

3) Application Programs for Data Communication

Application programs will be developed so as to transfer data files and process data from local terminals using the online system by data communication.

4) Other Supporting Activities

- Advice and support for the introduction and practical use of personal computers in the divisions concerned
- User support and completion of computer training
- Program documentation and arrangement of users' manuals
- Systematization of computer management

II-4 IRRIGATION AND DRAINAGE FACILITY DESIGN

Based on the criteria etc. for planning and design which have been prepared in the IEC Project Phase I, design standards, manuals etc. easy enough to utilize will be prepared and diffused. This is in order to contribute to appropriate investigation methodology, project planning and design engineering by applying them practically.

Moreover, improvement and systematization of construction control technology and maintenance technology will be carried out so as to construct high quality structures and to maintain them in good condition.

1. PREPARATION AND DIFFUSION OF PLANNING AND DESIGN CRITERIA, STANDARDS AND MANUALS

In the previous IEC Project, 28 items of criteria, etc. were taken up and more than half of them have been prepared. In the IEC Project Phase II, the items shown in Table 1 were selected as the ones to be prepared and diffused taking the necessity, possibility of achievement and support into account. Based on these considerations a few items will have emphasis placed on them every year so that they will be prepared and/or diffused.

1) Preparation of Design Criteria, Standards and Manuals

With regard to the criteria, etc. which have been prepared in the previous IEC Project, technical guides will be prepared so as to enable those criteria, etc. to be used more easily and more efficiently. Other important criteria, etc. in the previous IEC Project shown in Table 2, in principle, should be prepared by RID herself and IEC Project Phase II may offer some technical assistance to a few topics based on necessity.

At present, two (2) new topics are proposed including 'Guidelines for Remote Sensing Engineering' and 'Dam Maintenance Manuals'. Additional new topics may be proposed if necessary.

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

The criteria, etc. prepared in the Project will be disseminated and reviewed if necessary through seminars, workshops and/or trainings. The process of dissemination is shown in Fig. 1.

Table-1 ITEMS OF CRITERIA PREPARATION AND DIFFUSION

Topics	Chairman Responsible	Remarks
1. O&M Manuals	Operation & Maintenance Division	First draft completed
2. Geological and Material Investigation	Geotechnical Division	-ditto-
3. Irrigation Structures	Design Division	-ditto-
4. Construction Manuals	Construction Divisions	-ditto-
5. Embankment Dams	Design Division	-ditto-
6. Guidelines for Project Planning	Project Planning Division	-ditto-
7. Gates and Lifting Devices	Design Division	-ditto-
8. Diversion Dams	Design Division	-ditto-
9. Hydrological Investigation	Hydrology Division	-ditto-
10. Engineering Drafting	Design Division	-ditto-
11. Pumping Works	Design Division	-ditto-
12. Topographical Investigation	Topographical Survey Division	-ditto-
13. Safety of Existing Dams	Construction Division	-ditto-
14. Reinforced Concrete Design	Design Division	-ditto-
15. Feeder Roads and O&M Roads	Design Division	Ongoing
16. Guidelines for Remote Sensing Engineering	Project Planning Division	New topic
17. Dam Maintenance Manuals	Construction Division	-ditto-

Table-2 OTHER IMPORTANT CRITERIA TO BE PREPARED BY RID

Topics	Chairman Responsible	Remarks
1. Drainage Systems	Design Division	First draft completed
2. Guidelines for Report Preparation		
1) Implementation Plan Reports	Construction Division	-ditto-
2) Progress Reports		
3) Completion Reports	Design Division	First draft almost completed
4) Detailed Design Reports		
3. Salinity Control in Irrigated Land	Geotechnical Division	-ditto-
4. Onfarm Systems and Structures	Design Division	-ditto-
5. Small Irrigation Projects	Design Division	-ditto-
6. Land Classification Survey	Geotechnical Division	First draft partly completed
7. Laboratory Testing	Research & Laboratory Div.	-ditto-
8. Irrigation Systems	Design Division	-ditto-
9. Architectural Design	Design Division	-ditto-
10. Steel and Timber Design	Design Division	-ditto-
11. Specifications and Cost Estimation	Design Division	-ditto-
12. Water Use	Operation & Maintenance Division	Ongoing

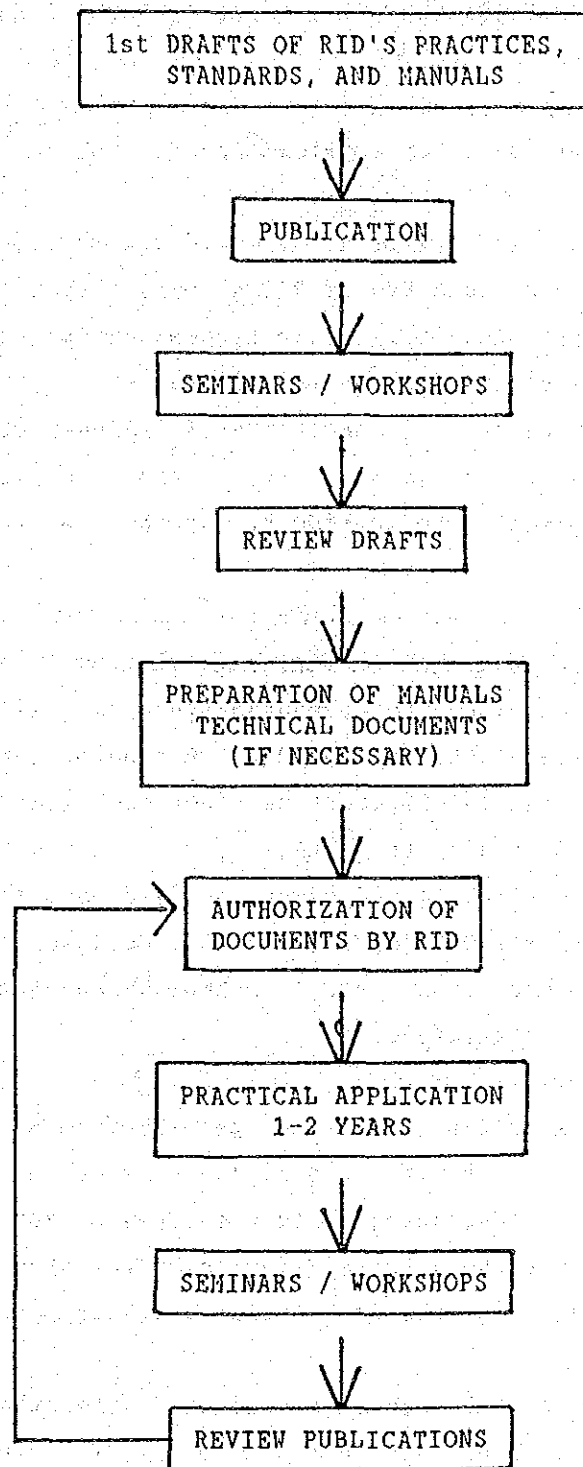


Fig. 1 FLOWCHART SHOWING DISSEMINATION OF RID'S PRACTICES, STANDARDS AND MANUALS

2. IMPROVEMENT ON CONSTRUCTION CONTROL AND MAINTENANCE TECHNOLOGY FOR MAIN IRRIGATION FACILITIES

1) Improvement and Diffusion on Construction Control

a) Systematization of Construction Control Technology

For controlling the quality of RID's construction works to meet the required specifications, it is desirable to set up standards and to systematize its construction control technology.

Out of many types of soil tests, specifying the types for each kind of construction work and assigning their priorities will enable RID's construction projects to be carried out in the same way from the quality control aspect.

b) Improvement and Diffusion on Construction Control Technology

There are several items to be managed such as moisture content, soil density, permeability, etc. in the construction of earth structures in order to achieve high quality control. For each item, there are several testing methods to obtain its value.

