付　属　資　料

１．合同評価報告書

２．第３回合同委員会議事録

NOTE OF UNDERSTANDING OF THE JOINT EVALUATION ON THE JAPANESE TECHNICAL COOPERATION FOR THE IRRIGATION ENGINEERING CENTER PROJECT PHASE II IN THE KINGDOM OF THAILAND

With about four months left until the termination of cooperation period of the Irrigation Engineering Center Project Phase II (hereinafter referred to as "the Project") on March 31, 1995, as stated in the Record of Discussions (hereinafter referred to as "R/D"), the Japanese Evaluation Team organized by the Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Mr. Norifumi TAKAMURA visited the Kingdom of Thailand in order to conduct an overall review and evaluation of the performance of the Project. In order to achieve this, a Joint Evaluation Team was formed consisting of the aforementioned Japanese and a Thai Evaluation Team headed by Mr. Chaiwat Prechawit.

The teams conducted interviews with the Japanese experts and the Thai counterparts assigned to the Project, had a series of discussions with the Thai authorities concerned, made field surveys and exchanged views among themselves.

As a result, both teams agreed to forward to their respective Governments a summary of the evaluation and recommendations which are referred to in the document attached hereto.

Bangkok, December 6, 1994

高村紀史

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JOINT EVALUATION REPORT ON THE JAPANESE TECHNICAL COOPERATION
FOR
THE IRRIGATION ENGINEERING CENTER PROJECT PHASE II
IN
THE KINGDOM OF THAILAND

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1. INTRODUCTION

The Government of the Kingdom of Thailand requested technical cooperation to the Government of Japan with the aim of the development and preparation of planning, design and construction for irrigation and drainage structures by using as effectively as possible the limited water resources available.

Both Governments began implementing the Irrigation Engineering Center Project on April 1, 1985, and the project was completed on March 31, 1990.

Subsequently, the Government of the Kingdom of Thailand requested technical cooperation to the Government of Japan in the form of a Phase II Project with the aim of the development and preparation of water management techniques by using the Irrigation Engineering Center .

Phase II has been implemented since April 1, 1990. The Project is scheduled to be implemented for five years.

The main activities are as follows, and Japanese technical assistance has been provided to support these activities.

(1) Water Management
  1) Improvement on Methodology concerning Data Observation, Collection and Compilation
  2) Improvement on Water Distribution Technology
  3) Development on Flow Analysis for Water Management
(2) Hydrological Analysis
  1) Improvement on Observation Systems and Raw Data Processing for Runoff Analysis
  2) Improvement on Water Balance Analysis for Water Resources Development and Water Management
  3) Examination on Monitoring Systems for Irrigation Water Quality
(3) Irrigation and Drainage Information Systems
  1) Development on Technical Calculation Systems for Water Management Technology
  2) Improvement of Database System for Water Management Projects
  3) Examination of Data Communication Systems for Water Management Technology
(4) Irrigation and Drainage Facility Design
  1) Preparation and Diffusion of Planning and Design Criteria, Standards and Manuals
  2) Improvement on Construction Control and Maintenance Technology for Main Irrigation Facilities
(5) Training

  1) Guidance and Advice on Technical Training

With the cooperation period about to reach its termination, the Government of Japan and the Government of the Kingdom of Thailand conducted a joint evaluation of the achievements of the Project.

2. MEMBERS OF THE JOINT EVALUATION TEAM

(1) The Japanese Evaluation Team

Norifumi TAKAMURA: Leader
General Director, Land Improvement Technical Service Center, Kanto Regional Agricultural Administration Office, Ministry of Agriculture, Forestry and Fisheries (hereinafter referred to as " M.A.F.F")

Yoshitake SHIMBO: Water Management / Hydrological Analysis
Deputy Director, Design Division, Construction Department, Agricultural Structure Improvement Bureau, M.A.F.F.

Kazuaki TATEISHI: Irrigation and Drainage Information System / Irrigation and Drainage Facility Design
The 1st Chief of Irrigation, Agricultural Irrigation and Drainage Division, Agriculture and Fishery Department, Hokkaido Development Bureau

Takashi SHINO: Effects of Technical Cooperation
Senior Technical Officer, International Cooperation Division, Economic Affairs Bureau, M.A.F.F.

Shigenari KOGA: Project Evaluation / Training
Deputy Director, Agricultural Technical Cooperation Division, Agricultural Development Cooperation Department, JICA

Kazuaki NAMBA: Coordinator
Staff, Agricultural Technical Cooperation Division, Agricultural Development Cooperation Department, JICA

(2) The Thai Evaluation Team

Mr. Chaiwat Prechawit: Leader
Senior Expert for Water Management and Improvement, Royal Irrigation Department (hereinafter referred to as "RID")

Mr. Va-son Boonkird: Water Management / Hydrological Analysis
Maintenance and Rehabilitation Planning Expert, RID

Mr. Sirirat Temiyanon: Irrigation and Drainage Information System / Irrigation and Drainage Facility Design
Director of Communication Division, RID

Mr. Wichai Supasod: Effects of Technical Cooperation
Assistant Chief of Foreign Finance Projects, O&M Division, RID

Mrs. Mananya Dhanabhumi: Project Evaluation / Training
Chief of Construction Training Branch, Training Division, RID

Mrs. Orathai Krisanayanyong: Coordinator
Head of Foreign Affairs Section 1, Foreign Financed Projects Administration Division, RID

Chaiwat

3. OBJECTIVES OF THE EVALUATION

(1) To make a comprehensive and objective evaluation of the achievements of the Project with regard to the contents of the R/D and other concerning official agreements. The period of the Project subject to the evaluation is 5 years from April 1, 1990 to March 31, 1995 (including scheduled activities and outputs).

(2) To make recommendations and suggestions to the authorities of the two Governments concerned after the termination of the cooperation period of the Project.

(3) To use the results and lessons obtained from the evaluation of the Project for cooperation planning and project implementation of similar cases in the future.

4. EVALUATION OF THE PROJECT

4-1. ITEMS OF THE EVALUATION

(1) The joint evaluation team consisting of the Japanese Evaluation Team and the Thai Evaluation Team, conducted an evaluation survey with regard to the following items:

① Project inputs

Japanese Inputs:

- Dispatch of experts;
- Provision of machinery and equipment;
- Acceptance of Thai counterparts (hereinafter referred to as "C/Ps") as trainees;
- Dispatch of survey teams;
- Local cost expenditure supplementation, and
- Others

Thai Inputs

- Provision of land, buildings and facilities;
- Allocation of budget;
- Assignment of Thai C/Ps and other personnel, and
- Others

② Project activities and accomplishments

③ Impact of the Project

④ Products of the Project

⑤ Management of the Project

⑥ Future plan after the termination of the cooperation period

4-2. EVALUATION METHOD

The evaluation was conducted in terms of the investigation of the accomplishments of the Project with regard to the items listed in the R/D and the Tentative Schedule of Implementation (hereinafter referred to as "TSI").

5. RESULTS OF THE EVALUATION

5-1. ACCOMPLISHMENTS IN TERMS OF THE INPUTS

5-1-1. JAPANESE INPUTS

(1) Dispatch of experts

A total of 17 long-term experts have been dispatched. Their areas of expertise include team leaders, coordinators, water management, hydrological analysis, irrigation and drainage information systems, irrigation and drainage facility design, which are as stated in the R/D.

In accordance with the R/D, short-term experts will be dispatched if the necessity arises. 45 short-term experts have been dispatched to Thailand. One additional expert is scheduled to be dispatched to Thailand before the end of the Project period.

Japanese experts have been dispatched in accordance with the R/D and the TSI. Technical transfer has been favorably carried out (Appendix 1).

(2) Acceptance of trainees

Training of C/Ps in Japan started in fiscal year 1990 (a Japanese fiscal year starts on April 1 and ends on March 31, and is hereinafter referred to as "FY"). 24 C/Ps have visited Japan to participate in technical trainings. One additional C/P is scheduled to visit Japan as a trainee before the end of the Project period (Appendix 2).

(3) Provision of machinery and equipment

Machinery and equipment shown in Appendix 3 were provided in order to carry out the Project activities effectively.

(4) Local cost expenditure supplement program

The Japanese side paid part of the facility construction cost and project management cost, which should have been the responsibility of the Thai side, in order to implement the Project effectively and on schedule. The supplemental expenses provided by Japanese side are shown in Appendix 4.

1) Local recurrent cost expenditure support

The main purpose of this expenditure is to support the technical cooperation activities of Japanese experts dispatched to the Project. Items of expenditure include the cost of printing reports and procuring spare parts for machinery.

2) The intermediate-level trainees training program

The diffusion of technical results acquired through the Project activities has been promoted through training of RID staff and other organizations concerned. It has been carried out in all fields (Appendix 5).

3) Seminars

Seminars for diffusing IEC's technical results have been held for RID staff and other organizations concerned (Appendix 6).

4) Rotational irrigation implementation

A rotational irrigation implementation plan was implemented and studied. RID staff concerned have increased their technical skills and the benefits of the results have been transferred to other RID staff concerned.

5) Publications for diffusion

IEC News and pamphlets which introduce the activities of the Project have been published and distributed in order to provide an effective understanding of IEC activities.

6) Technology exchange program

Japanese experts and Thai C/Ps visited Indonesia and the Philippines, which have similar kinds of project and successfully implemented technical cooperation projects. They had discussions with the staff members of the projects on issues such as water management and irrigated fields. Experience and ideas obtained through this program subsequently contributed well to the management and the implemention of the Project.

7) Emergency countermeasures program

The status of the leased telephone line is still unstable. The Japanese side supplied funds to improve this unstable telephone line for the telemetering system and the data communication systems.

8) Thai language textbooks

The Project assisted financially with the production of Thai language textbooks in order to diffuse the results of the Project widely.

9) Model infrastructure construction program

3 systems were installed in the model infrastructure construction program as follows: the Telemetering System for monitoring real time water levels and rainfall from 4 gaging stations in the Chao Phraya River; the Data Communication Systems for quicker and accurate transmission of data and the improvement of water management works; and the Database System for the effective use of stored data.

(5) Dispatch of survey teams

1) Consultation Survey Team

A consultation Survey Team visited Thailand from January 15 to 27, 1991 in order to formulate the Work Plan (W/P) of the Project. The team and the authorities concerned of the Government of the Kingdom of Thailand reached agreement on the contents of the W/P.

2) Implementation Design Survey Team for Model Infrastructure Construction

An Implementation Design Survey Team visited the Project from March 28 to May 11, 1991 in order to create a draft plan for model infrastructure construction.

3) Technical Guidance Survey Team (Mid-term evaluation)

A Technical Guidance Survey Team visited the Project site from January 28

to February 10, 1993 in order to evaluate the activities of the Project over the previous 3 years. Though the team found some delay to part of the Project activities, there was no amendment made to the original the R/D and the TSI. A joint committee meeting was held during the visit of the team, and staff members of the Project presented their activities and achievements. RID requested continuation of the technical cooperation project after Phase II. And RID indicated its wish that IEC should function as an International Training Center (Third-Country Training Program) in Southeast Asia.

5-1-2. THAI INPUTS

(1) Provision of land, buildings, and facilities

Since the IEC Building with an area of 4,583 m^2, facilities and other equipment were donated through a JICA Grant Aid Program in 1985, the IEC Building has, for 10 years, been very effectively utilized for Phase I and Phase II activities. 6 rooms are available for experts and C/Ps. Other facilities such as computers, a lecture room for training, and copy rooms for textbook and report preparation are fully operational and properly maintained.

(2) Allocation of budget

Thai side contributed a total of 16,326,000 Baht in the four-and-a-half years from the start of the Project in 1990 to September, 1994. Contributions to the Project, by Thai side is as shown in Appendix 7,11and12.

(3) Assignment of C/Ps and other personnel

Thai C/Ps and other personnel were well assigned to the Project as shown in the following table. Almost all of the C/Ps, however, were not assigned on a full-time basis. (Appendix 8,9,10,13and14)

Title	1990	1991	1992	1993	1994
C/Ps	27	27	27	27	27
Administrative Staff	21	21	21	21	21
Secretaries	15	15	15	15	15
Others (Guards, etc.)	3	3	3	3	4
Total	66	66	66	66	67

(4) Supply and replacement of machinery and equipment

The computers and other equipment are in good condition at present. Additional purchase and renewal of parts will, however, be necessary after the termination of the Project period. For this reason, additional budget allocation will be needed.

5-2. PROJECT ACTIVITIES AND ACCOMPLISHMENTS

5-2-1. WATER MANAGEMENT

(1) Improvement on Methodology concerning Data Observation, Collection and Compilation

1) Improvement of hydrological monitoring

The installation of necessary machinery and equipment for establishing the Information Network System, and the planning and designing of the telemetering and network systems have been completed. Real time water level data have been sent from 4 gauging stations in the Chao Phraya River using the Telemetering System. In the near future, daily data will be sent from Regional Offices 7 and 8 to IEC using a Data Communication System. Received data will be stored in the VAX computer and will be used for many purposes. An operational program has to be completed for operation of the system and an operation manual needs to be formulated. Training of operators is also necessary. It is necessary to establish an operation and maintenance system for this Network System. It is not likely that this will be attained by the end of March, 1995.

2) Formulation of Calibration Curves

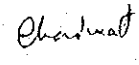
Observation of discharge, verification of calibration curves, and calculation of discharge using personal computers in the Chainat-Pasak Canal have been achieved. Regarding the calibration curves in the tidal area of the river, a flow analysis model for unsteady flow was developed and the estimation of discharge between Bang Sai and Memorial Bridge from water level data has been possible. For the diffusion of this technique, 4 seminars have been held as intermediate-level trainees training program. The desired objective has been attained.

3) Design of data compilation formats

The development of a Water Management Database, (a data entry system, a new input format and so on) is almost finished except for cropping data. Development of a new input format for Regional Offices 7 and 8 is necessary, as part of the development a Personal Computer version (hereinafter referred to as "PC version") for the Water Management Database. It is not likely, therefore, that the objective will be attained by the end of March, 1995.

4) Development of a database system for water management

The Water Management Database currently used in IEC was finished, and some data from 1964 to 1993 have been inputted. Basic development of the Water Management Monitoring Display system for utilizing this database in IEC has also been developed. The display system (PC version) at Regional Offices 7 and 8 will be developed as part of the activities of the Water Management Database (PC version). These offices will not only send daily data to IEC using the Data Communication System but will also monitor using various kinds of graph. These offices will be able to grasp flow conditions in their areas using stored data at each office. The establishment of a Water Management Database (PC version) is necessary. It is not likely, therefore,



that the objective will be attained by the end of March,1995.

(2) Improvement on Water Distribution Technology

1)Formulation of a Water Management Handbook

A water demand prediction model was developed for the Sam Chuk Project and how to formulate water distribution plans was studied with the model. Based on the results of activities in the Sam Chuk Project, a handbook will be made containing facility data necessary for water management. Water distribution planning methodology for accurate water management, based on water demand forecasts, is necessary and an operational handbook on water management is under investigation. It is not likely that the handbook will be completed by the end of March,1995.

2)Formulation of a Water Operation Guideline

Various water distribution patterns were made for the purpose of examining techniques for canal facility operation, based on a prediction for the Chainat-Pasak Canal, and a flow analysis model was developed (a model for analyzing non-uniform flow). Methods for the proper operation of the regulators in the Chainat-Pasak Canal will be studied by using the model and a guideline will be formulated. Many kinds of the simulation of flow condition using the model are necessary, and it is not likely, therefore, that the guideline will be attained by the end of March,1995.

3)Examination of an estimation method for water demand

Various elements necessary for developing a water demand calculation method were fixed, and an estimation model for water demand was developed, with an operation manual. The water demand estimation and prediction program in the Sam Chuk Project has already been developed based on this model. It is possible to evaluate past water distribution and to predict future water demand at each regulator using these two programs. An operation manual was made and training was given. In the rainy season of 1993, a rotational irrigation test (water supply at 20% less than normal supply) was carried out to confirm the effect. A report was made regarding this test, and the results were distributed. In the rainy season of 1994, a comparative test with further reduced water (water supply at 30% less than normal supply) was carried out, with changed efficiency, and so on. It is likely that the objective will be attained by the end of March,1995.

4)Formulation of standard report formats

Standard reporting formats have been developed as output formats for the Information Network System except for cropping data. A basic idea has been, however, already formulated. A format for cropping data can be prepared by the Thai staff concerned after the termination of the Project. It is certain, therefore, that the objective will be attained by the end of March,1995.

