level																															◎RM, RA	DRBFC
(Output 2.Road management system, in which central and regional road offices cooperate with each other,is formulated.)																																
2-1. Formulate a manual for reporting system between central and regional road offices on road management																															◎RM, RA	DRBFC
2-2. Formulate a disaster manual for reporting system between central and regional road offices on road management																															◎RM, RA	DRBFC
(Output 3.Staff of DRBFC and DTEM, concerning on the maintenance and repair works of arterial roads are trained.)																																
3-1. Formulate a training program for the following personnel in collaboration with DRBFC and DEM, and train them																																
(1) Road maintenance management engineer																															RM	DRBFC
(2) Road construction management engineer																															RCM	DRBFC
(3) Equipment/tools management engineer																															CEM1	DEM
(4) Mechanic																															CEM2	DRBFC, ◎DTEM
(5) Operator																															CEO	DRBFC, ◎DTEM
(Output 4.Case studies of Management plan on the maintenance and repair works of arterial roads are appropriately planned, designed and implemented by MTCPW.)																																
4-1. Formulate a maintenance management plan																															◎RCM,RM,CEM1	◎DRBFC, DTEM
4-2. Formulate a site management plan																															◎RCM,CEM1	◎DRBFC, DTEM
4-3. Job description the duties of the Project staff																															◎RCM,CEM1	◎DRBFC, DTEM
4-4. Formulate a safety training program concerning the works on the maintenance and repair of arterial roads																															◎RCM,CEM1,CEO	◎DRBFC, DTEM
4-5. Implement the safety training program																															◎RCM,CEM1,CEO	◎DRBFC, DTEM
4-6. Implement case studies concerning road maintenance and repair of arterial roads appropriately in MTCPW's projects																															◎RCM,RM,CEM1, CEO	◎DRBFC, DTEM
(Output5.Operation system for construction equipment and repair equipment/tools is appropriately maintained and managed by MTCPW.)																																
5-1 Prepare inventory of construction equipment and repair equipment/tools and formulate its management system																															◎CEM1, CEM2	DTEM
5-2. equipment/tools																															◎CEM1, CEM2	DTEM
5-3. Formulte a management plan for construction equipment and repair equipment/tools necessitated in the MTCPW's regional offices																															◎CEM1, CEM2	DTEM
5-4. Formulate a maintenance system of construction equipment and repair equipment/tools in collaboration with DRBFC and DEM																															◎CEM1, CEM2	◎DTEM,DFBRC
5-5. Operate necessary construction equipment and repair equipment/tools appropriately																															◎CEM1, CEM2	DTEM

Note-1: (Japanese Experts) RM:Road Maintenance Expert/Chief Advisor, RCM:Road Construction Management Expert, CEM1:Construction Equipment Management and Procurement Expert 1
CEM2:Construction Equipment Management and Procurement Expert 2, CEO:Construction Equipment Operation Expert, RA:Road Advisor, ◎:Responsible Personnel

Note-2: (C/Ps from Timor-Leste)DRBFC: Directorates of Road, Bridge and Flood Control, DEM: Directorates of Equipment and Material, ◎:Responsible Directorate

Annex III Assignment Schedule of JICA Experts for the Project



MINUTES OF MEETING

OF

THE JOINT STEERING COMMITTEE MEETING (2)

FOR

THE PROJECT FOR THE CAPACITY BUILDING OF ROAD MAINTENANCE

IN

THE DEMOCRATIC REPUBLIC OF TIMOR-LESTE

(CBRM)

Date & Time	:	6th January 2006, 10:00 – 12:00 P.M.
Place of Meeting	:	Conference Room at Taci Tolu CBRM office (IP-GEM office)
Participants	:	See attached participants list
Agenda	:	1) Opening address by the chairman 2) Self introduction of participants 3) Presentation on activities and progress of CBRM in 1st field work and next schedule of CBRM 4) Question and answers 5) AOB (any other business) 6) Closing address by the chairman

The Joint Steering Committee Meeting (2) was opened by the chairman, who is Mr. Raul Mousaco, Vice Minister of MPW, Project Director, at 10:00 a.m.

After opening address by the chairman and self introduction of all participants on the meeting, Mr. Koji Naito, Team Leader of the Project for the Capacity Building of Road Maintenance in the Democratic Republic of Timor Leste (hereinafter referred to as "CBRM") explained the outline of activities and progress of CBRM in 1st field work (Japanese fiscal year 2005/2006) and next schedule in 2nd field work (fiscal year of 2006/2007). The presentation was done by using Power Point prepared based on the Progress Report (1) which draft was submitted in December 2005. Summary of the Progress Report is attached hereinafter.

After questions and answers, the following matters pertaining to the activities and progress in 1st field work and next schedule of CBRM were duly agreed by the Joint Steering Committee.

Matters Discussed and Approved by the Joint Steering Committee Meeting (2)

1. Activities and progress in 1st field work and next schedule in 2nd field works of CBRM were understood and accepted by the steering committee.
2. Mechanics and operators trained in 1st field work by CBRM will be kept for training in 2nd field work by IP-GEM so as to carry out continuous training for them as possible as they can.
3. As for road maintenance plan and manual for reporting system, these will be finalized in cooperation with Working Group coordinated in MPW.
4. It is necessary in next stage that the concrete work item of CBRM prepared in this stage is referred to the work item mentioned in Project Design Matrix (PDM) in Record of Discussions agreed on April 20, 2005, though formulation and contents of work for CBRM is not changed from those of PDM.
5. It is confirmed at the meeting that CBRM activities are very useful of the Government of Timor Leste, especially in DRBFC, MPW and IP-GEM, MTC.