Some suitable testing methods such as field permeability tests and the radio isotope (RI) method will be introduced for the purpose of improvement of construction control technology and these methods should be diffused through trainings.

c) Case Study on Analysis of Monitoring Data of Dams and Related Structures

Three dams of the Mae Kuang Irrigation Project are now under construction and have been installed with many instruments in order to monitor the behaviour of the dams during and after the construction period.

A large amount of data has been collected since the early stages of construction. Reviewing these data in detail will provide important information for future improvement of design consideration and construction technology. The monitoring of these instruments' data will also provide a means of improving maintenance technology for such large dams.

d) Case Study on Analysis of Special Foundation Problems

RID has been involved in constructing new irrigation structures together with maintaining and improving existing irrigation structures. Often the problems encountered during design and construction are due to the foundation.

A special type of foundation will exist within a certain geographical area. Each has its own characteristics. A thorough understanding of the foundation condition will help reduce the problems during design and construction. These special types of foundation problems will be surveyed and examined as a case study.

2) Improvement of Maintenance Technology from the Viewpoint of Design Work

a) Establishment of an Inventory System for Soil Testing Data

Good design work for the construction and improvement or maintenance of earth structures depends on good soil testing data results. These data are increasing all the time and in the case of improvement or maintenance work, the data obtained at the construction stage should promptly be provided.

Therefore, an inventory system for soil testing data either past or present is necessary. This will enable us to retrieve them more easily, quickly and accurately.

b) Establishment of an Inventory System for Important Existing Dams

For maintaining dams in safe and effective condition, it is desirable to set up an inventory system and basic data and information should be registered for computer searching to achieve quick processing.

In connection with the activity mentioned in 2.,1), c), this activity will serve as an example for RID to establish further dam safety programs.

II-5 TRAINING

Training will be organized mainly to transfer technology from research and findings of the IEC project in order to increase the available manpower of RID staff.

The research and findings gained during the implementation of the IEC Project will be converted into suitable training materials i.e. technical papers, manuals and media for the most effective learning process.

1. GUIDANCE AND ADVICE ON TECHNICAL TRAINING

The divisions concerned will prepare training materials and conduct training in 5 categories.

- a. Special Lectures
- b. Seminars & Exhibitions
- c. Practical Technical Meetings
- d. Staff Training
- e. Field Practical Training

WORK PLAN (FRAMEWORK)

Item of Activity	Year	1990.4- 1991.3	1991.4- 1992.3	1992.4- 1993.3	1993.4- 1994.3	1994.4- 1995.3
1. Water Management						
1) Improvement on Methodology Concerning Data Observation, Collection and Compilation						
(1) Improvement of Hydrological Monitoring						
(2) Formulation of Calibration Curves						
(3) Design of Data Compilation Formats						
(4) Development of a Database System on Water Management						
2) Improvement on Water Distribution Technology						
(1) Formulation of a Water Management Handbook						
(2) Formulation of a Water Operation Guideline						
(3) Examination of an Estimation Method on Water Demand						
(4) Formulation of Standard Report Formats						
3) Development on Flow Analysis for Water Management						
(1) Simulation Analysis of Flow Conditions in a Canal						
(2) Development of a Flow Prediction Model						
2. Hydrological Analysis						
1) Improvement on Observation Systems and Raw Data Processing for Runoff Analysis						
(1) Examination on Hydrological Observation						
(2) Improvement on Hydrological Data Entry System and Development of Programs						
(3) Making Manual on Hydrological Data Processing						

..... Preparation —— Implementation

Item of Activity	Year	1990.4- 1991.3	1991.4- 1992.3	1992.4- 1993.3	1993.4- 1994.3	1994.4- 1995.3
2) Improvement on Water Balance Analysis for Water Resources Development and Water Management						
(1) Conducting of Case Studies of Runoff Analysis						
(2) Making Manual on Runoff Analysis Methods						
(3) Improvement of the Hydrological Database						
3) Examination on Monitoring Systems for Irrigation Water Quality						
(1) Examination on Water Quality Measurement and Analysis						
(2) Making Manual on Water Quality Research Methods and Data Processing						
3. Irrigation and Drainage Information Systems						
1) Development on Technical Calculation Systems for Water Management Technology						
(1) Development of Simulation Models						
(2) Development and Improvement of Application Programs on Technical Calculation						
2) Improvement on Database System for Water Management Projects						
(1) Improvement of the Hydrological Database						
(2) Development of the Water Management Database						
(3) Development of Application Programs Concerning Databases						
3) Examination of Data Communication Systems for Water Management Technology						
(1) System Support Concerning the Telemetering System						
(2) Improvement of Monitoring System						
(3) Application Programs for Data Communication						
(4) Other Supporting Activities						

Item of Activity	Year	1990.4- 1991.3	1991.4- 1992.3	1992.4- 1993.3	1993.4- 1994.3	1994.4- 1995.3
4. Irrigation and Drainage Facility Design						
1) Preparation and Diffusion of Planning and Design Criteria, Standards and Manuals						
(1) Preparation of Design Criteria, Standards and Manuals						
(2) Diffusion of Planning and Design Criteria, Standards and Manuals						
2) Improvement on Construction Control and Maintenance Technology for Main Irrigation Facilities						
(1) Improvement and Diffusion on Construction Control						
a. Systematization of construction control technology						
b. Improvement and diffusion on construction control technology						
c. Case study on analysis of monitoring data of dams and related structures						
d. Case study on analysis of special foundation problems						
(2) Improvement of Maintenance Technology from the Viewpoint of Design Work						
a. Establishment of an inventory system for soil testing data						
b. Establishment of an inventory system for important existing dams						
5. Training						
1) Guidance and Advice on Technical Training						
(1) Special lectures						
(2) Seminars & exhibitions						
(3) Practical technical meeting						
(4) Staff training						
(5) Field staff training						

III PROJECT MANAGEMENT

1. Progress of Project Activities

1) Japanese assistance

Japanese assistance mentioned in the R/D, namely, dispatching of experts, provision of equipment, training of counterpart personnel in Japan, special measures for execution of the training program has been carried out as scheduled. (See Attached Paper 1)

2) Measures taken by RID

The Project has the organization and counterparts as shown in Attached Paper 2. Furthermore, the Joint Committee and the Board of Directors have already been organized (See Attached Paper 3) as a supporting body to make the project activities more effective. The Board of Directors, especially, is expected to play an important role.

The budget proposed by the Thai side for the Project is shown in Attached Paper 4. As regards the initial stage of the Project, their cooperation is fully appreciated.

2. Project Management for the Future

Regarding project management, the Thai side made the following requests to the Team:

1) Dispatch of Design Team for Telemetering and Data Communication System Project

The Thai representative requested the Team that the Japan International Cooperation Agency dispatch a Design Team for the Monitoring and Data Communication System Project to make a detailed design.

This Project will play an important role in improving water management technology in Thailand.

2) Budget for Publication of an IEC News Quarterly

Publication of an IEC News quarterly will be effective in letting the authorities concerned know the activities of the Project.

3) Budget for Publication of Thai Language Textbooks

Publication of Thai Language Textbooks will be very useful for the purpose of technical transfer of the fruits of the IEC project to RID officers.