(3) Development of Flow Analysis for Water Management

1)Simulation analysis of flow condition in a canal

An unsteady flow analysis model was developed and this makes it

possible to estimate the effect of regulator operation on flow condition. A non-uniform flow analysis was also developed and, using this, it is possible to estimate how much the gate of a regulator should be opened to suit change in flow condition, when discharge changes, and to predict flow arrival time. In the Chainat-Pasak Canal and the Sam Chuk Project, the advantage of the gate operation method using the developed non-uniform flow analysis model was established through unsteady flow analysis simulation. An operation manual has been made (English and Thai), and the objective has thus been attained. These achievements are utilized in preparing operation guidelines for facilities.

2) Development of a flow prediction model

A flow prediction model between Bang Sai and the mouth of the Chao Phraya River was developed. The model consists of two parts. One is the prediction model which can estimate water level and discharge at any point between Bang Sai and Memorial Bridge directly inputting the observed water level data from the telemetering system. The other is the prediction model which can estimate the expected water level at any point between Bang Sai and the mouth of the Chao Phraya River inputting the estimated discharge at Bang Sai and estimated tidal sea level at the mouth of the Chao Phraya River. The adaptability of the model using actual water levels and observed discharge was studied. An operation manual has been made and distributed. It is likely that the objective will be attained by the end of March, 1995.

5-2-2. HYDROLOGICAL ANALYSIS

(1) Improvement on Observation Systems and Raw Data Processing for Runoff Analysis

1) Examination of hydrological observation methods

In order to grasp hydrological data accurately and speed up their processing, the present condition of the hydrological data transmission system between Headquarters and 8 Regional Hydrological Offices was examined for quicker transmission by means of personal computers. Location of observation points, observation items (rainfall, water levels of rivers and canals, discharge, temperature, pan-evaporation, wind velocity, humidity, water-quality, sediment), and observation methods were studied together with case studies of runoff analysis. As a result, there were no items requiring substantial improvement in the location of observation points, the density, classification and frequency of conducting runoff analysis case studies. However, observation equipment was introduced for more accurate observation. There have been no problems with the examinations made so far. It is likely that the objective will be attained by the end of March, 1995.

2) Improvement of the hydrological data entry system and development of programs

In order to speed up hydrological data processing by setting up personal computers, the Hydrological Database (PC version), design of formats for hydrological observation and development for technical calculation have been completed. A system for inputting hydrological data not only at Headquarters but also in Hydrological Offices was established and is now in use. Moreover,

training in personal computer operation was held for the wide use of the new formats. Probability calculation programs (Iwai's method, Gumbel's method, Hazen's method) were developed for applied utilization of hydrological data, and the Stream Measuring / Discharge and Suspended Sediment Statistical Program (PC version) was developed for processing data on discharge and estimated sediment volume. Study and training meetings have been held 4 times since 1991 for the diffusion of techniques.

The Hydrological Database (PC version) needs improvement for the purpose of storing effective data by personal computers for adequate water management in the Chao Phraya River Basin. The Water Management Monitoring Display System has also to be established. It is not likely, therefore, that the objective will be attained by the end of March, 1995.

3) Making manuals for hydrological data processing

For diffusing the techniques of hydrological data processing using personal computers, an operation manual was made on the hydrological data input/output system (English and Thai). A manual on probability calculation for utilizing technical calculation programs was made (English and Thai), and a manual on statistical processing of flow volume and estimated sediment volume was also made (English). For diffusion of these manuals, study and training meetings have been held 4 times since 1991 for Hydrological Offices staff. The objective of diffusion has been attained.

(2) Improvement on Water Balance Analysis for Water Resources Development and Water Management

1) Conducting case studies of runoff analysis

In order to transfer technology of runoff analysis as well as analysis and evaluation of runoff characteristics identified through analysis of a basin which is typical of each area, runoff analysis was conducted with a Tank Model through conducting runoff analysis case studies as follows.

1991	Northeast Thailand:	Huay Luang Project
1992	North Thailand :	The Upper Chao Phraya River Basin Analysis point : Sirikit Dam
1993	North Thailand :	The Upper Chao Phraya River Basin Analysis point : Nakhon Sawan
1994	North Thailand :	The Upper Chao Phraya River Basin Analysis point : Nakhon Sawan

In the Huay Luang Project, where analysis has been continued from the former Project, and in the other target areas, analysis was conducted mainly in the Upper Chao Phraya River in accordance with the main theme of Phase II. Runoff analysis was conducted for Nakhon Sawan including the Sirikit Dam (using data from 1986 to 1989), and runoff analysis technology and evaluation of runoff characteristics have been transferred. The Thai staff concerned are expected to utilize this technology for irrigation water management in the Chao Phraya Delta. However, additional data and improvement of the analysis model are necessary for utilizing the model in irrigation water management such as

runoff forecasting.

As the Upper Chao Phraya River Basin is very important for water management in the Chao Phraya Delta, top priority has been given to case studies in this area. This extensive and complicated basin, however, necessitates considerable time for analysis ranging from data collection to orderly arrangement of results. The analysis at Chai Nat, which marks the beginning of the Chao Phraya Delta, is necessary for utilizing the results for appropriate irrigation water management. The amount of water resources available at this point has to be made clear. It is not likely, therefore, that the objective will be attained by the end of March, 1995.

2) Making manuals of runoff analysis methods

A manual was made for each district in the case studies, for the purpose of diffusing techniques of runoff analysis. These manuals are, however, closely connected with case studies, and therefore they concern only those districts where analysis has been conducted. Making a manual for the Chai Nat Diversion Dam analysis point and the introduction of results of runoff analysis case studies are necessary. It will be difficult to prepare manuals by the end of March, 1995.

3) Improvement of the Hydrological Database

For hydrological analysis, a new hydrological database was developed by combining the existing Hydrological Database (rainfall, water level, and discharge) with the Meteorological Database (daily evaporation, temperature, wind velocity, and humidity). 8 Hydrological Offices have been equipped with personal computers, with which data processing is performed in a uniform manner. The objective has been attained.

(3) Examination on Monitoring Systems for Irrigation Water Quality

1) Examination of water quality measurement and analysis

For the purpose of understanding present water quality (pH, BOD, DO and so on), observation points were selected on the Mae Klong, Tha Chin, Chao Phraya, and Bang Pakong Rivers, and the contents and method of observation were examined. Techniques for arrangement, processing and storage of data about water quality were introduced for the purpose of effectively utilizing those data already stored. Technology transfer was conducted by introducing techniques for processing and analyzing water quality data. Various standards for water quality were introduced with a view to promoting the diffusion of understanding and techniques that are indicators of present water quality monitoring. Techniques for evaluation and analysis of present water quality were also introduced. The objective has been attained.

2) Making manuals of water quality research methods and data processing

Basic knowledge of water quality and techniques for collecting and processing data on water quality were introduced to the staff at Headquarters and Hydrological Offices for the purpose of diffusing techniques and for water quality research methods and data processing. A manual on water quality research methods (English and Thai) and a manual on water quality data processing (English) were made. The objective has been attained.

5-2-3. IRRIGATION AND DRAINAGE INFORMATION SYSTEMS

(1) Development on Technical Calculation Systems for Water Management Technology

1) Development of Simulation Models

The Flow Analysis Model (unsteady / non-uniform) for the Chainat-Pasak Canal and the Flow Analysis Model in the Chao Phraya River have already been developed by the Water Management Division and the System Development Division. The Runoff Analysis Model for Northeast and North Thailand (at the Sirikit Dam and Nakhon Sawan) has already been developed by the Hydrological Research and Application Division and the System Development Division. Necessary support such as setting a PC environment, advice for improving the models and so on has been given to each division. The development of the Runoff Analysis Model for North Thailand at Chai Nat is necessary in order to contribute appropriate water management. It is not likely that the objective will be attained by the end of March, 1995.

2) Development and Improvement of Application Programs on Technical Calculation

Water Demand Calculation and Prediction Models have been developed by the Water Management Division. Necessary support such as setting a PC environment, advice for improving the models and so on has been given. The Water Management Database (PC version) is being developed aiming at enabling data communication between IEC and Regional Irrigation Offices. So far the functions on data input, transferring data to the database in IEC and retrieval have already been developed. It is necessary to implement developing output functions, making a user's manual and system training. The Hydrological Database (PC version) is being developed. The function on data output to floppy disk has been developed up to now. Developing data output and data communication functions, making a user's manual and system training need to be implemented. It is not likely that the objective will be attained by the end of March, 1995.

(2) Improvement on Database System for Water Management Projects

1) Improvement of the Hydrological Database

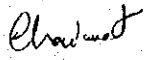
Meteorological data were added to the existing database. A user's manual has been made and system training has been implemented. The objective has been attained.

2) Development of the Water Management Database

A main database (DSM : Digital Standard MUMPS version) has already been developed. Making a manual and implementing system training for practical use will be needed. It is not likely that the objective will be attained by the end of March, 1995.

3) Development of Application Programs concerning Database

The Stream Gauging/Discharge and Suspended Sediment Statistical Program (PC version) has already been developed. Following this, a user's



manual and system training was completed. A Water Management Monitoring Display System (Workstation version) is being developed. Display functions to show present conditions have been developed. Developing display functions that reflect actual water management, making a user's manual and implementing system training will be vital. It is not likely that the objective of this activity will be attained by the end of March, 1995.

(3) Examination of Data Communication Systems for Water Management Technology

1) System Support concerning the Telemetering System

A telemetering system has been installed to get real time data from gauging stations, aiming at better water management. A technical comparison between radio and TOT (Telephone Organization of Thailand) leased lines has been made in order to study which is the better method of telemetering data communication. Further study on telemetering methods, network management and so on has been made. The telemetering system was installed in July, 1994. The system's condition has been bad since it was installed. Testing TOT leased lines, studying the reason why the system's troubles occur, recommissioning telemetering equipment and so on has been done to improve the system. Emergency construction work to improve the system was implemented in 1994. The condition has been improving slightly. However data was sometimes still missing. Technical examination to improve the system will be needed. Making a maintenance manual and conducting user training to support establishing a management system is also vital. It is not likely that the objective will be attained by the end of March, 1995.

2) Improvement of Monitoring System

A Water Management Monitoring System applied in Japan was introduced. Targets of monitoring were defined, and monitoring procedure was studied. A plan was formulated based on these. The objective has been attained.

3) Application programs for data communication

Instruction was given on the utilization of VAX Utility for data communication. Guidance was given for transmission and reception application programming using transmission and reception, VAX Utility. Alongside the development of the Water Management Database, technology for data communication between personal computers of Regional Offices and the database, as well as communication means, were examined. A program for fixing communication conditions was developed, and a data communication trial was carried out. The objective has been attained completely.

4) Other Supporting Activities

Guidance was given regarding the use of machinery and equipment in related fields, and training was given in the utilization of utilities and developed systems for the purpose of assisting users in utilizing them. A technical guidance was given in standardization of documentation technology related to the host computer. The present maintenance conditions were reviewed with a view to promoting the establishment of a proper operation and management system for the computer system. Regulations have to be formulated regarding computer system management. It is not likely that the

objective will be attained by the end of March,1995.

5-2-4. IRRIGATION AND DRAINAGE FACILITY DESIGN

(1)Preparation and Diffusion of Planning and Design Criteria, Standards and Manuals

1)Preparation of Design Criteria, Standard and Manuals

Originally, 17 criteria were to be prepared by the Project, but after examination, they were changed to 16 criteria. Original criteria have already been formulated for 15 of these 16 criteria and it is expected that original criteria will be formulated for the one remaining criterion by the end of March,1995. The original criteria for 10 criteria were revised after review work by the Japanese supporting committee. RID can complete the 6 criteria for which review work has not been finished. The objective has been attained. 6 criteria have been authorized as RID standards.

2)Diffusion of Planning and Design Criteria, Standards and Manuals

In accordance with the mid-term evaluation that the printing of the criteria in the Thai language and the distribution of matter thus printed should be promoted systematically, 9 topics have been printed in the Thai language, 2 topics will be printed by the end of March,1995. The remaining 5 topics have to be printed as fast as possible for diffusion. This is going to be done by RID. Seminars have been held 20 times for diffusion. Effectiveness, safety and economical design techniques, for instance, were achieved through this activity. In particular, it proved to be quite successful with junior engineers. The objective has been attained.

(2)Improvement on Construction Control and Maintenance Technology for Main Irrigation Facilities

1)Systematization of Construction Control Technology

The present condition and problems of construction control by RID have been collected and analyzed. The standard for construction control of dam embankments was prepared through discussions of the working group, and original criteria have been formulated. It has been put to practical use, with a view to promoting the diffusion of the original criteria for one year to October 1995. Therefore, the objective has been attained.

2)Improvement and Diffusion of Construction Control Technology

Field permeability tests and field density tests by the R.I. (Radio Isotope) method, which had not previously been conducted by RID, were introduced. Regarding field permeability testing, especially a lecture was given on simplified field permeability tests of the fluctuating water level type, and technical transfer was conducted in practical training at the dam site. In December 1994, training is going to be given at the dam site regarding moisture density testing by the R.I. method. It is therefore expected that the objective will be attained by the end of March,1995.

3)Case study on analysis of monitoring data of dams and related structures

A buried measuring instrument data display system was developed which demonstrated the importance of buried measuring instruments in evaluating dam safety. A seepage flow analysis program and other programs which were developed are being used to promote the diffusion of technology for evaluating dam safety. In January 1995, a seminar is going to give about dam safety. The objective has been attained.

4) Case study on analysis of special foundation problems

A case study was conducted for studying problems of special ground, under the subject of measures for preventing embankment collapse in large-scale earth canals with the conditions in Thailand being taken into consideration. The soft ground slope stability analysis system was modified so that it could be used on personal computers for the purpose of its diffusion. The objective has been attained.

5) Establishment of an inventory system for soil testing data

It seemed necessary to promote data inputting at the mid-term evaluation. Entry of data on soil tests carried out for the past 5 years from 1989 to 1993 has been finished, and data search is now possible. The objective has been attained.

6) Establishment of an inventory system for important existing dams

A dam dimension data search system was developed for personal computers and installed in the Dam Safety Center, the Large-scale Project Construction Division. Registration was finished regarding 31 major RID dams. As it seemed necessary at the mid-term evaluation to promote data entry, data of more than 300 dams have already been entered and their utilization is encouraged by providing a manual. The objective has been attained.

5-2-5. TRAINING

(1) Guidance and Advice on Technical Training

The diffusion of the technical results acquired in the Project activities was promoted through training. Technical training was given especially for the development of human resources necessary for improving water management. Results of technical cooperation in accordance with the Project objectives have been released not only within IEC but also at seminars held for RID staff and the organizations concerned. The intermediate-level trainees training program is also given to leading Thai agricultural engineering technicians. These training programs are planned and conducted by C/Ps themselves, and it is expected that these activities will be continued.

5-3. PROJECT'S IMPACT

5-3-1. IMPACT

(1) Technical impact

As a result of technical transfer through this Project, water management became quicker and more accurate by utilizing the Water Management Information Network System which collects hydrological data accurately and speeds up their processing. As a result, planning and design criteria have been improved. This has changed long-experience-based water and construction management to data-analysis-based management. Moreover, various training courses thus far given have strengthened the recognition that survey, design, construction control and maintenance technology constitute integral parts. This Project was promoted through cooperation between the departments and divisions concerned.

(2) Institutional impact

Smooth transmission of information between Headquarters and RID Regional Offices has now been achieved thanks to the Water Management Information Network System. Regional Office personnel have been motivated greatly through various trainings. Project activities and various training seminars have strengthened cooperation between the departments and divisions concerned. As awareness of the importance of the Project has deepened, the possibility of IEC becoming a permanent organization is being examined.

(3) Social impact

Awareness of the importance of RID has been increased in Thailand by the field activities of long- and short-term experts, C/P training in Japan, Third-Country Training for technical exchange, participation in international seminars, and contact with IEC visitors.

(4) Environmental impact

RID is in charge of both water utilization and flood control. In the field of water utilization, it controls water not only for irrigation but also for domestic use, industry, salinity control and navigation. It is urgently necessary to take measures for water quality preservation in Bangkok and its environs, and for controlling the rise in salt concentrations in tidal rivers. The results of the Project are being actively utilized for these purposes. The telemetering system and programmes developed by this Project are also utilized in forecasting floods in the last stages of the rainy season.

