農業・灌漑関係では米の収穫量予測と水田の状況把握（農業大臣は農業用地の非農業用地への転換が米の収穫を低減させているのではないかと懸念している）をやってみたい。

- ジャワ島では開発適地はすでになく、非農業用への転換も進んでいるので、いわゆる外領が今後の開発の中心となろう。

(3) 国家開発企画庁　プロジェクトモニタリング担当(Ir. Asmarni Sjamsu(MSC))(Asmarni)

(先方) 農業開発でどのようにリモートセンシング、ＧＩＳが使われているのか

(団員) → 評価調査で入手した主題図、評価図を作成した事例を紹介。

(先方) このプロジェクトの評価はどうなりそうか

(団員) → 合同評価報告書について協議しているところであるが、特定の分野を除きおおむね順調との感触である。

(先方) ガイドラインの骨子は何か

(団員) → 地図（主題図、評価図）の作成に関すること。これは計画担当部局と地図提供側との作業を体系化していくことにも寄与するものをプロジェクトは念頭においているようである。

(先方) ＪＩＣＡのローカルコスト負担をもっと増やして欲しい

(団員) → 基本的にはそちらが対応すべきもの。これまでも充分とはいい難いと聞いている。協力期間の終了後はインドネシア側でローカルコスト負担に対応する必要がある。

(先方) 中央だけではなく、地方への拡大が重要である。リアウ州事務所（機材を供与した地方事務所のひとつ）ではうまくいっているようだ。

(4) 国家開発企画庁　天然資源・環境管理担当（Prof. Dr. Ir. Herman Haeruman)

(先方) 活動を完了させるためにフォローアップすることはとても重要なことである。

(団員) → 今後、手続きが必要になるのできちんと対応して欲しい。

(先方) このガイドラインの目指す関係機関との調整は重要なことである。

９．２．合同評価の経過

(1) インドネシア側評価調査メンバーと評価の目的及び方法の基本的事項についての事前協議

- 評価調査の目的（３項目）のうち評価結果のフィードバックについてはインドネシア側にとって何をどうフィードバックさせるのか理解されなかった。これは主として日

本側の評価調査の目的であることから、合同評価調査の目的からは除外した。

－ 評価の方法としてＲ／ＤやＴＩＳにおいては指標が設定されていないことからどのような判断指標を用いるかを協議した。技術移転（インドネシア側からすれば技術習得）を評価するための指標のひとつの考え方として①何もできない（専門家がいなければできない）②専門家の指導・助言があれば可能③一人で実施可能（専門家の指導・助言なしにできる）④更に、自分達で改良・発展といった応用ができるの４段階を目安としてはどうかとの案があり、これで把握できるものはカウンターパートへのインタビュー等により評価を進めることとした。しかしながらＲ／Ｄ、ＴＳＩでは具体的に何（どのような技術）をカウンターパートが習得するのか明確でないこと、４段階評価の最上位であっても技術の水準が例えば中学生レベルか大学院レベルかによって内容は異なり同一に取り扱うことはできないことから、これに固執した評価は適切ではないケースもあるとして特に指標を設定することはしなかった。

(2) 評価調査の方法として、日本人専門家からの説明聴取及びカウンターパートへのインタビューの実施した。カウンターパートへのインタビューは案件の効果等の評価に利用した（概要は参考として資料９－１に簡潔にまとめた）。

(3) インドネシア側からインドネシア側の評価に関するポジションペーパーの提示付属資料３(3) に掲載したが、日本側評価と大きな違いはなかった。

(4) 合同評価報告書に関する協議

インドネシア側からは指標は明確でなくとも、事実のみを記述するのではなく（例えば投入実績）、可能な範囲でその事実を評価して欲しいとの意見が出され、評価項目ごとに簡潔に評価を記すこととした。

(5) プロジェクトの合同委員会(Joint Committee) への評価結果サマリーの報告

日本・インドネシア双方の代表から評価結果のサマリーについてポイントをプロジェクト関係者及び他機関の合同委員会メンバーに報告した。異論や意見は特にコメントされなかった。

（資料９－１）

'93.1.28

カウンターパートへのＩｎｔｅｒｖｉｅｗ概要

日　時　　１９９３年1月２８日　　Ａ．Ｍ．９：３０～１２：００

場　所　　情報処理図化センター会議室

出席者　　インドネシア側カウンターパート　　ソロソ、ナニー、サルオ、リニー、ジョコステヤニシ、アディ、ヘルー

長期専門家　　境リーダー

調　査　団　　松尾、向井、犬塚

調査団側より質問事項について用意したメモを板書し、それに応えてもらう形で行った。

質問事項は以下の通り

質問事項グループ１

(1) ①５年間（配属されてから）何ができるようになったか
②どの技術が最も重要だと考えているか

(2) ①今後、習得した技術をどのように使って行きたいか
②又その場合どんな困難に直面すると思うか

(3) 技術を習得するうえで日本側のどの協力（専門家、機材供与、日本での研修）が最も効果的だったと思うか

質問事項グループ２

(1) リモセンによる主題図、評価図を利用するうえでの注意点は何か（メリット、デメリット）

(2) ＧＩＳは今後、何に応用（利用）できると思うか

(3) 政策、計画と技術（リモセン、ＧＩＳ）の関係をどう考えているか

(4) どうすれば、業務をパターン化出来ると思うか、今後の応用課題として何を考えているか

(5) アプリケーションソフト（ＥＲＤＡＳ，ＡＲＣ／ＩＮＦＯ）を使って不十分な点はあったか、それは何か

(6) データベースをどのように（何に）使って行きたいか

質問事項グループ１については各カウンターパートに順番に解答してもらい、質問事項グループ２については自由な回答を引き出す契機としての質問であり関連事項の回答を得た。以上の形式でカウンターパートとのＩｎｔｅｒｖｉｅｗの内容をまとめると以下の通りとなる。

(1) 最も良かった技術習得の方法としては、専門家に教えてもらいながら仕事を行ない、その過程で技術を習得する方法が一番よかった。

(2) ＰＵＳＤＡＴＡのリモセン課（プロジェクトのカウンターディヴィジョン）は、(1) ガイドラインの作成(Regulation task)、(2)他組織（地方事務所及び D.P.Uの他総局へのAssistance、(3) 主題図及び評価図の作成の業務がある。 (3)は(2) の業務の具体的なOutputである。(2)(3)の業務はこのプロジェクトで移転された技術の応用であり、かなりの部分はカウンターパート自身で行なえる（専門家の助けを必要とする場面も一部ある）

(3) 移転すべき重要な技術はData Qualityを検討することである。ある業務を行なううえで利用可能なデータの精度を検討すること等の意味である。

(4) 現在、地方事務所の人間を対象とする研修を行なっているが、彼等が地方事務所のシステム（ＰＣシステム）を実際に利用できるレベルになっていないので研修は今後もインドネシア自身で続けて行く必要がある。

(5) 応用業務を行なう場合、本プロジェクトで導入されたアプリケーションソフト（ＥＲＤＡＳ，ＡＲＣ／ＩＮＦＯ）だけでこなす事が出来ない。この場合特別のソフトを開発する必要があるが、これはほとんど日本側専門家でなければ出来ない。

(6) データベースは画像データと地図情報データから構成されるが、現在地図情報をデータベースに入力する部分の設計は終わっていないので早く完成させて欲しい。今後、応用業務を行なう過程で収集した地図情報データは順次データベースに入力して行く予定である。

付属資料

1－(1) ：合同評価報告書（英文）

1－(1) ：合同委員会への報告ペーパー（合同評価調査結果の要約）

2： インドネシア側（公共事業省情報処理図化センター）への質問事項及び回答（概要）

3： 終了時評価調査での収集資料リスト

（プロジェクトより提供されたもの）

(1) 年次報告書(Anual Report IV)(91.4.~92.3.31)（分量大のため本報告書には略す）

(2) プロジェクト活動実績表

（インドネシア側より提供されたもの）

(3) インドネシア側ポジションペーパー

(4) 衛星データー購入のための予算（88年度～93年度）

(5) 運営費支出実績（92年度まで）と予算配置（93年度）（(1)からの抜粋）

(6) 政府予算以外の収支実績（業務受託）

(7) 中堅技術者の今後の研修計画

(8) 情報処理図化センター組織改正案

（日本人専門家より提供されたもの）

(9) ガイドラインの概念とその策定

(10) 業務受託実績（主題図、評価図の作成）（(1)からの抜粋）

(11) プロジェクト関係者の成果発表実績

(12) カウンターパートへ移転された技術一覧（英）

(13) 日本人専門家の作成した報告書一覧

付属資料１－(1)：合同評価報告書（英文）

NOTE OF UNDERSTANDING OF THE JOINT EVALUATION REPORT ON THE JAPANESE TECHNICAL COOPERATION FOR THE REMOTE SENSING ENGINEERING PROJECT PHASE II FOR THE DEVELOPMENT OF AGRICULTURAL INFRASTRUCTURE IN THE REPUBLIC OF INDONESIA

With about four months left until the termination of cooperation period of "the Remote Sensing Engineering Project Phase II for the Development of Agricultural Infrastructure in the Republic of Indonesia" (hereinafter referred to as "the Project") on June 5,1993 as stated in the Record of Discussions which was signed on June 6, 1988, the Japanese Evaluation Team organized by Japan International Cooperation Agency (hereinafter, referred to as "JICA") and headed by Mr.Nobuyoshi SAKINO, Director, Disaster Prevention Division, Construction Department, Agricultural Structure Improvement Bureau, Ministry of Agriculture, Forestry and Fisheries (MAFF), visited Indonesia from January 25 to February 5, 1993 in order to conduct an overall evaluation of the Project together with the Indonesian Evaluation Team headed by Dr.Ir. KNG Bambang Soemitroadi, Acting Director General for Research and Development Agency, Ministry of Public Works.

The teams conducted interviews with Japanese experts and their Indonesian counterpart personnel assigned to the Project, had a series of discussions with Indonesian authorities concerned, exchanged views among themselves.

As a result, the both teams agreed to forward to their respective Governments the summary of the evaluation referred to in the document attached herewith.

February 3, 1993
Jakarta, Indonesia

崎野信秋	
Mr. Nobuyoshi Sakino	Dr.Ir. KNG Bambang Soemitroadi
Leader, Japanese Evaluation Team, Japan International Cooperation Agency	Leader, Indonesian Evaluation Team Ministry of Public Works

SUMMARY OF THE JOINT EVALUATION REPORT ON THE REMOTE SENSING ENGINEERING PROJECT PHASE II FOR THE DEVELOPMENT OF AGRICULTURAL INFRASTRUCTURE IN THE REPUBLIC OF INDONESIA

I. INTRODUCTION

The Government of the Republic of Indonesia requested the Technical Cooperation on remote sensing technology on October, 1977, in order to carry out the selection of suitable land for agricultural development, which formed a part of the increasing food production program in connection with the Second Five Years National Development Plan (REPELITA II : 1974/75 - 1978/79). The Government of the Republic of Indonesia and Government of Japan started the project as "The Remote Sensing Engineering Project for The Development of Agricultural Infrastructure" from April, 1980, and technology transfer on the remote sensing had executed for seven(7) years (Phase I and follow up program).

Additionally, the Government of the Republic of Indonesia have requested Phase II of the Project which improve the technology acquired through implementation of the previous project (phase I) in order to establish data base system needed for agricultural development planning balanced with rural development planning. The Government of Japan dispatched the formulation survey team to confirm the request and consult on a tentative technical cooperation plan with Indonesian authorities concerned in response to additional request.

The Project started as five years project type technical cooperation program from June 6, 1988, based on the Record of Discussion (hereinafter referred to as the R/D) signed with Mr. Y. Kitano, Resident Representative of JICA Indonesia office and Mr. H. A. Rasjid, Secretary General, Ministry of Public Works, on June 6, 1988.

The Tentative Schedule of Implementation (hereinafter referred to as the TSI) was signed with K. Ueno, Leader of the Consultation Survey Team dispatched by JICA and Mr. P. Duarsa, Acting Secretary General, Ministry of Public Works, on July 11, 1989.

The objectives of the Project phase II are smooth promotion of the development of agricultural infrastructure in the Republic of Indonesia through the following activities :

1) Production of thematic maps and evaluation maps;

2) Establishment of guidelines for development of agricultural infrastructure;

3) Establishment of data base system for collection and use of agricultural development data and information;

4) Training;

The Project has been implemented based on the R/D and the TSI.

II. EVALUATION OF THE PROJECT

1. PURPOSE OF THE EVALUATION

(1)To make a comprehensive evaluation on the achievement of the Project including implementing activities.

(2)To make recommendation to the authorities concerned of both Governments on the measures to be taken after the evaluation.

2. METHOD OF THE EVALUATION

(1)Evaluation study was conducted by the Joint Evaluation Team (hereinafter referred to as the Team) consisting of the Japanese Team and the Indonesian Team.

(2)Evaluation item of cooperation field was based on the R/D and the TSI, and the Team grasped the performance of the project, mainly project activities and technical transfer.

(3)Evaluation studies was carried out by means of interview with personnel concerned and collecting data from organization concerned.

3. EVALUATION ITEMS

(1) Input of supporting the Project

1) Contribution of the Government of Japan

(a)Dispatch of Japanese experts

(b)Provision of machinery and equipment

(c)Training of Indonesian personnel in Japan

(d)Supplement of local cost expenditures

(e)Others

2) Contribution of the Government of the Republic of Indonesia

(a)Provision of land, buildings and facilities

(b)Allocation of budget

(c)Assignment of counterpart and other personnel

(2) Project activities

1) Production of thematic maps and evaluation maps;

2) Establishment of guidelines for development of agricultural infrastructure;

3) Establishment of data base system for collection and use of agricultural development data and information;

4) Training

(3) Impact of the Project

1) Impact on counterpart personnel

2) Impact on implementation institution

3) Impact on others

(4) Prospect of sustainability

1) Administration and organization

2) Financial sustainability

3) Technical sustainability

4. MEMBERS OF JOINT EVALUATION TEAM

4.1. THE JAPANESE EVALUATION TEAM

Name (Assignment) and Position

(1) Mr. Nobuyosi SAKINO (Team leader)

Director, Disaster Prevention Division, Construction Department, Agricultural Structure Improvement Bureau, Ministry of Agriculture, Forestry and Fisheries (MAFF)

(2) Dr. Yoshio MATSUO (Agricultural Development)

Senior Researcher, Lab. of Rural Planning, Rural Improvement Department, National Research Institute of Agricultural Engineering, MAFF

(3) Dr. Yukio MUKAI (System Development and Data Base System)

General Manager of Research Department, Remote Sensing Technology Center of Japan

(4) Mr. Masayoshi INUZUKA (Evaluation on Technical Planning)

Agricultural Technical Cooperation Division, Agricultural Development Cooperation Department, JICA

4.2. THE INDONESIAN EVALUATION TEAM

Name (Assignment) and position

(1) Dr.Ir.KNG Bambang Soemitroadi (Leader)

Acting Director General for Research and

Development Agency, Ministry of Public Works(MPW)

(2) Drs.Gembong Priyono

Head of International Cooperation Bureau, MPW

(3) Dr.Soenarno

Head of Center for Data Processing and Mapping, MPW

5. SCHEDULE OF THE EVALUATION

From 25 January, 1993 to 2 February,1993 (Summary report to the Joint Committee by the Team will be scheduled on 3 February, 1993)

III. RESULT OF EVALUATION

1. INPUT OF SUPPORTING THE PROJECT

1.1. CONTRIBUTION OF THE GOVERNMENT OF JAPAN

The inputs of the Government of Japan are as follows. They are considered to have contributed to the effective and efficient implementation of the Project.

1.1.1. Dispatch of Japanese experts

Ten(10) long-term experts in four(4) fields specified in the R/D has been dispatched. In addition, twenty(20) short-term experts were dispatched when necessity arose. The total cost of the aspects were approximately 374 million yen. The details of the dispatched experts are shown in APPENDIX 1 and 2.

1.1.2. Provision of machinery and equipment

The total amounts of machinery and equipment provided by Japan from 1988 to 1992 has a value of approximately 297 million yen. Most of them have been utilized effectively in accordance with the objectives of the Project and they are well maintained (APPENDIX 2-1,2).

1.1.3. Training of Indonesian personnel in Japan

Sixteen(16) Indonesian counterpart personnel concerned of the Project visited Japan for training and observation from June,1988 to January,1993. List of training are shown in APPENDIX 3.

1.1.4. Supplement of local cost expenditures

JICA has taken special measures to supplement the local cost expenditures from 1988 to 1992. About fifty-three(53) million yen have been spent for supplement of running cost and details are shown in APPENDIX 4-2.

(1) Under the Middle Level Technicians Training Program, several training of remote sensing technology have been implemented to the staffs of regional offices and other organizations concerned for the purpose of technology transfer. About 25.4 million yen has been spent for conducting these training from 1989 to 1992 (including budget of training course scheduled before the end of cooperation period).

(2) Under the Technology Diffusion Promotion Program, about 0.9 million yen was spent in 1989 and 1991 for publication of the pamphlets in order to introduce the remote sensing technology and project activities.

(3) Under the Project Seminar Program, about 1.4 million yen has been spent for enlightenment of remote sensing and Geographic Information Systems(hereinafter referred to as the GIS) technologies from 1990 to 1992(including budget planned in 1992).

(4) Under the Appropriate Technology Development Program in internal support program, budget allocated was approximately 1.9 million yen for development of analysis model on a swampy land in 1990.

(5) The other local cost supporting from 1988 to 1992 has been spent about 23.4 million yen for running cost of the Project.

1.1.5 Others

Five(5) Japanese Missions were dispatched for the effective implementation of the Project from 1988 to 1991 as shown in APPENDIX 5. (including this evaluation mission)

1.2. CONTRIBUTION OF THE GOVERNMENT OF THE REPUBLIC OF INDONESIA

It is regarded that the Government of the Republic of Indonesia have taken much efforts to provide inputs as follows, against hard circumstances.

1.2.1. Provision of land, buildings and facilities

The Government of the Republic of Indonesia has provided necessary land, buildings and facilities for the implementation of the Project.

1.2.2. Allocation of budget

The Government of the Republic of Indonesia has allocated total of Rp. 1,203 million for running the Project from 1988 to 1992. The record are shown in APPENDIX 4-2.

1.2.3. Assignment of counterpart and other personnel

Total of twenty-three(23) counterpart personnel have been assigned to the Project by the Government of the Republic of Indonesia. The details of them are shown in APPENDIX 6.

2. PROJECT ACTIVITIES

2.1. PRODUCTION OF THEMATIC MAPS AND EVALUATION MAPS NECESSARY FOR FORMULATION OF AGRICULTURAL DEVELOPMENT PLANS

On the activities of thematic map production, the progress has reached at a satisfactory level and also the technical on this activity has been performed. On the other hand, in regard to the development of the method for production of evaluation maps, the progress is considered to have been delayed because the some methods of evaluation maps are under developing. But it will be finished until the termination of the Project.

Activities mentioned in the TSI are:

(1) Production of thematic maps ;

(2) Development of method for production of evaluation maps.