After constructive discussions and having a confirmation of cooperation to implement CBRM smoothly and effectively, the Joint Steering Committee Meeting (2) was closed at 12:00 P.M. on January 06, 2006 by the closing address of the chairman.

Mr. Paul Monaco
Vice Minister of Ministry of Public Works,
Project Director
(Chairman of the Joint Steering Committee)

Mr. Koji Naito
Team Leader of the JICA Experts
The Project for the Capacity Building of
Road Maintenance (CBRM)

Summary of Progress Report (1)
on
The Project for Capacity Building of Road Maintenance in the Democratic of Republic of Timor Leste (CBRM)

Activities / Progress of CBRM in 1st Field Work

(1) Overall Progress; overall progress achieved as of December 2005 is 90.4 % of total work in 1st field work in fiscal year 2005/2007. Work items in 1st field work and their progress is shown in Figure 1 as per attached.

(2) Road Maintenance Inventory Survey;

a) Road maintenance inventory survey was carried out on all arterial roads in Timor Leste with total length of about 1,360 km. Inspection of road maintenance inventory survey was done by staff of regional offices of Division of Road, Bride and Flood Control (DRBFC), Ministry of Public Works (MPW), by supporting of CBRM based on the inspection sheet and criteria prepared by CBRM.

b) In parallel with the inspection activities, installation of Km posts on all arterial roads with an interval of 5 km was carried out for future road maintenance of the roads. Km posts for road maintenance installed on the roads are reached 284 numbers. Preparation of computerized database is being carried out based on the inspection results.

(3) Capacity Building to DRBFC;

a) Method and criteria of inspection for road maintenance was carried out to regional staff of DRBFC at regional offices and actual roads before starting the inspection by regional staff. Number of staff who was trained for road inspection with inspection sheets and criteria is 18 trainees for several days at respective regional offices.

b) Review of present condition of road maintenance works and existing rehabilitation plan in Timor Leste was carried out so as to reflect the maintenance plan. Draft Maintenance Plan has been prepared in November 2005. Draft manual of reporting system between central office and regional offices of DRBFC in normal condition and disaster condition will be prepared in January. These reports will be finalized in 2nd field work of CBRM based on the results of experiences in 2nd field work and discussion with DRBFC and relevant offices.

c) In addition to the above, training at actual construction site, which is the Project for Improvement of Roads between Dili and Casa financed by Japanese Grant Aid, is carried out in November to the four staff of respective regional offices. Training is done as to the importance of quality management established by proper mobilization of equipment and facilities, proper organization and enough

document management.

(4) Capacity Building for Equipment Management System of IP-GEM;

a) The frame work of the equipment management system such as preparation of database, division of duties among sections of Public Institute of Equipment and Material Management (IP-GEM), and how to coordinate these duties was carried out and completed except the rules and regulations for the operation of IP-GEM which to be drawn up by the Government of Timor Leste.

b) Preparation of database for equipment management was executed. Its usefulness in equipment management is fully recognized by IP-GEM and Ministry of Transportation and Communication (MTC). However, gathering data and updating database is still in process, and further training for IP-GEM personnel is necessary to master database operation.

(5) Training for Mechanics of IP-GEM;

a) Mechanic training course was commenced on September 2005 to seventeen (17) mechanics with lecture and practice. Training by lecture consists of safety work, four rules of arithmetic. SI units, structure and function of construction machine, principle of engine, principle of power train, torque, pressure, basic electric, etc. Practice training consisted of safety work, preparation of workshop, periodic maintenance, welding, repairing machine and etc.

b) Although there are some trainees who still can not do four-arithmetical-operation, an achievement test carried out in November proved that more than half members of trainees have learned the multiplication table at least. Regarding learning of technical knowledge, most of trainees learned how engine works or how transmission works through this training course. And about two-third of trainees now can read and draw a simple electric wiring diagram.

c) As a result of a crush program, at least five (5) mechanics have learned how to check and diagnose the engine trouble, though not reached the stage of perfection yet. Through repairing practice, trainees have also learned how to repair under carriage of the bulldozer. Trainees have repaired one bulldozer, which has broken power train, by cannibalizing parts from another broken-down machine. On the job training (OJT) for welding that converts container into a tools store was completed by trainees. It was assessed that the purpose of welding training as well as construction of tools store were fully attained.

(6) Training for Construction Equipment Operators of IP-GEM;

a) Training for construction equipment operators is carried out by lecture and practice at construction equipment training field located at the back of Taci Tolu office. Operators trained in this period are 20 operators according to the request of IP-GEM, which technical level was poor. In future, IP-GEM intends to organize the system that one operator and assistant operator will operate one

equipment selected only for them. Specialist operators will be requested for special equipment selected for respective operators.

b) In the lecture. training for prevision of danger (safety training) and prevention maintenance is carried out for all trainees. Though these training, almost all trainees became to understand prevision of danger during operating, how to read fuel gauge, how to use strait ruler and why necessary prevention maintenance for equipment.

c) In the practical operating training, classification of trainees was at first done in order to grasp the technical level of trainees and to evaluate their aptitude for operating. Trainees were classified into 6 groups. According to the classified groups, operators were trained by bulldozer, excavator, motor grader, wheel loader, stone crusher, vibration roller, crawler dump in parallel with some kinds of equipment. After finishing the practice training, operators were tested with technical level check sheet. According to the test results, operating technical levels of almost all operators were graded up. However, further training will be required for level up so as to operate at actual construction site, since almost all of them were beginners for operation of heavy construction equipment.