(5) Impact of the equipment provided

Equipment has played an important role in this Project. Particularly, the diffusion of computers provided by the Government of Japan and improved skill in their operation have speeded up data processing. And the introduction of various testing instruments has made it possible for RID technical staff to conduct various tests themselves.

5-3-2. EXTENT OF IMPACT

(1) IEC level

C/Ps have made technical progress through joint daily activities with long- and short-term experts.

(2) RID level

Participation in various trainings and international seminars was an attempt to acquire basic techniques in each field and understand new techniques. Particularly, various trainings in which a total of 2,500 staff have participated in 5 years, have resulted in technical improvement in water management.

Techniques developed by this Project are to be applied to other projects especially regarding the systematic monitoring and controlling of water in the East Bank Chao Phraya Project.

(3) Regional level

Improvement of water management in irrigation and drainage facilities has promoted farming in which limited water resources are used effectively. It is expected that agricultural production will be increased by the construction of irrigation and drainage facilities through the techniques developed by this Project.

(4) Macro level

It can be expected that agricultural production will be increased and the lower reaches of the Chao Phraya Delta will be protected from flood damage through the utilization of the Water Management Information Network System. As a result, this system is expected to be used in other river basins throughout the country.

(5) Outside Thailand

Various techniques are diffused to countries neighboring Thailand by means of various contacts.

5-4. PROSPECTS FOR SUSTAINABILITY

5-4-1. PROSPECTS FOR ORGANIZATIONAL SUSTAINABILITY

(1) Implementing agency

IEC is under the direct control of RID, and RID's Director General is responsible for its operation. The Director of IEC is appointed by RID's Director General. The organization consists of 5 divisions namely the General Management Division, the Water Management Division, the Hydrological Research & Application Division, the System Development Division and the Engineering Development Division. Several C/Ps equal in rank to RID Directors, Chiefs of Branches and Sections are assigned to each division. In IEC, 27 C/Ps have been assigned: 3 C/Ps to the General Management Division; 6 C/Ps to the Water Management Division; 6 C/Ps to the Hydrological Research & Application Division; 8 C/Ps to the System Development Division; and 4 C/Ps to the Engineer Development Division. All C/Ps except those in the

General Management Division are working for RID. Some jobs have to be dealt with on a case-by-case basis. Under this system, however, technical transfer has on the whole been conducted well.

(2) Operation and management system of this Project

The Directors Meeting within IEC, the Board of Directors within RID, and the Joint Committee stipulated in R/D are agencies which examine the budget, organization and activities of IEC. This operation and management system seems to be working well and it is necessary to continue to provide favorable conditions for the operation of the system.

(3) Reorganization of RID

For the purpose of stabilizing and enhancing IEC activities, full-time IEC personnel is under consideration on the basis that IEC will be a permanent organization within RID.

5-4-2. PROSPECTS FOR FINANCIAL SUSTAINABILITY

(1) Necessary expenses

At present, IEC is well financed concerning necessary expenses. So, after the Project, it will be able to bear the costs for ensuring financial sustainability.

(2) Stable public assistance

If IEC becomes a permanent organization of RID, not only the expenses for personnel administration and facilities' maintenance but also those for purchasing new machinery and equipment can be borne publicly by the new organization.

5-4-3. PROSPECTS FOR PHYSICAL AND TECHNOLOGICAL SUSTAINABILITY

(1) Contents of technical transfer and its appropriateness at technical levels

17 long-term experts and 46 short-term experts were dispatched over 5 years and technology was transferred through daily work and training in the 5 fields of water management, hydrological analysis, irrigation and drainage information systems, irrigation and drainage facility design, and training. The C/Ps, who are capable persons, are university graduates, and have practical experience. Any of their inadequacies have been covered by C/P training in Japan. The technical levels of RID staff have been greatly improved and it seems certain that technological sustainability will be attained.

(2) Conditions of technical transfer

Skilled C/Ps are active in such ways as delivering papers at international conferences and giving lectures in training courses covering various fields. In this manner, efforts are made to cause transferred techniques to be diffused and sustained. C/Ps trained in Japan have a chance to report their achievements in RID. RID has adopted some established planning and design criteria as its own official criteria.

(3) Development of successors

Technical transfer is conducted through daily work with long- and short-term experts for C/Ps, and through various kinds of training and instruction at the site for RID staff for the purpose of developing successors. Particularly C/Ps make an effort to enhance their capabilities by preparing, as lecturers, materials for training, as well as by giving guidance in the field.

6. CONCLUSIONS AND RECOMMENDATIONS

6-1. SUMMARY OF THE EVALUATION

1. The Joint Evaluation Team found that the Project had been conducted well and the results of the Project were mostly accomplished as expected.

2. The results of the Project are being used in strengthening the performance of RID in managing the water regime in the Chao Phraya Project which is the main agricultural area of Thailand comprising an area of about 7.5 million rai (1.2 million hectares).

3. Some of the appropriate techniques, which can also be transferred and applied not only to other irrigation projects in other regions of Thailand but also to neighboring countries, have been developed by the Project. In this meaning, it is considered that IEC obtained such capability to implement, for example, the Third-Country Training Program and/or FAO seminar program, and so on for them.

4. Training in various fields under the Project is also very useful for the development of RID's manpower in the highly technical fields of irrigation development.

5. However, due to the highly complicated technology employed by the Project, the Joint Evaluation Team found that there were still some activities except for in the field of Irrigation and Drainage Facility Design that need to be continued in order to receive the full benefits of the Project, namely:
   (1) Water Management.
   (2) Hydrological Analysis.
   (3) Information Systems.

6-2. RECOMMENDATIONS

1. As some of the C/Ps are not assigned on a full-time basis, it is desirable that a system will be established in which the C/Ps work on a full-time basis. And budget to enable IEC sustainability is needed. From these points of view, if RID is reorganized, the establishment of IEC as a permanent organization is considered by the Joint Evaluation Team to be an excellent idea.

2. In the past,repairing was needed for some of the equipment. So far there has been no major hindrance but it is important that IEC should take timely action including budgetary considerations to repair equipment. Efforts should

be made to have a maintenance system for the equipment, especially related to the telemetering system.

3. As the manuals, handbooks, and guidelines such as the Hydrological Data Processing Manual, the Water Management Handbook and the Water Operation Guideline, and so on are mostly applicable to a certain place, they should be adopted for common use in other places when this is possible.

4. Methodology and models which are for specific areas and cases should be adopted for wider use when this is possible.

5. The Information Network Systems on Water Management is very important. It should be developed to full effectiveness within the follow up programs.

6. When possible, related models should be combined or linked, such as the Water Demand Estimation Model and the Flow Analysis Model.

7. Consequently, the Joint Evaluation Team concludes that a two-year follow up program is required in the following fields to complete the Project Activities stipulated in the R/D and the TSI.

1)WATER MANAGEMENT
- (1) Improvement of hydrological monitoring
- (2) Design of data compilation formats
- (3) Development of a database system for water management
- (4) Formulation of a Water Management Handbook
- (5) Formulation of a Water Operation Guideline

2)HYDROLOGICAL ANALYSIS
- (1) Improvement of the hydrological data entry system and development of programs
- (2) Conducting case studies of runoff analysis
- (3) Making manuals of runoff analysis methods

3)IRRIGATION AND DRAINAGE INFORMATION SYSTEMS
- (1) Development of Simulation Models
- (2) Development and Improvement of Application Programs on Technical Calculation
- (3) Development of the Water Management Database
- (4) Development of Application Programs concerning Database
- (5) System Support concerning the Telemetering System
- (6) Other Supporting Activities

8. For the smooth implementation of the follow up program, it is necessary for the Thai side to take same measures for the Project, such as organizational structure, budget, C/Ps and the assignment of other staff

9. It is recommended that in the follow up program there should be short-term experts assigned to the Project when the need arises for period long enough to realize the objective of the assignment and to transfer the pertinent know-how.

Appendix 1 Dispatch of Japanese Experts

(1) Long - Term Experts

(Dec.1,1994)

	Name	Position	Dispatched duration
Leader	1.Mr.Meitoku MASUDA 2.Mr.Yoshiharu USUKI 3.Mr.Kitoshi HORII	Ministry of Agriculture,Forestry and Fisheries ditto ditto	Apr. 1,1990～Mar.31,1991 Apr. 8,1991～Mar.31,1994 Mar.26,1994～
Coordinator	1.Mr.Naruhide NAGAYO 2.Mr.Akio SAITO 3.Mr.Masafumi TAGUCHI	Japan International Cooperation Agency ditto ditto	Apr. 1,1990～Mar.31,1992 Mar.17,1992～Mar.16,1994 Mar. 8,1994～
Water Management	1.Mr.Takashi MITOMO 2.Mr.Hiroshi ERIGUCHI 3.Mr.Hideaki YAMAMOTO	Water Resources Development Public Corporation ditto ditto	Apr. 1,1990～Mar.31,1991 Mar.26,1991～Mar.25,1993 Apr. 1,1993～
Hydrological Analysis	1.Mr.Junji ICHIKAWA 2.Mr.Masahisa YAGIHASHI 3.Mr.Kaichi KOSEKI	Aomori Prefecture ditto ditto	Apr. 1,1990～Mar.31,1992 Apr. 1,1992～Mar.31,1994 Apr. 1,1994～
Irrigation and Drainage Information Systems	1.Mr.Yoshitake KAMIGATAGUCHI 2.Mr.Takanobu KOBAYASHI	Ministry of Agriculture,Forestry and Fisheries ditto	Apr. 1,1990～Mar.31,1993 Apr. 1,1993～
Irrigation and Drainage Facilities Design	1.Mr.Akira HASSHIMOTO 2.Mr.Kiyotaka MOMOSE 3.Mr.Yoshiyuki SUTOU	Ministry of Agriculture,Forestry and Fisheries Yamagata Prefecture ditto	Apr. 1,1990～Mar.31,1991 Mar.26,1991～Mar.31,1993 Apr. 1,1993～

(2) Short -Term Experts

Water Management Division

No	Name	Position	Dispatched period	Subject
1	Katuo SIODA	M.A.F.F	91. 2.14 ~ 91. 3.16	Flow analysis in the Chao-Phraya River
2	Hajime TANJI	"	92. 3.15 ~ 92. 3.26	Data Management System
3	Takasi KATO	"	93. 3. 8 ~ 93. 3.25	Flow analysis in the Chao -Phraya River
4	Kyoji TAKAGI	"	94. 3.8 ~ 94. 3.25	"
5		"	94.10.24 ~ 94.11.11	"
6	Hideo YOSHINO	"	91.12.15 ~ 91.12.28	Flow analysis
7		"	92.12.10 ~ 92.12.24	Flow analysis in the Canal
8		"	93.12.12 ~ 93.12.22	"
9		"	94.12. 6 ~ 94.12.21	"
10	Akihiko SHIMAMZAKI	"	94. 6.13 ` 94. 7. 1	Flow analysis for project level
11	Tetsuto FUKUDA	Kyusyu University	92. 3.22 ~ 92. 4.18	Water demand estimation method
12			92. 9.14 ~ 92.10.11	"
13			93. 9.28 ~ 93.10.20	"
14			94. 7. 5. ~ 94. 7.27	"
15	Naoki HORIKAWA	M.A.F.F	94. 2.11 ~ 94. 2.25	Water distribution Plan
16			94. 9.23 ~ 94.10.14	"

Hydrology Division

NO	Name	Position	Dispatched period	Subject
1	Takao Masumoto	Ministry of Agriculture Forestry and Fisheries	Feb. 5.91 ~ Mar. 4.91	System improvement for hydrological data processing
2			Nov.13.92 ~ Dec.25.92	Runoff analysis and application to water development, water management
3			Feb. 9.93 ~ Feb.28.93	Runoff analysis in the Upper Chao Phraya River Basin (Analysis point: Sirikit Dam)
4	Yoshio Hayase	Ministry of Agriculture Forestry and Fisheries	Sep.28.93 ~ Nov.2 .93	Runoff analysis in the Upper Chao Phraya River Basin (Analysis point: Nakhon Sawan)
5			Aug. 9.94 ~ Sep. 6.94	Runoff analysis in the Upper Chao Phraya River Basin (Analysis point: Nakhon Sawan)
6	Hideo Nakasone	Ibaragi University	Mar. 7.91 ~ Apr. 5.91	Fundamental Knowledge of water quality
7			Aug.31.92 ~ Sep.18.92	Data processing/ analysis of water quality
8			Jan. 4.94 ~ Jan.16.94	Evaluation and analysis of typical water quality for agriculture

(continued)

NO	Name	Position	Dispatched period	Subject
9	Isao Minami	Kyoto University	Jun.18.91 ~ Jul.16.91	Present situation of water quality in Estuaries of Thailand

Engineering Development Division

	NAME	Position	Dispatched period	Subject
1	Mr. Yoshiaki Hideshima	Hokkaido Development Bureau	Feb, 19-Mar, 16 1991	Maintenance of Earth Fill Dams
2	-ditto-	-ditto-	Feb, 11-Mar, 7 1992	Safety of Existing Dams
3	-ditto-	-ditto-	Feb, 11-Feb, 27 1993	Construction Control of Embankment Dams
4	-ditto-	-ditto-	Jan, 25-Feb, 12 1994	Analysis and Evaluation of Monitoring Data
5	Mr. Yasushi Hirashima	Ministry of Agricultere, Forestry and Fisheries	Jan, 28-Feb, 27 1992	Establishment of Inventory System for Soil Testing Data
6	Mr. Takuhiko Tateishi	Nippon Giken Inc.	Apr, 9-May, 7 1993	Resarch and Analysis of Soft Soil
7	Mr. Shigeru Tani	Ministry of Agricultere, Forestry and Fisheries	Oct, 23-Nov, 5 1994	Slope Protection on Canal Embankment

Model Infrastructure

No.	Name	Position	Dispatched period	Subject
1.	Mr. U. Tomioka	SCI*1	Feb. 29,92 ~ Apr. 28,92	Construction Control
2.	Mr. T. Hiwatashi	"	May. 18,92 ~ July. 26,92	"
3.	Mr. I. Komagata	"	May. 18,92 ~ July. 26,92	"
4.	Mr. T Shimoji	"	Dec. 1,92 ~ Dec. 21,92	Data Communication Management

* 1 Sanyu Consultants Inc.

System Development Division

No.	Name	Position	Dispatched period	Subject
1.	Mr. Y. Hirashima	MAFF * 1	Nov. 29,90 ~ Dec. 28,90	Documentation Technique
2.	Mr. H. Tanji	MAFF	Mar. 6,91 ~ Mar. 20,91	Monitoring System Design
3.	Mr. R. Nagasawa	PSCI * 2	Jan. 6,92 ~ Feb. 18,92	Geographic Information System Design
4.	Mr. S. Sugiyama	DEC * 3	Feb. 9,92 ~ Mar.21,92	Design of System Environment
5.			Aug. 7,92 ~ Sept.17,92	Database Management
6.			Nov. 26,93 ~ Dec. 23,93	Information Management System
7.			Feb. 15,94 ~ Mar. 25,94	Graphical Information System
8.			Sept. 13,94 ~ Oct. 24,94	Computer Management
9.	Mr. H. Sato	DEC	Aug. 21,92 ~ Sept.17,92	Graphical User Interfact
10.	Undecided		Jan. ,95 ~	Computer Network

* 1 Ministry of Agriculture , Forestry and Fisheries

* 2 Pasco International Inc.