On the item (1) of the TSI, a number of thematic maps have been produced through all activities of the Project. The types of thematic maps are listed in APPENDIX 7. Some of the above outputs were selected and compiled as the first satellite image collection, "INDONESIA FROM SPACE".

Furthermore, some of the developed software in Phase I were converted to Phase II system and many advanced software were newly developed in Phase II for producing the thematic maps that can not be generated by ERDAS software.

In respect of the item (2) of the TSI, the Project developed the methods for producing seven(7) kinds of evaluation maps, such as a land capability map and a farm land conservation map.

Among those developed evaluation maps, the land capability map is the first remarkable result produced according to the existing criteria of agricultural land evaluation for transmigration.

2.2. ESTABLISHMENT OF GUIDELINES FOR DEVELOPMENT OF AGRICULTURAL INFRASTRUCTURE

To establish the guidelines, the Project has been forming the scheme of map-provision based on practical planning method for agricultural infrastructure development of the relevant organizations, which is one of the significant results of the Project. The Team, however, regards the progress of this activity as having delayed because the guidelines, which are the final outputs of this activity, have not been finished yet. The approach to establish the guidelines is still under transfer to the counterparts.

The activities mentioned in the TSI are:

(1) Establishment of guidelines for formulation of rural development plans;

(2) Establishment of guidelines for formulation of irrigation and drainage plans;

(3) Production of farm land conservation maps in critical land.

The R/D and the TSI do not mention about the details of the guidelines. Therefore the Project clarified the prerequisites for the guidelines in order to make them acceptable for agricultural infrastructure development. (APPENDIX 8-1)

In order to realize the above items, the following activities were implemented.

1) The activity to clarify the Indonesian conventional method of practical planning for agricultural infrastructure development.

This activity was implemented in order to grasp what kinds of thematic maps and evaluation maps are applicable and available. In this regard, the Project established working groups which were constituted with relevant

organizations and working group meetings were held seven (7) times. (APPENDIX 8-2)

2) The activity to analyze the information about the conventional planning method clarified in the above activity.

Through this activity, the criteria for agricultural land evaluation were refined in the view of computerization.

3) The activity to establish the methodology of provision of thematic maps and evaluation maps.

In respect of this activity, the frame of the map-provision scheme in Center for Data Processing and Mapping, Ministry of Public Works (hereinafter referred to as PUSDATA) was considered (APPENDIX 8-3) and to realize the idea of the above scheme, the computer supporting system for land evaluation has been developed.

To finalize establishment of the guidelines, the following activities are considered to be remained.

1) The activity to fix the methodology of map-provision under the agreement of the working group members.

2) To describe the established scheme of map-provision into the guidelines.

2.3 ESTABLISHMENT OF DATA BASE SYSTEM FOR COLLECTION AND USE OF AGRICULTURAL DEVELOPMENT DATA AND INFORMATION

The Project has almost completed the system design and is developing the data base system. The collected data in the case study area and all original satellite data collected by PUSDATA are almost registered into the above data base system. The techniques for designing the data base items have been transferred. The data base system should be improved in some points for an effective use.

The activity mentioned in the TSI is establishment of the data base system for collection and use of agricultural development data and information.

The following activities are involved and implemented.

1) The activity to design the framework of the data base system.

The list items and their allocation in the data base system are almost achieved.(APPENDIX 9-1,2) The data base system make it possible to collect and use effectively for the data and information agricultural development.

2) The activity to collect and accumulate data into the above data base system

All original satellite data (about three hundred(300) scenes) are registered into the above data base system. Image data, thematic maps, evaluation maps and other related data in the case study area are almost registered into it. And also, some kinds of maps and related data of other area in Indonesia are registered, which are collected through the assistance works to the other relevant organizations. (APPENDIX 9-3)

In order to make the data base system more effective, the following items are required :

1)Collection and registration of additional data

2)Storage of the collected data and their display of a specific study area.

2.4. TRAINING

The training program on remote sensing and GIS technologies named "Middle level technicians training" mainly for staffs in regional office and other relevant organizations has been successfully implemented.

The achievement of the training is almost satisfactory. The training programs were developed under the collaboration between Indonesian

counterparts and Japanese experts and the related skills and knowledge were well transferred to the counterparts.

Activities mentioned in the TSI are:

(1) Development of curricula and teaching materials;

(2) Implementation of training for the staff of regional data center and relevant organizations.

1) The fundamental course has been eight(8) times implemented and one hundred and thirty(130) trainee have finished this course. The advanced course has been three(3) times implemented and thirty six(36) trainee have finished this course.(APPENDIX 10)

2) Standard curricula and teaching materials, for the fundamental and advanced training course, are prepared by Indonesian counterparts. These are appropriate materials to introduce both fundamentals and recent technology of Remote Sensing to participants.

3) The first satellite image collection named as "INDONESIA FROM SPACE" has been prepared as a reference material for the training. It is utilized effectively for implementation of the training.

3. IMPACT OF THE PROJECT

3.1. IMPACT ON COUNTERPART PERSONAL

(1) To be effective for raising up the capabilities of the counterparts through the training program in PUSDATA of the Project and for promotion of relationship to the outside of PUSDATA.

(2) To be effective for increasing the self confidence of the counterparts through the project activities in the case of operating, maintaining and improving the system and training latecomers.

3.2. IMPACT ON IMPLEMENTATION INSTITUTION

(1) To be capable to provide maps obtained using remote sensing and GIS technologies to related organizations such as Ministry of Agriculture, Ministry of Forestry, Ministry of Transmigration and each Directorate General of Ministry of Public Works.

(2) To be capable to provide rapidly the images and maps in high quality and precision, and to contribute to increase the practical use of remote sensing data as the role and standpoint of the leading position in the Indonesian remote sensing technology.

(3) To be effective for popularization of remote sensing and GIS technologies through the training of participants from the regional offices.

3.3. IMPACT ON OTHERS

(1) To be capable to contribute to international activities such as International Space Year 1992 relating to Remote Sensing and GIS technologies.

(2) To be capable to make presentation or lecture concerning to Remote Sensing and GIS technologies at relating organizations and educational institutes.

(3) The first satellite image collection, "INDONESIA FROM SPACE" was presented to the President of the Republic of Indonesia, all the ministers of the Indonesian Cabinet and the other organizations, for introducing remote sensing technology visually. This book is evaluated highly in other organizations.

4. PROSPECT OF SUSTAINABILITY

(1) Administration and organization

Administrative management condition of Project is quite satisfactory now, and it is expected to last this condition after the termination of cooperation.

Progressive attitude of Indonesian counterparts is expected to be continued after the end of Project.

PUSDATA status capable to accept service tasks will contribute to increase the sustainability of Remote Sensing Division in future.

(2) Financial sustainability

Priority allocation of budget by Indonesian Government is necessary to enable the sustainability.

PUSDATA status of accepting service tasks will contribute to financial sustainability also.

Considering the actual conditions mentioned above, additional financial opportunity will be needed.

Budget allocation by the head office to regional offices for operation of the Personal Computer, which is provided by technical cooperation, will help their financial sustainability.

(3) Technical sustainability

Establishment of Guideline will make it sustainable to generate standard production and to apply it effectively to actual development planning of users.

Technical level which Indonesian counterparts already achieved is enough high for sustainable production of effective result for normal needs from relevant organizations.

The capability of Indonesian counterparts to maintain the system (hardware and software) will contribute to its technical sustainability .

The capability of Indonesian counterparts to transfer their technology to another person will maintain the technical sustainability.

It is desirable that the Indonesian counterparts should make efforts to catch up the latest technologies on remote sensing and GIS.

VI. CONCLUSIONS AND RECOMMENDATIONS

1. Conclusions

The Team concludes that the results of the activities have reached at a satisfactory level.

(1) The activities of the Project have been conducted in accordance with the four(4) fields mentioned in the R/D and the TSI. The Project has been implemented with the efforts of Japanese and Indonesian personnel concerned in order to apply the technologies of remote sensing and GIS to planning of agricultural infrastructure development.

(2) Counterpart personnel have acquired the knowledge and skills through the implementation of the Project activities. Thematic maps were produced progressively and the method for production of evaluation maps are developing.

(3) The framework for the establishment of the guideline is almost finished.

(4) The data base system was designed and data of the case study area and original satellite data were registered.

(5) The training was implemented and has contributed to technical transfer.

2. Recommendations

The Team recommends as follows.

(1) On the data base systems ;

The system was expected to be improved for its effective use. Therefore, the Project shall make effort to accomplish the storage of the collected data and their display of a specific study area for the establishment of data base system, by the termination of the cooperation on 5 June, 1993.

(2) On the establishment of guidelines ;

The following activities are remained in order to finalize the establishment of guidelines as a draft level.

- To fix the methodology of map-provision
- To describe the established scheme of map-provision.

It is necessary to carry out a follow up program of one year on the field of establishment of guidelines for development of agriculture infrastructure. In this field, activities shall be concentrated to the accomplishment the above two(2) items of rural development plan and irrigation and drainage plan.

For the smooth implementation of the follow up program,it is necessary for the Indonesian authorities to take the following measure hereinafter.

- Promotion of effective activities of the working group
- Preparation of implementation component such as budget allocation, staff assignment and others.

(3) Preparation for the maintenance of the equipments supplied through the Project;

It is expected that the Indonesian side should establish a firm maintenance formation for all machinery and equipments.

(4) The Indonesian counterparts should make efforts to catch up the latest technologies on remote sensing and GIS .

ANNEX

(INPUT)

(ACTIVITIES)

APPENDIX-1 <LIST OF JAPANESE EXPERTS>(LONG TERM)

NAME		FILDE	PERIOD
KOICHI	YAMAZAKI	TEAM LEADER	16.JUL.1988 - 15.JUL.1990
HIROSHI	ISHIDA	AGRICULTURAL DEVE,PLANNING	1.AUG.1988 - 31.JUL.1991
HIDEMOTO	TANAKA	COODINATOR	18.NOV.1988 - 16.MAR.1991
SATOSHI	UCHIDA	SOFTWARE DEVELOPMENT	31.JUL.1989 - 30.JUL.1991
RYOTA	NAGASAWA	SYSTEM DEVELOPMENT	15.AUG.1989 - 14.SEP.1991
SHINOBU	SAKAI	TEAM LEADER	5.JUL.1990 - 5.JUN.1993
MAMORU	IZUMI	COODINATOR	10.MAR.1991 - 5.JUN.1993
KEN-ICHIRO	KAMIMURA	AGRICULTURAL DEVE,PRANNING	25.JUL.1991 - 5.JUN.1993
MASAMI	SHIZUKUISHI	SOFTWARE DEVELOPMENT	5.AUG.1991 - 5.JUN.1993
KAZUMI	SUWABE	SYSTEM DEVELOPMENT	1.OCT.1991 - 5.JUN.1993

<LIST OF JAPANESE EXPERTS>(SHORT TERM)

NAME		FILDE	PERIOD
TAKASHI	HOSHI	SOFTWARE(DATA BASE MANAGEMENT SYSTEM)	4.MAR.1989 - 31.MAR.1989
TOSHIO	IGARI	HARDWARE(PHOTO EQUIPMENT MAINTENANCE)	25.MAR.1989 - 22.APR.1989
TEITARO	KITAMURA	SOFTWARE(GUIDELINE FOR RURAL DEVELOPMENT)	1.AUG.1989 - 25.AUG.1989
YASUFUMI	EMORI	" (SOFTWARE DEVELOPMENT)	31.OCT.1989 - 21.NOV.1989
MICHIO	YOSHINO	HARDWARE(PHOTO PRINTER MAINTENANCE)	5.FEB.1990 - 17.FEB.1990
MAKOTO	OHASHI	SOFTWARE(P.C. SYSTEM INSTALLATION)	10.APR.1990 - 9.JUN.1990
JUN-ICHI	TANIMOTO	HARDWARE(W.E.S. INSTALLATION)	15.MAY.1990 - 22.MAY.1990
MOTOKAZU	YASUDA	" (COLOR PROTTER INSTALLATION)	15.MAY.1990 - 22.MAY.1990
SHINTARO	KOBAYASHI	SOFTWARE(WATER AVAILABILITY APPRAISAL)	17.JUL.1990 - 12.SEP.1990
NOBORU	IKENISHI	" (ROAD SITE SELLECTION)	19.DEC.1990 - 30.JAN.1991
YUKIYO	YAMAMOTO	" (LAND EVALUATION STUDY)	8.APR.1991 - 7.JUN.1991
MICHIO	YOSHINO	HARDWARE(LAZER PHOTO PRINTER INSTALLATION)	18.SEP.1991 - 29.SEP.1991
JUN-ICHI	TANIMOTO	" (E.W.S. MAINTENANCE)	31.MAR.1992 - 5.APR.1992
SHIGEO	OGAWA	SOFTWARE(EVALUATION MAP MAKING)	31.MAR.1992 - 30.MAY.1992
SEIJI	HASEGAWA	HARDWARE(M.T. UNIT MAINTENANCE)	7.APR.1992 - 12.APR.1992
TAMOTU	FURUYA	SOFTWARE(FARM LAND CONSERVATION)	7.APR.1992 - 30.APR.1992
MASAO	OKAJIMA	" (G.I.S. DATA ANALYSIS)	9.JUL.1992 - 8.SEP.1992
KAZUHIKO	ONUMA	" (SOFTWARE CONVERSION)	24.AUG.1992 - 9.OCT.1992
YASUHARU	YAMADA	" (RURAL DEVELOPMENT PLANNING)	14.SEP.1992 - 14.OCT.1992
KAZUYA	MIYAMA	" (IRRIGATION & DRAINAGE PLANNING)	30.NOV.1992 - 25.DEC.1992

APPENDIX 2-1

LIST OF MAIN MACHINERY AND EQUIPMENT PROVIDED BY JAPAN
(Real expenditure for providing)

	Amounts (thousand yen)	Main Equipment
1988	7,720	Vehicles(2) Copy Machine(1)
1989	80,396	Work Station system(1) Personal Computer system(2) Magnetic Disc Drive(1)
1990	81,972	Work Station system(1) Personal Computer system(1) Magnetic Disc Drive(1)
1991	73,617	Personal Computer System(2) Magnetic Optical Disk Media Laser Printer
1992	53,710 (Estimate)	Personal Computer System(2)
Total	297,415	

Note: Including consumption tax in Japan and transportation fee

APPENDIX-2-2

<EQUIPMENT USING AND MAINTENANCE CONDITION>

YEAR	NAME OF EQUIPMENT	QUANT-ITY	USING CONDITION	MAINTENANCE CONDITION	MAITENANCE CONTRACT OR COMMENT
88	COPY-MACHINE(XERO X-4790)	1 SET	A	B	OFTEN TROUBLED
	AUTO MOBILE(TOYOTA KIJANG)	2 SET	A	A	
89	ERDAS	1 SET	A	A	
	ARC/INFO	1 SET	A	A	
	P.C.ERDAS	2 SET	A	A	
	P.C.ARC/INFO	2 SET	A	A	NEED TOTAL
	dBASE-III	2 SET	A	A	MAITENANCE
	E.W.S.(SUN-4370-59)	1 SET	A	A	CONTRACT
	MEMORY MODULE(SN-014)	1 UNI	A	A	
	MAGNETIC DISC DRIVE(SN-429)	1 UNI	A	A	
	// (SN-427)	2 UNI	A	A	
	PAGE PRINTER(SN-333)	1 UNI	A	A	
	IMAGE PROCESSING BORD(UDC-3242-12C)	1 UNI	A	A	
	20" MONITOR(HL-6915-SATGK)	1 UNI	A	A	
	DIGITIZER-AO(DH-8503)	1 UNI	B	A	
	COLOR PLOTTER(EP-4010)	1 UNI	C	B	
	UNINTERRUPTED POWER SUPPLY(5KVA)	2 UNI	A	A	
	MAGNETIC TAPE DRIVE(SN-516)	1 UNI	B	A	
	STABILIZER	2 UNI	A	A	
	P.C.(ACER-1133-341)	2 SET	A	A	
	IMAGE PROCESSING BOARD(ATVISTA-4M)	2 UNI	A	A	
	20" MONITOR(HC-30WEX)	2 UNI	A	A	
	TRANSFORMER(YTC-100-5K)	2 UNI	A	A	
90	P.C.(ACER-1133-341)	1 SET	A	A	
	IMAGE PROCESSING BOARD(ATVISTA-4M)	1 UNI	A	A	
	DISPLAY MONITOR(HC-39WEX)	1 UNI	A	A	NEED TOTAL
	DIGITIZER-AO(DH-8503)	2 UNI	B	A	MAITENANCE
	TRANSFORMER(220V-110V)	1 UNI	A	A	CONTRACT
	P.C.ARC/INFO	1 SET	A	A	
	P.C.ERDAS	1 SET	A	A	
	dBASE-III	1 SET	A	A	
	E.W.S.(SN-470)	1 SET	A	A	
	MEMORY MODULE 24MB(SN-014)	1 UNI	A	A	
	MAGNETIC DISC DRIVE(SN-427)	2 UNI	A	A	
	//	1 UNI	A	A	
	IMAGE PROCESSING BOARD(UDC-3424-12C)	1 UNI	A	A	
	20" MONITOR(HL-69159)	1 SET	A	A	
	UNITERRUPTED POWER SUPPLY(SFT-2K)	2 UNI	A	A	
	SUN-OS	1 SET	A	A	
	FORTRAN-77	1 SET	D	A	
	C & ASSEMBLER	1 SET	A	A	
	ERDAS(INC.3-D)	1 SET	A	A	
	NETWORK	1 SET	A	A	
	MAGNETIC TAPE DRIVE	1 UNI	B	A	
	PAGE PRINTER	1 UNI	A	A	
	LASER PRINTER(3302-L)	1 SET	C	A	
	MT MEMORY UNIT(1305)	1 SET	C	A	

<EQUIPMENT USING AND MAINTENANCE CONDITION>

YEAR	NAME OF EQUIPMENT	QUANT-ITY	USING CONDITION	MAINTENANCE CONDITION	MAITENANNCE CONTRACT
91	HOOD 14"	1 PCE	D	A	
	LENS UNIT	1 PCE	D	A	
	P.C.(ACER1131-431)	2 SET	A	A	
	IMAGE PROCESSING BOARD(ATVISTA-4M)	2 SET	A	A	
	DISPLAY MONITOR(HC-39WEX)	2 SET	A	A	
	DIGITIZER-AO(DH-8503)	2 SET	B	A	NEED TOTAL MAINTENANCE CONTRACT
	TRANSFORMER(220V-100V)	2 SET	A	A	
	UNINTERRUPTIED POWER SUPPLY(2KVA)	2 SET	A	A	
	P.C.ARC/INFO	2 SET	A	A	
	P.C.ERDAS	2 SET	A	A	
	dBASE-III	2 SET	A	A	
	MAGNETIC OPTICAL DISK UNIT(300MB)	4 SET	A	A	
	PEN PLOTTER(MP-4300)	4 SET	C	A	

USING CONDITION

A:Daily
B:Often(2-3 week)
C:Sometime(2-3 month)
D:Seldom(2-3 year)
E:Not used

MAINTENANCE CONDITION

A:Good
B:Almost good
C:Can be used
D:Not for used/Out of order

APPENDIX-3

<LIST OF INDONESIAN PERSONNEL TRAINED IN JAPAN>

NAME	TRAINING ITEM	PERIOD	ACCEPTANCE OF TRAINEE
Drs. Suroso	SYSTEM DESIGN	27.AUG.1988 - 14.SEP.1988	M.O.A.F.F.,JICA,CHIBA-UNIV, etc
Drs. Ibnu Katamsi	R/S ADVANCE	29.OCT.1988 - 9.DEC.1988	RESTEC(GROUP TRAINING)
Dra. Sri Sarwoasih	AUTO SCANER & GIS	27.MAR.1989 - 23.JUN.1989	PASCO CO,. TUKUBA-UNIV
Drs. Taruli Silalahi	R/S BASIC	8.MAY.1989 - 23.JUN.1989	RESTEC(GROUP TRAINING)
Dra. Setyningsih Haryadi	DATA-BESE	3.JUL.1989 - 8.OCT.1989	TUKUBA-UNIV, CHIBA-UNIV
Dra. Adi Sasutji	//	//	//
Ir. Hariyatno Soemarman	SWAMP ANALYSIS	4.SEP.1989 - 8.OCT.1989	CHIBA-UNIV,
Drs. Joko Setiyono	//	26.MAR.1990 - 3.MAR.1990	M.O.A.F.F.(TUKUBA)
Mr. Abdul Mukmin	ARC/INFO	24.OCT.1990 - 3.FEB.1991	PASCO CO,.
Mr. Guridno	SPATIAL ANALYSIS	18.NOV.1990 - 2.MAR.1991	PASCO CO,. KYOTO-UNIV
Mr. Taufic	//	//	// //
Dr. Ir.Bambang Soemitroadi	PROJECT MANAGEMENT	28.JUL.1991 - 14.AUG.1991	M.O.A.F.F., JICA, KYOTO-UNI, etc
Ir.Naniek Siti	TEMPERATURE ANALYSIS OF T.M.	28.JUL.1991 - 28.SEP.1991	M.O.A.F.F.(HOKKAIDO)
Mr. Adiwarman	SPATIAL ANALYSIS	27.JAN.1992 - 28.MAR.1992	PASCO CO,.
Dra. Marcelina Rinny	SYSTEM DEVELOPMENT	2.FEB.1992 - 28.MAR.1992	CHIBA-UNIV, PASCO CO,.
Dra. Sri Yumadiati	FARM LAND CONSERV-ATION	20.JAN.1993 - 30.MAR.1993	CHIBA-UNIV, PASCO CO,.