Next Schedule of the Project (CBRM)

(7) Work item in 2nd field work of CBRM which is scheduled for May 2006 to February 2007 is classified into 3 main categories such as i) capacity building of road maintenance to DRBFC, ii) capacity building to IP-GEM, iii) case study at actual road works for capacity building to DRBFC and IP-GEM.

(8) Basic contents for the work items are flow charted in Figure 2 and schedule of work in next stage is shown in Figure 3 as per attached.

Recommendation

(9) The Project for Capacity Building of Road Maintenance in Timor Leste (CBRM) purpose to have capabilities on daily and periodic maintenance/repair of arterial roads and restoration against road disaster areas on the arterial roads are strengthened. For achievement of the purpose, the Project (CBRM) pursues establishment of the self operation and maintenance system in both organizations of DRBFC and IP-GEM, and capacity building to technical staff of them.

(10) Taking into considerations of the above concept and experiences in the 1st field works and their results, the following recommendations are presented from CBRM to DRBFC and IP-GEM:

a) The importance of the systematic routine inspection for road conditions should be recognized.

b) The road maintenance works should be planed based on the results of routine inspection excluding emergency cases taking into considerations priority of

maintenance works within the limited budget

c) Emergency maintenance should be reacted first of all against the damaged portion due to disasters so as to keep the road safety and shorten the road blockage periods as possible as they can

d) Emergency maintenance works should be acted as the Government management works by using the Government's construction equipment of IP-GEM in order to complete the recovering works at the damaged place by disaster as early as possible.

e) The importance of effective usage of database and logbooks for construction equipment management of IP-GEM should be recognized.

f) Not only mechanics but equipment operators should recognize of the importance of daily and periodic maintenance of construction equipment in order to keep the equipment of IP-GEM in good conditions continuously.

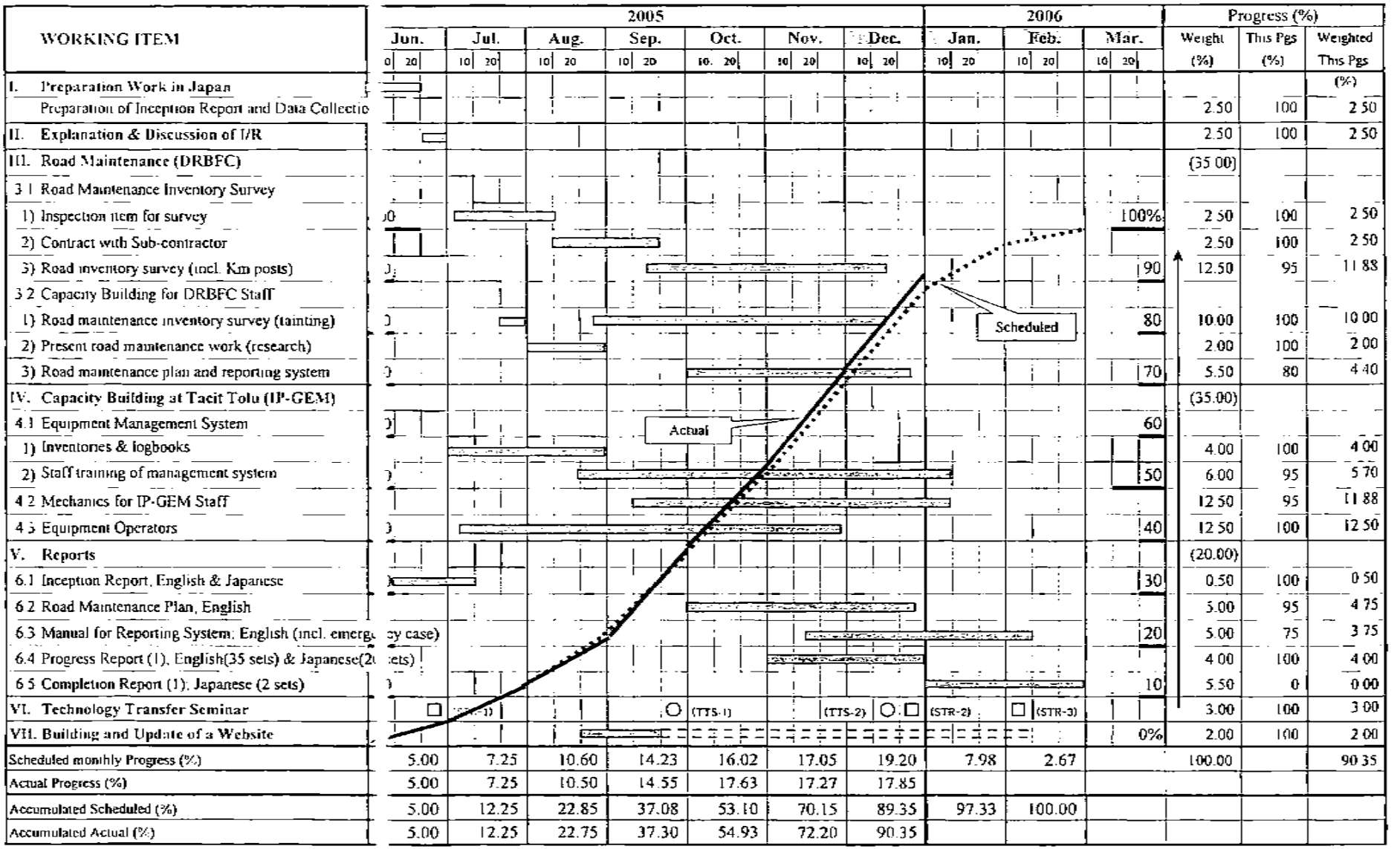
g) Mechanics and heavy equipment operators, who have been trained in 1st field work of CBRM, should be continuously trained in next stage of training in 2nd field work of CBRM.