*3 Degital Equipment Corporation

Appendix 2 Acceptance of Trainees

ITEM	BUDGET YEAR / MONTH	1990 4 5 6 7 8 9 10 11 12 1 2 3	1991 4 5 6 7 8 9 10 11 12 1 2 3	1992 4 5 6 7 8 9 10 11 12 1 2 3	1993 4 5 6 7 8 9 10 11 12 1 2 3	1994 4 5 6 7 8 9 10 11 12 1 2 3	
C/P TRAINING IN JAPAN	W/M	1 Mr Akkapong Boonmash Aug.26 - Sep.25	2 Mr Apichai Wathanayonnapron Mar.30 - Jun.6 3 Mr Piphat Sathianpantarit Mar.30 - Jun.6	4 Mr Anusak Mujjalinvimutti Mar.24 - Jul.13 5 Mr Chachawal Punyavateenun Mar.24 - Jul.13	6 Mr Arnan Suwannasindh Oct.6 - Nov.16 7 Mr Sittichai Manajareansook Mar.23 - May.24	8 Mr Kicha Polpalsi Oct.18 - Oct.29 9 Mr Chaiwat Preechavit Oct.18 - Oct.29 10 Mr Vira Vongsagnak(IEC) Mar. -	10
	H/Y	1 Mr Amporn Chongvan Aug.26 - Sep.25		2 Mr Sunguam Kanthawong Sep.19 - Oct.23	3 Mr Attapon Buddapalit Jan.17 - Feb.22	4 Mrs Spawadee Yimsricharoenkit Sep.12 - Nov.9	4
	F/D		1 Mr Suthi Songvoravit(IEC) May.20 - Jun.9 2 Mr Ruogrit Amnawat May.20 - Jun.9	3 Mr Monthian Kangsasitian Sep.19 - Oct.16 4 Mr Adisak Ongdulyaphinvn Sep.19 - Oct.23	5 Kanoksak Tasna Feb.2 - Feb.18	6 Mr Venvs Kawpradub Sep.18 - Oct.12 7 Mr Suparat Kosumapinvn Sep.18 - Oct.12 8 Mr Suwit Thanopanvwat Oct.10 - Nov.2	8
	S/Y		1 Mr Suksan Pocharassaengkul Nov.4 - Dec.13		2 Miss Suwana Chan-aim Nov.7 - Nov.30	3 Mr Chairat Gua-arun Oct.3 - Oct.23	3

Note : W/M ; Water Management Division,
: H/Y ; Hydrology Divisoion
: F/D ; Engineering Development Division (Facility Design)
: S/Y ; System Development Division

Appendix 3 List of Machinery and Equipment provided by Japanese Side

. Water Management Division

. Hydrological Division

. System Development Division

. Engineering Development Division

. Administration & Training Division

Water Management Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
W1 (1990)	Personal Computer (NEC) Powermate 286 Plus with 42MB Hard Disk Drive and Multisync 3D APC - H2010 (16 bit, 1MB RAM) APC - H4120 (Keyboard) EXT - H4900 (Printer Cable) JC - 14041HME (Display) APC - H5520F (Math Co- Processor) APC - H4210 (Floppy Disk Drive) P6300 (printer) Accessory Table for Computer (C-201) Table for Printer (C-100) Chair (A-7)	6 sets	Irrigated Branch (RID) Water Managment Branch (RID) Manorom Project Koke Kathiem Project Reong Rang Project Sam Chuk Project	A	A	W1-W3 Supplied in 1990
W 2	Stabilizer (DENSEI, MUD 1065)	6	-ditto-	A	A	
W 3	X - Y Plotter (RoLAND, DXY 1300)	4	Engineering Branch (RID) Water Management Branch (RID) Irrigated Branch (RID) Regional Office 7	B	A	
W4 (1991)	Horizontal Water Level Recorder (SEBA - X1)	1	Sam Chuk Project	A	A	W4 - W21 Supplied in 1991

Condition of use:

A : Use the equipment almost everyday

B : Use sometimes (serveral times per month)

C : Use little (serveral time per year)

D : Do not use

Condition of Maintenance :

A : Good mainteriance condition

B : Sometimes cause trouble,but can be repaired it and use

C : Out of order

D : Scrapped

Water Management Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
W5	Current Meter (SEBA - M1)	3	Water Management Branch (RID) Sam Chuk Project Regional Office 7	B	A	W4 - W21 Supplied in 1991
W 6	MODEM (DATALINK 2400)	4	Regional Office 7 Regional Office 8 IEC (2)	A	A	
W 7	Universal Current Meter F1, SEBA	1	Sam Chuk Project	B	A	
W 8	SEBA Mini Current Meter M1	4	-ditto-	B	A	
W 9	SEBA Horizontal Water Level Recorder X1	1	-ditto-	A	A	
W10	Evaporation Pan with Stilling-Well & Hook Gage	4	-ditto-	A	A	
W11	Rain Gage	4	-ditto-	A	A	
W12	Radio transceiver VHF/FM base station RF power 60 watts	1	-ditto-	A	A	
W13	Radio transceiver VHF/FM portable RF power 10 watts	2	-ditto-	A	A	
W14	Radio transceiver VHF/FM handie talkie RF power output 5 watts	7	-ditto-	A	A	
W15	Radio Antenna Tower	1	-ditto-	A	A	
W16	Automatic Level "NIKON" model AP-7 with Standard accessories (with Tripod CMF)	1	Sam Chuk Project	B	A	

Water Management Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
W17	Aluminum Staff 4m/4 section "MYZOG"	1	Sam Chuk Project	B	A	
W18	ELE Dial-type Gauge Tensiometer for insection into the ground 600 long, Weight 1 kg, Cat, No. EL514-020	4	-ditto-	A	A	
W19	WTW · Microcomputer Conductivity Meter Model LF196 with Conductivity Cell Model Tetracon 96-1.5	2	Irrigated Branch (RID)	A	A	
W20	WTW Microprocessor Oxygen Meter OXI 96-B/SET (cable length 1.5 m)	2	-ditto-	A	A	
W21	NEC Power Mate SX/20 Micro Computer System	1	Chong Kae Project	A	A	
W22	Automatic Water Level Recorder 4	4	Manorom Project(2 sets) Chong Kae Project (2 sets)	A	A	W22-W29 Supplied in 1992
W23	MEC powermates 386/331 Microcomputer system	2 stes	Engineering Branch IEC	A	A	
W24	3MB Memory Upgrade for MEC Powermate 286 PLUS	6 sets	Manorom Project Water Management Branch Koke Kathiem Project Reung Rang Project Sam Chuk Project Irrigated Branch	A	A	

Water Management Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
W25	120MB Hard Disk Replacement for Powermate 286 PLUS	6 sets	-ditto-	A	A	
W26	Cut sheet feeder for NEC P6300 Printer	6 sets	Sam Chuk Project Regional Office 7 Regional Office 8 Engineering Branch Water Management Branch Irrigated Branch	A	A	
W27	Automatic Level Nikon AP7 with accessories	1 sets	IEC	B	A	
W28	Aluminium Staff 4m/4 section	1 sets	-ditto-	B	A	
W29	Planimeter TAMAYA MODEL PLAMIX 7	4 sets	Water Management Branch Engineering Branch Irrigated Branch Sam Chuk Project	B	A	
W30 (1993)	iSEBA Horizontal Water Level Recorder X1	10 sets	Phonlathep (2 sets) Thabote (2 sets) Sam Chuk (2 sets) Pho Phaya (2 sets) Chnasutr (2 sets)	A	A	W30-W49 Supplied in 1993
W31	Recording Rain Gage	3 sets	Sam Chuk Experiment Station	A	A	
W32	THIES # 1.0610.00.000 Hygrograph	3 sets	-ditto-	A	A	
W33	THIES # 2.0600.00.011 Thermograph	3 sets	-ditto-	A	A	

Water Management Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
W34	THIES # 6.1420.00.000 Evaporation Recorder	2 sets	Sam Chuk Experiment Station	A	A	
W35	THIES # 7.1400.10.00 Sunshine Recorder acc. to Campbell Stokes	2 sets	-ditto-	A	A	
W36	CASELLA CONDON ' W-1224 Vertical window, Kilomter	1 set	-ditto-	A	A	
W37	Wet&Dry Psychorometer (SK#7320 August Hydrometer)	1 set	-ditto-	A	A	
W38	THIES # 73.0800.00.00 Barograph	2 sets	-ditto-	A	A	
W39	THIES # 7.1410.00.000 Bimetallic Actinographs	2 sets	-ditto-	A	A	
W40	Evaporation Pan	1	-ditto-	A	A	
W41	Precision Oven Model ED 53	1	-ditto-	A	A	
W42	Electironic Basic Balance Model BA 610	1	-ditto-	A	A	
W43	WTW Microprocessor Conductivity Meter Model LF 196 with Conductivity Cell Model Tetracon 96A (cable length 5m)	3	Irrigated Branch 1 set Rungsit Tai 1 set Phasi Chareun 1 set	B	A	
W44	Automatic Lovell Nikon Model AP-7 with Acessories	4	Manorom Project Chong Kae Project Koke Kathiem Project Roeng Rang Project	B	A	

Water Management Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
W45	Aluminium Staff 4m/4 section	4	Manorom Project Chong Kae Project Koke Kathiem Project Roeng Rang Project	B	A	
W46	Lotus 1-2-3 R.2.3 Thai for Dos	5	Regional Office 7 Regional Office 8 Sam Chuk Project Manorom Project Chong Kae Project	A	A	
W47	Lotus 1-2-3 R.4 for Windows	3	Water Management Branch Engineering Branch Irrigated Branch	A	A	
W48	Cut sheet feeder for NEC P6300	3 units	Manorom Project Chong Kae Project Koke Krathiem Project	A	A	
W49	Cut sheet feeder for LQ-1170 Overdrive 486DX2-66 MHz Digital	2units	Regional Office 7 Regional Office 8	A	A	
W50	DEC 466D2, 433SX	2units	-ditto-	A	A	
W51(1994)	Automatic water level recorder	7 sets	Sam Chuk Project			W51 - W56 Supplied in 1994
W52	Mini curent meter	3 sets	Manorom Project Chong Kae Project Koke Krathiem Project			

Water Management Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
W53	Personal computer	1 set	Pasak Thai Project			
W54	PH Meter	2 sets	Irrigated Branch			
W55	Oxygen Meter	2 sets	-ditto-			
W56	Planimeter	2 sets	Regional Office 7 Regional Office 8			

Hydrology Division

No	Equipment	Unit/No	Installed place	Use	Maintenance	Remarks
H 1 1990	Personal Computer (NEC) Powermate 280 Plus with 42 MB Hard Disk Drive and Multisync 3D APC - H2010 (16 bit. 1MB RAM) APC - H4120 (Keyboard) EXT - H4900 (Printer Cable) JC - 1484 HME (Display) APC - H5520F (Math Co-Processor) P6300 (Printer) Stabilizer (DENSEI, MUD1065) Accessory Table for Computer Table for Printer Chair Table for plotter and Digitizer	1 set	Sediment Section	A	A	H 1 ~ H 13 Supplied in 1990
H 2	Personnel Computer (NEC) Power Mate 286 Plus with 42 MD Hard Disk Drive and ADI Monitor APC - H2010K (-16 bit. 1 MB RAM) APC - H4120 (Keyboard) EXT - H4900 (Printer Cable) ADI Monitor 14"	2 sets	1. Hyd. Office - Chainat 2. Hyd. Office - Phisanuloke	A A	A A	

Condition of use

A : Use the equipment almost every day
B : Use sometimes (several times per month)
C : Use little (serveral times per year)
D : Do not use

Condition of maintenance

A : Good maintenance condition
B : Sometimes cause trouble, but can be repaired it and use
C : Out of order
D : Scrapped

Hydrology Division

No	Equipment	Unit/No	Installed place	Use	Maintenance	Remarks
	P6300 (Printer) Stabilizer (Silicon) Accessory Table for Computer (C - 201) Table for Printer (C - 100) Chair (A - 7)					
H 3	Degitizer (CALCOMP, Model 23240)	1	Water Level Section	A	A	
H 4	HP Plotter (HEWLETT - PAKARP, Model 7475A	1	- ditto -	B	A	
H 5	Aluminum Boat Seafarer 16" Floor Center Length 16" 2.5" with Outboards Engine 40 MP	2	1. Chao Phraya River-Chainat 2. Tha Chin River-Kanchanaburi	B	A	
H 6	Trailer for Alluminum Boat	2	- ditto -	B	A	
H 7	PH Meter KNICK , Portamens, 751-set	2	- ditto -	B	A	
H 8	Conductivity Meter (WTW, LF-196)	2	- ditto -	B	A	
H 9	Oxygen Meter (WTW, 96-B/set)	2	- ditto -	B	A	
H10	Turbidity Meter (DR > LAMGE, HTI)	2	- ditto -	B	A	
H11	Precipitation Recorder (THIES-54010.0)	2	Hyd. Office - Chonburi	A	A	
H12	Horizontal Water Level Recorder (SEBA-X1)	1	Hyd. Office - Chainat	A	A	
H13	Universal Current Moter (SEBA-F1)	1	Tha Chin River - Kanchanaburi	A	A	

Hydrology Division

No	Equipment	Unit/No	Installed place	Use	Maintenance	Remarks
H14 1991	KNICK Microprocessor pH Meter Model Portamess 751-SET	1	Sediment Section	B	A	H14 ~ H21 Supplied in 1991
H15	WTW Microprocesso Conductivity Meter Model LF 196 with Conductivity Cell Model Tetracon 96-1.5	1	Sediment Section	B	A	
H16	WTW Microprocessor Oxygen Meter Model OXI 96-B/SET (Electrod Cable Length 1.5m)	1	Sediment Section	B	A	
H17	DR. LANGE Turbidity Meter with Turbidity Probe Model RT1	1	Sediment Section	B	A	
H18	Aluminum Boat STARCRAFT Model Seafarer 16" with Outboard Engine Mercury 40HP. and Accessories (Specification Attach)	1	Hyd. Office - Chonburi	A	A	
H19	Trailer for Aluminum Boat NEC	1	- ditto -	A	A	
H20	Powermate SX/20 Microcomputer System	2	Hyd. Office - Phathalung - ditto - Kanchanaburi	A	A	
H21	Memory Expansion for NEC Powermate 286 Plus	2	Hyd. Office - Kanchanaburi Hyd. Office - Phathalung	A	A	
H22 1992	Aluminum Boat "Starcraft" Model SF16 with outboard Engine "Mercury" Model 40m and accessories (specification attach)	1 EA	RID. Pakret	A	A	H22 ~ H31 Supplied in 1992

Hydrology Division

No	Equipment	Unit/No	Installed place	Use	Maintenance	Remarks
H23	" THIES " No. 5.4010.00.000 Precipitation Recorder Acc. to hellmann	1 set	Hyd. Office - Chiang Mai	A	A	
H24	KNICK Microprocessor ph Meter	1 set	Hyd. Office - Kanchanaburi	A	A	
H25	WTW Microprocessor Conductivity Meter	1 set	Hyd. Office - Kanchanaburi	A	A	
H26	WTW Microprocessor Oxygen Meter Model OX196-B/set	1 set	Hyd. Office - Kanchanaburi	A	A	
H27	Hach Portable Turbidity Meter Model 2100 p	1 set	Hyd. Office - Kanchanaburi	A	A	
H28	NEC Powermate 386/331 Microcomputer system	2 sets	1. Hyd. Office - Chiang Mai 2. Hyd. Office - Chon Buri	A	A	
H29	2 MB Memory Upgrade for NEC Powermate 286 Plus	1 set	Sediment Investigation Branch	A	A	
H30	Thedolite - Sokkia SET2C - Memory card reader - Prism - Pole prism - Telescope Planimeter Ushikata X-Plan 360C	 1 set 1 set 1 set 2 sets 2 sets 1 set	Hyd. Office - Kanchanaburi	A	A	
H31	Inflatable Boat " Quicksilver " 12' 6" Sport can handle six people and outboard motor 25 HP. to hellmann	1 set	Hyd. Office - Chonburi	A	A	

Hydrology Division

No	Equipment	Unit/No	Installed place	Use	Maintenance	Remarks
H32 1993	" SEBA " Universal Current Meter F1	1 set	RID Pakret	B	A	H32 ~ H46 Supplied in 1993
H33	" THIES " No. 5.4010.10.000 Precipitation Recorder ACC	1 set	- ditto -	B	A	
H34	Microcomputer Dell Model 486DX-33	5 units	1. Hyd. Office - Khon Khen 2. Hyd. Office - Nakhon Ratchasima 3. Rainfall Station 4. Research and Applied Hyd. Section 5. Room 200 IEC	A	A	
H35	Dot Matrix Printer Epson LQ1170	4 units	1. 1. Hyd. Office - Khon Khen 2. Hyd. Office - Nakhon Ratchasima 3. Rainfall Station 4. Research and Applied Hyd. Section	A	A	
H36	Dot Matrix Printer Epson LQ2250	1 unit	Room 200 IEC	A	A	
H37	Digitizer A3 Size	8 units	Hyd. Office - Phattalung	A	A	
H38	Summasketch III Series UPS 500 VA	5 units	1. Hyd. Office - Khon Khen 2. Hyd. Office - Nakhon Ratchasima 3. Rainfall Station 4. Research and Applied Hyd. Section 5. Room 200 IEC	A	A	
H39	Upgrade Mainboard 286 To 486DX-33	1 unit	Water Level Section	A	A	
H40	Upgrade Mainboard 286 To 486DX-33 with 4 MB RAM, 250 MB IDE harddisk	1 unit	- ditto -	A	A	