*M.O.A.F.F. : MINISTRY OF AGRICULTURE FORESTRY AND FISHERIES
RESTEC : REMOTE SENSING TECHNOLOGY CENTER OF JAPAN

RECORD OF RUNNING COST EXPENDED BY INDONESIA AND JAPAN

APPENDIX 4-1
INDONESIAN SIDE (1,000 Rp)

YEAR / ITEM	Material Consumption	Operation	Commission	Total
1988	21,280	188,000	5,000	214,280
1989	21,280	189,364	9,000	219,650
1990	24,996	117,360	76,799	219,155
1991	25,411	218,266	10,000	253,677
1992	53,864	206,524	36,000	296,387
Total	146,837	919,514	136,799	1,203,145

(Note) Total is including other items such as salary.

APPENDIX 4-2
JAPANESE SIDE (1,000 YEN)

ITEM/YEAR	1988	1989	1990	1991	1992
Local Cost	3,104	5,395	4,723	4,758	5,411
M.L.T.	-	4,562	9,730	7,412	3,721
T.D.P.	-	519	-	405	-
Seminar	-	-	473	395	500
A.T.D.	-	-	1,875	-	-
Total	3,104	10,476	16,801	12,965	9,632

(Note) M.L.T. : Middle Level Technicians Training
T.D.P. : Technology Diffusion Promotion
A.T.D. : Appropriate Technology Development
Data of 1992 is estimated

APPENDIX-5

<LIST OF JAPANESE MISSION TO THE PROJECT>

「PROJECT FORMULATION SURVEY MISSION」(22.MAY.1988 - 1.JUN.1988)	
LEADER :KAZUO KIMURA	MINISTRY OF AGRICULTURE FORESTRY AND FISHERIES
COOPERATION PLANNING :MAMORU ISHIKAWA	〃
AGRICULTURAL DEVELOPMENT :SHINSUKE OTA	〃
NATURAL RESOURCES DEVELOPMENT :YASUHIKO NOGUCHI	MINISTRY OF INTERNATIONAL TRADE AND INDUSTRY
NATURAL RESOURCES INQUIRY :HIROYA TUKADA	EARTH RESOURCES SATELLITE DATA ANALYSIS CENTER
REMOTE SENSING :TOSHIO MICHINO	REMOTE SENSING TECHNOLOGY CENTER OF JAPAN
COODINATOR :KAZUO NAGAI	JAPAN INTERNATIONAL COOPERATION AGENCY

「CONSULTATION SURVEY TEAM」(3.JUL.1989 - 15.JUL.1989)	
LEADER :KATUNOSUKE UENO	MINISTRY OF AGRICULTURE FORESTRY AND FISHERIES
AGRICULTURAL DEVELOPMENT :KEN-ICHIRO KAMIMURA	〃
SOFTWARE DEVELOPMENT :YUKIO MUKAI	REMOTE SENSING TECHNOLOGY CENTER OF JAPAN
COORDINATOR :HITOSHI GOTO	JAPAN INTERNATIONAL COOPERATION AGENCY

「TECHNICAL GUIDANCE TEAM」(18.NOV.1990 - 29.NOV.1990)	
LEADER :THUNEO MATHUTOMI	MINISTRY OF AGRICULTURE FORESTRY AND FISHERIES
AGRICULTURAL DEVELOPMENT :MASATOSHI HOSOKAWA	〃
SOFTWARE & SYSTEM DEVELOPMENT :YUKIO MUKAI	REMOTE SENSING TECHNOLOGY CENTER OF JAPAN
COORDINATOR :SHIRARA SHIOKAWA	JAPAN INTERNATIONL COOPERATION AGENCY

「TECHNICAL GUIDANCE TEAM」(19.NOV.1991 - 29.NOV.1991)	
LEADER :TAKASHI AOI	MINISTRY OF AGRICULTURE FORESTRY AND FISHERIES
GUIDELINE :MAMORU ISHIKAWA	〃
SYSTEM DEVELOPMENT :YUKIO MUKAI	REMOTE SENSING TECHNOLOGY CENTER OF JAPAN
COORDINATOR :SHIRARA SHIOKAWA	JAPAN INTERNATIONL COOPERATION AGENCY

「FINAL EVALUATION MISSION」(25.JAN.1993 - 5.FEB.1993)	
LEADER :NOBUYOSHI SAKINO	MINISTRY OF AGRICULTURE FORESTRY AND FISHERIES
AGRICULTURAL DEVELOPMENT :YOSHIO MATHUO	〃
SOFTWARE DEVELOPMENT :YUKIO MUKAI	REMOTE SENSING TECHNOLOGY CENTER OF JAPAN
COORDINATOR :MASAYOSHI INUZUKA	JAPAN INTERNATIONL COOPERATION AGENCY

APPENDIX 6

LIST OF INDONESIAN COUNTERPART AND ADMINISTRATIVE PERSONNEL

Name	Assignment	Period of allocation
Ir. Tubagus Haedar Ali	Project Head	1. Apr. 1980 - Oct. 1990
Dr. Ir. Bambang Soemitroadi	- ditto -	20. Oct. 1990 - 3. Sep. 1991
Dr. Soenarno	- ditto -	14. Sep. 1991 - up to now
Drs. Suroso M. Djojosoekarto	Deputy Project Head(Manager)	1. Apr. 1980 - up to now
Drs. Ibnu Katamsi	Deputy Manager	1. Apr. 1980 - 11. Nov. 1992
Ir. Hariyatno Soemarman	Agricultural Development Planning	15. Jun. 1981 - up to now
Dra. Sri Yumadiati	- ditto -	1. Oct. 1982 - up to now
Drs. Joko Setiyono	- ditto -	25. Feb. 1983 - up to now
Dra. Sri Sarwoasih	- ditto -	25. Feb. 1983 - up to now
Ir. Naniek Siti Murdjiati	Software Development	1. Mar. 1981 - up to now
Drs. Muh Dimyati	- ditto -	25. Feb. 1983 - Mar. 1991
Dra. Marcelina Riny	- ditto -	1. Jul. 1982 - up to now
Dra. Setyaningsih	System Development	1. Apr. 1981 - up to now
Dra. Adi Sasutji	- ditto -	1. Apr. 1982 - up to now
Mrs. Hayrita Woworuntu	Accounting and Administrative	1. Apr. 1980 - up to now
Mrs. Henny Purwihati	Administrative	1. Apr. 1981 - up to now
Mr. Win Ellas Yekti M.	- ditto -	1. Mar. 1985 - up to now
Mr. Sutarno Lestari	- ditto -	6. Jun. 1983 - . Dec. 1992
Mr. Gunanto	- ditto -	1. Mar. 1987 - up to now

Mr. Heru Sasongko	Technical Assistance	25. Feb. 1983 - up to now
Mr. Suhadi Nurwedha	- ditto -	1. Apr. 1981 - up to now
Mr. Wagiyo	- ditto -	1. Jun. 1983 - up to now
Mr. Abdul Mukmin	- ditto -	24. Oct. 1983 - up to now

APPENDIX 7 Thematic maps and evaluation maps

I. Possibility of production of thematic maps

I.1 Developed thematic maps in Phase II

1. Temperature map
2. Elevation map
3. Slope map
4. Slope azimuth map
5. Plot scale map
6. Plot aspect map
7. Drainage network map
8. Specific discharge map

I.2 Recovery of Phase I function

1. False color map
2. Biomass estimation map
3. Soil moisture map

I.3 Capability through Phase I and Phase II

1. Land cover map
2. Soil color map
3. Geomorphological map
4. Drainage pattern

I.4 Digitized by exsisting map

1. Soil map
2. Geological map
3. Land use map
4. Soil depth map
5. Forest zone map
6. Flood area map
7. Peat depth map
8. Population map
9. Administration boundary map
10. Road network map
11. Land system map
12. Land unit map
13. Settlement disribution map
14. Rainfall map

II. Produced evaluation maps

II.1 Applied exclusive evaluation criteria

1. Land suitability map for wetland rice
2. Road site suitability map
3. Suitabiliy map for transmigration

II.2 Applied standard evaluation criteria

1. Land capability map
2. Forest zoning map
3. Critical land map
4. Farmland conservation map

APPENDIX 8-1 Requirements for the scheme of map-provision of PUSDATA

There are 3 requirements to be satisfied for the scheme of map-provision, which is described in the guidelines.

1.Acceptable or not for the user

The scheme of PUSDATA's map-provision should be acceptable for the user side. Therefore, if the user side has a land evaluation scheme, the scheme of PUSDATA should follow its criteria and methodology as far as possible.

2.Attractive or not for the user

If the map-provision scheme is not enough attractive, the user may not want to use the evaluation maps from PUSDATA. The Project should give the scheme attractive value and increase the cost-performance of the maps provided by PUSDATA.

3.Achievable or not for PUSDATA

Even if the above scheme with acceptability and attractivity is formed, as far as its methodology is hard or impossible to achieve, PUSDATA never produce such maps. The scheme should be constituted with careful attention on the limitations of the hardware, software and administrative circumstances of the Project.

From the view point of the above requirements, the progress of "Establishment of Guidelines for Development of Agricultural Infrastructure" is considered as below.

	ACCEPTABLE	ATTRACTIVE	ACHIEVABLE
Rural Development	Almost OK by using the criteria of RePPProT.	Inadequate	-
Irrigation & Drainage	Inadequate	Results of Drainage Network Analysis are expected to lead quite attractive outputs.	-
Farmland Conservation	Almost OK by using USLE & the criteria of Ministry of Forestry.	Almost OK by advanced approach with Drainage Network Analysis and USLE.	OK

APPENDIX 8-2 Activity of Working Groups

[Attendance list of working group meetings]

Ministry of Agriculture
- PUSDATA
- Soil Research Center in Bogor

Ministry of Forestry
- Directorate General of Reforestation and Land Rehabilitation

Ministry of Transmigration
- Directorate General for Settlement Preparation

National Coordinate Agency for Survey and Mapping (BAKOSURTANAL)

National Institute of Aeronautics and Space (LAPAN)

National Land Agency (BPN)

State Ministry of Population and Environmental (KLH)

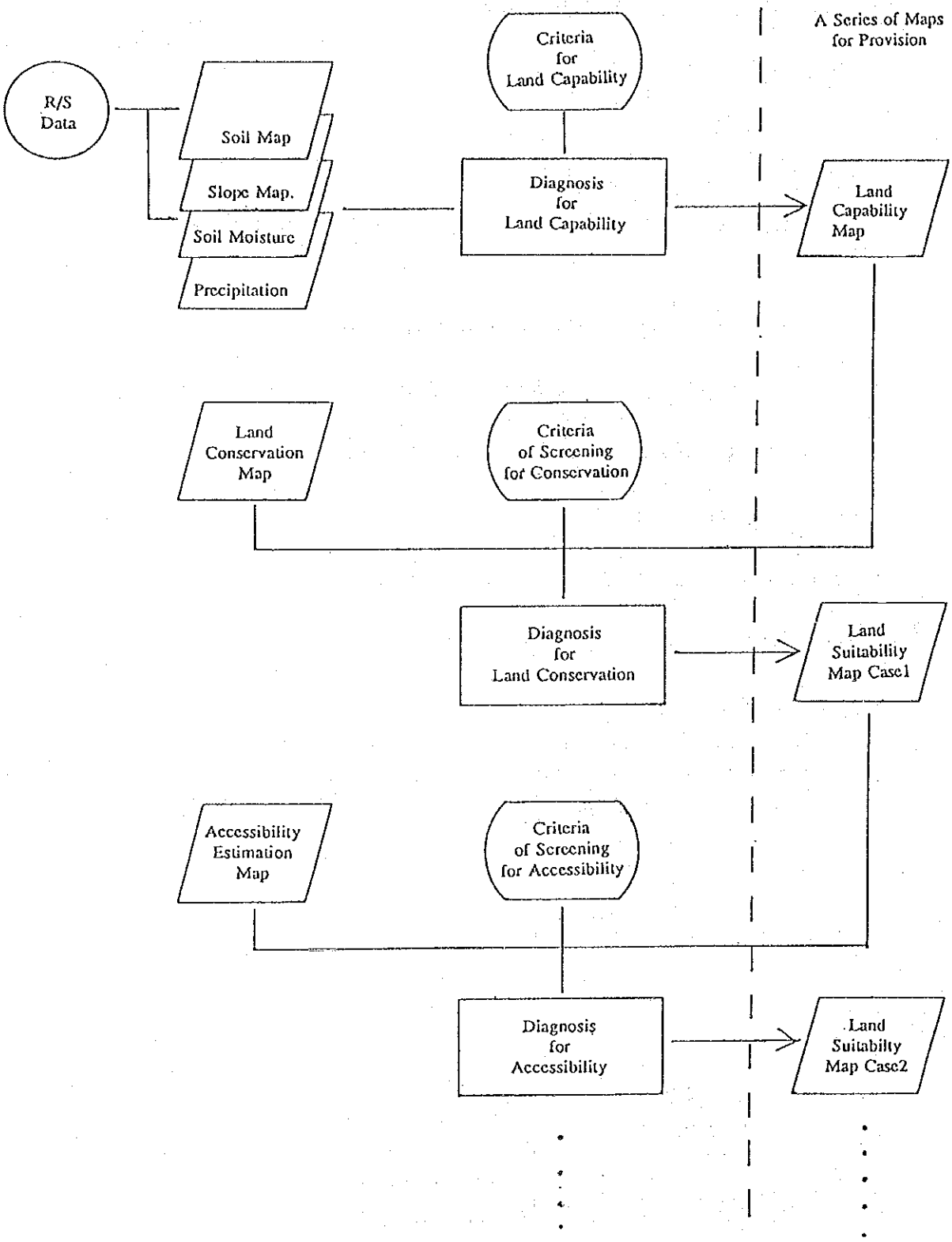
Agricultural University of Bogor (IPB)

Ministry of Public Works
- Directorate General of Water Resources Development
- Directorate General of Human Settlement
- Research and Development Institute
- PUSDATA

[List of Working Group Meetings]

No.	Date	Subject
1	25/NOV/1991	Irrigation and Drainage Plans
2	22/JAN/1992	General
3	13/FEB/1992	Rural Development Plans
4	29/APR/1992	Farm Land Conservation Plans
5	1/JUL/1992	Land Evaluation Scheme of Ministry of Transmigration
6	15/JUL/1992	Land Evaluation Scheme of KLH
7	28/JUL/1992	Land Evaluation Scheme of Soil Research Center

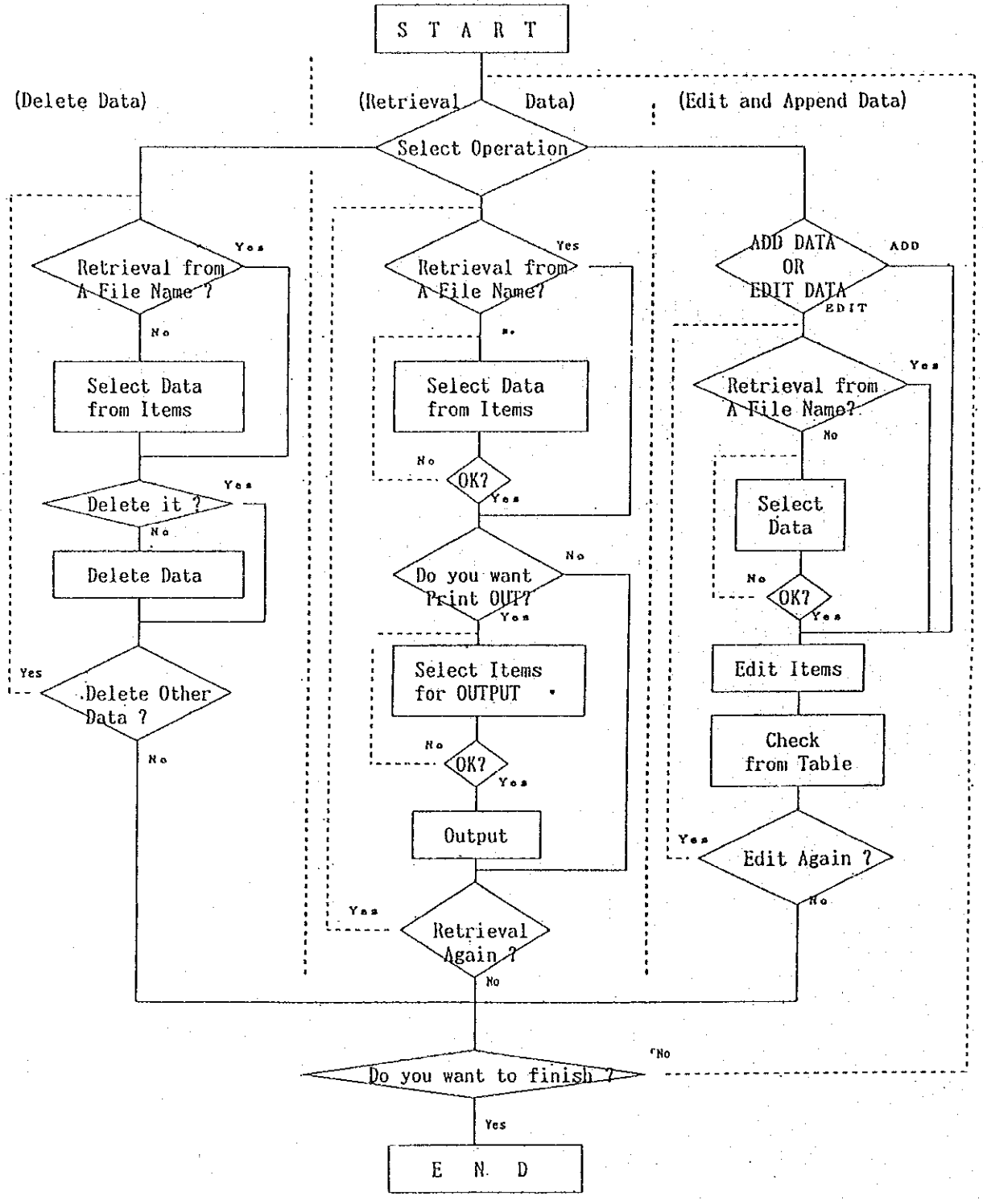
APPENDIX 8-3 The Scheme of Map-Provision of PUSDATA