JAPANESE ASSISTANCE

1. Dispatch of Experts

1) *Long-Term Experts*

<u>Name</u>	<u>Field/Speciality</u>	<u>Assignment</u>
Mr. Akinori MASUDA	Team Leader	Apr. 1, 90-Mar. 31, 91
Mr. Narihide NAGAYO	Coordinator & Training	Apr. 1, 90-Mar. 31, 92
Mr. Takashi MITOMO	Water Management	Apr. 1, 90-Mar. 31, 91
Mr. Junji ICHIKAWA	Hydrological Analysis	Apr. 1, 90-Mar. 31, 92
Mr. Yoshitaka KAMIGATAKUCHI	Irrigation and Drainage Information Systems	Apr. 1, 90-Mar. 31, 92
Mr. Akira HASHIMOTO	Irrigation and Drainage Facility Design	Apr. 1, 90-Mar. 31, 91
Mr. Yoji EBIHARA	Coordinator	Apr. 1, 90-Apr. 30, 90

2) *Short-Term Expert*

<u>Name</u>	<u>Field/Speciality</u>	<u>Assignment</u>
Mr. Yasushi HIRASHIMA	Documentation Technology	Nov. 29-Dec. 28, 1990

Within the Japanese Fiscal Year 1990 (Apr. 90 to Mar. 91) seven more Short-Term Experts will be dispatched.

2. Provision of Equipment

Japanese Fiscal Year 1990	39,600,000 Yen
---------------------------	----------------

3. Training of Counterpart Personnel in Japan

<u>Name</u>	<u>Post</u>	<u>Period</u>
Mr. Akkapong Boonmash	Chief of Project Improvement Planning Section I, Engineering Branch, O&M Division, RID	Aug. 26-25 Sep, 90
Mrs. Amporn Chongvanitswat	Hydrologist 5 Hydrology Division, RID	Aug. 26-25 Sep, 90

4. Special Measures for Execution of the Training Program

Japanese Fiscal Year 1990 5,817,000 Yen (Tentative)

5. Technical Exchange Program

a) *Dispatched*

- Members of the Team

The Thai Side

Mr. Kitcha Polparsi	Director of IEC
Mr. Skulwattanna Chanthrobol	Director of Operation & Maintenance Division
Mr. Supot Promnaret	Chief of Computer Branch, Data Processing Division

Japanese Side

Mr. Yoshitaka KAMIGATAKUCHI	Expert, Irrigation & Drainage Information System
-----------------------------	---

- Period: December 12-19, 1990

- Places Visited

- (1) Center for Data Processing and Mapping (Jakarta, Indonesia)
- (2) Construction Guidance Service Center (Jakarta, Indonesia)
- (3) Diversion Crops Irrigation Engineering Project (Manila, the Philippines)

b) Received

(1) From the Irrigation Technology Center, Myanmar

- Members of the Team

Mr. Noboru MURAYAMA Expert for Construction Material Test

Mr. U. Kyaw San Deputy Director of the Irrigation
Technology Center

- Period: November 29 - December 13, 1990

(2) From Academic Development of the Graduate Program, Bogor
Agricultural University, Indonesia

- Members of the Team

Mr. Tadaharu NAKAMURA Team Leader

Mr. Isao NISHIMURA Expert

Mr. Muriano Jojomarutono Counterpart

Miss Tinike Mandan Counterpart

- Date: December 8, 1990

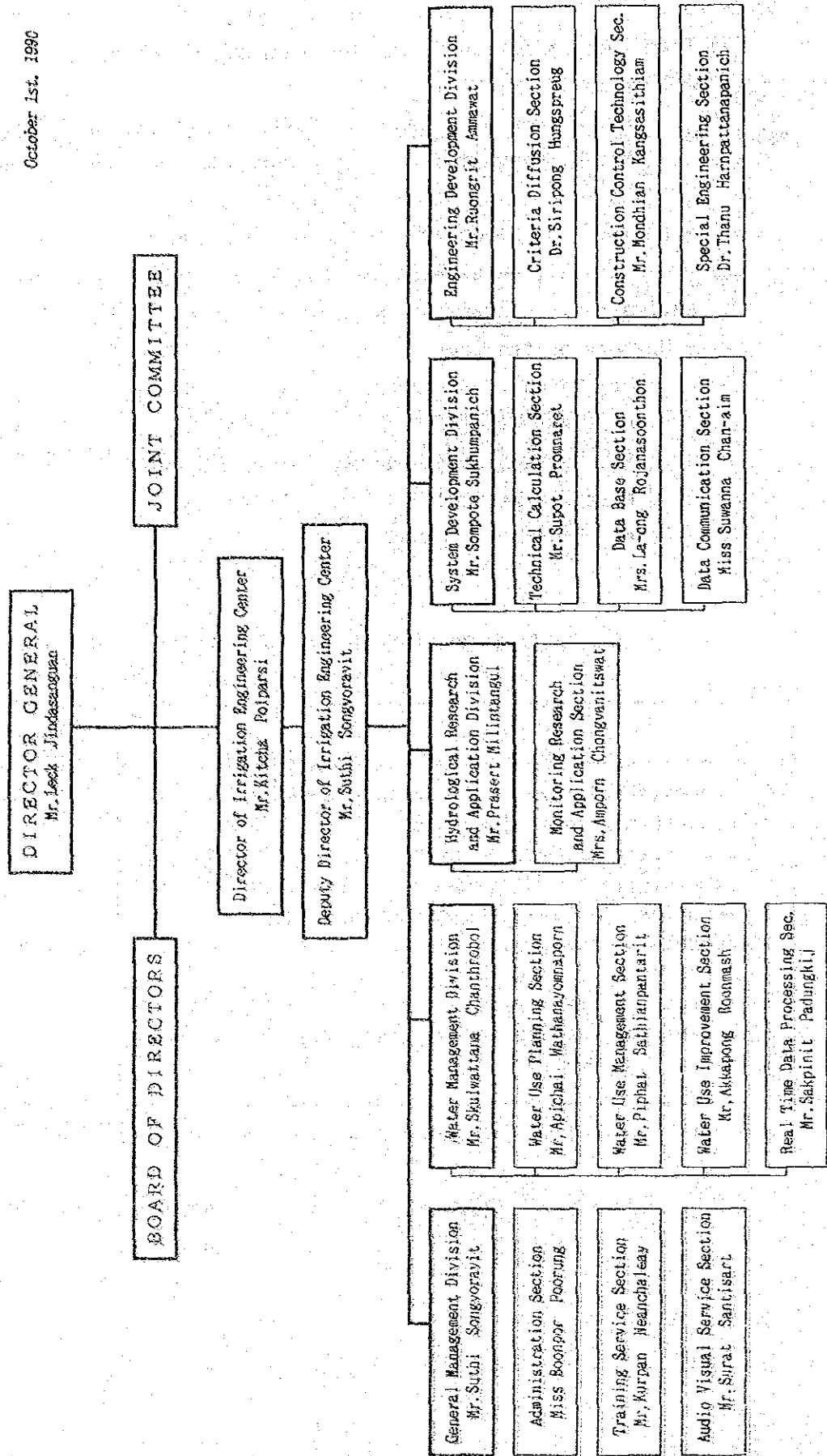
Table-1 SUMMARY OF JAPANESE ASSISTANCE

Items	Japanese F/Y 1990
1) Budget for Provision of Equipment	39,600
2) Long-term Experts (persons)	6
3) Short-term Experts (persons)	8
4) Counterpart Training in Japan (persons)	2
5) Technical Exchange Programme (persons)	4
6) Budget for Intermediate-level Trainees Training Program	5,817
7) Budget for Publication of the Project's Pamphlets	637
8) Budget for Publication of Thai Language Textbooks	507
9) Budget for Seminar	303

(Budget: Thousand Yen)