Hydrology Division

No	Equipment	Unit/No	Installed place	Use	Maintenance	Remarks
H41	Computer Table (D.60, W.84, H.75)	5 units	1. Hyd. Office - Khon Khen 2. Hyd. Office - Nakhon Ratchasima 3. Rainfall Station 4. Research and Applied Hyd. Section 5. Room 200 IEC	A	A	
H42	Printer Table (D.60, W.64, H.75)	5 units	- ditto -	A	A	
H43	Digitizer Table	8 units	Hyd. Office - Phattalung	A	A	
H44	Chair	5 units	1. Hyd. Office - Khon Khen 2. Hyd. Office - Nakhon Ratchasima 3. Rainfall Station 4. Research and Applied Hyd. Section 5. Room 200 IEC	A	A	
H45	Trailer for aluminum boat	1 EA	RID Pakret	B	A	
H46	" SEBA " Universal Current Meter F1	1 set	RID Pakret	B	A	
H47 1994	Planimeter	2 sets	1. Applied Hydrology Section 2. Discharge Study and Analysis Section			
H48	Water Level Recorder SEBA OGASAWARA	2 sets	1. Hyd. Office - Chai Nat (2)			
H49	Suspended Water Quality Sampler	4 sets	1. Hyd. Office - Chai Nat 2. Hyd. Office - Kanchanaburi 3. Hyd. Office - Chaing Mai 4. Hyd. Office - Phisanulok			

System Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
S1 1990	VAX-Software (DEC)					S1 ~ S2
	CDD/Plus Update kit					Supplied
	QA-897AA-HM	1	IEC (Samsen) Room 302	A	A	in 1990
	QA-987AN-UJ	1	"	A	A	
	DTR Update kit (for VAX-11)					
	QA-898AA-HM	1	"	A	A	
	QA-898AN-UJ	1	"	A	A	
	Rdb/VMS Update kit					
	(for Relational Database)					
	QA-VD2AA-HM	1	"	A	A	
	COBOL Version Up					
	QA-099AA-HM	1	"	A	A	
	QA-099AJ-UJ	1	"	A	A	
	FMS Update kit					
	QA-VD7AA-HM	1	"	A	A	
	QL-VD7AJ-UJ	2	"	A	A	
	ALL-IN-1 Update kit					
	QA-AAAAA-HM	1	"	A	A	
	DECALC Software					
	QA-310AA-HM	1	"	A	A	

Condition of use

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D : Do not use

Condition of Maintenance

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System Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
	GKS Software (for graphic software)					
	QA-810AA-HM	1	IEC (Samsen) Room 302	A	A	
	QL-810AQ-AA	1	"	A	A	
	LISP/VMS					
	QA-917AA-HM	1	IEC (Samsen) Room 402	A	A	
S2	VAX-Hardware (for Micro VAX II)					
	MS 630-CA	1				
S3 1991	1.5 GB Disk Drive RA92-CD	1	IEC (Samsen) Room 302	A	A	S 3 ~ S 7
	SDI Cable (12Ft) BC26V-12	1		A	A	Supplied
	SDI Cable (25Ft) BC26V-25	1		A	A	in 1991
S4	Thai Text Term. VT382-TB	10	"	A	A	
	25 Ft. (7.6M) Cable BC 22D-25	5		A	A	
	50 Ft. (15M) Cable BC 22D-50	5		A	A	
	Table C-201	10		A	A	
	Chair A-7	10		A	A	
S5	Thinwire Enet SNGPRT RPTR DESPR-AB	1	"	A	A	
	PLENUM Transceiver Cable BNE3M-10	1		A	A	
	IGBIT DEPCA TURBO/AT EISA CTRL.DE200-AB	1		A	A	
	RG58 Thinwire Cable PVC BCIG M-30	1	"	A	A	
	PCSA LIC. for PC QL-OTLA9-AA	1		A	A	

System Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
	Pathworks VMS Tk50 QA-A93AA-H5	1	IEC (Samsen) Room 302	A	A	
	Pathworks for PC RX33 QA-OTLAA-H7	1		A	A	
S6	Disk controlller KDB50-A	1		A	A	
S7	1.5 GB Disk Drive RA92-HA	1	"	A	A	
	12 Ft, Cable BC26V-12	1		A	A	
	25 Ft, Cable BC26V-25	1		A	A	
	Etherworks MC DE210-AA	1		A	A	
	Etherwoprks LC DE200-AB	2		A	A	
	Etherworks LC DE100-AA	1	"	A	A	
	Cable BC16M-30	4		A	A	
	Pathworks/DOS Single Lic.	4		A	A	
	Installation Kit H8242	1		A	A	
	10 Ft, Cable W/ADPT.	10		A	A	
	300 M Thinwire Cable	1	"	A	A	
	BNC Plug	20		A	A	
S8 1992	RA 92-MA 1.5 GB disk drive	1	IEC (Samsen) Room 302	A	A	S 8
	BC 26V-12 12FT cable	1		A	A	Supplied in
	BC 26V-25 25FT cable	1		A	A	1992
	DE 200-AC etherworks turbo	6	"	A	A	
	BC 16M-30 cable	6		A	A	
	QL-OTLA9-AA pathworks/DOS	6		A	A	

System Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
	Single LIC					
	PdP 11-Fz DEC pc 320 p80 MB	1	IEC (Samsen) Room 302	A	A	
	GB-MESAA-SA MS-DOS/WIN	1		A	A	
	BN 24R-2E power card	1		A	A	
	GA-VERAA-H5 distributed	1	"	A	A	
	name service					
	6603 RGB Calcomp color	1		A	A	
	master plus (image printer)					
S9 1993	DEC 3000/600 AXP	1	IEC (Samsen) Room 302	A	A	S 9 ~ S 20
	OPENVMS & CD-ROM					Supplied in
	64 MB MEMORY					1993
	3 BUTTON MOUSE					
	NAS 250, DEC WINDOW					
	DEC PHIG RUNTIME					
	19 IN VRT19					
	RZ26 1.0 GB DISK					
	PE 421 - NB					
	PXG + CARD	1	"	A	A	
	PMZGB-EB					
	POWER CORD	1	"	A	A	
	BN19H-2E					
	KEYBOARD	1	"	A	A	
	LK201-AA					

System Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
	THIN/ETHERNET ADAPTER DECXM-AA	1	IEC (Samsen) Room 302	A	A	
	THINWIRE ETHERNET CBL 30 FT. BC16M-30	1		A	A	
	2.0 GB DISK RZ28-EJ	1	"	A	A	
	OPENVMS 8 USER LIC. QL-MT2A9-BE	1		A	A	
	OPENVMS AXP MED . & DOC QA-MT1AA-H8	1	"	A	A	
	LAYER S/W FOR OPENVMS QA-03XAA-H8	1		A	A	
	DEC FORTRAN AXP LIC. QL-MV1AE-AA	1	"	A	A	
	DEC FORTRAN AXP DOC. QA-MV1AA-GZ	1		A	A	
	DEC C AXP LIC. QL-MU7AE-AA	1	"	A	A	
	DEC C AXP DOC. QA-MU7AA-GZ	1		A	A	
	DEC GKS AXP LIC QL-810AA-2B	1	"	A	A	
	DEC GKS AXP DOC. QA-810AA-GZ	1		A	A	
	DSM LIC QL-130AA-3B	1	"	A	A	

System Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
	DSM DOC.	1	IEC (Samsen) Room 302	A	A	
	QA-130AA-GZ					
	SVGA COLOR MONITOR 14"	1		A	A	
S10	PERSONAL COMPUTER	1		A	A	
	FR-766TH-WC DECpc LPX 466DX2		"			
	- i486DX2/66MHZ					
	- 8 MB MEMORY					
	- 525 MB HDD		"			
	- KEYBOARD , MOUSE					
	- DOS 6.0/MS WINDOWS					
	PC76H-EB SVGA S3 928 VLbus	1	"	A	A	
	PC7XV-DE 14" SVGA COLOR MONITOR	1		A	A	
	PC7XR-BA 5.25" FLOPPY	1				
	DE200-AC ETHERWORK TURBO	1	"	A	A	
	BC16M-30 30FT THINWIRE CABLE	1		A	A	
	H8223-00 T-CONNECTOR	1		A	A	
	PC74M-AA 4MB RAM	2	"	A	A	
S11	SYSTEM UPGRADE	8		A	A	
	UPGRADING UPGRADING NEC APC 8					
	UNITS WITH 486DX, 4MB MEMORY		"			
	170 MB H/D					
	COLOR MONITOR					
	1.44 MB & 1.2MB FDD					

System Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
S12	LASER PRINTER	1	IEC (Samsen) Room 302	A	A	
	LZR1560-20 DATAPRODUCT LASER					
	PRINTER W/THAI					
S13	LAN ETHERNET EQUIPMENT					
	FR-766TH-WC DECpc LPX 466DX2	1	"	A	A	
	-i486DX2/66MHZ					
	-8 MB MEMORY					
	-525 MB. HDD					
	-KEYBOARD , MOUSE					
	-DOS 6.0/MS WINDOWS					
	NETWARE NOVELL NETWARE V3.11	1	"	A	A	
	10 USERS					
	PC76H-EB SVGA S3 928 VLbus	1		A	A	
	PC7XV-DE 14" SVGA COLOR MONITOR	1		A	A	
	PC7XR-BA 5.25" FLOPPY	1	"	A	A	
	DE201-AC ETHERWORK	8		A	A	
	DE200-AC ETHERWORK	1		A	A	
	DETMR-AZ DECrepeater 90T	1		A	A	
	BN25G-07 UTP CABL 7M	8		A	A	
	QL-YV9AW-AA PATHWORKS/DOS	1	"	A	A	
	(TCP/IP)LIC					
	QA-YV9AA-HW PATHWORKS/DOS	1		A	A	
	MED & DOC					

System Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
	QA-GLV/..A-HW PATHWORKS/DOS	1	IEC (Samsen) Room 302	A	A	
	MED & DOC					
	BC16M-30 THINWIRE30 ET	2		A	A	
	PC74M-AA 4 MB RAM	2		A	A	
	DSRVG-AZ DECSERVER 90L+	4	"	A	A	
	BC16M-30 THINWIRE 30 FT.	4		A	A	
	H8575D MMJ TO DB25 ADAPTER	32		A	A	
	BC16E-10 MMJ CABLE 10 FEET	32	"	A	A	
	VIDEO PLAYER					
	SD10 NATIONAL VIDEO PLAYER	2		A	A	
S14	SPECIAL SORTWARE					
	MS VISUAL BASIC PROFESSIONAL	1	"	A	A	
	MS WIN SOUND SYSTEM	1		A	A	
	QB-25AA-WA DEC C++ FOR WINDOW NT	1		A	A	
	BORLAN PASCAL W/OBJECT	1	"	A	A	
	SCANMAKER II W/IMAGE STAR II	1		A	A	
	SORTWARE					
S15	DEC ALPHA AXP					
	PB220-BB ALPHA PC AXP 150	1	"	A	A	
	32 MB MEMORY					
	2.8MB FD.SCSI CTRL					
	VRC16 17" COLOR MONITOR					
	600MB SCSI 426 MB HD					
	3.5 SCSI 426 MB HD					
	US KEYBOARD/3 BUTTON					

System Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
	MOUSE					
	2 SERIAL/1 PARALLEL					
	ETHERNET ADAPTER					
	SVGA ADAPTER					
	USER DOCUMENTATION					
	NT MEDIA KIT					
	BN19C-2E POWER CORD	1	IEC (Samsen) Room 302	A	A	
	PCXAL-AE KEYBOARD	1		A	A	
	PB2RA-DA 1 GB HD	1		A	A	
	BC16M-30 THINWIRE CABLE	1		A	A	
S16	PERSONAL NOTEBOOK COMPUTER					
	NOTEBOOK NEC ULTRALLTE VERSA 25C	1	"	A	A	
	INTEL 486SL-25MHZ					
	COLOR TFT LCD					
	12 MB RAM					
	FAX MODEM ADAPTER					
	ETHERNET ADAPTER					
	120 MB HARD DISK					
	180 MB HARD DISK	1	"	A	A	
S17	NETWORK CABINET					
	19" RACK W/POWER SWITCH	2	"	A	A	
	AND FAN 100CM HEIGHT					
S18	DESK & CHAIR					
	C201 MOFLEX DESK	2	"	A	A	

System Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
	A7 MOFLEX CHAIR	2	IEC (Samsen) Room 302	A	A	
S19 1994	[SORTWARE FOR VAX]					S 19 ~ S 23
	POLYCENTER PERFORMANCE DATA					Supplied
	COLLECTOR FOR OPEN VMS VAX					in 1994
	(FOR MICRO VAX 3100)					
	LIQ.QL-GX1A9-AA	1	IEC (Samsen) Room 302	A	A	
	DQC.QA-GX1AA-H5	1	"	A	A	
	POLYCENTER PERFORMANCE DATA					
	COLLECTOR FOR OPEN VMS VAX					
	(FOR VAX STATION 4000)					
	LIC.QL-GX1A9-AA	1	"	A	A	
	POLYCENTER PERFORMANCE ADVISOR					
	RUN-TIM FOR OPEN VMS AXP					
	(FOR DEC 3000/600 AXP)					
	LIC.QL-29NA9-AA	1	"	A	A	
	DOC.QL-29NAA-GZ	1	"	A	A	
	DEC FILE OPTIMIZER FOR OPEN VMS					
	AXP (FOR DEC 3000/600 AXP)					
	LIC.QL-2GNA9-AA	1	"	A	A	
	SW LIB.OVMS AXP LP'S CDROM					
	QT-03XAA-H8	1	"	A	A	
	DOC.QA-GJ8AA-GZ	1	"	A	A	

System Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
	CMS FOR OPEN VMS AXP					
	(FOR DEC 3000/600 AXP)					
	LIC.QL-007AA-3B	1	IEC (Samsen) Room 302	A	A	
	DOC.QA-MUPAA-GZ	1	"	A	A	
	[LICENSE, DOCUMENT]					
	OPENVMS AXP LIC. 8 TO 32 USER					
	LIC.QL-MT2A9-YG	1	"	A	A	
	DSM FOR OPENVMS AXP LIC. 1 TO 16 USER					
	LIC.QL-130AA-3B	15	"	A	A	
	COBOL FOR OPENVMS AXP LIC. UNLIMITED					
	DOC.QL-0JUAE-AA	1	"	A	A	
	COBOL FOR OPENVMS AXP DOC.					
	DOC.QL-0JUAA-GZ	1	"	A	A	
	GKS FOR OPENVMS VAX LIC. 1TO 2 USER					
	LIC.QL-810AA-2B	1	"	A	A	
	DEC DB INTEGRATOR GATEWAY FOR DSM					
	LIC.QL-2DEAA-3B	3	"	A	A	
	DOC.QA-2DEAA-H5	1	"	A	A	
	DEC FMS FOR OPEN VMS AXP					
	LIC.QL-MVSAE-AA	1	"	A	A	
	DOC.QA-MVSAA-GZ	1	"	A	A	
S20	[HARDWARE FOR PC]					
	DEC PC LPx 566					

System Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
	PENTIUM 66MHz, 8MB RAM, 3.5"FDD,					
	540 MB HDD VIPER GRAPHIC CARD					
	FR811AA-WD	2	IEC (Samsen) Room 302	A	A	
	5, 25" FDD					
	FR-PC7XR-BA	2	"	A	A	
	8 MB MEMORY					
	FR-PC77M-AA	2	"	A	A	
	DEC 14" COLOR CRT					
	FR-PCXBV-PE	2	"	A	A	
	INTEL ETHER EXPRESS (THIN WIRE)	2	"	A	A	
	COMPATIBLE WITH ETHERWORKS 3					
	TURBO					
	30 FT THIN WIRE	2	"	A	A	
	T-CONNECTOR	2	"	A	A	
S21	[PERIPHERALS]					
	64 MB MEMORY					
	MS15-DA	1	"	A	A	
	1600/6250 MAGNETIC TAPE DRIVE (SCSI)					
	TSZ 07-BB	1	"	A	A	
	DUAL FAST SCSI-2 TURBO CHANNEL					
	OPTION CARD					
	PMAZC-AA	1	"	A	A	
	HP DESKJET 1200C COLOR PRINTER	1	"	A	A	
	2MB RAM, PARALLEL					
	HP LASERJET 4 PLUS	1	"	A	A	

System Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
	4GB TAPE DRIVE (EXTERNAL)	1	IEC (Samsen) Room 302	A	A	
	TLZ 06-FA					
	6FT SCSI CABLE (50pin -50pin)	1	"	A	A	
	BC09D-06					
	DISK DRIVE 10GB (2 GB X 7) WITH					
	CABINET					
	DRV.RZ28-VA	7				
	CAB.BA350-KB	1	"	A	A	
	20GB TAPE DRIVE			A	A	
	TZ87-TA	1				
	SCSI CABLE		"	A	A	
	BC06P-06	3				
S22	PATHWORKS FOR WINDOWS NT (CLIENT)		"	A	A	
	(SINGLE USER LICENSE)					
	LIC. QM-2K5AA-A1	1				
	MEDIA.QA-2K5AA-H8	1	"	A	A	
	DOC.QA-2K5AA-GZ	1	"	A	A	
	MICROSOFT VISUAL C++FOR WINDOWS	1	"	A	A	
	NT		"	A	A	
S23	DEC PC LP X 466D2	1				
	CPU 486DX2-66,8MB RAM,525MB HDD		"	A	A	
	FDD 3.5" X 1, 5.25" X 1, S3 GRAPHIC CARD					
	14" COLOR CRT					

Engineering Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
E 1	Personal Computer (ACMA 386-25) ACMA, INTEL 80836-25 Monitor (ACMA, CM335) Keyboard (ACMA) Printer (EPSON, LQ1050) Plotter (ROLAND, DXY1300) Mouse (ACMA) Math Co-Processor (ACMA, 80387-25)	1 1 1 1 1 1 1 1	Construction Control Technology (RID, Pakret)	A	A	E1-E15 Supplied in 1990
E 2	Micro Disk Recorder (Tokyo Sokki RM-351)	1	Constrution Control Technology Sec, (RID, Pakret)	A	A	
E 3	Automatic Volume Change (Wykeham Farrance / WF 17040)	1	- ditto -	A	A	
E 4	Calibrating Device for LSCT (Wykeham Farrance ? WF 17055)	1	- ditto -	A	A	
E 5	Leading Edge Laptop (DC-8212)	1	Special Engineering Sec, (RID, Samsen)	A	A	
E 6	Dragon Software	1	Criteria Diffusion Sec, (RID, Samsen)	B	A	
E 7	Personal Computer (TOSHIBA, T3100 SX)	2	Criteria Diffusion Sec, 1 set special Engineering Sec. 1 set	A	A	
E 8	Additional Battery pack	2	Special Engineering Sec. 1 set, Criteria 1 set	A	A	

Condition of use

A : Use the equipment almost everyday
B : Use sometimes (several times per month)
C : Use little (several times per year)
D : Do not use

Condition of Maintenance

A : Good maintenance condition
B : Sometimes cause trouble, but can be repaired it and use
C : Out of order
D : Scrapped

Engineering Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
E 9	Printer EPSON LX-800 with orginal EPSON Ribbon	2	Special Engineering Sec. 1 set Criteria 1 set	A	A	
E10	Laser Printer (SHARP, JX 9500)	1	Criterial Diffusion Sec.	B	A	
E11	Plotter Roland DXY - 1300	1	Special Engineering Dec.	A	A	
E12	Power Card Stabilizer, 1KVA	1	-ditto-	A	A	
E13	Color Monitor (Display) with VGA card	1	Construction Contrlo Sec.	A	A	
E14	HEC1, HEC2, HEC6, HECWRC, MLRP, STATS and HEC-5	1	Criterial Diffustion Sec.	B	A	
E15	Maruto Dial Type Transducer RE-d20W	6	Construction Control Sec.	A	A	
E16	Leading Edge D3/25	1	Special Engineering Sec.	A	A	E16-E32
E17	Hard Disk	1	Constructtion Control Technology Sec.	A	A	supplied in
E18	UPS 5 KVA "Powercard"	1	- ditto -	A	A	1991
E19	5902AE Plotmaster	1	Criterial Diffusion Sec.	B	A	
E20	Software for "DAM Safety Programe"	1	Special Engineering Sec.	B	A	
E21	Automatic volome change measuring apparatus	1	Construction Control Technology Sec.	A	A	
E22	Dial type displacement transducer	6	- ditto -	A	A	
E23	Reference Books	83	Construction Control Technology Sec.	B	A	
E24	Computer 80486-33 - 80486-33 CPU, clock speed 156 MHz - BWLT-IN 80387 MATH Co-proceesor and WEITEK 4167	1 set	Criteria Diflusion Sec.	A	A	E24-E36 Supplied in 1992

Engineering Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
E24	- 8Kb internal cache memory 32-BIT / EISA Architecture - 128 KB, cache memory (Expan256KB) - 4 MB RAM on board (EXPAN64KB) - 1 X 1.2 MB, FDD 5.25" - 1 X 1.44 MB, FDD 3.5" - 200 MB hard disk (conner 16 MSEC) - Controller AT BUS - VGA Graphics card T-SENG ET-400 (RAM 1 MB) - Hard lock MBQA-V - AGER 330 Super VGA Monitor 14" - 2 Serial/1 paraller Port - Two enhanced keyboard 101 key - Power supply 200 Watts/mini power - Computer Table - Mouse (Ball) - Anti Virus-1100 - Diskette HD 5.25" - Monitor filter	1 set 1 set 1 set 1 box 1 set				
E25	Digitizer CALCOMP (A1) Model 33360 ser (24" × 36" size) - Digitizing surface, Manual - Interface KIT with software driver	1 set	Criteria Diffusion Sec.	B	A	

Engineering Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
E25	- 220 V/50 Hz Power supply (P2) - I/Q cable - 16-button, in-line cursor-corded		Criteria Diffusion Sec.	B	A	
E26	Printer EPSON Model LQ-1060+ (color)	1 set	Criteria Diffusion Sec.	A	A	
E27	Dam Data Processing I	1 set	Special Engineering Sec.	B	A	
E28	Dam Data Processing II	1 set	- ditto -	B	A	
E29	Dam Data Processing III	1 set	- ditto -	B	A	
E30	G.P.I.B. Interface PCL-848B IEEE-448 interface card with IEC 625 D-25 connecter - 2M IEEE-488 to IEC-625 cable - Firmware driver for basic & Qbasic - C & Pascal driver on diskette, user ' s manual	1 set	Construction Control Technology	A	A	
E31	Personal Computer (TAVOM486 SX-20)	1 set	- ditto -	A	A	
E32	Laser Printer (HP Laser Jet IIP Plus) -HP TOMER (92275A) -PACIFIC RAM 2 MB	1 set 1 set 1 set	- ditto -	A	A	
E33	Land sat MMS data - 40 inch color print at 1: 250,000 scale - 9 Tracks, 1600 bpi. Computer, compatible tape	 4 4	Criteria Diffusion Sec.	B	A	

Engineering Development Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
E34	Land sat TM data - 40 inch color print Geocoded Subscene at 1: 50,000 scal - 9 Tracks, 1600 bpi. Geocoded, computer, compatible tape	 3 3	Criteria Diffusion Sec.	B	A	
E35	Automatic Vloume change measuring apparatus WF 17044 with transducer and mounting bracket WF 17015, 17051	1 set	Construction Control Technology Sec.	A	A	
E36	Training Program	21Volume	Special Engineering Sec.	B	A	
E37	"SEEP/W" Finite Element Supage Analysis Software for Windows	1 set	- ditto -	B	A	E37-E40 Supplied in 1993
E38	RI Moisture Density Gauge Model FT - 102, AC 100V., 50 HZ, 1 PH 0.1A	1 set	Construction Control Technology Sec.		A	
E39	TML Data logger Model TDS-302 (-01)	1 set	- ditto -	A	A	
E40	Ultra light Dynamic Penetrometer for Soil Investigation	1 set	- ditto -	B	A	
E41	Water Level Indicator	1 set	Special Engineering Sec. (RID Samsen)			
E42	Soil Mechanics Laboratory Equipment 1. Mechanical Compactor 2. Air Compressor 3. Large Capacity Oven 4. Matorited Laboratory CBR Apparatus	 1 set 1 set 1 set 1 set	Construction Control Technology (RID Pakret)			

Administration & Training Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
1990	Earth Leakage Breaker (MITSUBISHI)					
T1	100A (TYPE NV100-SS 4P)	1	IEC	A	A	
T2	75A (TYPE NV100-SS 4P)	1	"	A	A	
T3	50A (TYPE NV100-SS 4P)	1	"	A	A	
T4	150A (TYPE NV225-SB 4P)	1	"	A	A	
T5	175A (TYPE NV225-SB 4P)	1	"	A	A	
T6	225A (TYPE NV225-SB 4P)	1	"	A	A	
T7	Slide Projector with Accessories					
	KODAK CAROUSEL S-AV2050	1	"	A	A	
	VARIO-RETINAR 85-210 MM.LENS	1	"	A	A	
	KODAK S-AV PROGRAMMABLE	1	"	A	A	
	DISSOLVE					T1 - T8
	CONTROL					Supplied
T8	Overhead Projector	1	"	A	A	in 1990
	ELMO HP-5500 ZOOM					
T9 1991	Fuji Xerox Copier Machine Model 5038	2	IEC	A	A	
T10	PRO SIXTEEN Multi-Image	1	"	A	A	
	Programming System					
	- 115/220 volts AC 220 volts AC,					
	20 Watts					
	- Automatic Prequency Sensing 50/60 Hz					

Condition of use

A : Use the equipment almost every day

B : Use sometimes (several times per year)

C : Use little (several times per year)

D : Do not use

Condition of maintenance

A : Good maintenance condition

B : Sometimes cause trouble , but can be repaired it and use

C : Out of order

D : Scrapped

Administration & Training Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
	- SMPTE time code read/generate 25fps or 30 fps - Signal strength indicators - Mate-Trac signal verification indicator - Built-in Nicad batteries automaticcally recharge, protecting data stored in the PRO SIXTEEN memory - Durable all metal construction - 1/4" phone facks for secure signal connections		IEC			
T 11	WESS Brand VR Hand Punch for 35 mm, film	1	"	A	A	
T 12	ELMO Brand Model HP-A380 Zoom - Lens : 170-380 mm. Powered Zoom Lens - Lamp : 36V. 400 W, Halogen Lamp - Brightness Control : Provided - Automatic Lamp Change : Provided Head Rotation : 360 Degrees	1	"	A	A	

Administration & Training Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
T13	PAUL Wire Stitching Machine Model, 747	1	IEC	A	A	
T14	Surface-Mount Microphone "SHURE" SM-91	10	"	A	A	
T15	Audio Master 1200 " SHURE "	2	"	A	A	
T16	Pre-Amplifiler " SHURE "	8	"	A	A	
T17	Speaker " JBL " Control 5	2	IEC	A	A	T9 - T20
T18	Speaker Stand Wall Type	2	"	A	A	Supplied
T19	Microphone Box Pop-up	8	"	A	A	in 1991
T20	Accessories and installation	1	"	A	A	
T21 1992	- Surface-Mount Microphone "SURE" Model SM-91	14sets	IEC	A	A	
T22	- Pop-up box for Connector	14sets	"	A	A	
T23	- Table Microphone "National" WM-330N with top stand Model WM-172	14sets	"	A	A	
T24	- Automatic Mixer Model for "JBL" Model 7510B	3pack	"	A	A	
T25	- Double cassette Tapedeck Model W-505R	3 sets	"	A	A	
T26	- Monitor Panel	1 set	"	A	A	
T27	- Cabinet Rack 19"	1 set	"	A	A	
T28	- Accessories	-L.S.	"	A	A	
T29	- Installation	-L.S.	"	A	A	
T30	- Panasonic Video Movie Camera Super-VHS Model NV-M8000E	1 set	"	A	A	

Administration & Training Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
T 31	- Panasonic Television set complete - 1x Panasonic TX-33V1X33" (64cm) colour TV with stereo and teletext reception capability - tx Panasonic NV-F55AM HIFI Video cassetts recorder - tx AV table with casters	1 set	IEC	A	A	
T 32	- Kodak Ektapro Model 9000 slide projector - 3 Kodak extapro projection FF lens 75-120mm. F/3.5 - 3 Kodak extapro cable remote - 3 Kodak extapro 12/7 pin module - 3 Kodak extapro 12/7 adapter cable	3 sets	"	A	A	
T 33	- Kroy Model Duratype 240SE (type supplies individually package)	1 set	"	A	A	
T 34	" XEROX " Copy machine Model V.500 without option	1 set	"	A	A	
T 35	- "WESS" Holder SE 7200 - registration device for 35mm. slide 30 copy and contact printing with accessary	1 set	"	A	A	

Administration & Training Division

No	Equipments	Unit / No	Installed place	Use	Maintenance	Remarks
T36	- " WESS " Glower SE 7650 - for exiting " GLOW " effects use with Holder SE 7200 with acessary	1 set	IEC	A	A	T21 - T36 Supplied in 1992
T37 1993	Toyota HI-ACE long Whellbase Diesel Engine 2446 CC. 5 Speed Tran	1unit	IEC	A	A	
T38	Canon Copier Model NP-6060	1unit	"	A	A	
T39	Canon Sorter-B1 (20 Bins)	1unit	"	A	A	
T40	Panasonic Video Movie Camera Super-VHS Model NV-9000EN	2 set	"	A	A	T37-T41 Supplied in 1993
T41	First Horizon 7115 Tripod Video Camera with Case & Strap	2 set	"	A	A	
T42 1994	Gestetner "copy printer Model 5325 with cabinet	1 set	IEC	A	A	
T43	"3M" LCD Projection Panel 5900	1 set	"	A	A	
T44	"3M" Overhead Projector Model 9550	1 set	"	A	A	T42 - T46 Supplied in 1994
T45	"PLUS" Direct Projector Model DP-20	1 set	"	A	A	
T46	"PANASONIC" Electric Copy Board	1 set	"	A	A	

Appendix 4

Provision of Machinery and Equipment,and Local Cost Expenditure Supplementation (Thousand yens)

Budget	Fiscal year	1990	1991	1992	1993	Total
Provision of machinery & equipment	Total	31,898	52,610	114,566	50,943	250,017
	the year	31,898	43,726	75,547	50,943	202,114
	Postpone	-	8,884	39,019	-	47,903
Equipment with expert	Total	1,433	3,809	5,173	2,056	12,471
	the year	1,433	3,809	5,173	2,056	12,471
	Postpone	-	-	-	-	
Model infrastructure	Total	-	-	17,046	-	17,046
	the year	-	-	-	-	-
	Postpone	-	-	17,046	-	17,046
Intermediate-level training	Total	5,498	5,418	6,947	3,156	21,019
	the year	5,498	5,418	6,947	2,887	20,750
	Postpone	-	-	-	269	269
Local recurrent cost	Total	6,492	5,049	7,220	7,424	26,185
	the year	6,492	5,049	4,170	7,108	22,819
	Postpone	-	-	3,050	912	3,962
Others	Total	292	-	5,132	4,418	9,842
	the year	292	-	5,132	4,418	9,842
	Postpone	-	-	-	-	-
Grand total	Total	45,613	66,886	156,084	67,997	336,580
	the year	45,613	58,002	96,969	67,412	267,996
	Postpone	-	8,884	59,115	1,181	69,180

Appendix 5 Intermediate-Level Trainees Training

Water Management

F/Y	No	Course Name	period	No. of Trainees
1990	1	Flow Analysis in a Canal	Feb,26,91 ~ Mar, 1,91	30
	2	Computer Use Method for Irrigation	Mar,18,91 ~ Mar,22,91	40
1991	3	Policy Level Water Management	Mar,9,92 ~ Mar,13,92	60
1992	4	PC Training for Water Management	Oct,19,92 ~ Oct,21,92	22
	5	Operation and Maintenance Training	Dec,14,92 ~ Dec,18,92	75
	6	Micro - Irrigation	Mar,10,93	20
	7	Management Information System	Mar,16,93	40
1993	8	Water Distribution Plan (1)	Nov, 8,93 ~ Nov,26,93	40
	9	" (2)	Nov,22,93 ~Nov,26,93	40
	10	" (3)	Dec,13,93 ~ Dec,17,93	40
1994	11	Appropriate Operation for Water Management Facilities	Nov (plan)	30
	12	Water Distribution Plan	Oct,11,94 ~ Oct,13,94	20
	13	Water Management Information Network System	Dec (plan)	20