h) It will be important to carry out the public works not only road works but other development works for public infrastructure with close cooperation between DRBFC, MPW and IP-GEM, MTC. Especially recovery works to the damaged portions by the disaster should be done with the construction equipment of IP-GEM.

i) The case study will be included in 2nd field works in 2006/07 fiscal year which is next schedule of CBRM. It is necessary to select the construction site for the case study by the Government at early stage on the Government management works or In-house project. It will be important to train at actual conditions and construction site how to manage the construction site and heavy equipment of IP-GEM. and how to maintain the construction equipment and how to operate the construction equipment at actual conditions.

j) It should be recognized that some arrangement works before starting the construction works should be required. Training to the staff of DRBFC and IP-GEM as to the arrangement works will be carried out as a case study.

Figure 1 Work Progress fo the Project for Capacity Building of Road Maintenance; CBRM (First Year 2005) as of December 2005



WORKING ITEM	Progress (%) Weight (%)	This Pgs (%)	Weighted This Pgs (%)
I. Preparation Work in Japan			
Preparation of Inception Report and Data Collectio	2.50	100	2.50
II. Explanation & Discussion of I/R	2.50	100	2.50
III. Road Maintenance (DRBFC)	(35.00)		
3.1 Road Maintenance Inventory Survey			
1) Inspection item for survey	2.50	100	2.50
2) Contract with Sub-contractor	2.50	100	2.50
3) Road inventory survey (incl. Km posts)	12.50	95	11.88
3.2 Capacity Building for DRBFC Staff			
1) Road maintenance inventory survey (tainting)	10.00	100	10.00
2) Present road maintenance work (research)	2.00	100	2.00
3) Road maintenance plan and reporting system	5.50	80	4.40
IV. Capacity Building at Tacit Tolu (IP-GEM)	(35.00)		
4.1 Equipment Management System			
1) Inventories & logbooks	4.00	100	4.00
2) Staff training of management system	6.00	95	5.70
4.2 Mechanics for IP-GEM Staff	12.50	95	11.88
4.3 Equipment Operators	12.50	100	12.50
V. Reports	(20.00)		
6.1 Inception Report, English & Japanese	0.50	100	0.50
6.2 Road Maintenance Plan, English	5.00	95	4.75
6.3 Manual for Reporting System, English (incl. emerg cy case)	5.00	75	3.75
6.4 Progress Report (1), English(35 sets) & Japanese(2 ets)	4.00	100	4.00
6.5 Completion Report (1), Japanese (2 sets)	5.50	0	0.00
VI. Technology Transfer Seminar	3.00	100	3.00
VII. Building and Update of a Website	2.00	100	2.00

	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.			
Scheduled monthly Progress (%)	5.00	7.25	10.60	14.23	16.02	17.05	19.20	7.98	2.67		100.00		90.35
Actual Progress (%)	5.00	7.25	10.50	14.55	17.63	17.27	17.85						
Accumulated Scheduled (%)	5.00	12.25	22.85	37.08	53.10	70.15	89.35	97.33	100.00				
Accumulated Actual (%)	5.00	12.25	22.75	37.30	54.93	72.20	90.35						