October 1st, 1990

ORGANIZATION OF IRRIGATION ENGINEERING CENTER PHASE II



BOARD OF DIRECTORS

Name	Grade	Position in RID	Position in IEC
1. Mr. Leck Jindasanguan	10	Director General	Chairman of Board of Directors
2. Mr. Roongrueng Chulajata	9	Deputy Director General for Construction	Vice-Chairman of Board of Directors
3. Mr. Chamroon Chindasanguan	9	Deputy Director General for Operation & Maintenance	Vice-Chairman of Board of Directors
4. Mr. Youth Kingkate	9	Deputy Director General for Administration	Vice-Chairman of Board of Directors
5. Mr. Nit Kesjumpol	9	Chief Mechanical Engineer	Member of Board of Directors
6. Mr. Kitcha Polparasi	9	Chief Civil Engineer	Member of Board of Directors
7. Mr. Kamol Chitrakorn	9	Chief Engineer for Special Affairs	Member of Board of Directors
8. Dr. Bonyok Vadhanaphuti	9	Senior Expert for Water Resources Planning & Development	Member of Board of Directors
9. Mr. Niphond Saihom	9	Senior Expert for Irrigation Project Design	Member of Board of Directors
10. Mr. Pramote Maiklad	9	Acting Special Expert for Operation & Maintenance	Member of Board of Directors
11. Mr. Skulwattana Chanthrobol	8	Director of Operation and Maintenance Division	Director of Water Management Div.
12. Mr. Prasert Milintangul	8	Director of Hydrology Division	Director of Hydrological Research and Application Division
13. Mr. Sompote Sukhumpanich	8	Director of Data Processing Division	Director of System Engineering Div.
14. Mr. Sawet Yasaravana	8	Director of Design Division	Member of Board of Directors

Name	Grade	Position in RID	Position in IEC
15. Mr.Pradoongkarn Hungsvaisya	8	Director of Training Div.	Member of Board of Directors
16. Mr.Vidhaya Samaharn	8	Acting Director of Research and Laboratory Division	Member of Board of Directors
17. Mr.Arom Khunkongool	8	Director of Programs and Budget Division	Member of Board of Directors
18. Mr.Maitri Poolsup	8	Director of Project Planning Division	Member of Board of Directors
19. Mr.Sinserm Kedutat	8	Director of Communications Division	Member of Board of Directors
20. Mrs.Hanerat Makduangkaeo	8	Secretary of the Office of the Secretary	Member of Board of Directors
21. Mr.Kitcha Polparisi	9	Chief Civil Engineer	Director of IEC Secretary of Board of Directors
22. Mr.Suthi Songvoravit	7	Chief of Policy Branch, Project Planning Division	Deputy Director of IEC Assistant Secretary of BOD

BUDGET OF IEC IN FISCAL YEAR 1991 (October 1990-September 1991)

Description

1. Allowance	₱	335,000
2. Fringe Benefits		940,000
3. Materials		<u>1,860,000</u>
	₱	<u>3,135,000</u>

- Notes:
1. Electricity, water supply and telephone charges are included in RID's central budget.
 2. Procedure, Preventive Maintenance costs of the Computer System are included in the Data Processing Division.

IV CONCLUSIONS AND RECOMMENDATIONS

1. Conclusions

We judged that the draft of the work plan which has been made between Thai counterparts and Japanese experts was suitable as the vehicle for achieving Technical Cooperation in the IEC Phase II Project. Therefore, we have formulated the work plan in accordance with the draft.

We judged that the allocation of budget in the first fiscal year and the post assignment of counterparts from the Thai side is acceptable. We hope that the Thai side will take the necessary measures continuing from next fiscal year also in accordance with activities.

The Water Management Information Network System is the base of the technical cooperation activity in the project, and this system is indispensable for achieving the goals of activities.

We think that it is possible to implement the project activities smoothly and effectively through the early implementation of this system.

2. Recommendations

1) Establishment of the Water Management Information Network System

The Water Management Information Network System, which consists of the telemetering system, the data communication system, and the graphic panel system was requested in the form of financial assistance from the Japanese side by the Thai side.

This system is to establish the basis of activities in this project and is essential to accomplish the objects of this project. Furthermore, the smooth and effective implementation of activities will be made possible by introducing this system at an early stage of the project.

Therefore, it is necessary that a detailed design team should be dispatched for designing the whole system in detail and JICA should provide the budget for the establishment of the system.

2) Cooperation between each field

In this project, in order to improve various technical subjects concerning water management works, many activities will be carried out.

In particular, most activities in the water management field, hydrology field, system development field, etc. relate to each other closely.

Consequently, in order to carry out these activities smoothly and to obtain many benefits, it is important that each field concerned actively and effectively cooperates with each other field by setting up working groups, etc.

3) Practical use and diffusion of the fruits of the IEC Phase I Project

The IEC Project Phase II aims at the improvement of water management techniques etc. at actual irrigation project sites. Consequently, it is necessary for RID to apply effectively the basic technology which has been established in the IEC Phase I Project and it is also desirable to disseminate widely to local staff the appropriate technology which will have been developed through the activities of this project.

4) Financial support by the Thai side

In the IEC Project Phase II, many activities will be implemented through a variety of case studies and trainings for local staff, but financial assistance from the Japanese side will be insufficient for the smooth implementation of activities.

Therefore, it is also indispensable for the Thai side to make extensive efforts towards conducting project management such as positive and planned financial support.

V. ANNEX

MEMBER LIST OF JICA CONSULTATION SURVEY TEAM

Team Leader	Mr. Tadashi HASHIMOTO	Director, Office of Disaster Restoration, Agricultural Structure Improvement Bureau, Ministry of Agriculture, Forestry and Fisheries
Water Management	Mr. Hideaki SEKIOKA	Deputy Director, Irrigation and Drainage Division, Agricultural Structure Improvement Bureau, Ministry of Agriculture, Forestry and Fisheries
Irrigation and Drainage Facility Design	Mr. Seiki MOMOSE	Manager, Farmland Planning Division, Department of Agriculture, Forestry and Fisheries, Yamagata Prefectural Government
Coordinator	Mr. Yuichi NOBUTA	Staff, Technical Cooperation Division, Agricultural Development Department, Japan International Cooperation Agency

SCHEDULE OF JICA CONSULTATION SURVEY TEAM

<u>Date</u>	<u>Time</u>	<u>Activities</u>
Jan. 15 (Tue)		TOKYO ----> BKK
Jan. 16 (Wed)	08:30	Leave Hotel
	09:00-10:00	Courtesy call, JICA Thailand Office and Embassy of Japan
	11:00-12:00	Meeting between Team and Experts about schedule, <i>Room 408</i>
	13:30-14:30	Courtesy call, RID and explanation about the line of investigation, <i>Room 306</i>
	14:30-16:30	Meeting between Team and Experts, <i>Room 408</i> and observation of facilities
Jan. 17 (Thu)		- Meeting of each division to discuss work plan -
	09:00-12:00	Meeting between member of Team and Expert, <i>Room 408</i>
	13:30-15:00	Meeting, Water Management Division (Counterparts, Member of Team and Expert concerned) <i>Room 408</i>
	13:30-15:00	Meeting, Engineering Development Division (- do -) <i>Room 306</i>
	15:20-16:30	Meeting, Hydrology Division (- do -) <i>Room 408</i>
Jan. 18 (Fri)	08:40-11:00	Meeting, System Development Division (- do -) <i>Room 408</i>
	08:40-11:00	Meeting, Training Division (- do -) <i>Room 306</i>
	12:00	Leave IEC for Nakon Sawan via Chao Phraya Dam
	18:00	Arrive at Nakon Sawan