Hydrology Division

Fiscal Year	NO	Course Name	Period	No. of Trainees
1990	1	Hydrological observation for technicians	Feb.22.91~Feb.27.91	44
	2	Research on water quality	Mar.27.91~Mar.29.91	22
1991	3	Hydrological observation for technicians	Dec. 2.91~Dec. 4.91	15
	4	Data processing by micro-computers	Feb.18.92~Feb.25.91	39
1992	5	Hydrological data processing by micro-computers	Nov.9.92~Nov.12.92	17
	6	Seminar on hydrology, water resources development, water management and the environment	Mar.1,93~Mar.4.93	42
1993	7	Seminar on hydrological techniques	Feb.21.94~Feb.24.94	40
1994	8	Hydrology information related to water resources development and environment	Dec(tentative)	80

System Development Division

Fiscal Year	No.	Course Name	Period	No. of Trainees
1990	1	Database Management	Mar,25,91 ~ Mar,29,91	15
	2	Data Processing by PC	Mar,20,91 ~ Mar,22,91	20
1991	3	Introduction to Computer (1)	Feb,11,92 ~ Feb,12,92	31
	4	Introduction to Computer (2)	Feb,19,92 ~ Feb,21,92	26
	5	Database Management	Feb,24,92 ~ Feb,28,92	16
	6	Fortran Programming	Mar, 3,92 ~ Mar, 6,92	20
	7	Form Management	Mar, 3,92 ~ Mar,13,92	20
	8	Information Management	Mar,16,92 ~ Mar,20,92	20
1992	9	Data Processing by	Jan,19,93 ~ Jan,22,93	29
	10	Computer	Jan,26,93 ~ Jan,29,93	29
	11	dBASE (Advanced Level)	Aug,25,92 ~ Aug,28,92	19
	12	Pascal Programming	Feb, 2,93 ~ Feb,12,93	22
	13	Fortran Programming	Feb,22,93 ~ Feb,26,93	22
	14	Database Management	Mar, 1,93 ~ Mar, 5,93	23
	15	The Hydrological Database	Mar, 8,93 ~ Mar,12,93	20
	16	Form Management System	Mar,22,93 ~ Mar,26,93	20
		Information Management		
1993	17	Introduction to Computer (1)	Nov,29,93 ~ Dec, 3,93	33
	18	Introduction to Computer (2)	Dec,13,93 ~ Dec,17,93	31
	19	Pascal Programming	Dec,20,93 ~ Dec,24,93	39
	20	Database Management	Jan,10,94 ~ Jan,14,94	30
	21	Rdb/SQL	Feb, 7,94 ~ Feb,11,94	32
1994	22	Computer Concept and System Software	Sep, 5,94 ~ Sep, 9,94	20
	23	Irrigation and Drainage Package	Oct,17,94 ~ Oct,21,94	20
	24	Application Software	Sep,12,94 ~ Sep,16,94	20
	25	Water Management Information Network System	Dec, (To schedule)	20

Engineering Development Division

Japanese fiscal year	Number	Course Name	Period	No. of Trainees
1990	1	Geotechnical Investigation Standards for Impounding Dams and Apparatus Structure	Mar, 15, 1991	25
	2	Guideline for Planning and Design for Improving Irrigation Project	Mar, 20-22 1991	70
	3	Improvement of Water Distribution and Maintenance Manual	Mar, 28-30 1991	60
1991	4	Embankment Construction on Soft Soil Foundation	Apr, 26, 1991	110
	5	Dam Safety organization and Maintenance	Nov, 29, 1991	70
	6	Standard for Drafting and Drawing	Jan, 31, 1992	104
1992	7	Dam Safety for Dam Operators	May, 21-22 1992	81
	8	Rock Slope Engineering	Jul, 6-10 1992	50
	9	Standards for Reinforcement Details in Concrete Structure	Aug, 28, 1992	150
	10	Technology Management in Construction Quality Control	Sep, 15-16 1992	70
	11	Analysis and Application of Remote Sensing Data	Jan, 11-15 1993	14
	12	Guideline for Project Planning	Mar, 12-14 1993	80
1993	13	Standard Quality Control for Earth Fill Dam Construction	Aug, 4-8 1993	20
	14	Compaction Quality Control for Earth Fill Dam	Feb, 19-21 1994	65
1994	15	Remote Sensing	Nov, 8-9 1994	27
	16	Quality Control by R.I Method	Dec, 13-15 1994 (plan)	70
	17	Introductory course to Dam Safety	Jan, 19-20 1995 (plan)	60

Appendix 6 Seminars

1. Technical Development and Water Management

Nov. 27,1990 - Nov. 29,1990 Participants 147 Persons

2. Expert Consultation of Asian Network on Irrigation / Water Management (FAO,RID,IEC)

Aug. 25,1992 - Aug. 28,1992 Participants 50 Persons

3. Expert Consultation of Asian Network on Irrigation / Water Management (FAO,RID,IEC)

May 16,1994 - May 20,1994 Participants 80 Persons

4. Training seminar on the application of the Scheme Irrigation Management Information System (FAO,RID,IEC)

June 25,1994 - Aug. 5,1994 Participants 45 Persons

5. Irrigation & Drainnage Technique and Water Management

Feb. 22,1995 - Feb. 24,1995 Participants 60 Persons

Appendix 7 IEC Project Operation Cost supported by RID

DESCRIPTION	1990	1991	1992	1993	1994	1995	Remarks
	Oct/89-Sep/90	Oct/90-Sep/91	Oct/91-Sep/92	Oct/92-Sep/93	Oct/93-Sep/94	Oct/94-Sep/95	Baht
IEC SAMSEN							
1. Allowance	320,000	335,000	587,320	609,000	630,000		
2. Fringe Benefits	1,010,000	940,000	1,325,000	1,323,000	1,320,000		
3. Materials	1,730,000	1,860,000	720,000	736,000	750,000		
Sub-Total	3,060,000	3,135,000	2,632,820	2,668,000	2,700,000		
IEC PAKRET							
1. Allowance	240,000						
2. Fringe Benefits	730,000						
3. Materials	1,160,000						
Sub-Total	2,130,000						
TOTAL	5,190,000	3,135,000	2,632,820	2,668,000	2,700,000		

Appendix 8 Counterparts' Assignment and Fields

(Management, Administration/Training)

	Fisical Year	Term of appointment					Training inJapan		Remarks
		1990	1991	1992	1993	1994	Year	TrainingOrg.	Comment about Technical Trancefer&Technical Acquirment
	C／P名 Month	4 7 0 1	4 7 0 1	4 7 0 1	4 7 0 1	4 7 0 1			
	Mr. Kitcha Polopasi	———	——— Feb. 92				9 4	MAFF	Director of IEC
	Mr. Chamroon Chindasanguan			———	——— Oct. 93				Director of IEC
	Mr. Roongrueng Chulajata				———	———			Director of IEC
	Mr. Suthi Songvoravit	———	———	———	——— Nov. 93		9 1	MAFF	Deputy Director of IEC
	Mr. Vira Vongsangnak				———	———	9 4	MAFF	Deputy Director of IEC
	Mr. Surat Santisart	———	———	———	———	———			Chief of Audio Visual Service Section
	Mrs. Boonpor Poorung	———	——— Apr. 92						Chief of Budget Planning Section
	Mrs. Somjai Traipanya			——— Apr. 92	———	———			Chief of Administration Section
	Mr. Kurpan Neanchaloay	———	——— Apr. 92				Phase1		Chief of Training Service Section
	Mr. Vira Vongsangnak				——— Nov. 93	———	9 4	MAFF	Chief of Training Service Section

WATER MANAGEMENT

Budget F/Y / Name of C/P	Appointment					Training in JAPAN		Remarks
	1990	1991	1992	1993	1994	F/Y	Place	
Month	4 7 0 1	4 7 0 1	4 7 0 1	4 7 0 1	4 7 0 1			
Mr. Skulwathana Chantharobol	———	———	———	———	———			Director of O/M Div.
Mr. Apichai Watanayomnaporn		———	———	———	———	91	NRIAE	
Mr. Pipat Sathiantanit		———	———	———	———	91	Kyusyu University	
Mr. Akkapong Boonmash		———	———	———	———	90	NRIAE	
Mr. Anusak Mujjalinvimuti			———	———	———	92	Kyusyu University	
Mr. Preeda Wongdoywang					———			Director of O/M Div.

* NRIAE : National Research Institute of Agricultural Engineering

IRRIGATION AND DRAINAGE INFORMATION SYSTEMS

Name of C/P	Budget F/Y / Month	Appointment 1990 4 7 0 1	1991 4 7 0 1	1992 4 7 0 1	1993 4 7 0 1	1994 4 7 0 1	Training in Japan F/Y	Training Place	Remarks
Mr.Sompot Sukhumpanich									Director (till Oct.94)
Mr.Supot Promnaret									Director (from Oct.94)
Ms.La-ong Rojanasoonthon									
Ms.Suwanna Chan-aim							93	LIPMO	
Mr.Chairat Gua-arum							94	WRDPC	
Mr.Somnuk Jirasirisopon									
Mr.Suksan Pocharassaengkul							91	LIPMO	
Mr.Rasana Patimaprakorw									

LIPMO : Land Improvement Planning and Management Office
WRDPC : Water Resources Development Public Corporation

* NRIAE : National Research Institute of Agricultural Engineering

HYDROLOGICAL ANALYSIS

Budget F/Y / Name of C/P / Month	Appointment 1990 (4 7 0 1)	1991 (4 7 0 1)	1992 (4 7 0 1)	1993 (4 7 0 1)	1994 (4 7 0 1)	Training in Japan F/Y	Training Place	Remarks
Mr.Prasert Millintangul								Director (till Sep.94)
Mr.Kamjorn Lapcharoen								Director (from Oct.94)
Mrs.Anporn Chongvanitswat						90	NRIAE	
Mr.Attaporn Buddahapalit						93	NRIAE	
Mr.Veeravit Pornrattaphan								
Mrs.Spawadee Yinsricharoenkit						94	NRIAE Ibaragi Univ.	
Mr.Sunguan Kanthawong						91	NRIAE	

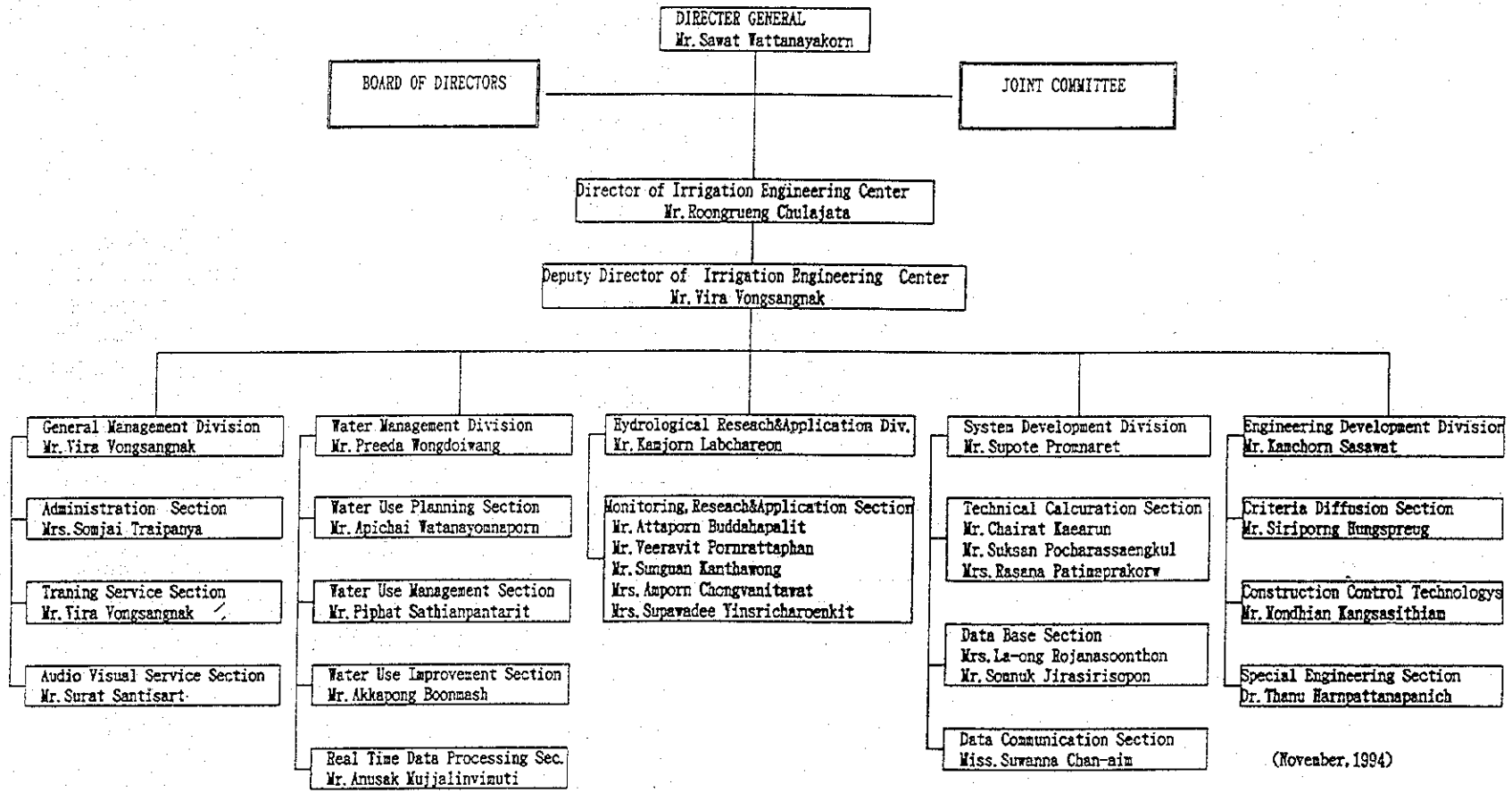
* NRIAE : National Research Institute of Agricultural Engineering

IRRIGATION AND DRAINAGE FACILITY DESIGN

NAME OF C/P	APPOINTMENT	TRAINING IN JAPAn		REMARKS
Budget F/Y / month	1990 (4 7 0 1) / 1991 (4 7 0 1) / 1992 (4 7 0 1) / 1993 (4 7 0 1) / 1994 (4 7 0 1)	F/Y	PLACE	
Mr. Ruogrit Ammawat	Oct. 93	91	MAFF	Director of Engineering Development Division
Mr. Sanan Sirion	Nov. 93 – Sep. 94			Director of Engineering Development Division
Mr. Kamchorn Sasavat	Oct. 94			Director of Engineering Development Division
Dr. Siripong Hungspreug				Chief of Criteria Diffusion Section
Mr. Mondhian Kangsasithiam		92	MAFF	Chief of Construction Control Section
Dr. Thanu Harnpattanapanich		89	MAFF	Chief of Special Engineering Section