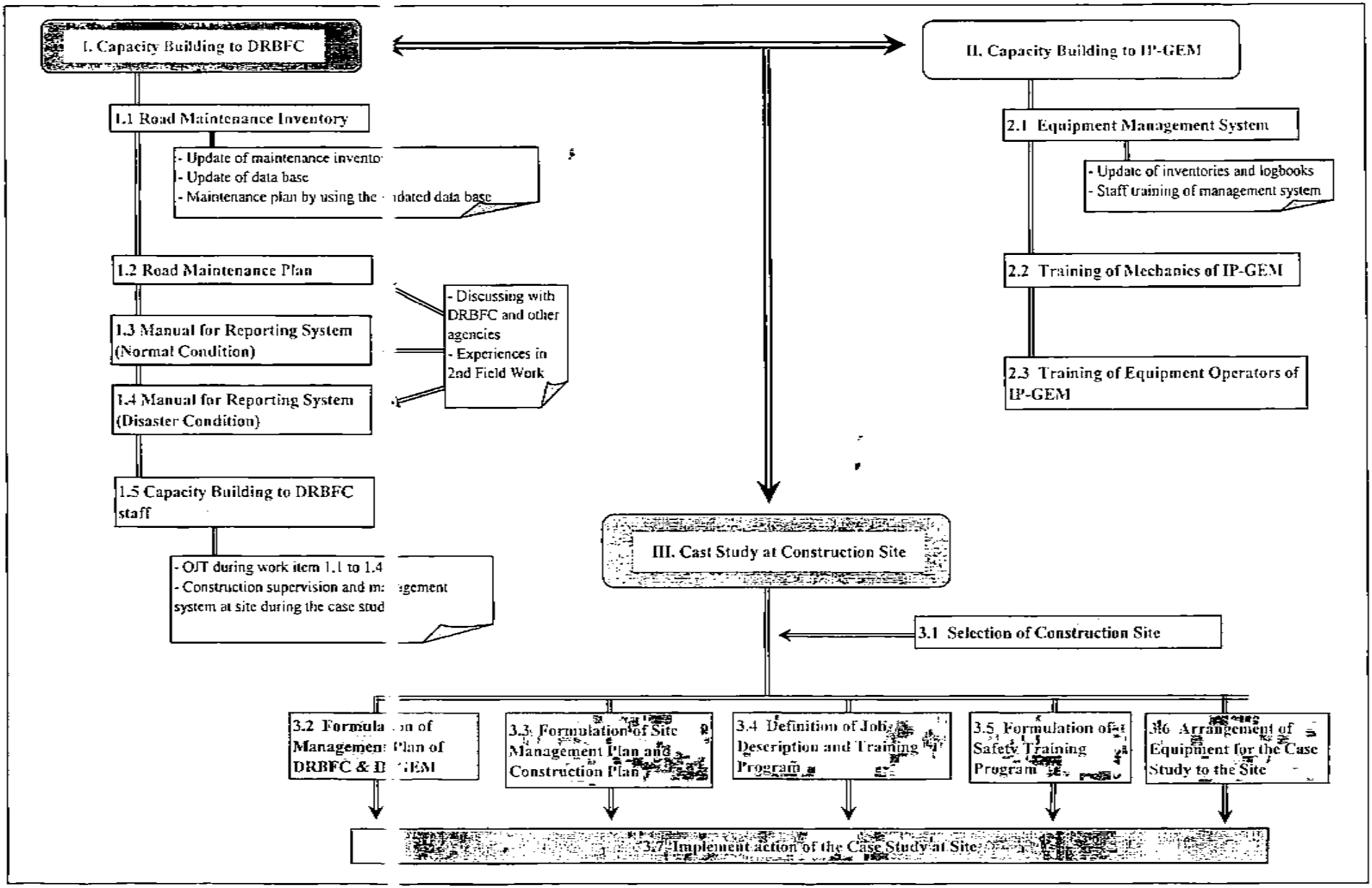
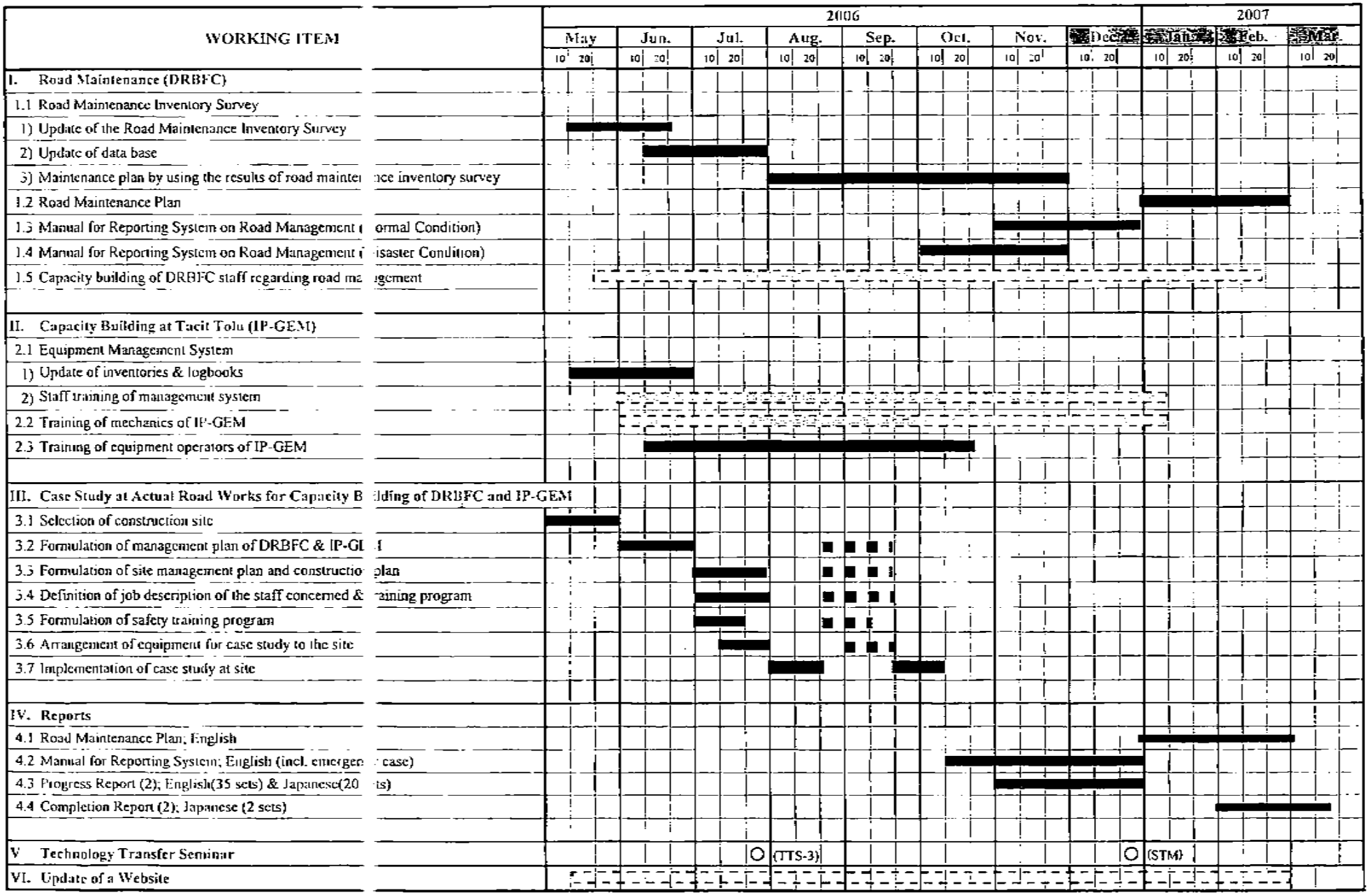