Jan. 19 (Sat)	08:00	Leave Hotel To Samchook Irrigation Project via C2 Station
	13:00	Arrive at Samchook Irrigation Project Office Observation of Experimental Station
	15:30	Samchook ---> Bangkok
Jan. 20 (Sun)		- Arrangement of Data -
Jan. 21 (Mon)		- Meeting of each division to arrange discussions about work plan -
	09:00-10:00	System Development Division (Counterparts, Member of Team and Expert concerned) <i>Room 408</i>
	09:00-10:00	Engineering Development Division (- do -) <i>Room 306</i>
	10:30-12:00	Water Management Division (- do -) <i>Room 408</i>
	13:30-14:30	Hydrology Division (- do -) <i>Room 408</i>
	13:30-14:30	Training Division (- do -) <i>Room 306</i>
Jan. 22 (Tue)	08:30-10:30	Meeting between Consultation Team and Experts about Telemetry and Data Communication System Project, <i>Room 408</i>
	10:45-12:00	Joint Meeting about Telemetry and Data Communication System Project (Counterparts, Experts concerned and Team) <i>Room 305</i>
	13:30-15:00	Courtesy call, DTEC and MOAC
Jan. 23 (Wed)		- Preparation of Documents for Joint Committee Meeting -
Jan. 24 (Thu)	10:00-12:00	Joint Committee Meeting, <i>Room 300</i>
	14:00-16:30	Observation of facilities at Pakret
	18:00-20:00	Dinner Party organized by Consultation Team (Princess Hotel)

Jan. 25 (Fri) 08:30 Leave Hotel
09:00-10:30 Report to JICA Thailand Office and Embassy of
JAPAN
11:30-12:00 Report to RID

Jan. 26 (Sat) BKK ----> TOKYO

3) モデルインフラ要請書
(水管理情報ネットワークシステム)

No. 0318/28



Royal Irrigation Department
Samsen Road, Bangkok 10300

21 January 1991 (B.E. 2534)

Subject : Request of financial assistance for Implementation of
Water Management Information Network System.

Dear Mr. T. HASHIMOTO

RID would like to make a request for financial assistance from the Government of Japan for the Implementation of Water Management Information Network System according to the document enclosed herewith. RID is agreed to give the cooperation on the project implementation and take responsibility for the cost of land, shelters including the operation and maintenance cost of the system.

Yours sincerely,

A handwritten signature in cursive script, appearing to read "Kitcha Polpari".

(Mr. Kitcha Polpari)

Director of Irrigation Engineering Center

Mr. T. HASHIMOTO,

Team Leader,

The Japanese Consultation Survey Team,

Bangkok Thailand.

REQUEST FOR FINANCIAL ASSISTANCE

PROPOSED SOURCE OF ASSISTANCE

THE GOVERNMENT OF JAPAN

FACILITY NAME

WATER MANAGEMENT INFORMATION NETWORK SYSTEM

REQUESTING AGENCY

ROYAL IRRIGATION DEPARTMENT

MINISTRY OF AGRICULTURE AND COOPERATIVES

FACILITY NAME : WATER MANAGEMENT INFORMATION NETWORK SYSTEM

PROPOSED SOURCE OF ASSISTANCE : THE GOVERNMENT OF JAPAN

REQUESTING AGENCY : ROYAL IRRIGATION DEPARTMENT
MINISTRY OF AGRICULTURE AND COOPERATIVES

1. BACKGROUND

1.1 Importance of Water Management

In Thailand, irrigated agriculture has developed with rice as the main crop. Nowadays, the water balance has become to be considerably tight because of the increase in diversified cropping especially in the dry season and the increase in domestic water use. However, it is very difficult to develop water resources any further because of a shortage of sites suitable for constructing reservoirs.

Therefore, water management has become one of the most important matters requiring improvement so as to deal with increased water demand and to make effective use of limited water resources.

1.2 Irrigation Engineering Center Project Phase-II

The Irrigation Engineering Center Project Phase-II has been running in its first year after the commencement of the Project on April 1, 1990. The Project has been progressing effectively and smoothly because of intimate cooperation by both parties.

Out of the project activities, water management is one of the most important matters to be improved. The IEC officials concerned and the RID have been discussing solutions to the problems and have made out a Work Plan for IEC Phase-II activities.

At present, almost all water management work in RID is conducted by hand from data collection and transmission to the formulation of water allocation plans, and it is very difficult for RID to reflect data effectively to water management because reliability of data accuracy is low and data processing is slow.

Taking these present conditions of water management into consideration, IEC Phase-II aims at, as one of its main activities, accelerating prompt and precise progress of water management work.

1.3 Need for Introduction of a water management information network system.

Fruits of activities in IEC Phase-II should be applied to practical water management work in RID. It is certain that the introduction of a water management information system will encourage RID engineers to acquire experience in up-to-date water management methods and promote them to broaden their outlook on water resources and water management.

RID cannot afford the financial provision for the system. Therefore, it must request the Government of Japan to make the necessary arrangements to introduce this system.

2. FRAMEWORK OF THE WATER MANAGEMENT INFORMATION NETWORK SYSTEM

2.1 Outline of the network system

A network system on data collection, data transmission and data processing necessary in minimum for improvement of water management will be established by setting the Chainat Dam along the Chao Phraya River as the core of the network system.

The network system is composed of three sub-systems, that is, a "Telemetering System" for monitoring flow and rainfall conditions at key points, a "Data Communication System" for quick and precise transmission of data and the improvement of water management works, and a "Graphic Display Panel" for indicating key data obtained by the network system on a panel board in RID's Head Office.

2.2 Telemetering System

Water levels and rainfall will be monitored at key points along the Chao Phraya River and be sent to RID's Head Office.

Using this telemetering system, these data will be collected on real-time periodically at each point and flow condition in the river will be grasped to reflect quick and proper operation of irrigation facilities.

2.3 Data Communication System

Data necessary for implementing water management such as flow conditions in a river and in a canal, records of gate operation, rainfall, cropping, etc., will be input to computers in regional offices and a hydrology office, and will be sent to RID's Head Office.