APPENDIX 9-1 Items of data base Date / /

No	Field	Description	Enter
1	Media_No	Pre-storage media number: Media<1-3>, Cupboard<4-5>, Rack number <6>, running number<7-8>	c<8>
2	File_No	Running number of a data in media	C<2>
3	Filenam1	FIle name except exptension	C<20>
4	Filenam2	Extension name	C<3>
5	Source	Satellite name and supplier name as laboratory, department, di	C<20>
6	Client	vision	
7	Type	1-Satellite, 2-Raster, 3-Vector, 4-Numeric, 5-Map, 6-Film	N<1.0>
8	Content	1-Original 2-Thematic, 3-Evaluation, 4-Planning, 5-Output	N<1.0>
9	Data_nam	Sensor name and map name as Topogrphic map, soil map, road map road and so on	C<20>
10	Data_Cha	Satellite : data correction level (Original, Bulk, 1A, 2A, MOSAIC) Map data : data charcteristic (Physical, Socio)	C<20>
11	Format	BIL , BSQ , BIP2 , MIS , AVHRR, EXPORT, IBM Cover (coverage), Tar, other	C<5>
12	Accuracy	Pixel size (Unit is m) and scale (denominator)	N<15.5>
13	Location	Location number is BPS code (Kabupaten or Province) Max:9	N<6.0>
14	Path	Path number from orbital map	N<3.0>
15	Row	Row number ftom orbital map	N<3.0>
16	UTM_zone	Zone number of UTM	N<2.0>
17	Coord1	X-(Longitude-) coordinate of upper left point	N<8.0>
18	Coord2	Y-(Latitude-) coordinate of upper left point	N<8.0>
19	Coord3	X-(Longitude-) coordinate of lower right point	N<8.0>
20	Coord4	Y-(Latitude-) coordinate of lower right point	N<8.0>
21	Grid	National grid cell number (scale 1/250,000) (Corner)	N<6.0>
22	Colum	Number of column	C<5>
23	Line	Number of line	C<5>
24	Channel	Number of channel	C<2>
25	Ch_name	Channel name or number of channel	C<20>
26	Date	Date of issue map or Date of acquisition	D<8>
27	Cloud	Cloud cover % of raster data and number of class	N<3.0>
28	Geocorre	Ground Control Point File	C<2>
29	Map_type	Map projection type => Fig.12	C<2>
30	Geo.dat1	Ground control point file	C<20>
31	Geo.dat2	Affine parameter file	C<20>
32	RMS	What value is RMS error ?	N<3.0>
33	Purpose	What purpose was this data created?	C<20>
34	Method	What method was this data analyzed?	C<20>
35	Legend	Legend file name of the data	C<20>
36	Dscript	Attiribution file name of the data	C<20>
37	Annotat	Annotation file name of the file	C<20>
38	Media_ql	Quality of Media 0 - not yet, 1 - success, 2 - difficult, 3 - Unable	N<1.0>
39	Output	1-Negative film, 2- Negative film, 3- Color Plotter 4-Nothing	N<1>
40	Display	The file is stand in a Computer	C<1>
41	Report	Report (Job) number which the data is used or created	C<20>
42	Update	update or input date	D<8>
43	Register	Who Panched?	C<10>
44	Lending	Lending now ? : Y or N	C<1>
45	Lend_day	When Lending?	D<8>
46	Borrower	Borrower name is as same as No.5	C<10>

APPENDIX 9-2 Flow chart of data base system



APPENDIX 9-3 List of data in data base

Production of Data Base

Whole Indonesia				
	1) Administrative boundary of Kabupaten	Oct.1992	Longitude/ Latitude	1.Code of Kabupaten 2.Kabupaten Name
	2) Catchment Area	Oct.1992		1.Code of Catchment. 2.Catchment Name
	3) Observatory position of Rainfall,	Sep.1992		1.Position 2.Code & Name of Observatory 3.Rainfall data
	4) Observatory of Water flow	Sep.1992		1.Position 2.Code & Name 3.Water flow data
	3) Orbital map of Landsat-4	Dec.1992		1.Scene Number 2.Number of Scene 3.Sensor, etc
2. Case study area				
(1) Indaragiri River - Riau Province -				
(A) Satellite Data				
(B) Digital Map				
1) Land Unit Map		May.1991	UTM	30 items(ANNEX-)
2) Land System Map		Aug.1992	UTM	25 items(ANNEX-)
3) Terrtain units		May.1992	UTM	Soil Type, Land cover Geology, Water Body
4) Elevation		May.1992	UTM	1.Contour, 2.Levelling Point
5) Slope-Aspect		May.1992	UTM	1.Slope, 2.Aspect, Surface-area
6) Streems		May.1992	UTM	1.Name, 2.Periodicity, 4.Width
7) Well-Gauging		May.1992	UTM	1.Gauging Station Numbr Springs
8) Lineamets/Fault		May.1992	UTM	1.Type name of Hazard
9) OwnerShip		may.1992	UTM	1.Owner, 2.Province District
10) Road		May.1992	UTM	1.Name Type of Width
(2) Samarinda				
(B) Digital Map				
1) Geological Map		July.1991	UTM	
2) Geomorphological		July.1991	UTM	
3) Land Unit		July.1991	UTM	1.Land Unit Code & Name
3. Others				
(1) Land Unit	1) North Sumatera	6 sheet		
	2) Riau	3 sheet		
	3) East Kalimantan	1 sheet		
(2) Land System	1) Riau	2 sheet		
(3) Elevation	1) Riau	2 Sheet		
	2) Lampung	2 Sheet		
(4) Catchment Area	1) Whole Indonesia			
(5) Road	1) Jatilhul			
(6) Administrative Boundary				
(7) Water Body and River				

APPENDIX-10

<RECORD OF TRAINING PROGRAM>

YEAR	NAME OF TRAINING	NUMBER OF TRAINEES	PERIOD
89/90	1ST R/S & G.I.S. BASIC COURCE	21	90. 7.16- -90. 8.25
	2ND R/S & G.I.S. BASIC COURCE	17	90.11. 5- -90.11.30
	R/S & G.I.S. ADVANCE COURCE	13	90.12. 5- -90.12.30
	TOTAL	51	

MINISTRY OF PUBLIC WORKS
HEAD OFFICE :17
REGIONAL OFFICE :22
MINISTRY OF AGRICULTURE : 2
MINISTRY OF FORESTRY : 2
AGENCY FOR FOR THE ASSESSMENT & APPLICATION OF TECHNOLOGY : 2
NATIONAL INSTITUTE OF AERONAUTICS & SPACE : 2
OTHERS : 4

TOTAL :51

YEAR	NAME OF TRAINING	NUMBER OF TRAINEES	PERIOD
90/91	1ST R/S & G.I.S. BASIC COURCE	10	91. 2.25- -91. 3.15
	2ND R/S & G.I.S. BASIC COURCE	20	91. 7. 1- -91. 7.27
	R/S & G.I.S. ADVANCE COURCE	10	91.10. 7- -91.10.26
	TOTAL	40	

MINISTRY OF PUBLIC WORKS
HEAD OFFICE : 4
REGIONAL OFFICE :24
MINISTRY OF TRANSMIGRATION : 3
AGENCY FOR THE ASSESSMENT & APPLICATION OF TECHNOLOGY : 1
NATIONAL INSTITUTE OF AERONAUTICS & SPACE : 1
OTHERS : 7

TOTAL :40

YEAR	NAME OF TRAINING	NUMBER OF TRAINEES	PERIOD
91/92	1ST R/S & G.I.S. BASIC COURCE	20	92. 5. 4- -92. 5.30
	2ND R/S & G.I.S. BASIC COURCE	14	92. 7. 6- -92. 7.30
	R/S & G.I.S. ADVANCE COURCE	13	92. 8.24- -92. 9.15
	TOTAL	47	

MINISTRY OF PUBLIC WORKS
HEAD OFFICE : 5
REGIONAL OFFICE :23
MINISTRY OF TRANSMIGRATION : 5
MINISTRY OF AGRICULTURE : 2
MINISTRY OF FORESTRY : 1
MINISTRY OF STATE FOR POPULATION & ENVIRONMENT : 1
MINISTRY OF MINES & ENERGY : 3
OTHERS : 7

TOTAL :47

YEAR	NAME OF TRAINING	NUMBER OF TRAINEES	PERIOD
92/93	1ST R/S & G.I.S. BASIC COURCE	13	92.12.12- -93. 1. 9
	2ND R/S & G.I.S. BASIC COURCE	15	93. 1.11- -93. 1.30
	TOTAL	28	

MINISTRY OF PUBLIC WORKS
HEAD OFFICE : 2
REGIONAL OFFICE :17
MINISTRY OF TRANSMIGRATION : 1
MINISTRY OF AGRICULTURE : 2
MINISTRY OF FORESTRY : 1
MINISTRY OF STATE FOR POPULATION & ENVIRONMENT : 1
OTHERS : 4

TOTAL :28

付属資料１－(2)：合同委員会への報告ペーパー（合同評価調査結果の要約）

SUMMARY OF THE JOINT EVALUATION ON THE REMOTE SENSING ENGINEERING PROJECT PHASE II FOR THE DEVELOPMENT OF AGRICULTURAL INFRASTRUCTURE FOR THE JOINT COMMITTEE ON 3 FEBRUARY , 1993

1. PURPOSE OF THE EVALUATION

(1)To make a comprehensive evaluation on the achievement of the Project including implementing activities.

(2)To make recommendation to the authorities concerned of both Governments on the measures to be taken after the evaluation.

2. METHOD OF THE EVALUATION

(1)Evaluation study was conducted by the Joint Evaluation Team (hereinafter referred to as the Team) consisting of the Japanese Team and the Indonesian Team.

(2)Evaluation item of cooperation field was based on the R/D and the TSI, and the Team grasped the performance of the project, mainly project activities and technical transfer.

(3)Evaluation studies was carried out by means of interview with personnel concerned and collecting data from organization concerned.

3. EVALUATION ITEMS

(1)Input of supporting the Project

(2)Project activities

1)Production of thematic maps and evaluation maps;
2)Establishment of guidelines for development of agricultural infrastructure;
3)Establishment of data base system for collection and use of agricultural development data and information;
4)Training

(3)Impact of the Project

(4)Prospect of sustainability

4. Conclusions

The Team concludes that the results of the activities have reached at a satisfactory level.

(1) The activities of the Project have been conducted in accordance with the four(4) fields mentioned in the R/D and the TSI. The Project has been implemented with the efforts of Japanese and Indonesian personnel concerned in order to apply

the technologies of remote sensing and GIS to planning of agricultural infrastructure development.

(2) Counterpart personnel have acquired the knowledge and skills through the implementation of the Project activities. Thematic maps were produced progressively and the method for production of evaluation maps are developing.

(3) The framework for the establishment of the guideline is almost finished.

(4) The data base system was designed and data of the case study area and original satellite data were registered.

(5) The training was implemented and has contributed to technical transfer.

5. Recommendations

The Team recommends as follows.

(1) On the data base systems ;

The system was expected to be improved for its effective use. Therefore, the Project shall make effort to accomplish the storage of the collected data and their display of a specific study area for the establishment of data base system, by the termination of the cooperation on 5 June, 1993.

(2) On the establishment of guidelines ;

The following activities are remained in order to finalize the establishment of guidelines as a draft level.

- To fix the methodology of map-provision
- To describe the established scheme of map-provision.

It is necessary to carry out a follow up program of one year on the field of establishment of guidelines for development of agriculture infrastructure. In this field, activities shall be concentrated to the accomplishment the above two(2) items of rural development plan and irrigation and drainage plan.

For the smooth implementation of the follow up program, it is necessary for the Indonesian authorities to take the following measure hereinafter.

- Promotion of effective activities of the working group
- Preparation of implementation component such as budget allocation, staff assignment and others.

(3) Preparation for the maintenance of the equipments supplied through the Project

It is expected that the Indonesian side should establish a firm maintenance formation for all machinery and equipments.

(4) The Indonesian counterparts should make efforts to catch up the latest technologies on remote sensing and GIS.

付属資料２：インドネシア側（公共事業省情報処理図化センター）への質問及び回答（概要）

	質　問　事　項	インドネシア側からの回答
1	運営費(ﾛｰｶﾙｺｽﾄ)の支出実績	・年次報告書に記載されているとおり。 （付属資料３(5)に抜粋を掲載） ・予算と支出実績は一致しているので予算額を支出額として扱う
	特に衛星データー購入のための支出実績	・付属資料３(4)参照
2	今後の予算見込み （要請中、計画中を含めて）	・付属資料３(5)参照 (1993年度予算まで、その後は未確定)
3	機材（主としてコンピューター）の維持管理のための保守契約の実施計画	・1993年度において40万Rpの予算を確保。現在保守契約の手続き中。
4	政府予算以外の収入	・外部からの業務受託に際して経費として予算以外の収入あり（付属資料３(6)参照）
5	後継者の育成計画	・1993年度に72名を対象とした研修の計画あり（付属資料３(7)参照）
6	今後の組織改革計画	計画案あり（付属資料３(8)参照）。但し、この計画案は最終案でなく、改正及び実施時期は未定。
7	本プロジェクトの効果をどう考えているか	・インドネシア側のポジションペーパー （付属資料３(3)参照）
8	プロジェクト活動（４項目）のインドネシア側の評価	

付属資料３：終了時評価調査での収集資料リスト

（プロジェクトより提供されたもの）

（１）年次報告書(Anual Report Ⅳ)（91.4.～92.3.31）（分量大のため本報告書には略す）

（２）プロジェクト活動実績表

（インドネシア側より提供されたもの）

（３）インドネシア側ポジションペーパー

（４）衛星データー購入のための予算(88年度～93年度)

（５）運営費支出実績(92年度まで)と予算配置(93年度)（(1)からの抜粋）

（６）政府予算以外の収入実績（業務受託）

（７）中堅技術者の今後の研修計画

（８）情報処理図化センター組織改正案

(日本人専門家より提供されたもの)