Figure 2 Procedure for Next Work (2nd Field Work) of CBRM

Figure 3 Schedule for the Project for Capacity Building of Road Maintenance (CBRM), Second Field Works, Fiscal Yea 2006/2007



MINUTES OF MEETING

OF

THE THIRD (3rd) JOINT STEERING COMMITTEE MEETING

FOR

THE PROJECT FOR THE CAPACITY BUILDING OF ROAD MAINTENANCE

IN

THE DEMOCRATIC REPUBLIC OF TIMOR-LESTE

(CBRM)

Date & Time	:	6th July 2007, 10:00 a.m. – 12:00 a.m.
Place of Meeting	:	Meeting Room of MPW
Participants	:	See attached participants list
Agenda	:	1) Opening address by the chairman 2) Explanation for progress and results in 2nd Field Work of CBRM (from Dec.2006 up to June 2007) 3) Explanation for next schedule in 3rd Field Work (schedule to be from Sep. 2007 to Mar. 2008) and some recommendations 4) Questions and answers with members of Steering Committee 5) Closing address by Director of IGE

The Third (3rd) Joint Steering Committee Meeting, Joint Steering Committee Meeting (3), was opened by the chairman, Mr.Jose G,R.C. Piedade, Permanent Secretary of Ministry of Public Works (MPW), Project Manager of CBRM, at 10:00 a.m., since it was suddenly decided that Vice Minister of MPW, Project Director of CBRM,, who was scheduled to chair this meeting, should attend Council of Minister's Meeting of Timor Leste in the same time and date.

After opening address by the chairman, Mr. Koji Naito, Team Leader of the Project for the Capacity Building of Road Maintenance in the Democratic Republic of Timor Leste (CBRM), explained the outline of activities and progress of CBRM in 2nd Field Work (2006/2007) and next schedule in 3rd Field Work (2007/2008). Recommendations to Division of Road, Bridge and Flood Control (DRBFC), Ministry of Public Works (MPW) and to Public Institute of Equipment Management (IGE), Ministry of Transportation and Communication (MTC), which are Counterpart Agencies of CBRM, were also presented at this meeting. The explanation was done by using the summary note for the Progress Report (2), which draft has been submitted to C/P agencies and members of Steering Committee in June 2007.

After explanation of activities in 2nd Field Work, next schedule of CBRM and

recommendations, questions and answers with attendance of the meeting were advanced. After questions and answers, the following matters pertaining to the activities and progress in 2nd Field Work and next schedule of CBRM were duly agreed by the Joint Steering Committee.

Matters Discussed and Approved by the Joint Steering Committee Meeting (3)

1. Activities and progress in 2nd Field Work and next schedule in 3rd Field Work of CBRM were understood and accepted by the Steering Committee.
2. Capacity building by CBRM was started by preparation of systematic management system for road maintenance and equipment management in 1st Field Work. Activities for CBRM in 2nd Field Work and 3rd Field Work are continuing activities based on the results of 1st Field Work, since continuous and repeating training are effective ones for carrying out systematic management for road maintenance and equipment by DRBFC and IGE themselves.
3. Leaderships by DRBFC and IGE are very important factor for capacity building to staff of DRBFC and IGE. Leading character for CBRM is not JICA experts but Timorese peoples.
4. DRBFC should make more efforts to do periodic road maintenance inventory survey and to input the data base and to use fully the database by themselves so as to carry out systematically road maintenance works on arterial roads in Timor Leste.
5. Further and continuous training how to make good use of database in equipment management is needed for enabling IGE personnel to use/manage database for themselves. Continuous and repeating training for equipment management, mechanics and operators of IGE will be required.

After constructive discussions and having a confirmation of cooperation to implement CBRM smoothly and effectively, the Joint Steering Committee Meeting (3) was closed at 12:00 P.M. on July 06, 2007 by the closing address of Director of IGE.

Mr. Jose G.R.C. Piedade
Permanent Secretary of Ministry of Public Works, Project Manager of the Project for the Capacity Building of Road Maintenance (CBRM)

Mr. Koji Naito
Team Leader of the JICA Experts, The Project for the Capacity Building of Road Maintenance (CBRM)

MINUTES OF MEETING

OF

THE FIFTH (5th) JOINT STEERING COMMITTEE MEETING

FOR

THE PROJECT FOR THE CAPACITY BUILDING OF ROAD MAINTENANCE

IN

THE DEMOCRATIC REPUBLIC OF TIMOR-LESTE

(CBRM)

Date & Time	:	5th March 2008. 14:20 p.m. – 16:15 p.m.
Place of Meeting	:	Meeting Room of MOI
Participants	:	See attached participants list
Agenda	:	1) Opening address by the chairman 2) Explanation for Draft Final Report and CBRM Activities in 1st, 2nd and 3rd Field Work 3) Questions and answers with members of Joint Steering Committee 4) Closing address by the Chairman

The Fifth (5th) Joint Steering Committee Meeting was opened by the chairman, Mr. Domingos do Santos Caiero, Secretary of State for Public Works, MOI, Project Director of CBRM, at 14:15 p.m.