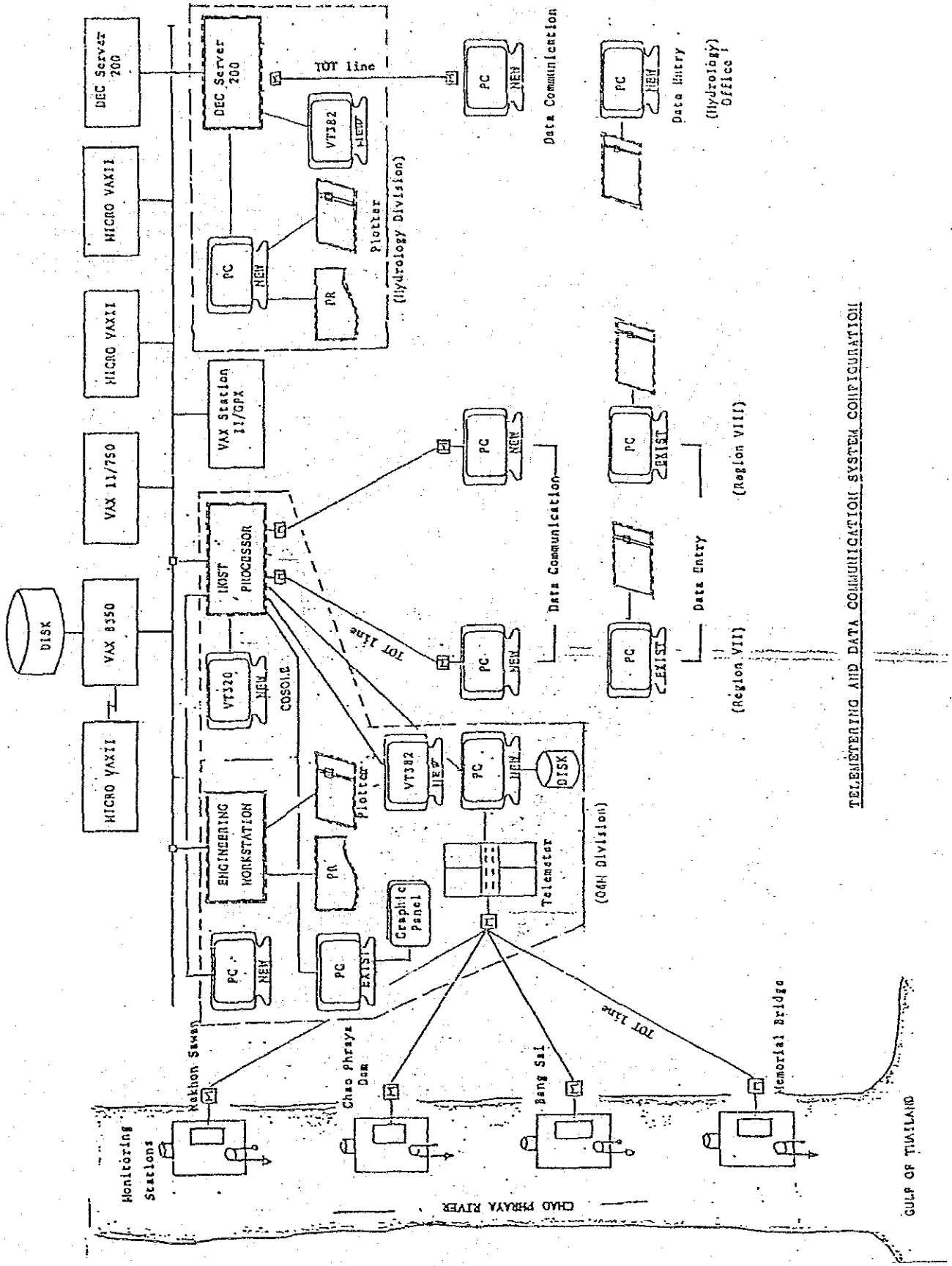
2.4 Graphic Display Panel

A graphic display panel will be installed at RID's Head Office. A map of the Chao Phraya River Basin will be drawn on the panel, and both the real-time data obtained by the telemetering system and some of the data obtained by the data communication system will be indicated on the panel.

3. ESTIMATED CONSTRUCTION COST

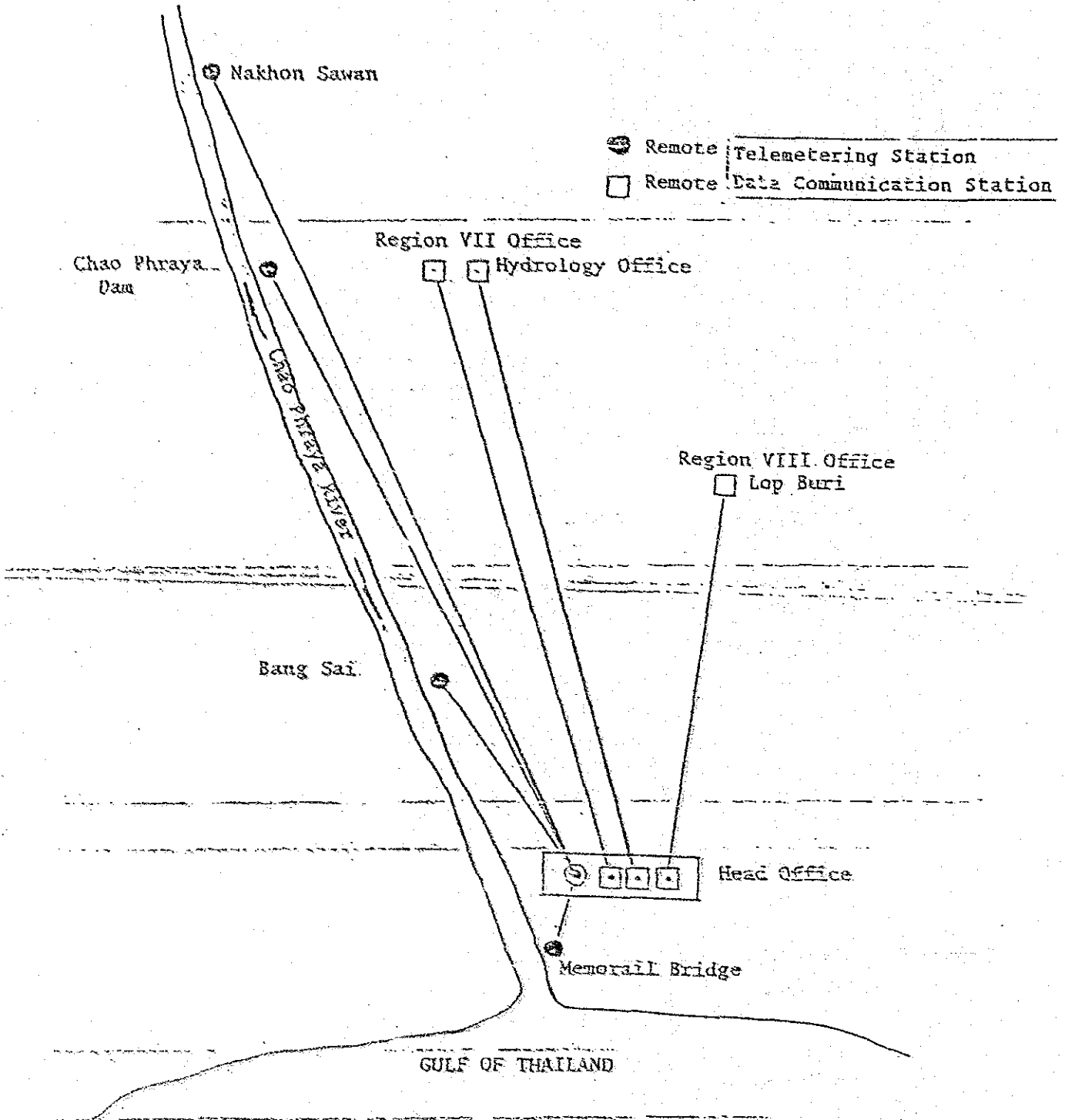
Approximately 18 million baht

The Thai side will share the cost of land and shelters for the telemetering stations and so on, and the maintenance cost of the system.



TELEENGINEERING AND DATA COMMUNICATION SYSTEM CONFIGURATION

CONFIGURATION OF TELEPHONE SYSTEM
(PLAN I)




4) R / D

RECORD OF DISCUSSIONS
BETWEEN THE JAPAN INTERNATIONAL COOPERATION AGENCY
AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT
OF THE KINGDOM OF THAILAND ON TECHNICAL COOPERATION
FOR THE IRRIGATION ENGINEERING CENTER PROJECT (PHASE II)

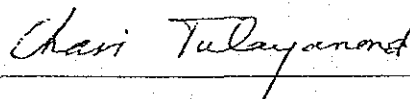
With regard to the recommendations in the Note of Understanding of the Joint Evaluation on the Technical Cooperation for the Irrigation Engineering Center Project dated November 23, 1989, the Resident Representative of the Japan International Cooperation Agency (hereinafter referred to as "JICA") in Thailand and the authorities concerned of the Government of the Kingdom of Thailand had a series of discussions for the purpose of working out the details of the technical cooperation for the Irrigation Engineering Center Project (Phase II) (hereinafter referred to as "the Project").

As a result of the discussions, both sides agreed upon the details of the technical cooperation program and agreed to recommend to their respective governments the desirable measures to be taken by both governments, which are referred to as the documents attached hereto.

Bangkok, February 26, 1990



Mr. Tsutomu Saito
Resident Representative in Thailand,
Japan International Cooperation
Agency



Mr. Chari Tulayanond
Director General,
Royal Irrigation Department,
Ministry of Agriculture
and Cooperatives

ATTACHMENT

I. COOPERATION BETWEEN BOTH GOVERNMENTS

In accordance with the provisions of the Agreement on Technical Co-operation between the Government of Japan and the Government of the Kingdom of Thailand signed in Tokyo on November 5, 1981 (hereinafter referred to as "the Agreement"), the both governments will cooperate with each other in implementing the Project based on the Master Plan in I of the Annex.