（９）ガイドラインの概念とその策定

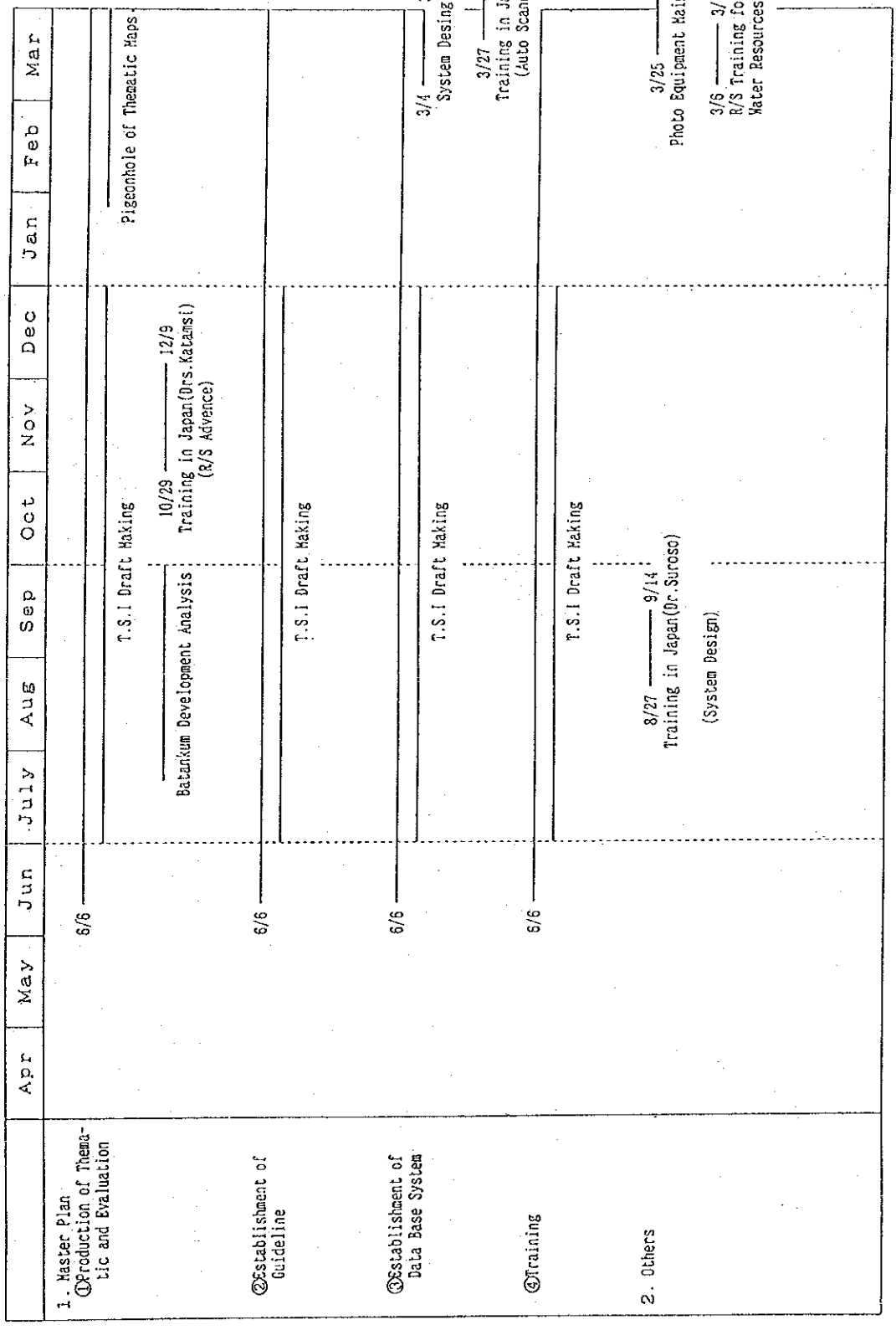
(10) 業務受託実績（主題図、評価図の作成）（(1)からの抜粋）

(11) プロジェクト関係者の成果発表実績

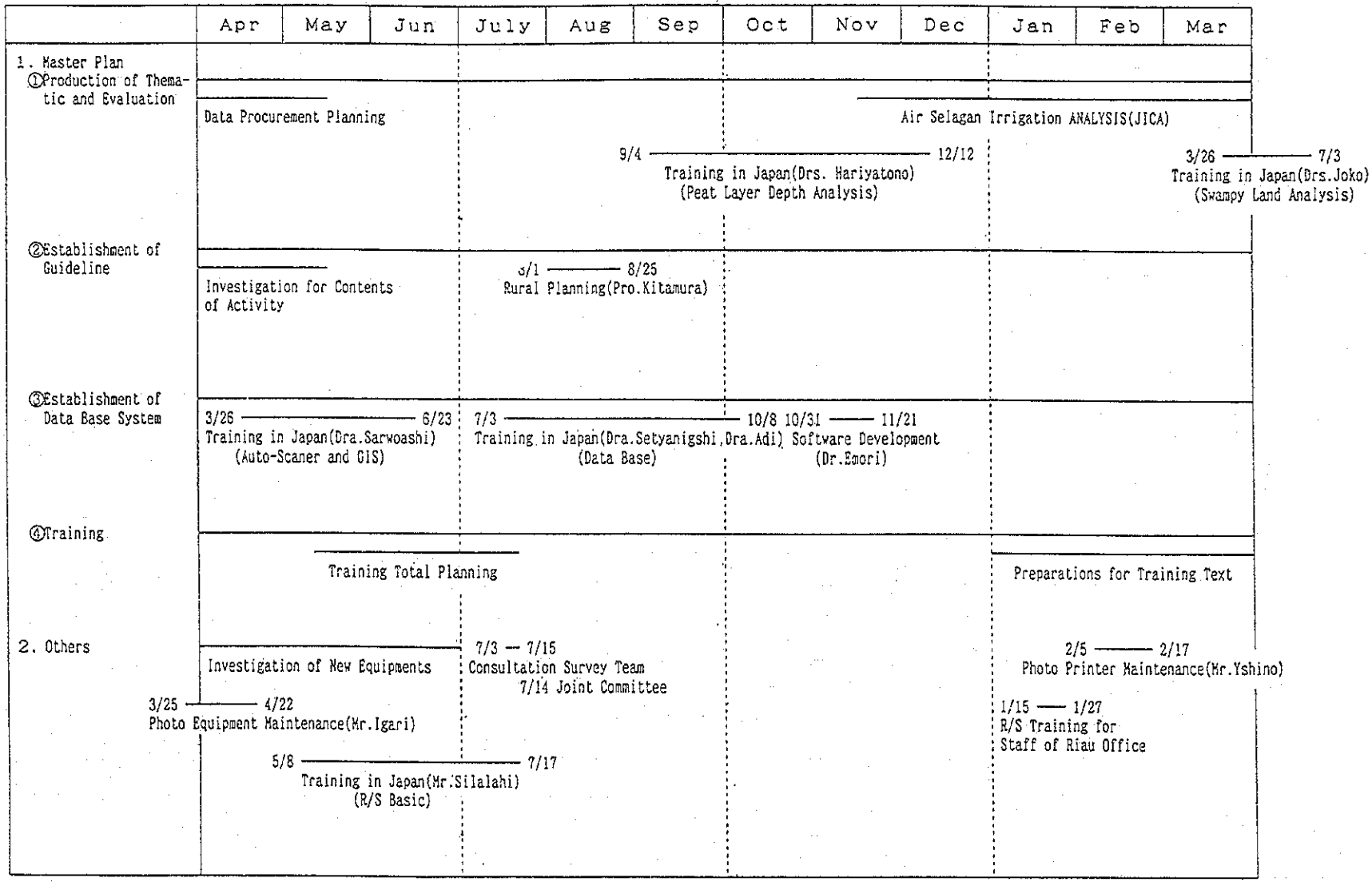
(12) カウンターパートへ移転された技術一覧（英）

(13)日本人専門家の作成した報告書一覧

(2) プロジェクト活動実績表



Results of 89/90 fiscal year



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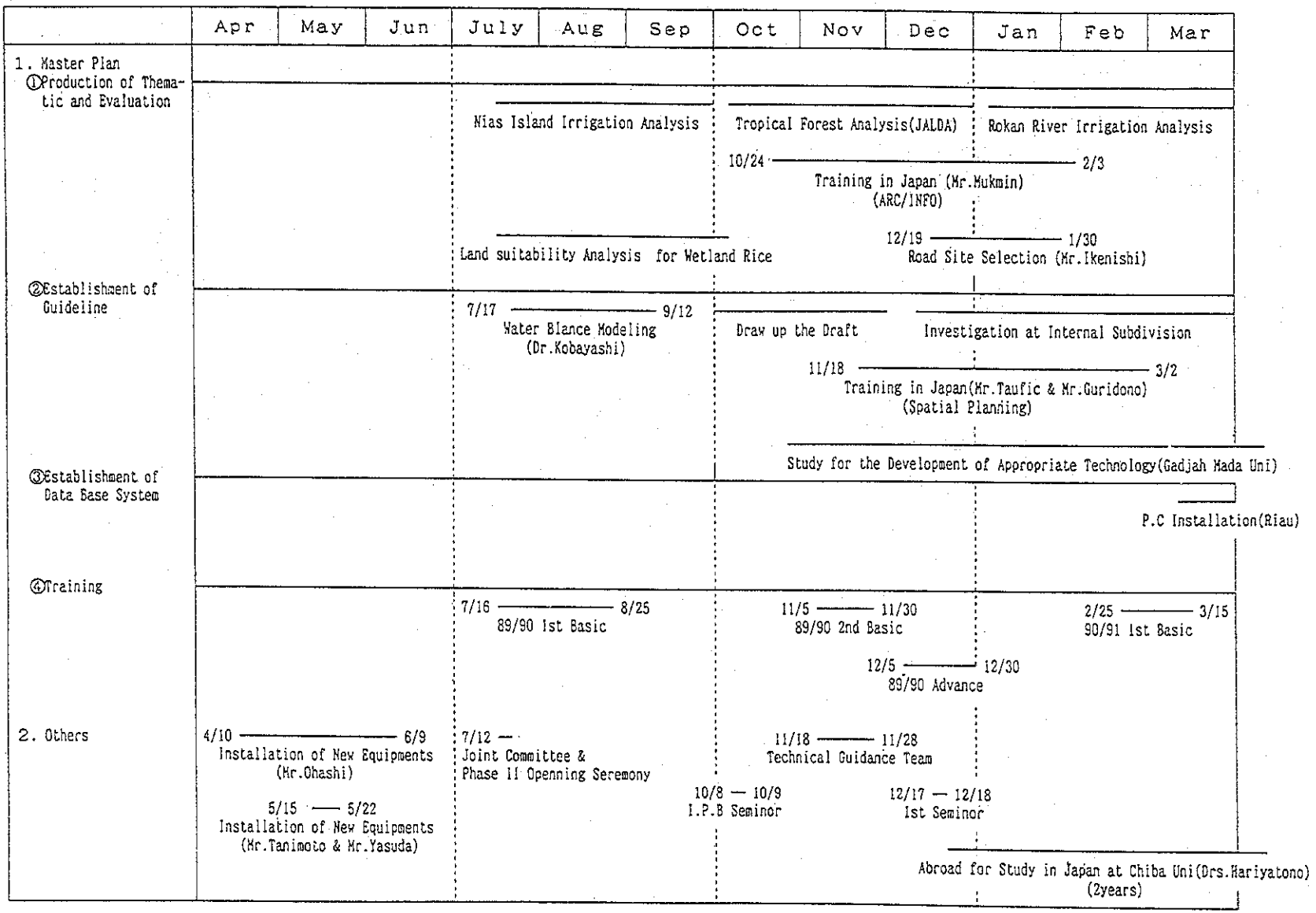
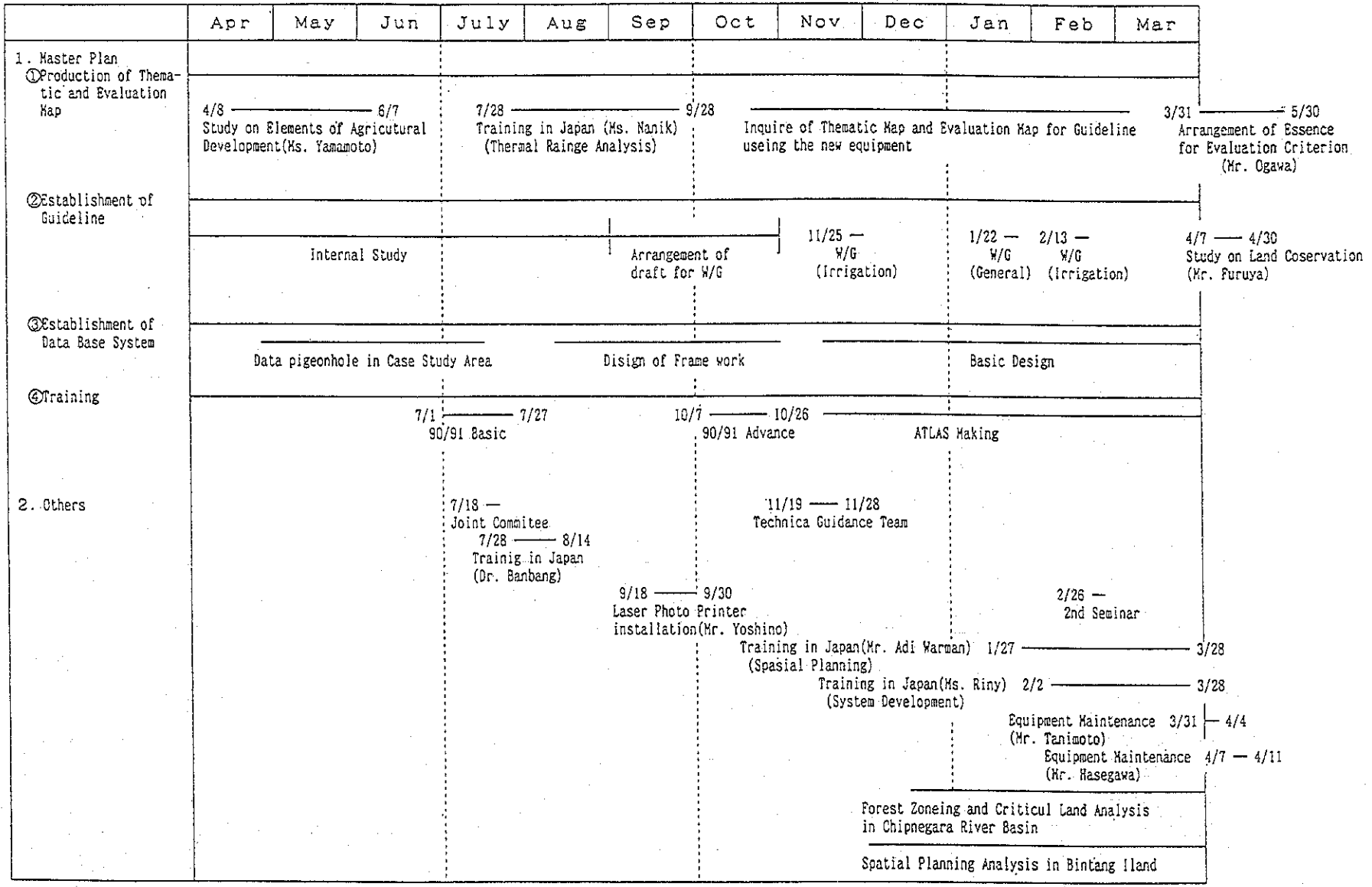
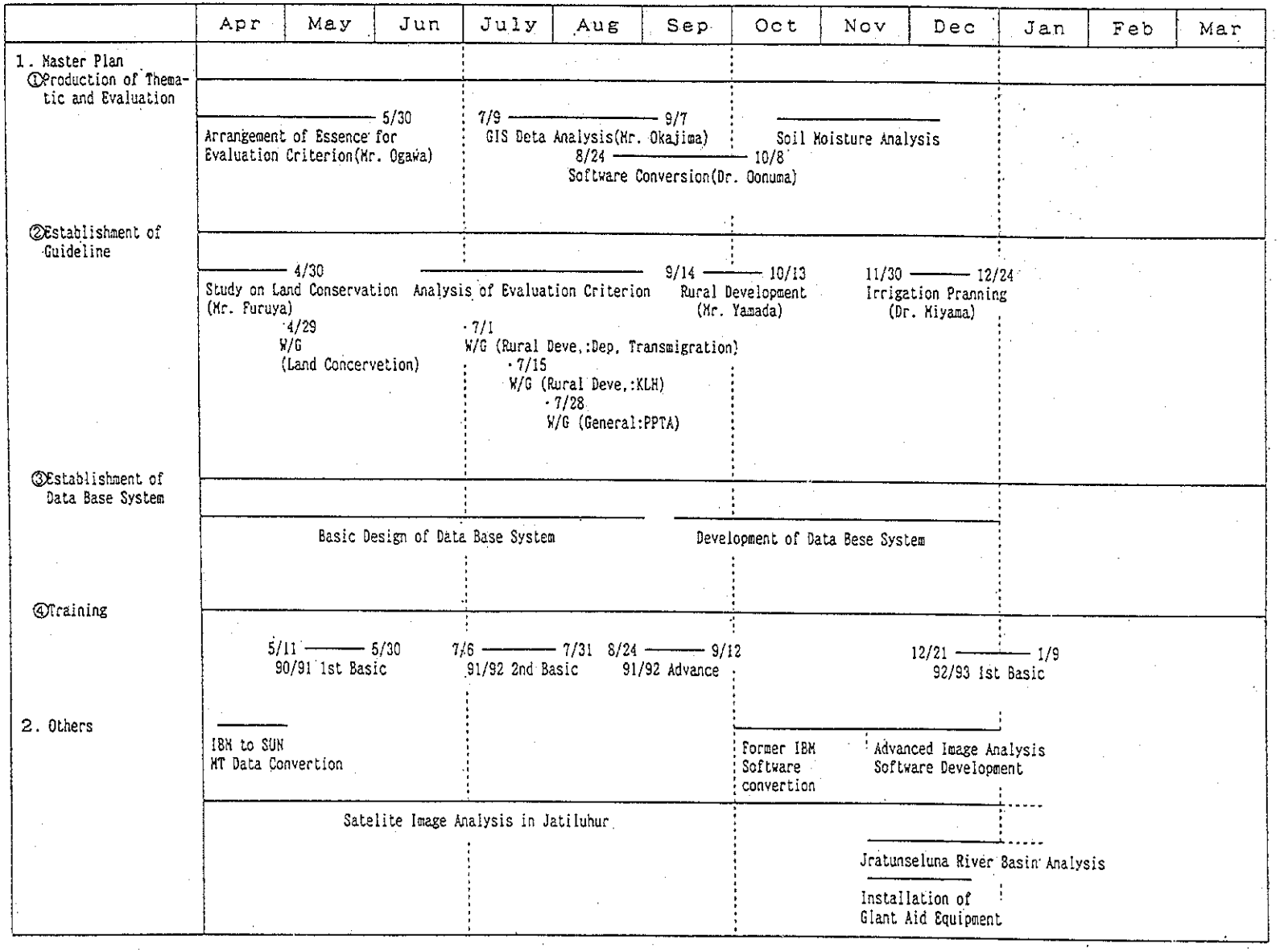


Results of 91/92 fiscal year



Results of 92/93 fiscal year



（3）インドネシア側ポジションペーパー

POSITION PAPER

THE REMOTE SENSING ENGGINEERING PHASE II FOR THE DEVELOPMENT OF AGRICULTURAL INFRASTRUCTURE IN THE REPUBLIC OF INDONESIA

JANUARI, 1993

I. DEVELOPMENT PATTERN AND ACHIEVEMENTS

Principles of National Development.

1. Since 1969, Indonesia has embarked upon a nation development and modernization programme aimed at gradually raising the living standard of people, through equal distribution of property and opportunities, and eventually sheering in a period of self-reliance and self-sufficiently.
   The whole national development plan (First 25 year Long Term Development Plan/PJPT-I) is structured on namely : "the Three Basic Principles of Development" (Trilogi Pembangunan), as follows :

   a. Equal distribution of development activities and their results, for the creation of social justice for the entire people.

   b. A sufficiently higher rate of economic growth.

   c. Sound and dynamic national stability.

2. In order to ensure successful achievements of PJPT-I, which implementing, a series of five year development plans, known as "REPELITA", each REPELITA is focused on specific objectives, as follows :

   2.1. REPELITA I (1969/1970 - 1973/1974) :

   places emphasis on rehabilitation of the agriculture sector, including industries that support it.

2.2. REPELITA II (1974/1975 - 1978/1979) :

the emphases was still on the agricultural sector. but the Government also encourage the convertion of agricultural raw material into industrial raw material.

2.3. REPELITA III (1979/1980 - 1983/1984) :

the emphasis was still on the agricultural sector. but the industries were encouraged to convert their raw materials into finished product.

2.4. REPELITA IV (1984/1985 - 1988/1989) :
concentration still on agriculture sector. while at the same time due attention is given to upgrading the industrial sector begin producing industrial machineries: the manufacturing capacity of industries is being developed.

2.5. REPELITA V (1989/1990 - 1993/1994) :
Emphasis on building up the country's industrial strength based on a strong agro-industry economy.

II. SUSTAINABLE DEVELOPMENT CONCEPT

The National Strategy Development Program was established to ensure the following principles :

1. Economic development must also be undertaken in a sustainable manner. The management of natural resources must therefore be taken into account the principles of ecological balance. Natural resources and the environment must be managed so as to make the greatest possible contribution to current development and the prosperity of the population as well as to

provide continuous benefits for future generations.

2. All resources, particularly natural resources which are required for national development, should be exploited efficiently, taking special care to maintain the environmental and sosio-cultural equilibrium.

3. Long-term spatial planning and management should be undertaken to achieve optimum utilization of resources.

III. THE MINISTRY OF PUBLIC WORKS FUNCTIONS.

1. The main duties of the Ministry are to carry out the general task of governmental administration and office management. While technically it is to develop infrastructures to support other development sectors. In fulfilling its function and enhancing its role in the national development, the general policy of the Ministry of Public Works is tangibly geared internally, for the realization of the following tasks :

   1. Regulating task (Pengaturan) in the framework of institutional development, manpower planning, producing judiciary and legal products, and other relevant information services.