After opening address by the chairman, Mr. Koji Naito, Team Leader of the Project for the Capacity Building of Road Maintenance in the Democratic Republic of Timor Leste (CBRM), explained the outline of "Draft Final Report for CBRM" which was submitted to all JSC members on February 27, 2008 for reviewing the report by members. He explained the following subjects based on the "Draft Final Report".

i) Composition of Final Report

ii) Project background, project purpose, counterpart agencies, and project area

iii) Implementation process, experts assignment process, and outline of CBRM activities

iv) Activities and achievement by the Project (CBRM)

v) Recommendation to DRBFC and IGE

After explanation of "Draft Final Report", question and answer proceeded accordingly. Based on the questions and answers, following matters pertaining to "Draft Final Report", activities and achievement by the Project, recommendations was agreed and accepted between members of Joint Steering Committee for CBRM.

Matters Discussed and Approved by the Joint Steering Committee Meeting (5)

1. Contents of "Draft Final Report" were understood and accepted by the Joint Steering Committee.
2. Permanent Secretary of Public Works, MOI, Project Manager, informed at the meeting that we are very appreciating of the activities of CBRM and JICA T/A project.
3. Land sliding area. which is found in many places in East Timor, should be carefully treated and investigated continuously. Land sliding places should be considered firstly for traffic safety by temporary countermeasure works and continuously investigated with simple methods. After settlement of sliding, some permanent works should be considered with due consideration of technical matters. cause of sliding, etc.
4. Management of construction equipment of IGE should be central control at Taci Tolu. Dili in order to make periodic maintenance work for them.
5. DRBFC staff has developed their capability as a result of CBRM activity through the implementation period. They can manage the database and carry out the periodic condition survey by themselves. DRBFC intends to continue the road condition survey and usage of the database. Staff of DRBFC was learned many technical issues through the Case Study by CBRM. They can do the same kinds of works by them in close cooperation with IGE by using the equipment of IGE.
6. Close cooperation between DRBFC and IGE will be necessary and continued.

After constructive discussions. the 5th Joint Steering Committee Meeting was closed by the closing address of SE of Public Works. Project Director. informing their wishes for further Technical Assistance by JICA like CBRM.

Mr. Domingos do Santos Caiero
Secretary of State for Public Works. MOI. Project Director for the Project for the Capacity Building of Road Maintenance (CBRM)

Mr. Koji Naito
Team Leader of the JICA Experts.
The Project for the Capacity Building of Road Maintenance (CBRM)

CONCLUSION AND RECOMMENDATIONS

Conclusion

Taking all evaluation results into consideration, it can be concluded that the Project achieved almost all indicators for project purpose and was in line of success. For instance, routine (daily) maintenance works are implemented by DRBFC and regional offices by themselves. The road inventory and its database as well as the reporting manual are effectively used for the process of these works. Moreover, it is recognized that the road inventory and its database were utilized for budget preparation for the next fiscal year of 2008 and for five years planning. Also, DRBFC has already decided to assign local staff at regional offices for maintenance works. These observed facts are the objective evidences telling that the institutional capacity of road maintenance management by DRBFC has been improved. It has also been observed in IGE that the technical skills of operators and mechanics were drastically enhanced and the management capacity of equipments/tools was also strengthened through the operation of equipment management system established by the Project.

On the other hand, the number of rehabilitation projects under DRBFC is growing because of sharp increase in the budget allocation to the road sector thanks to the oil and natural gas revenue. Degree of dependence on contracting-out for the projects including the periodical maintenance are now on the increase under the circumstance of difficulties in increasing the number of DRBFC staff, which leads to the necessity of strengthening management capacities with regard to contracting-out activities such as TOR preparation, design and cost estimation.

With regard to IGE, it is scheduled that the future institutional set-up is in the process of being discussed and the Government will decide at Council Minister Meeting to be held in near future. Since IGE is very young organization, which has been established in 2004 with a staff of no-experience of equipment management, it would be necessary that management of IGE including technical and distractive matter should be continuously strengthened.

Recommendations

Purposes of the Project for the Capacity Building of Road Maintenance in East Timor (CBRM) as a technical cooperation project by JICA were that capabilities on daily and periodic maintenance/repair and restoration against the road disaster on arterial roads are strengthened and equipments of IGE are maintained properly. For achievement of project purposes, CBRM pursued in establishment of the self operation and maintenance systems in both organizations of DRBFC and IGE. Remarkable achievements were found through CBRM activities in 1st, 2nd and 3rd Field Work as mentioned in the preceding Chapters hereinbefore.

Taking project purposes and project experiences through activities of CBRM into consideration, the followings are recommended to DRBFC and IGE so as to execute the road maintenance works more systematically and properly on arterial (national) roads in East Timor by themselves.

【Recommendations to DRBFC】

1) According to CBRM activities during 1st, 2nd and 3rd Field Work, importance for road maintenance inventory survey to make the maintenance plan has been recognized and familiarized in all staff of DRBFC. All staff of DRBFC should be more recognized that the periodical road maintenance inventory survey is the most important issue for proper road maintenance works.

2) DRBFC should make continuous efforts to do the periodic road maintenance inventory survey and to input the survey data to the databases and to use fully the database by themselves so as to carry out systematically the road maintenance works on arterial (national) roads in East Timor. Instruction book and guideline for the database, which were submitted to DRBFC, should be fully used in the staff of DRBFC. Some staffs were trained continuously in 2nd and 3rd Field Work of CBRM activities how to use the database.