II. MEASURES TO BE TAKEN BY THE GOVERNMENT OF JAPAN

In accordance with the laws and regulations in force in Japan and the provision of Article III of the Agreement, the Government of Japan will take, at its own expense, the following measures through JICA according to the normal procedures under the Colombo Plan Technical Cooperation Scheme.

1. DISPATCH OF JAPANESE EXPERTS

The Government of Japan will provide services of the Japanese experts listed in II of the Annex. The provisions of Article IV-(C) and (D), V, VI and VII of the Agreement will apply to the above-mentioned experts.

2. PROVISION OF EQUIPMENT

The Government of Japan will provide such equipment, machinery and other materials (hereinafter referred to as "the Equipment") as listed in III of the Annex. The provisions of Article VIII-(1), (2) and (3) of the Agreement will apply to the Equipment.

3. TRAINING OF THE COUNTERPART PERSONNEL IN JAPAN

The Government of Japan will train the Thai counterpart personnel in Japan.

(The Government of the Kingdom of Thailand will take necessary measures to ensure that the knowledge and experience acquired by

them from technical training in Japan will be utilized effectively for implementation of the Project.)

4. SPECIAL MEASURES FOR EXECUTION OF THE TRAINING PROGRAM

The Government of Japan will consider, as requested, supplementing such a portion of local cost as listed in IV of the Annex for execution of the intermediate-level trainees training program.

III. MEASURES TO BE TAKEN BY THE GOVERNMENT OF THE KINGDOM OF THAILAND

In accordance with the laws and regulations in force in the Kingdom of Thailand, the Government of the Kingdom of Thailand will take, at its own expense, the following measures.

1. THAI COUNTERPART AND ADMINISTRATIVE PERSONNEL

In accordance with the provision of Article IV (b) of the Agreement, the Government of the Kingdom of Thailand will secure services of qualified Thai counterpart and administrative personnel listed in V of the Annex.

2. PROVISION OF LAND, BUILDINGS AND INCIDENTAL FACILITIES

In accordance with the provision of Article IV (a) of the Agreement, the Government of the Kingdom of Thailand will provide such land, buildings and incidental facilities as listed in VI of the Annex.

3. SUPPLY AND REPLACEMENT OF EQUIPMENT AND MACHINERY

The Government of the Kingdom of Thailand will supply and/or replace equipment, machinery, vehicles, instruments, tools, spare parts and other materials necessary for implementation of the Project except for the Equipment referred to in II-2 above.

4. ALL RUNNING EXPENSES

The Government of the Kingdom of Thailand will meet all running expenses necessary for implementation of the Project.

IV. ADMINISTRATION OF THE PROJECT

Administration of the Project will be as follows;

1. DIRECTOR GENERAL OF THE ROYAL IRRIGATION DEPARTMENT (RID)

The Director General of the RID, Ministry of Agriculture and Cooperatives will bear overall responsibility for implementation of the Project.

2. DIRECTOR OF THE IRRIGATION ENGINEERING CENTER (IEC)

The Director of IEC, as Head of the Project to be appointed by the Director General of the RID, will be responsible for administrative and managerial matters of the Project.

3. CONTRIBUTION OF JAPANESE EXPERTS

(1) The Japanese Team Leader will provide necessary recommendations and advice to the Head of the Project on technical and administrative matters concerning implementation of the Project.

(2) The Japanese Experts will give necessary technical guidance and advice to the Thai counterpart personnel on matters pertaining to implementation of the Project.

4. JOINT COMMITTEE

For effective and successful implementation of the Project, a Joint Committee will be established with the functions and composition referred to in VII of the Annex.

5. ORGANIZATION CHART

The Project will be administrated in accordance with the organization chart in VIII of the Annex.

V. MUTUAL CONSULTATION

There will be mutual consultations between the two Governments on any major issue causing from, or in connection with, this Attached Document.

VI. TERM OF COOPERATION

The duration of technical cooperation for the Project under this Attached Document will be five (5) years beginning April 1, 1990.

ANNEX

I. MASTER PLAN

1. Goal of the Project

The Goal of the Project is to secure and maintain stable agricultural production and to improve agricultural farm management by using as effectively as possible the limited water resources available in the Kingdom of Thailand.

2. Objectives of Technical Cooperation

The Objectives of the Technical Cooperation are to extend technology and to develop manpower in the field of water management.

3. Scope of Technical Cooperation

In order to obtain the above-mentioned objectives, the following cooperation activities will be implemented at IEC in Samsen and Pakret.

(1) Water Management

- 1) Improvement on methodology concerning data observation, collection and compilation
- 2) Improvement on water distribution management technology
- 3) Development on flow analysis for water management

(2) Hydrological Analysis

- 1) Improvement on observation systems and raw data processing for run-off 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 on database system for water management projects

- 3) Examination on 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

II. LIST OF JAPANESE EXPERTS

1. Team Leader
2. Coordinator/Liaison Officer
3. Experts in the following fields
 - (1) Water Management
 - (2) Hydrological Analysis
 - (3) Irrigation and Drainage Information Systems
 - (4) Irrigation and Drainage Facility Design

Note: Short-term experts may be dispatched for smooth implementation of the Project when necessity arises.

III. LIST OF EQUIPMENT

1. Equipment, machinery, instruments, tools and spare parts thereof necessary for activities in the five fields referred to in I-3 of the Annex.
2. Books and other necessary printed matter

3. Teaching materials for training
4. Vehicles
5. Other necessary equipment and materials

IV. LIST OF LOCAL COST TO BE SUPPLEMENTED BY THE GOVERNMENT OF JAPAN FOR EXECUTION OF INTERMEDIATE-LEVEL TRAINEES TRAINING PROGRAM

1. Travel allowance for trainees related to participation in training program
2. Production cost of teaching materials
3. Travel allowance for trainees and instructor related to study tour and field training
4. Special instructors' fees
5. Supply cost of training materials

V. LIST OF THAI COUNTERPART AND ADMINISTRATIVE PERSONNEL

1. Director of IEC
2. Deputy Director of IEC
3. Counterpart personnel in the following fields
 - (1) Water Management
 - (2) Hydrological Analysis
 - (3) Irrigation and Drainage Information Systems
 - (4) Irrigation and Drainage Facility Design
 - (5) Training

4. Administrative personnel
 - (1) Administration
 - (2) Accounting
5. Other necessary supporting staff

VI. LIST OF LAND, BUILDINGS AND FACILITIES

1. IEC in Samsen and Pakret
2. Other necessary land and facilities

VII. JOINT COMMITTEE

1. Functions

A Joint Committee will meet at least once a year and whenever necessity arises, and work:

- (1) To formulate the Annual Work Plan of the Project in line with the Tentative Schedule of Implementation formulated under the framework of this Record of Discussions;
- (2) To review the overall progress of the technical cooperation program as well as the achievements of the above-mentioned Annual Work Plan
- (3) To review and exchange views on major issues arising from, or in connection with, the technical cooperation program.