   2. Securing task in the guidance, control and management (Pembinaan & Pengawasan) of all activities with particularly on the audit and managerial built-in control system.

   3. Realization task in executing physical accomplishments of development projects (Pembagunan), both in respect of quality as well

as quantity. It refers also to all aspects concerning the pre and post-construction stages of projects.

2. To complement the formal task in providing infrastructure, the Ministry of Public Works (MPW) has an organization consist of :
Secretariat General and a core of staff of Special Assistants to Minister, an Inspectorate General; three Directorate General, respectively for Water Resources Development (Pengairan), Highway's (Bina Marga) and Human Settlements (Cipta Karya) and an Agency for Research and Development (BALITBANG).
The MPW is represented in the province by Regional Offices (KANWILL).

3. The Development Plan of the MPW is more directed to support others strategic Development sectors :

a. Agriculture
b. Transmigration
c. Industry
d. Energy
e. Communication
f. Health
g. Social Welfare
h. Natural Resources and Development

4. Each of Directorate General has own basic policy for Development Plan :

4.1. Directorate General of Water Resources :

a. to support the increase of food production by virtue of rehabilitation and construction of irrigation facilities improvement of irrigation water use, flood and erosion

protection of the intensive agriculture lands as well as debris control in desenly populated areas, and reclamation of swampy areas for agriculture purposes.

b. to support transmigration program and provide employment opportunities in the rural areas by implementing the program in conjunction with the construction of irrigation and drainage facilities.

c. to enchance the industrial development by construction of multipurpose project.

d. to support Public Health by means of providing raw water for drinking water supply, flushing and the like.

4.2. Directorate General of Highway :

a. to support transportation infrastructures for the distribution of agricultural and industrial products.

b. to support potential isolated villages with transportation infrastructures development program.

c. to support increasing demand in transportation and communication in urban area with various type of infrastructures.

4.3. Directorate General of Human Settlement :

a. to support the provision of basic infrastructure for human settlements in urban and rural areas.
b. to support the preparation of spatial developments plan, which provide the basis for sectoral development.

Result of Development within MPW shown on the figures 1-3.

IV. STATUS OF THE REMOTE SENSING ENGINEERING PHASE II PROJECT (RSE II - Project).

1. Objectives of the Project.

The RSE-Project Phase II is one of a series of the Remote Sensing Project for the Development of Agriculture Infrastructure, which in the first period (1980-1987), the aims of the project was establishment of the Remote Sensing method in the MPW, while in the second period (1989-1993) aims of the project is smooth promotion of the development of agricultural infrastructure methodology for development planning and monitoring.

To approach the objective of the Project, the following items will be done.

(1) Production of thematic maps and evaluation maps necessary for formulation of Agricultural Development Plans.
   1) Production of thematic maps.
   2) Development of a method for production of evaluation maps.

(2) Establishment of Guidelines for Development of Agricultural Infrastructure (in Collaboration to the Relevant Organizations).

1) Establishment of guidelines for formulation of rural development plans.

2) Establishment of guidelines for formulation of irrigation and drainage plans.

3) Production of farm land conservation maps in critical land.

(3) Establishment of Data Base System for Collection and Use of Agricultural Development Data and Information.

(4) Training

The training of officials from the regional data centers and relevant agencies in utilization of remote sensing techniques at the Center (PUSDATA).

2. Activity of the RSE II - Project.

During fourth and part of the fifth fiscal year, the following project achievement result, and transferred of technology was done.

(1) Production of Thematic maps and Evaluation maps.

(A) Developed the methodology of Seven (7) new thematic maps.

(B) Developed the evaluation map production system for vector type thematic data.

(C) Seven (7) technical reports are prepared by Japanese short term experts.

(D) Internal and external examples of methodology for evaluation map production (criterion) were collected.

(E) Recovered the capability of software production, which enables.

1) Recovery of the former important image processing and analysis function which were developed in Phase I.
2) Development of advance image analysis software for additional thematic map and/or evaluation map production.

(F) Applied transferred technology to various field by Indonesian counterparts, as the reply to the request from related organization.

(2) Establishment of Guideline

(A) Grasped the conventional land evaluation system and criteria applied in the related organization through Working Group activity.
(B) Analyzed the collected (internal and external) criteria, and refine the essence of them.
(C) Clarified an fundamental factor required as Guideline for production of thematic maps and/or evaluation maps.
(D) Set up one draft system for land capability map production applied "RePPProt" criteria.
(E) Confirmed the skeleton of Guideline.

(4) Establishment of Data Base System

(A) An effective data accumulation and retrieval system is designed.
(B) Collection of satellite data and existing maps
(C) Accumulation of thematic and/or evaluation map products.

(5) Training

(A) Four (4) times R/S & GIS Basic course
(total 8 times : 130 persons)
(B) Twice (2) R/S & GIS Advance course
(total 3 times : 36 persons)
(C) Preparation of Indonesian Satellite Scene

Collection (ATLAS)

(D) Three (3) Indonesian counterparts were trained in Japan.

(6) Seminar

(A) The second R/S & GIS seminar was held on 26. February 92.

3. Status of the RSE II-Project.

In the record of discussion mentioned that the RSE II-Project should finished the objective of the project. It is anticipated that in the period of project time (5 years) a manual of guideline and the database system will be completed.

Adjustment of the systems can accurate the implementation of the method in the period of application.

V. FUTURE TECHNICAL-COOPERATION.

1. Development Program in Second 25 Year Long Term Development Plan.

For the second 25 year development plan. (PJPT-II). infrastructural development will continue to support the other sectors. However, the needs for natural resources in the sector supported has changed substantially, both in quality and quantity due to progress of national development. The rapid development of industries, requires demand for raw water at a certain quality and a good spatial planning allocation. The provision to the increasing demand of sectors which support by infrastructures in the next 25 year will depend on the successfulness in conservation programs of natural resources and spatial planning in each region and Province.

In REPELITA VI (1994/1995 - 1998/1999), as the first 5 year development plan in PJPT-II is designated to become the are when the country is expected to have achieved a strong foundation which is a prerequisite for the nation as a whole to launch itself into persuit of a just and prosperous society.

2. The Role of Data and Information in PJPT-II

A data-base system and remote sensing system approach on integrated natural resources and man made sources has been implemented within MPW since 1980 by implementation of RSE-Project especially in infrastructure development plan and monitoring.
The environmental protection aspects, especially erosion and sedimentation, forest conservation are also considered in this model.
A good data bank system to record the natural resources and the result of development program in spatial approach is urgently needed to enchance the processing of data and its dissemination to the users.
A computer net working system for Remote Sensing and Geographic Information System (GIS) in the MPW is needed to support of the infrastructure development program.
(see figure 4)

3. Future request of Technical Cooperation.

3.1. Extension of RSE-II-Project.

Although, the guideline and data base system will be finished in the end of RSE-II Project (June, 1993), the MPW strongly request to extend of the RSE-II Project for one year due to following reasons :

(a) Production of thematic maps and Developments of a method for production of evaluation maps, there are no problems in the implementation of technology.

Anyhow for the continuation between RSE-Phase I Project and RSE-Phase II Project, it is needed to elaborate the function of ERDAS Software which already installed in RSE-II Project, and the function of Software was installed in RSE-I-Project.

Most of software, as well as moisture analysis, biomas analysis in RSE-I project, were based on the "PL/I-language" should be converted to "C-language" in RSE-II Project.

(b) Establishment of Guidelines in :

1) Rural development plans

A guideline for rural development plan is designed base on criteria of the Regional Physical Planning Programme for Transmigration (RePPProt). The basic concept of those criteria is based on the physical aspect of land as well as : ground water quality, potable water, innundated land, climate, dominant soil texture, depth of soil, soil drainage, nutrients, elevation, slope, soil drainage, nutrients, elevation, slope and fragmentation. Through the above criteria the land suitability is categories into 3 (three) main categories, those are suitable, unsuitable, and suitable for development with increase input such as conservation measures, bench terracing etc.

Moreover, the suitability itself is implemented for 4 (four) type of utilization, those are : Houselot, dryland

YEAR	MONTH	ACTIVITY	REMARKS
1993	FEBRUARY-APRIL	- Compiling of Method for Thematic Map Production - General Working Group Meeting	- 9 weeks examination of methology - 3 weeks preparation & implementation
	MAY-AUGST	- Detail investigation of the schener of land evaluation in the relevant organizations	- 2 weeks for discussion - 16 weeks for compiling
	SEP.-DEC.	- Compiling the method of evaluation maps - To examine all method of evaluation maps - Discribe evaluation map for irrigation and drainage - Case study	- Time duration required is 18 weeks
	JANUARY	Woskshope to discuss draft of iuideline	
	FEB-MAR	Revisa and Publish of the Guidelene	

arable, wetland arable, and Highland arable

2) Irrigation and drainage plans

To establish the guideline for irrigation and drainage plans have to be based on the fixed criteria, and already well recognized. Whitin the MPW there is not available yet the unified criteria to develop the irrigation and drainage. The technical unit, as well as Directorate of Irrigation, Bereau of Planning and DG. Waters itself still imolemented the different version.

Due to the above conditions, to formulate the guideline for irrigation and drainage on still.

In order to acquire the acceptability of the guideline being produced, needs to be compared and discussed the relevant with organization as well as, DG Water Ressources, DG. Human Settlement, DG Highway, Ministry Forestry (Transmigration), National Land Agency (BPN), Ministry of Poolation and Environment (KLH), and BAPPEDA (Board of Regional Planning and Programming).

The contents of guideline is sceheduled as follows :

Chapter I : General
Chapter II : Thematic Maps Production
Chapter III : Evaluation Map for Irrigation and Drainage
Chapter IV : Case Study

To implement the above programmed time schedule have been arranged as follows :

3) Farmland Conservation

A Guideline for farmland conservation is compiled based on the universal soil loss equation (USLE) approach and criteria of the Ministry of Forestry. The USLE is available to predict soil erosion, and it is applicable with high accuracy especially for a small plot of land (22 m x 2 m) with slope inclination is 9% or less.

To apply the USLE for larger area, the grid system have to be introduced to minimize error.

Furthermore, the criteria of the Ministry of Forestry, is base on 4 (four) main factors those an. Topographic, Slope, Drainage density, and Land Cover, respectively. Each factor was their own score value, and formulation is based on those score.

(c) Data base system

The data base system has two main target, those are date base in term of data retrieval as well as library of any information related to location of existing data file, and spatial data base which indicate the geographic position.

Those two terminology could be explained as follows :

Data Base as a library :

Within this sub-system will be stored information where and which instruction keep. Those data through this library it will much-more easier to find out the necessity data, rather than without such facility. In other words this data base will play as a clearing

house.

Data Base as a Spatial Data Base

This subsystem is directed to provide the information in relation with see geographic position. In other words "it will be visualized as map at a standard format in the digital manner. Therefore it is muchmore easier to applied for manypurpose.

3.2. The Geographic Information Center Project

The shifting of sectorals approach for the Development with focusing on the Physical Development in PJPT-II need to be assessed by considering the following items :

a. The technological advancement in engineering aspect (data base system and GIS)
b. The technical and administrative aspect, especially in the natural resources and spatial aspects.
c. The information net-working aspect among the agencies, either in central government and Provincial level.

PUSDATA of the MPW, request for the Geographic Information Center Project, aims to strengthen the technological advancement and development to support infrastructural development sectors.

Program/Case Study Area :

Two case study areas will be selected based on various aspects as well as the complexity, in term of space utilization, the decreasing of environmental quality, to avoid mis-management of land, and regional potential to develop to anticipate the future demand, toward the

industrialization era. The term of industry will not only concern to the factory but also to the other industrial sectors. such as agro-industry, tourism, agro-tourism, etc.
Besides, the lack of information in the eastern part of the country is a challenge to be completed. since the basic data/information is very urgent for supporting the regional planning and programming.

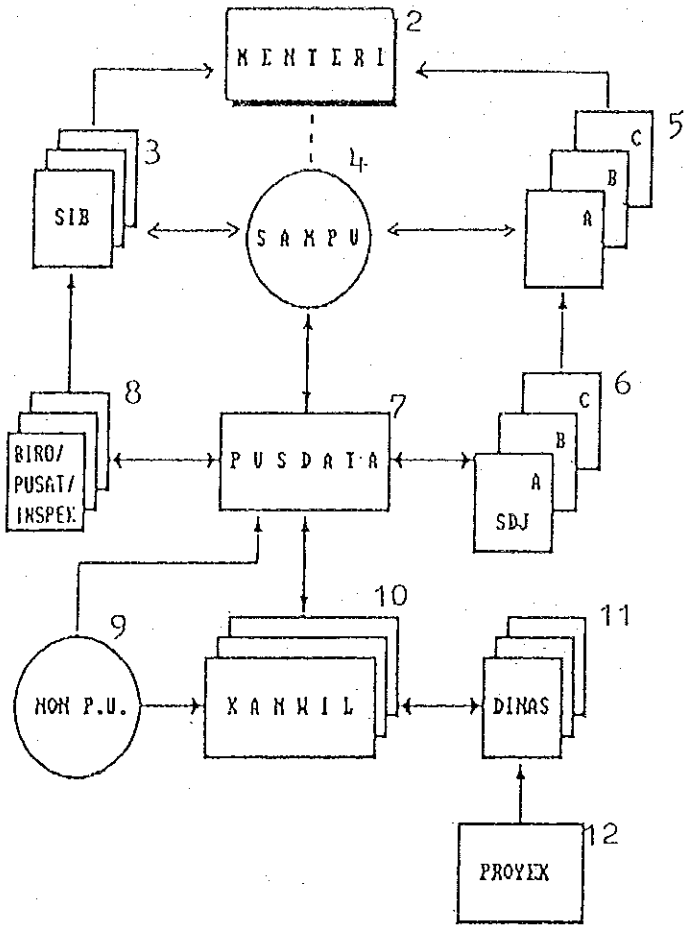
Those two case study areas are as follows :

1. Jawa :
   The Jawa island is selected as study area due to it's complexity of the land utilization. either for industry, agriculture settlement or other infrastructure. Population density in Jawa has an impact on various aspect of space utility. therefor it needs to be considered how to manage land/space not beyond the capability, to avoid the environmental hazard or decreasing the environmental quality.
   The environmental assessment will play an important role in the coming decade, in accordance with the industrial development.
   To provide the integrated information, as well as a representation of potential of a certain area intern of natural resources, the establishment of Geographic Information System seems to be very important.

2. Memberamo :
   The Memberamo area is located in the south eastern part of the Province of Irian Jaya. The southern part of this island is much more covered by low-land and swamp forest. Potentially, this once has image natural

resources, either remewable or unremewabel, and from the geographic position point of view, it's verv strategic for further development.
Along with the development policy of the Government of the Republic of Indonesia in the coming second phase Long Term Development Planning (PJPT-II).

ALUR INFORMASI 1



Note :

1). INFORMATION FLOW CHART
2). MINISTER
3). - SECRETARIATE GENERAL
    - INSPECTORATE GENERAL
    - DIRECTORATE GENERAL OF RESEARCH AND DEVELOPMENT

4). CORE OF STAFF ASSISSTANCE TO THE MINISTER
5). DIRECTORATE GENERAL OF :
    (A) : WATER RESOURCES DEVELOPMENT
    (B) : HIGHWAYS
    (C) : HUMAN SETTLEMENT

6) SECRETARITATE TO THE DIRECTORATE GENERAL OF
    (A) : WATER RESOURCES DEVELOPMENT
    (B) : HIGHWAYS
    (C) : HUMAN SETTLEMENT

7). CENTER FOR DATA PROCESSING AND MAPPING
8). BUREAU / CENTERS / INSPECTORATE
9). NON - PUBLIC WORKS
10). PROVINCIAL OFFICE OF PUBLIC WORKS
11). PROVINCIAL OFFICE OF PUBLIC WORKS (UNDER THE GOVERNOR)
12). PROJECTS

TABEL REALISASI FISIK PROGRAM PENGAIRAN, DEPARTEMEN PEKERJAAN UMUM, DALAM PJPT I

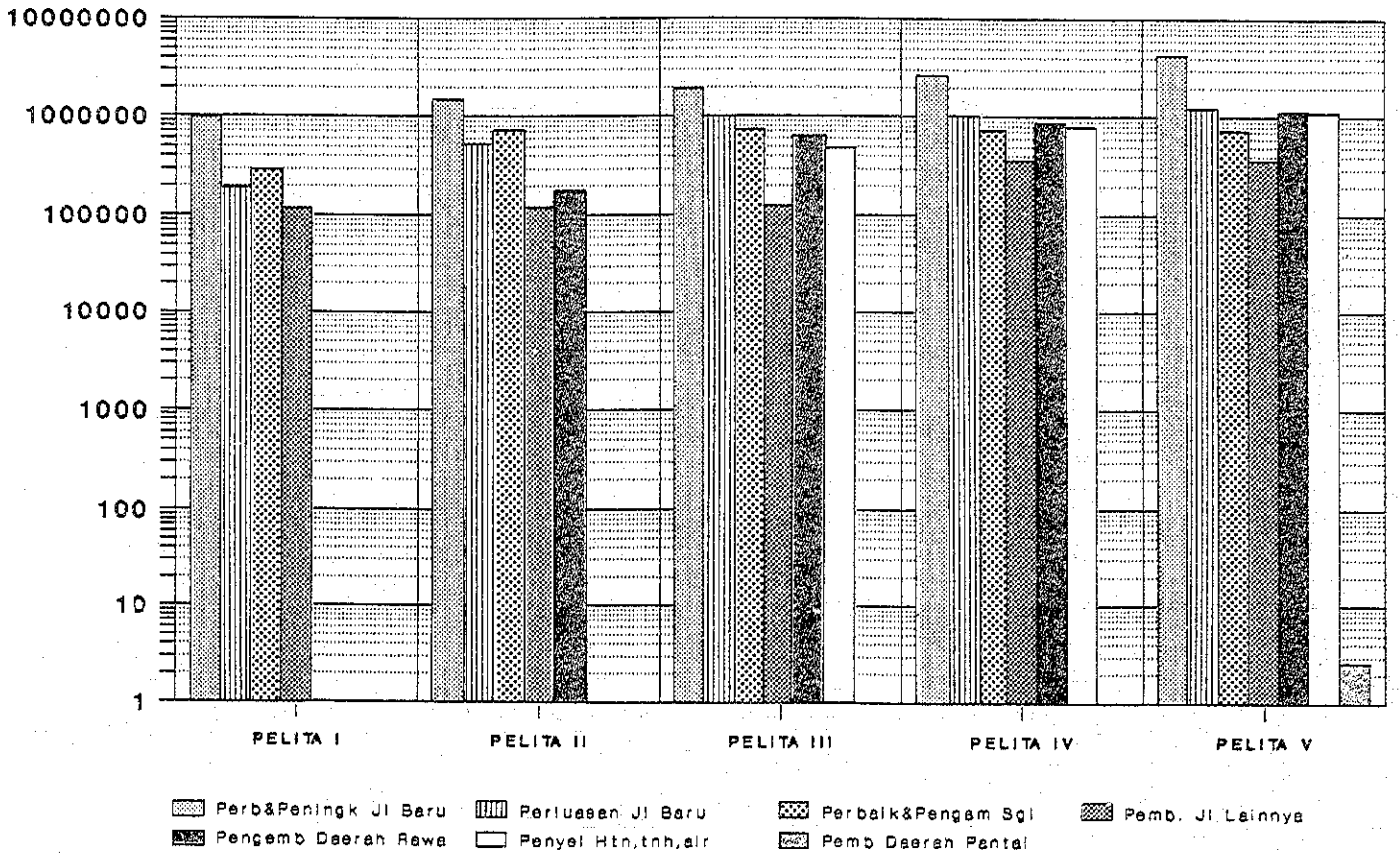
PELITA	SEKTOR PERTANIAN DAN PENGAIRAN					SEKTOR SUMBER ALAM DAN LINGKUNGAN HIDUP	
	SUB SEKTOR PENGAIRAN					SUB SEKTOR SUMBER ALAM DAN LINGKUNGAN HIDUP	
	PROGRAM					PROGRAM	
	Perbaikan dan Pemeliharaan Jaringan Irigasi Baru (Ha)	Pembangunan Jaringan Irigasi Baru (Ha)	Perbaikan dan Pengamanan Sungai (Km)	Pembangunan Jaringan Irigasi Lainnya (Ha)	Pengembangan Daerah Rawa (Ha)	Penyelamatan Hutan, Tanah dan Air (Ha)	Pembinaan Daerah Pantai (Km)
PELITA I	936.073	191.246	289.068	118.797	–	–	–
PELITA II	527.840	325.942	434.523	–	179.202	–	–
PELITA III	394.651	437.271	–	–	456.189	487.100	–
PELITA IV	401.370	–	–	–	171.971	442.900	–
PELITA V *)	5.770.824	96.478	–	–	135.144	321.508	2,6