MAFF : Ministry of Agriculture, Forestry and Fisheries

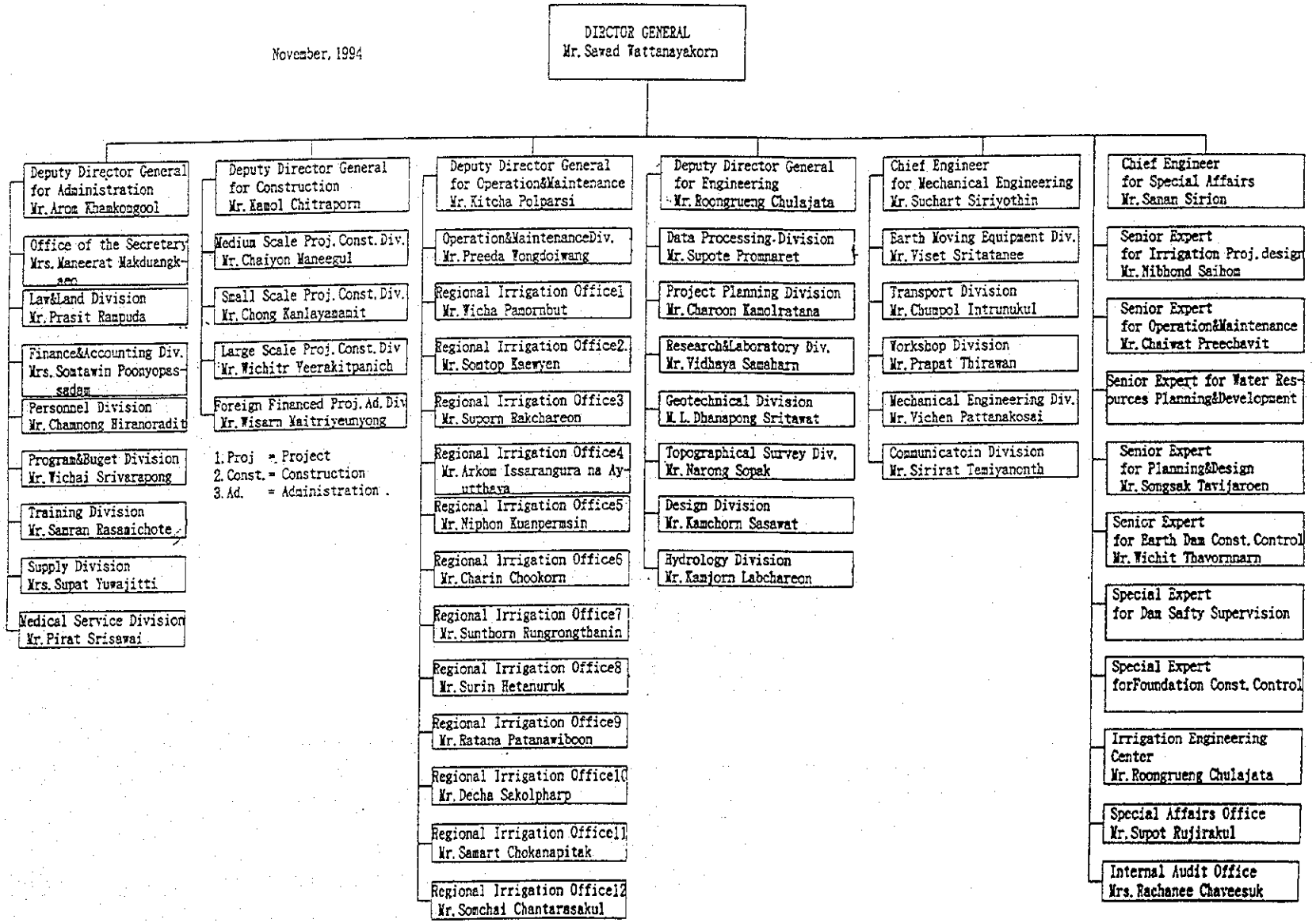
Appendix 9 Organization of Irrigation Engineering Center Phase II



(November, 1994)

Appendix 10 Organization of RID

November, 1994



Appendix 11 Details of RID Budgets

Unit : 1,000 Baht

Item	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95
1. Salaries : Permanent	2,066,262	2,595,174	3,149,925	4,167,130	4,401,248	4,560,726
2. Wages: Temporary Compensation	4,630	7,140	9,827	6,899	6,680	7,942
3. Ordinary Materials	174,512	183,684	210,984	241,374	261,102	283,336
4. Public Welfare	101,162	101,531	112,569	136,410	143,336	154,584
5. Equipment costs, land, building materials	8,272,321	11,101,460	12,467,546	16,631,217	19,157,155	23,047,215
6. Subsidies	78	82	680	764	770	770
7. Other Expenditure	432,792	734,084	866,827	1,030,864	1,108,506	1,428,965
TOTAL	11,051,757	14,723,155	16,818,358	22,214,658	25,078,797	29,483,538

Source : Agricultural Statistics of Thailand Crop Year 1988/99 (87-89)

: Programs and Budget Division RID (90-94)

Appendix 12 Annual Budget of Departments / Offices under the Ministry of Agriculture and Cooperatives

Department/Office	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95
1. Office of the Under-Secretary	421.2	616.8	690.0	889.5	3,497.2	3,153.5
2. Royal Irrigation Department	14,723.2	16,506.4	17,974.5	21,673.7	24,435.1	29,484.0
3. Department of Cooperative Auditing	117.2	153.2	172.7	230.9	258.6	307.9
4. Department of Fisheries	1,446.4	1,964.0	2,457.4	2,490.5	2,718.8	2,972.8
5. Department of Livestock	1,394.7	1,581.0	1,959.9	2,705.6	2,963.0	3,339.9
6. Royal Forest Department	2,791.3	3,410.0	4,019.1	5,202.1	6,959.1	9,305.7
7. Department of Land Development	1,203.2	1,279.6	1,290.0	1,640.2	1,849.7	2,041.8
8. Department of Agriculture	1,245.2	1,564.2	1,768.4	2,197.0	2,468.7	2,518.8
9. Department of Agricultural Extension	1,822.3	2,526.2	3,042.3	4,048.3	4,683.2	5,419.5
10. Department of Cooperative Promotion	727.4	918.4	1,050.0	1,685.4	1,987.6	2,854.4
11. Office of Agricultural Land Reform	720.4	757.6	1,017.6	1,330.6	2,628.0	2,643.9
12. Office of Agricultural Economic	114.3	161.2	201.3	234.7	245.3	277.6
13. Enterprise	-	-	-	506.6	1,327.0	-
TOTAL	26,586.8	31,420.6	35,643.2	44,328.5	54,694.2	63,924.3

Source : Thailand 's Budget in Brief (Fiscal Year 1992)

: Expense Budget for Fisical Year 1991-1994 (MOAC)

Appendix 13 Number of RID Officials in Grade-Level (Fiscal Year 1993-94)

DIVISION	Level										Total
	10	9	8	7	6	5	4	3	2	1	
1. Top Management	1	9	1	-	-	-	-	-	-	-	11
2. Office of the Secretary	-	-	1	2	5	4	5	16	10	16	59
3. Finance and Accounting	-	-	1	5	19	67	22	43	97	189	443
4. Supply	-	-	1	4	18	53	45	14	54	89	278
5. Medical Service	-	-	1	18	14	3	20	70	33	196	355
6. Training	-	-	1	2	4	1	2	23	3	8	44
7. Laws and Lands	-	-	1	4	23	1	1	74	11	20	135
8. Large Scale Project Construction	-	-	5	17	35	59	8	45	98	62	329
9. Medium Scale Project Construction	-	-	1	16	39	66	10	47	86	61	326
10. Small Scale Project Construction	-	-	1	14	65	32	13	72	204	304	705
11. Foreign Financed Project Administration	-	-	1	4	7	-	1	22	-	2	37
12. Operation and Maintenance	-	-	1	11	50	24	21	87	184	75	453
13. Regional Irrigation Office 1	-	-	1	9	19	33	5	6	33	7	123
14. - do - 2	-	-	1	12	13	35	12	8	51	15	147
15. - do - 3	-	-	1	16	13	37	13	8	114	32	234
16. - do - 4	-	-	1	11	16	38	5	13	97	24	205
17. - do - 5	-	-	1	14	12	25	8	8	100	27	195
18. - do - 6	-	-	1	11	21	32	5	10	85	17	182
19. - do - 7	-	-	1	18	32	105	62	9	95	79	401
20. - do - 8	-	-	1	17	23	74	44	7	54	87	307
21. - do - 9	-	-	1	12	20	40	18	9	102	41	243
22. - do - 10	-	-	1	19	17	51	29	8	55	23	203

DIVISION	Level										Total
	10	9	8	7	6	5	4	3	2	1	
23. - do - 11	-	-	1	9	13	23	13	13	75	55	202
24. - do - 12	-	-	1	10	14	24	6	15	81	26	177
25. Topographical Survey	-	-	1	8	24	79	6	31	161	82	392
26. Hydrology	-	-	1	5	16	7	2	24	34	26	115
27. Geotechical	-	-	1	6	19	26	4	62	66	31	215
28. Research and Laboratory	-	-	1	6	16	1	-	35	14	3	76
29. Design	-	-	1	26	77	35	8	153	138	33	471
30. Data Processing	-	-	1	3	3	-	2	13	-	14	26
31. Mechanical Engineering	-	-	1	11	29	89	9	22	172	121	454
32. Earth - Moving Equipment	-	-	1	18	56	35	3	2	23	16	154
33. Transport	-	-	1	5	12	15	5	5	20	10	73
34. Workshop	-	-	1	6	18	22	2	4	24	17	94
35. Communication	-	-	1	1	4	5	1	1	11	6	30
36. Personnel	-	-	1	4	6	1	6	28	5	18	69
37. Programe and Budget	-	-	1	4	14	2	2	31	11	10	75
38. Project Planning	-	-	1	6	14	7	2	66	11	6	113
39. Chief of Internal Audit Office	-	-	-	1	5	-	-	14	-	1	21
Total	1	9	42	365	805	1,151	420	1,118	2,412	1,849	8,172

Appendix 14 Members of the Board of Directors

November 1994

Name	Grade	Position in RID	Position in IEC
1. Mr. Sawad Wattanayakorn	10	Director General	Chairman of Board of Directors
2. Mr. Kamol Chitrakorn	9	Deputy Director General for Construction	Vice-Chairman of Board of Directors
3. Mr. Kitcha Polparsi	9	Deputy Director General for O&M	Vice-Chairman of Board of Directors
4. Mr. Arom Khamkomgool	9	Deputy Director General for Administration	Vice-Chairman of Board of Directors
5. Mr. Suchart Siriyothin	9	Chief Machanical Engineer	Member of Board of Directors
6. Mr. Roongrueng Chulajata	9	Deputy Director General for Engineering	Director of IEC Secretary of Board of Directors
7. Mr. Sanan Sirion	9	Chief Engineer for Special Affairs	Member of Board of Directors
8. Mr. Maitri Poolsup	9	Senior Expert for Water Resources P&D	Member of Board of Directors
9. Mr. Nibhond Saihom	9	Senior Expert for Irrigation Projects Design	Member of Board of Directors
10. Mr. Chaiwat Prechawit	9	Senior Expert for Water Management and O&M	Member of Board of Directors
11. Mr. Preeda Wongdoywang	8	Director of Operation and Mantenance Division	Director of Water Management Division
12. Mr. Kamjorn Labcharoen	8	Director of Hydrology Division	Director of Hydrological Research & Application Division
13. Mr Supote Promanaret	8	Director of Data Processing Division	Director of System Development Division
14. Mr. Kamjorn Sasawat	8	Director of Design Division	Director of Engineering Development Division
15 Mr Samran Rasamichote	8	Director of Training Division	Member of Board of Directors
16. Mr Vidhaya Samaharn	8	Director of Research and Laboratory Division	Member of Board of Directors
17. Mr Wichai Srivarapong	8	Director of Programs and Budget Division	Member of Board of Directors
18. Mr Charoon Kamolratana	8	Director of Project Planning Division	Member of Board of Directors
19. Mr Sinrat Temeyanonth	8	Director of Communication Division	Member of Board of Directors
20.Mrs.Maneerat Makduangkaeo	8	Secretary of Office of the Secretary	Member of Board of Directors
21. Mr. Vira Vongsangnak	7		Deputy Director of IEC Assistant Secretary of Board of Directors

THE MINUTES OF THE THIRD JOINT COMMITTEE MEETING FOR IRRIGATION ENGINEERING CENTER PROJECT PHASE II HELD ON WEDNESDAY, DECEMBER 7, 1994

The Third Joint Committee Meeting for the Irrigation Engineering Center Project Phase II was held on December 7, 1994 to inform the achievements of the present IEC to the meeting. Both Thai and Japanese sides tried to look for the extension of the technical cooperation for the IEC Project Phase II.

The guidelines for future cooperation and recommendation provided by both Thai and Japanese participants were noted in the Minutes of Meeting enclosed herewith.

Bangkok, December 7, 1994

Kiyoshi HORII
Team leader
Japanese Expert Team
IEC Project

Roongrueng Chulajata
Deputy Director General
for Engineering
Royal Irrigation Department
Ministry of Agriculture and
Cooperatives

MINUTES OF THE THIRD JOINT COMMITTEE MEETING

HELD ON WEDNESDAY, DECEMBER 7, 1994

AT ROOM 300, IRRIGATION ENGINEERING CENTER

The Minutes of the Third Joint Committee Meeting between the Thai and Japanese sides concerned was completed. We have pleasure to enclose it herewith for your consideration.

Participants

Thai Side

- RID Officials

1. Director General — Chairman
2. Deputy Director General for Engineering
3. Senior Expert for Water Management and O&M
4. Director of Data Processing Division
5. Director of Communication Division
6. Director of Design Division
7. Director of Hydrology Division
8. Deputy Director of IEC
9. Director of Water Management Division, IEC
10. Mr. Wichai Supasod, O&M Division
11. Mrs. Mananya Dhanubhumi, Training Division
12. Mrs. Orathai Krisanayanyong, Foreign Financed Projects Administration Division

- Thai Officials from Authorities Concerned

13. Mrs. Sineenart Khovitoonkij	Representatives from MOAC
14. Mr. Siranond Sakonvidhayanond	Representatives from the Bureau of the Budget
15. Mr. Wichai Chuwisetsuk	Representative from DTEC
16. Mr. Benchawan Srangnitra	Representatives from CIVICON

Japanese Side

- Evaluation Team

17. Mr. Norifumi TAKAMURA	Team Leader
18. Mr. Yoshitaka SHIMBO	Water Management/Hydrological Analysis
19. Mr. Kazuaki TATEISHI	Irrigation and Drainage Information System/Irrigation and Drainage Facility Design
20. Mr. Takashi SHINO	Effects of Technical Cooperation
21. Mr. Shigenari KOGA	Project Evaluation/Training
22. Mr. Kasuaki NAMBA	Coordinator

- Japanese Experts of IEC

23. Mr. Kiyoshi HORII	Team Leader
24. Mr. Yoshiyuki SUTO	Engineering Development Division
25. Mr. Kaichi KOSEKI	Hydrology Division
26. Mr. Takanobu KOBAYASHI	System Division
27. Mr. Hideaki YAMAMOTO	Water Management Division
28. Mr. Masafumi TAGUCHI	Coordinator

- RID Expert

29. Mr. Koichi YAMAZAKI Colombo Plan Expert, PPD

The Meeting started at 09.00 a.m.

1. Opening Remarks

As the Director General of RID, the Chairman of the Board of Directors was previously engaged, Mr. Roongrueng Chulajata, Deputy Director General for Engineering succeeded his office and welcomed all participants to the Meeting. He expressed his appreciation that the Project evaluation was carried out and achived with the hard attempt of the Thai and Japanese Evaluation Teams.

2. Introduction of Members

The Meeting commenced with Mr. Vira Vongsangnak, Deputy Director of IEC introducing the members of both Thai and Japanese sides.

3. Report by Team Leader of JICA Experts

Mr. Kiyoshi HORII, Team Leader of JICA Experts, expressed his thanks to the Meeting and then reported the achievements of activities under the IEC Project Phase II. The details are as shown in Appendix A .

4. Report by Joint Evaluation Team

- Japanese Evaluation Team

Mr. TAKAMURA, Team Leader of the Japanese Evaluation Team, expressed his heartfelt thanks to all participants for attending this Joint Committee Meeting.

Then, Mr. Takashi SHINO, on behalf of the Team Leader, summarized the Report prepared by the Evaluation Team as follows:

1. (3) Objectives of the Evaluation (Page 7 of the Report)
2. (4) Items of the Evaluation (Page 7 of the Report),
3. (5) Results of the Evaluation (Pages 8-23 of the Report)
4. (6) Conclusion and Recommodations (Pages 23-24 of the Report)

The details are as shown in Appendix B.

- Thai Evaluation Team

Mr. Chaiwat Prechawit, Team Leader of the Thai Evaluation Team, was of his opinion in addition to the presentation of Report by the Japanese side that the Project has provided and developed high technology concerning the water management, hydrological analysis, information systems, etc., which are very useful for the water resources development of RID; and the results of the Project should be applied to other projects throughout the country. He, therefore, proposed to the Meeting a new project called the "Intregrated Water Management in the East Bank of Lower Chao Phraya River Basin for Environmental Conservation and Sustainable Agricultural Development".

5. Questions, Comments and Recommendations

Mr. Wichai Chuwisetsuk, the Representative of DTEC said that the RID should send a request for two-year Follow Up Program to DTEC through the MOAC within December 1994 so that DTEC would submit it to the JICA Head Office in Japan for approval . After that the Record of Discussions between JICA and RID will be provided and signed in January 1995.

6. Closing Remarks

Mr. Sawad Wattanayagorn, the Director General of RID conveyed his deep gratitude and thanks to the Japanese Government, JICA, Japanese Experts and Thai authorities concerned for their kind cooperation and further action for the two-year follow up program.

The Meeting ended at 10.30 a.m.