2. Composition

(1) Chairman

Director General of RID

(2) Thai side

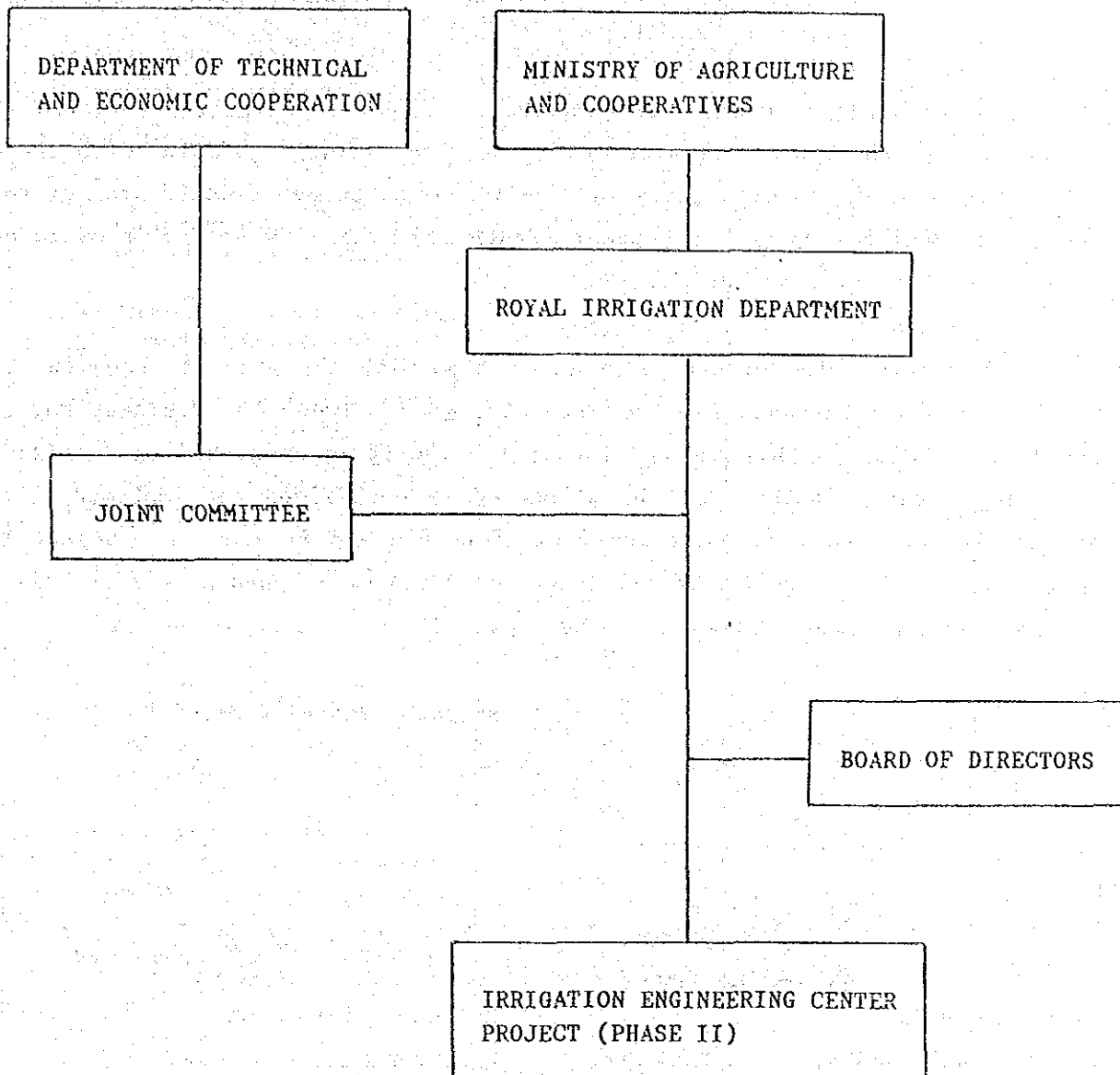
- 1) Deputy Director General of RID for Construction
- 2) Director of IEC
- 3) Representative of the Department of Technical and Economic Cooperation
- 4) Representative of the Budget Bureau
- 5) Representative of the Civil Service Commission
- 6) Deputy Director of IEC
- 7) Other officials appointed by the Chairman, if necessary

(3) Japanese side

- 1) Team Leader
- 2) Coordinator/Liaison Officer
- 3) Experts
- 4) Personnel concerned to be dispatched by JICA, if necessary
- 5) Resident Representative of JICA in Thailand

Note: Official(s) of the Embassy of Japan may attend the Joint Committee as observer(s).

VII. ORGANIZATION CHART OF THE PROJECT



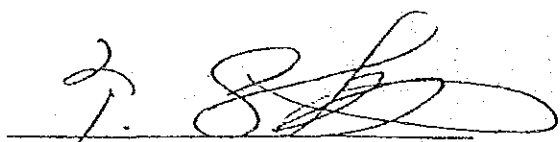
NOTE: BOARD OF DIRECTORS is organized by the division directors concerned of RID/IEC to manage and coordinate the Project activities.

TENTATIVE SCHEDULE OF IMPLEMENTATION
AND TECHNICAL COOPERATION PROGRAM
OF THE IRRIGATION ENGINEERING CENTER PROJECT (PHASE II)

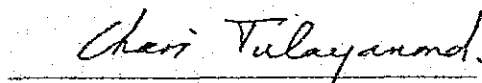
The Japan International Cooperation Agency (hereinafter referred to as "JICA") and the Thai authorities concerned have jointly formulated the Tentative Schedule of Implementation and the Technical Cooperation Program of the Irrigation Engineering Center Project (Phase II) (hereinafter referred to as "the Project") as annexed hereto.

These have been formulated in connection with the Attached Document of the Record of Discussions for the Project signed between the Resident Representative of JICA in Thailand and the Thai authorities concerned on condition that the necessary budget will be allocated by both sides for implementation of the Project, and that above-mentioned Schedule and Program are subject to change within the framework of the Record of Discussions when necessity arises in the course of implementation of the Project.

Bangkok, February 26, 1990



Mr. Tsutomu Saito
Resident Representative in Thailand,
Japan International Cooperation
Agency



Mr. Chari Tulayanond
Director General,
Royal Irrigation Department,
Ministry of Agriculture and
Cooperatives

I. TENTATIVE SCHEDULE OF IMPLEMENTATION

Item of activity	Year	1990.4	1991.4	1992.4	1993.4	1994.4
		-1991.3	-1992.3	-1993.3	-1994.3	-1995.3
1. Water Management						
(1) Improvement on methodology concerning data observation, collection and compilation						
(2) Improvement on water distribution management technology						
(3) Development on flow analysis for water management						
2. Hydrological Analysis						
(1) Improvement on observation systems and raw data processing for run-off 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 on database system for water management projects						
(3) Examination on data communication systems for water management technology						

----- Preparation ----- Implementation

Item of activity	Year	1990.4	1991.4	1992.4	1993.4	1994.4
		-1991.3	-1992.3	-1993.3	-1994.3	-1995.3
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					

----- Preparation ——— Implementation

II. TECHNICAL COOPERATION PROGRAM

Item of activity	Year	1990.4	1991.4	1992.4	1993.4	1994.4
		-1991.3	-1992.3	-1993.3	-1994.3	-1995.3
I. JAPANESE SIDE						
1. Long-term assignment of Experts						
(1) Team Leader						
(2) Coordinator/Liaison Officer						
(3) Expert in the following fields						
1) Water Management						
2) Hydrological Analysis						
3) Irrigation and Drainage Information Systems						
4) Irrigation and Drainage Facilities Design						
2. Short-term assignment of Experts						
3. Provision of the Equipment						
4. Training/Study in Japan						

----- Preparation ——— Implementation

Item of activity	Year	1990.4	1991.4	1992.4	1993.4	1994.4
		-1991.3	-1992.3	-1993.3	-1994.3	-1995.3
II. THAI SIDE						
1. Assignment of Counterpart and Administrative Personnel						
(1) Head of the Project						
(2) Counterpart personnel in the following fields						
1) Water Management						
2) Hydrological Analysis						
3) Irrigation and Drainage Information Systems						
4) Irrigation and Drainage Facility Design						
5) Training						
(3) Administrative Personnel						
1) Administration						
2) Accounting						
2. Land, buildings and other incidental facilities						
3. Running Cost (wages, expenses for telephone, electricity, fuel and installation of equipment etc.)						

----- Preparation ——— Implementation