3) Road maintenance Km posts set in 1st Field Work of CBRM on all arterial roads should be maintained by DRBFC, like re-painting, etc. If DRBFC would set another small Km posts with an interval of one (1) km between 5 Km interval Km posts set, road maintenance condition survey would be easier for indicating the location of defect places during survey period by the staff of regional offices.

4) It is recommended that DRBFC should act systematically the maintenance works on arterial roads (national roads) in East Timor, based on "Maintenance Plan" and "Manual for Reporting System in Normal Condition and Disaster Condition" which were presented and submitted by CBRM with due discussions of DRBFC. These plan and manuals are basic and fundamental issues to make the road maintenance plan and reporting system between the central office and regional offices of DRBFC.

5) Trough the implementation of the Case Study in 2nd Field Work, staff of DRBFC has been trained what kinds of preparatory works are required and how to execute remedial works at junction points between district roads and arterial (national) roads. Many junction points on arterial roads to the district roads are now damaged by rain flood due to shortage of drainage facilities from the district road to the arterial road. All staff of DRBFC should recognize that drainage facilities on the road are one of the key issues to prevent the damage of roads.

6) Trough the Case Study, staff of DRBFC understood that proper construction works for base, sub-base course and road bed is also one of the most important issues to repair the arterial (national) road. They also learned how to get the base course and sub-base course material from river bed. All technical staff of DRBFC should take careful attentions to repair the base, sub-base course and road bed for their maintenance works on the road in East Timor by using proof rolling test, which was presented during the Case Study and very simple method.

7) Through the Case Study in 3rd Field Work, counter measure works damaged by land sliding and investigation method for the progress of land sliding were presented. Arterial roads damaged by land sliding are found in many places in East Timor.

especially in mountain area. At first, temporary countermeasure should be taken for keeping traffic safety at the damaged place by land sliding. And, investigation should be continued by using the simple method presented in the Case Study. It would be recommended in this country that permanent countermeasure should be planned after settlement of land sliding. When land sliding would be progressed, temporary countermeasure with periodic maintenance works at the place should be considered continuously.

8) In the project management through the Case Study, especially in the engineering field, it has been recognized that there is an unbalance between capability of construction management and other management such as documentation management, quality control management by using the laboratory and design. These would be come out as the subject in near future.

【Recommendations to IGE】

1) So as to develop construction equipment management system more properly in IGE, it is recommended that IGE should manage construction equipment of IGE continuously, effectively and systematically with the following principles:

   a) All equipments should be centralized and managed by IGE head office so as to maintain the equipment of IGE periodically and properly by full responsibility of IGE staff. Equipment should be returned to IGE after lease period is completed to make periodic maintenance for the equipment. After equipment maintenance works is completed, the equipment should be leased again to users when and where they are required.

   b) Inventories and logbooks for those are essential materials to manage equipment to be prepared as a form of database to simplify the managerial works. The equipment management database should be fully and continuously used by IGE itself to manage the equipment of IGE properly and systematically. Some staff of IGE had been trained how to use the database and how to input the logbooks of equipment.

   c) The rules and regulations in equipment management should be clearly notified to all IGE [illegible] ensuring that the orders is thoroughly enforced.

2) Through CBRM training to mechanics of IGE, skills of mechanics have been drastically improved. However, in order to learn how to repair many and various machine troubles, it would be obviously sure that IGE mechanics will have need of further and continuous learning and acquiring more experience on machine repairing.

3) Skills of operators of IGE have been also improved drastically through CBRM activities. However operators of IGE should always recognize that skills to be required as a construction equipment operator are not only operation technique but also preventive maintenance ability and preventive operation ability. They must carry out daily check every morning and pay attention to machine condition all the time. Whenever machine trouble occurs, they must cope with trouble properly and swiftly. This is a very important role for operators. An investigation conducted by a construction machine

manufacturer in the past shows that the majority of machine trouble was caused by operators. It counted that around 60 % of machine failures was caused by insufficient daily check and poor operations by operators.

【Recommendation to both DRBFC and IGE】

1) Three times of the Case Study in close cooperation with DRBFC and IGE were carried out in 2nd and 3rd Field Work of CBRM. It is recommended that these experiences should be fully used in DRBFC so as to execute the road works as an In-house project or recovery works in emergency case by disaster, etc. by using the construction equipment of IGE in close cooperation with IGE.

2) It would be recommended that Joint Meeting between DRBFC and IGE would be continued to understand each other their present conditions, their requests, their problems and etc. for both organizations. It would be also recommended that the regional engineers meeting with all regional engineers and staff of the central office of DRBFC should be periodically held so as to discuss the problems and request between the central office and regional office of DRBFC. Meeting of section chiefs of IGE should be continued to hold regularly or whenever necessary.

3) It would be recommended that some maintenance unit with some equipment of IGE would be established specially for only maintenance works on roads in East Timor. Maintenance works are different to rehabilitation, improvement and new-construction works of roads. Maintenance works would be required quick action. When some pot holes or other defects points would be found newly in some places, immediate repairing/maintenance works should be carried out. Damaged places by disaster should be carried out by this maintenance unit immediately. When defect or damaged places would be repaired immediately, the reputation for DRBFC, IGE under MOI and the Government of East Timor would be more raised between peoples in East Timor, and social stability would be expected.