Keterangan: *) Sampai tahun ketiga Repelita V

PELITA	SEKTOR PERTANIAN DAN PENGAIRAN					SEKTOR SUMBER ALAM DAN LINGKUNGAN HIDUP	
	SUB SEKTOR PENGAIRAN					SUB SEKTOR SUMBER ALAM DAN LINGKUNGAN HIDUP	
	PROGRAM					PROGRAM	
	Perbaikan dan Pemeliharaan Jaringan Irigasi Baru (Ha)	Pembangunan Jaringan Irigasi Baru (Ha)	Perbaikan dan Pengamanan Sungai (Km)	Pembangunan Jaringan Irigasi Lainnya (Ha)	Pengembangan Daerah Rawa (Ha)	Penyelamatan Hutan, Tanah dan Air (Ha)	Pembinaan Daerah Pantai (Km)
PELITA I	936.073	191.246	289.068	118.797	–	–	–
PELITA II	1.463.913	517.188	723.591	118.797	179.202	–	–
PELITA III	1.858.564	954.459	723.591	118.797	635.391	487.100	–
PELITA IV	2.259.934	954.459	723.591	118.797	807.362	930.000	–
PELITA V *)	8.030.758	1.050.937	723.591	118.797	942.506	1.251.508	2,6

Keterangan: Data Kumulatif s.d. PELITA V Tahun III

GRAFIK REALISASI FISIK PROGRAM PENGAIRAN DEPARTEMEN PEKERJAAN UMUM DALAM PJPT I



DATA KUMULATIF
S.D. PELITA V TAHUN III

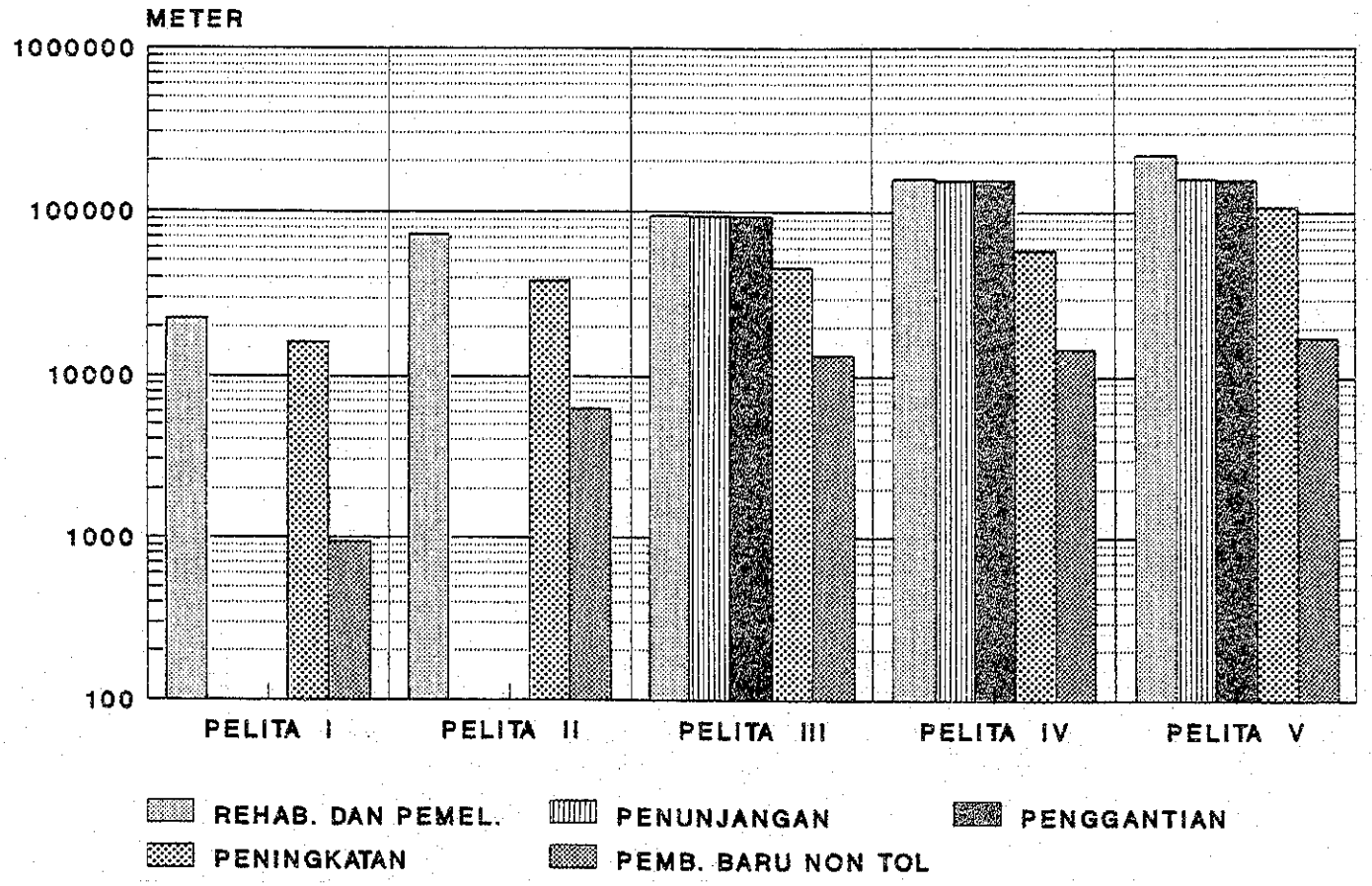
TABEL REALISASI FISIK PROGRAM BINA MARGA, DEPARTEMEN PEKERJAAN UMUM, DALAM PJPT I

PELITA	SEKTOR PERHUBUNGAN DAN PARIWISATA									
	SUB SEKTOR PRASARANA JALAN									
	PROGRAM									
	Rehabilitasi & Pemeliharaan Jalan dan Jembatan		Penunjangan Jalan dan Jembatan		Penggantian Jembatan	Peningkatan Jalan dan Jembatan		Pembangunan Baru Non Tol		Jalan Tol
	Jalan (KM)	Jembatan (M)	Jalan (KM)	Jembatan (M)	(M)	Jalan (KM)	Jembatan (M)	Jalan Non (KM)	Jembatan (M)	(KM)
PELITA I	99.207	21.629				3.765	15563	229	919	
PELITA II	57.092	49.448				4.494	21973	718	5184	
PELITA III	31.971	21.916	90.547	93.675	32.727	10.707	7583	1384	6868	
PELITA IV	94.229	61.431	62.033	59.836	36.059	15.830	11751	1023	1514	224
PELITA V *)	125.151	64.727				23.653	47.150	982	2.735	176
– TAHUN I	43418	19300				5778	10130	111	285	57
– TAHUN II	41097	17800				8461	17210	384	2216	119
– TAHUN III	40636	27627				9414	19810	487	234	0

PELITA	SEKTOR PERHUBUNGAN DAN PARIWISATA									
	SUB SEKTOR PRASARANA JALAN									
	PROGRAM									
	Rehabilitasi & Pemeliharaan Jalan dan Jembatan		Penunjangan Jalan dan Jembatan		Penggantian Jembatan	Peningkatan Jalan dan Jembatan		Pembangunan Baru Non Tol		Jalan Tol
	Jalan (KM)	Jembatan (M)	Jalan (KM)	Jembatan (M)	(M)	Jalan (KM)	Jembatan (M)	Jalan Non (KM)	Jembatan (M)	(KM)
PELITA I	99207	21629				3765	15563	229	919	
PELITA II	156299	71077				8259	37536	947	6103	
PELITA III	188270	92993	90547	93675	32727	18966	45119	2331	12971	
PELITA IV	282499	154424	152580	153511	68786	34796	56870	3354	14485	224
PELITA V *)	407650	219151	152580	153511	68786	58449	104020	4336	17220	400

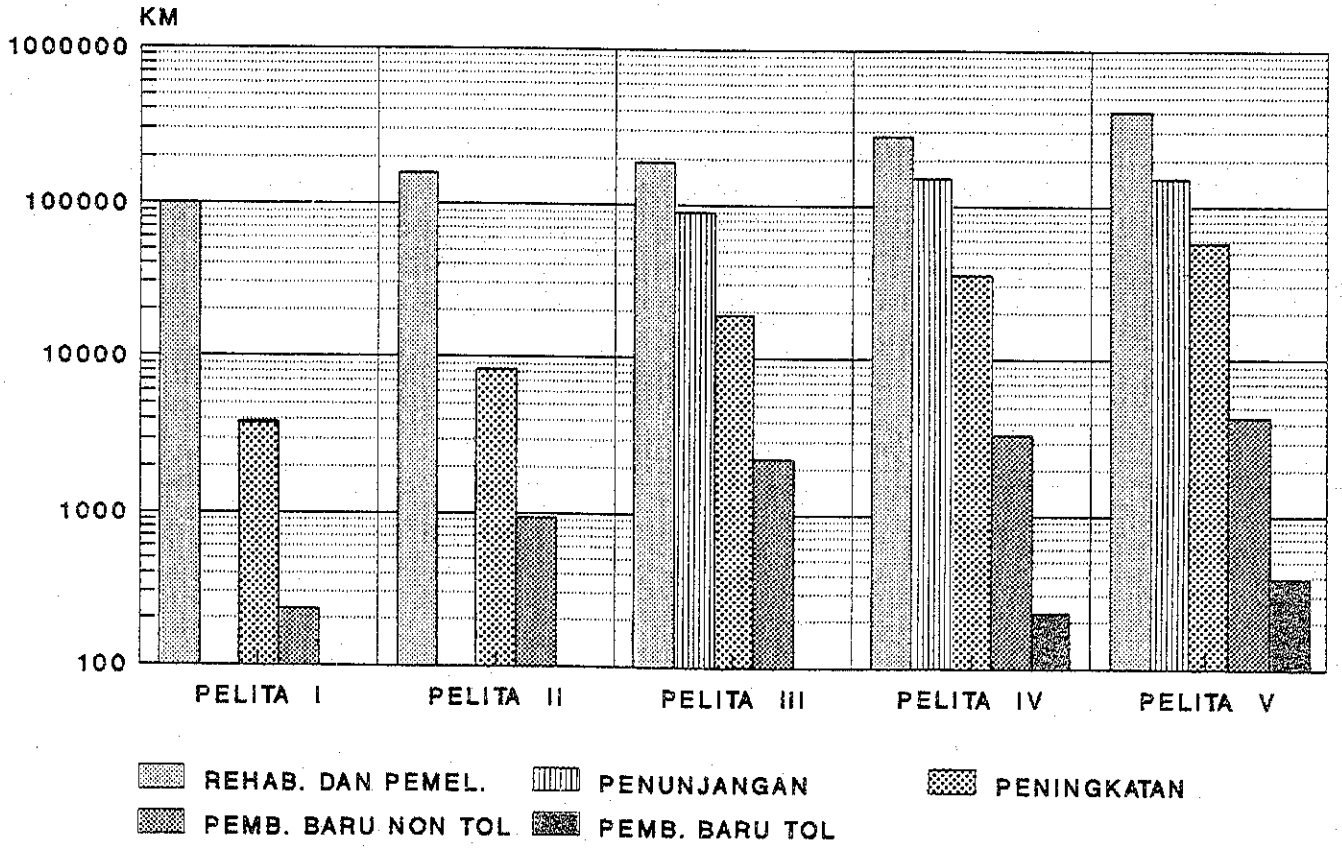
Keterangan: *) Sampai tahun ketiga Repelita V

REALISASI FISIK PROGRAM BINA MARGA UNTUK JEMBATAN, DEP. PU SELAMA PJPT I



DATA KUMULATIF
S.D PELITA V TAHUN III

REALISASI FISIK PROGRAM BINA MARGA UNTUK JALAN, DEP. PU SELAMA PJPT I



DATA KUMULATIF
S.D. PELITA V TAHUN III

TABEL REALISASI FISIK PROGRAM CIPTA KARYA, DEPARTEMEN PEKERJAAN UMUM, DALAM PJPT I

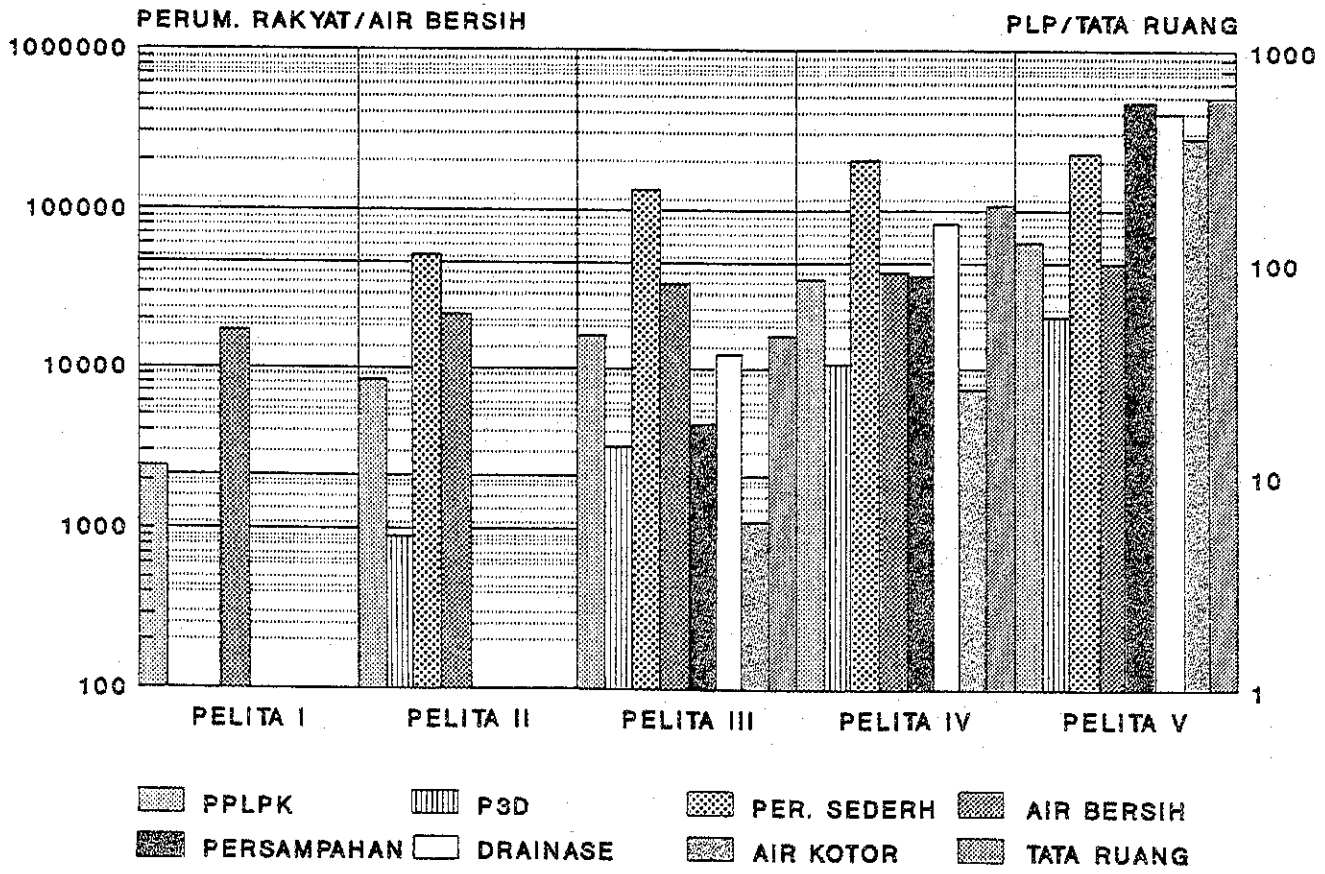
PELITA	SEKTOR PERUMAHAN RAKYAT DAN PEMUKIMAN							SEKTOR PEMBANGUNAN DAERAH, DESA & KOTA
	SUB SEKTOR PERUMAHAN RAKYAT DAN PEMUKIMAN							SUB SEKTOR PEMBANGUNAN DAERAH, DESA & KOTA
	P R O G R A M							P R O G R A M
	PERUMAHAN RAKYAT			AIR BERSIH (Liter/Detik)	PENYEHATAN LINGKUNGAN PEMUKIMAN			TATA RUANG NAS/PROP/KOTA (Naskah)
	PPLK (HA)	P3D (Desa)	PERUMNAS (Unit)		PERSAMPAHAN (Kota)	DRAINASE (Kota)	AIR KOTOR (Kota)	
PELITA I	2.400	0	0	17.129	0	0	0	0
PELITA II	6.160	900	50.670	5.090	0	0	0	0
PELITA III	7.480	2.320	81.323	11.576	17	38	6	45
PELITA IV	19.597	7.286	69.581	6.535	69	120	19	142
PELITA V *)	28.132	10.507	25.539	6.824	480	361	363	391

Keterangan: *) Sampai tahun ketiga Repelita V

PELITA	SEKTOR PERUMAHAN RAKYAT DAN PEMUKIMAN							SEKTOR PEMBANGUNAN DAERAH, DESA & KOTA
	SUB SEKTOR PERUMAHAN RAKYAT DAN PEMUKIMAN							SUB SEKTOR PEMBANGUNAN DAERAH, DESA & KOTA
	P R O G R A M							P R O G R A M
	PERUMAHAN RAKYAT			AIR BERSIH (Liter/Detik)	PENYEHATAN LINGKUNGAN PEMUKIMAN			TATA RUANG NAS/PROP/KOTA (Naskah)
	PPLK (HA)	P3D (Desa)	PERUMNAS (Unit)		PERSAMPAHAN (Kota)	DRAINASE (Kota)	AIR KOTOR (Kota)	
PELITA I	2.400	0	0	17.129	0	0	0	0
PELITA II	8.560	900	50.670	22.219	0	0	0	0
PELITA III	16.040	3.220	131.993	33.795	17	38	6	45
PELITA IV	35.637	10.506	201.574	40.330	86	158	25	187
PELITA V *)	63.769	21.013	227.113	47.154	566	519	388	578

Keterangan: Data Kumulatif s.d. PELITA V Tahun III

REALISASI FISIK BIDANG CIPTA KARYA DEPARTEMEN PEKERJAAN UMUM DALAM PJPT I



DATA KUMULATIF
PELITA V* : S.D TAHUN KE III

（4）衛星データー購入のための予算(88年度～93年度)

BUDGET ALLOCATION FOR SATELITE DATA

NO.	FISCAL YEAR	TYPE DATA	TOTAL SCENE	TOTAL BUDGET (RP 1,000.-)
1.	1988/1989	LANDSAT MSS	30	21,000
2.	1989/1990	LANDSAT MSS	20	14,000
		SPOT	2	20,000
3.	1990/1991	LANDSAT TM	4	36,000
4.	1991/1992	LANDSAT TM	4	36,000
5.	1992/1993	LANDSAT TM	6	60,000
6.	1993/1994	LANDSAT TM	6	60,000

BUDGET ALLOCATION

NO. / ITEM	BUDGET YEAR 1988/1989	1989/1990	1990/1991	1991/1992	1992/1993	TOTAL
	Indonesia Side					in Rp. 1.000,-
1 Building	-	-	-	-	-	-
2 Material Consumption	21,280	21,286	24,996	25,411	53,864	146,837
3 Operation	188,000	189,364	117,360	218,266	206,523.9	919,513.9
4 Commision	5,000	9,000	76,799	10,000	36,000	136,799
5 Salary	PM	PM	PM	PM	PM	PM
T O T A L	214,280	219,650	219,155	253,677	296,387.9	1,203,149.9

（注） 1） 1991/1992 までは支出実績、1992/1993 は予算である。

2） 2. Material Consumption は紙、写真用資材等の消耗品購入費

3. Operation は、機材の修理やスペアーパーツ購入等のメインテナンスのための運営費（短期の発注・契約で対応するもの）

4. Commision は、外部へ委託する必要経費（長期契約で対応するもの）

（情報処理図化センターリモートセンシング課長からのヒアリング）

（6）政府予算以外の収入実績（業務受託）

4. Income thourgh the activities excluding Government Budget

1991/1992	1992/1993	1993/1994
122,816	171,000	305.000

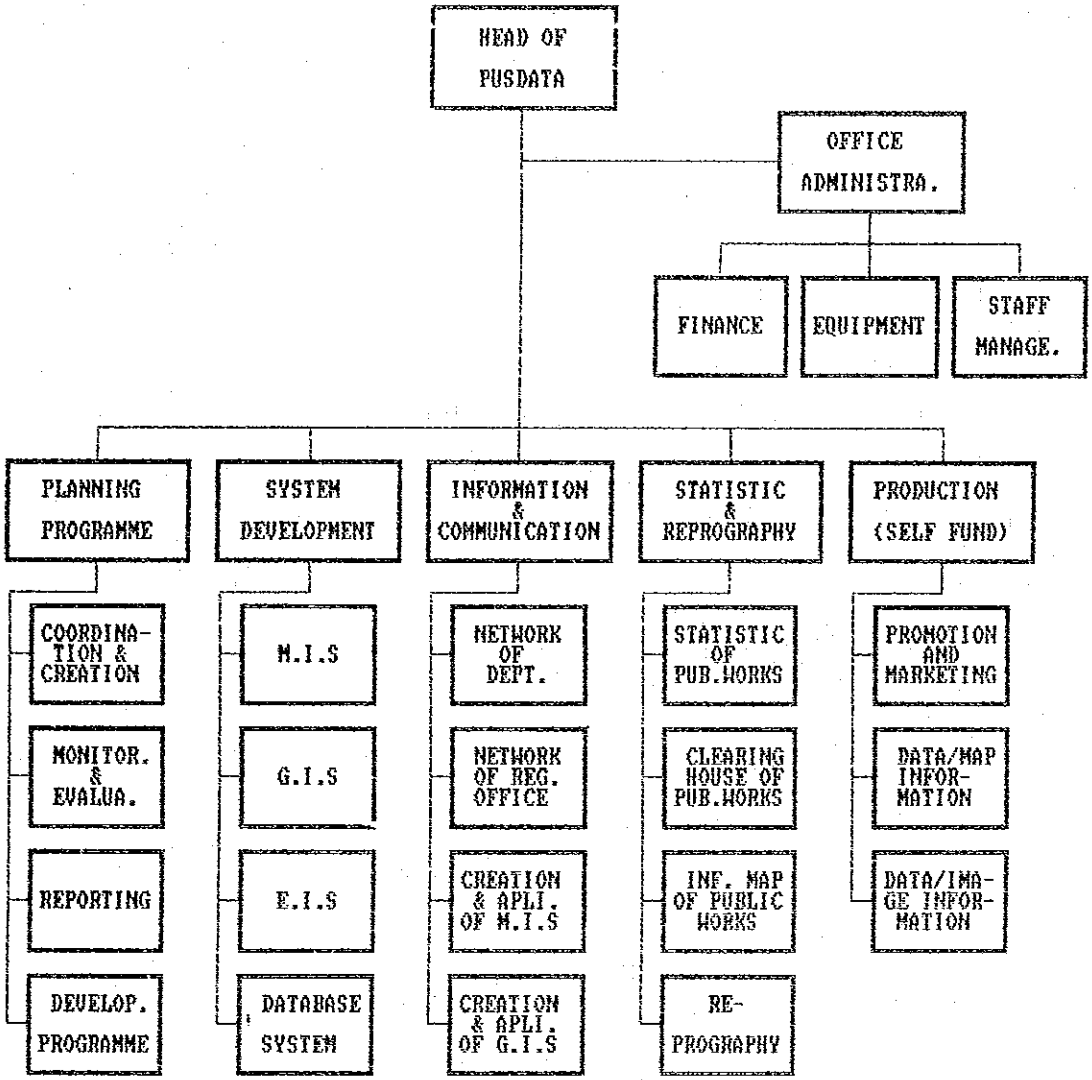
（7）中堅技術者の今後の研修計画

5. Plan of bleeding late comer

1. Middle level training course

YEAR	LEVEL	PARTICIPANT
1993/1994	BASIC I	12 Participants from : - Req. office (4) - DG. (4) - Others (4)
	BASIC II	12 Participants from : - Req. office (4) - DG. (4) - Others (4)
	ADVANCE I	12 Participants
	BASIC III	-- ditto --
	BASIC IV	-- ditto --
	ADVANCE II	-- ditto --

（8）情報処理図化センター組織改正案



（9）ガイドラインの概念と策定

（注：評価調査当初に日本人専門家より提示されたもの。日本人専門家案であり今後、インドネシア側（関係機関）と協議して改訂・整理されるものであり、最終版ではない。）

I　目的と役割

ガイドライン策定の目的とするところは、プロジェクトの目的である「農業開発計画におけるリモートセンシング技術の実効的活用促進」を円滑に実現する事にある。具体的にその役割を定義すると以下のようになる。

「農業開発関連事業実施部局ニーズに沿った、実用に供し得る主題図・評価図の仕様を規定し、ＰＵＳＤＡＴＡ（公共事業省情報処理図化センター）からの主題図・評価図の提供を円滑に進めると同時に、これにより、リモートセンシング技術の農業開発関連事業における利活用の定着を図ること。」

注）主題図：土地被覆、標高、傾斜、土壌などある特定の土地の特性（主題）を地図化したもの。

評価図：複数の主題図を組み合わせて、総合的な土地の特性を評価し、地図化したもの。作物生産可能図、移住事業適地図、かんがい事業適地図など。

II　背　景

公共事業省のかんがい事業計画においては、必ず対象地域の土地の特性評価(Land Evaluation)を行う事になっており、その土地評価の実施法に関しては“Guideline for Land Evaluation for Water Resources Studies in Indonesia”（1984、公共事業省水資源総局制定）にその概要が記されている。こうした土地評価は、他の農業開発関連事業（例えば移住事業）などにおいてもかんがい計画同様に実施されている。

上記の本プロジェクトの目的は、こうした土地評価における情報の収集・解析を、リモートセンシング技術を用いて高度化する事により達せられるものと考えられる。しかしながら、こうした従来の土地評価は、特にリモートセンシング技術を意識したものではない事もあって、その適用にあたっては以下のような問題をかかえている。

(1) 土地評価体系が必ずしも、コンピュータ処理が可能な定量的な体系に整備されていない。（各評価要因を組み合わせて評価図を作成する際に必要な評価基準が規定されていない）

(2) 土地評価に必要な要因の中に現在のリモートセンシング技術からは得られない情報が少なくない。（土壌の化学性、土層深、気象条件など）

こうした問題は、ユーザーである計画担当者側からみると、「どんな情報がリモートセンシングから得られるのか解らないため、リモートセンシングを利用したくともできない、また、期待していたほど利用価値の高い情報が得られない」、また、情報を提供する側（ＰＵＳＤＡＴＡ）からみると、「評価基準が定量化されていないために、評価図のようなより高度な付加価値をもった情報を提供できない」といった事態を招いている。(図１)

本プロジェクトでは、ユーザ側の合意のもとに、定量的な評価基準をもつ土地評価体系を確立した上で、ＰＵＳＤＡＴＡが提供する情報（主題図、評価図）の仕様をガイドラインに明示する事により、円滑なリモートセンシング技術の定着促進を図っている。（図２）

図1　現状（ガイドライン策定前）

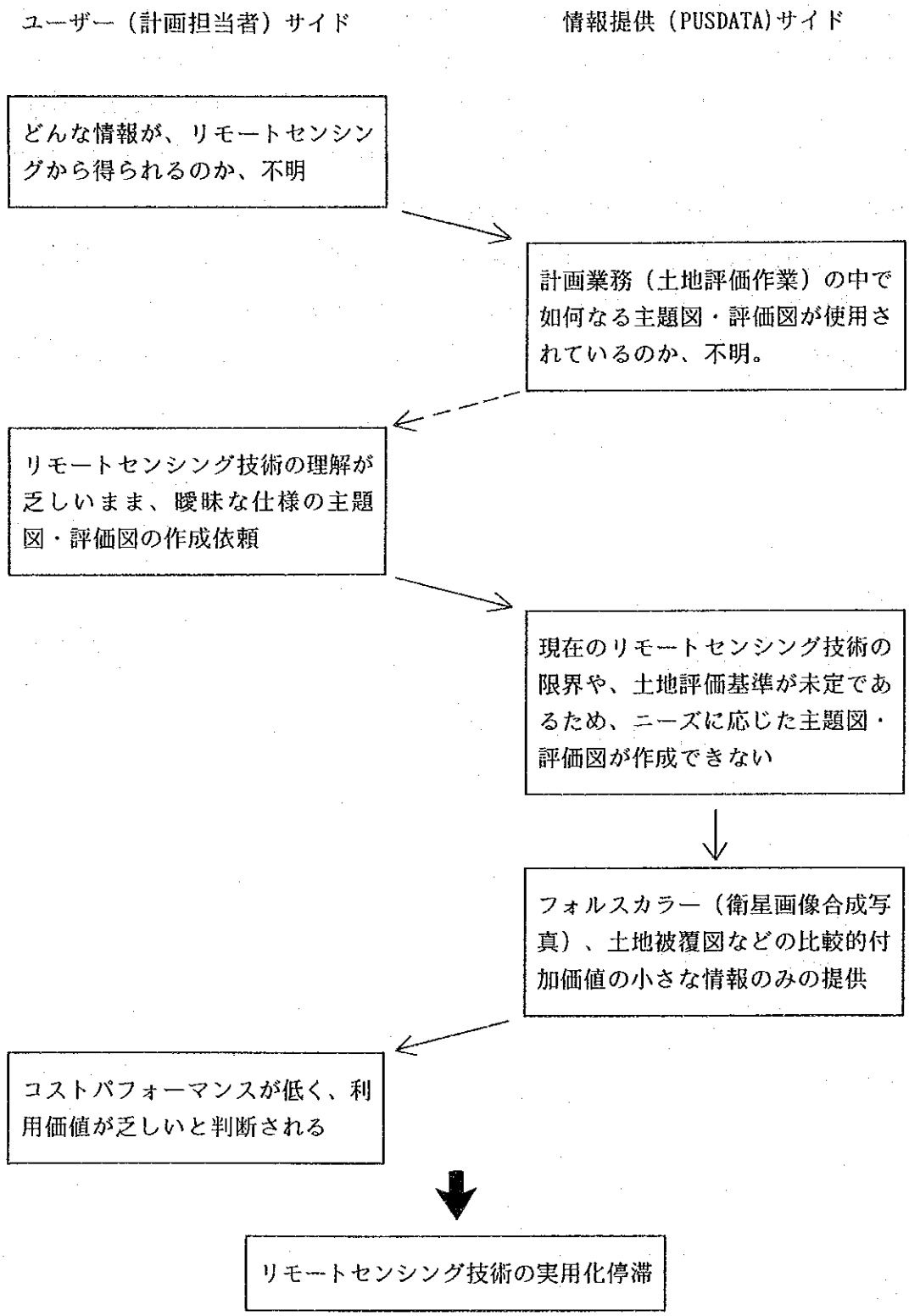
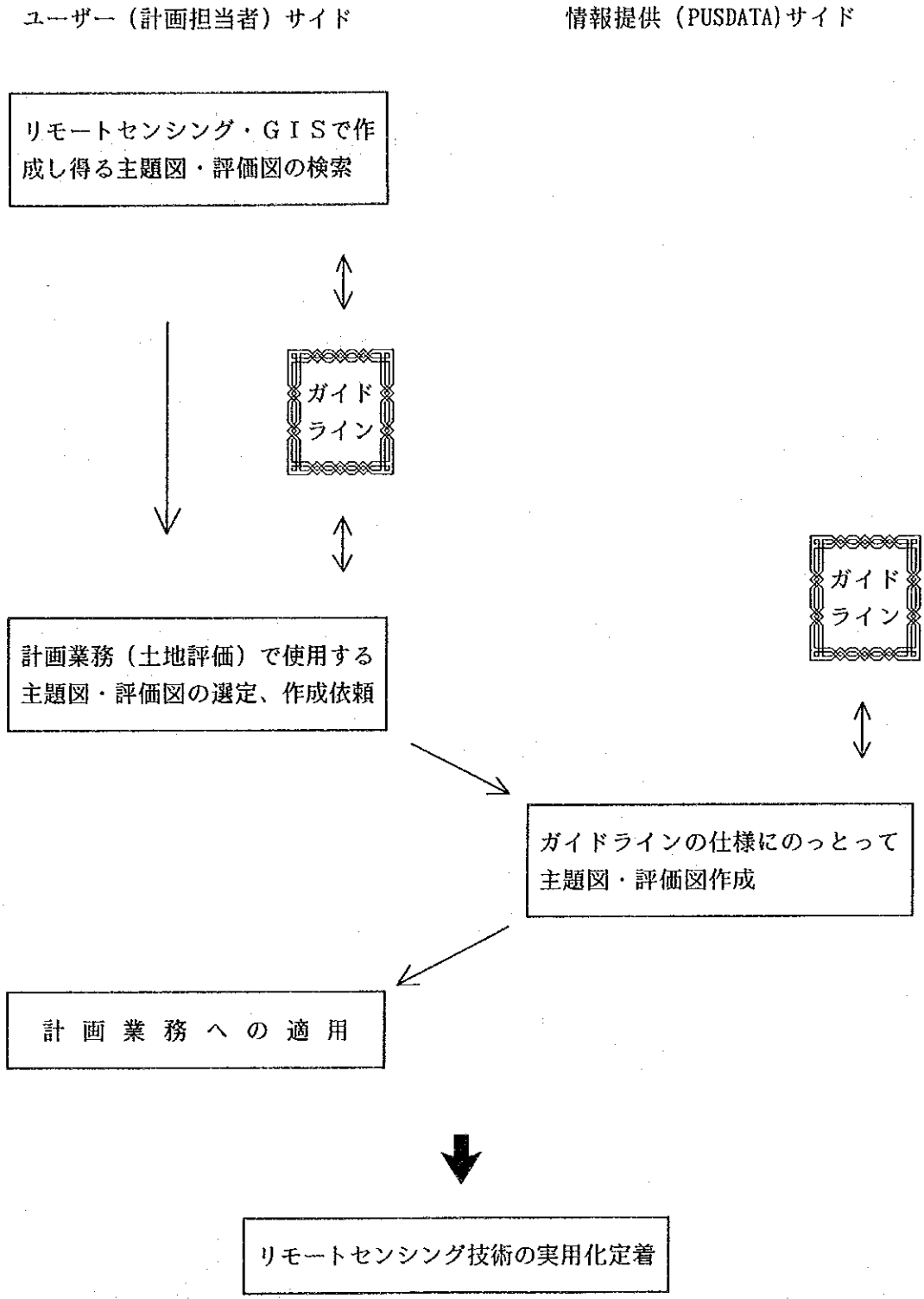


図2　ガイドライン策定後



Ⅲ　内　容

ガイドラインに記載される事項は以下の通りである。

第１章　概　説

農業開発に関わる機関で実際に施行されている土地評価体系を記述する。また、その土地評価体系の中で、必要とされる各種情報の内、リモートセンシング・ＧＩＳ(Geographic information System)技術による主題図・評価図で置き換え可能な情報を記述する。

１－１　本ガイドラインの目的と位置づけ

１－２　各機関・部局における土地評価体系－各省庁で実施しているものを事例として取り上げる

１－２－１　がいがい事業計画に関する土地評価体系

(1) 公共事業省水資源総局かんがい事業

１－２－２　農村整備事業計画に関する土地評価体系

(1) 公共事業省住宅総局空間計画

(2)　〃　道路総局道路建設事業計画

(3) 移住省移住事業計画

１－２－３　農地保全計画に関する土地評価体系

(1) 林業省森林計画

１－２－４　農業開発計画全般に関連する土地評価体系

(1) 国土庁空間計画

(2) 人口・環境庁空間計画

(3) 州政府空間計画

１－３　ＰＵＳＤＡＴＡにおける土地評価支援体系

１－３－１　土地生産可能性評価

１－３－２　スクリーニングによる土地評価

第２章　主題図の作成とその利用

「概説」で利用を位置づけた主題図の仕様（主題の内容、作成手法、利用上の留意点など）を記述。

２－１　フォルスカラー画像

２－２　リモートセンシングデータ解析による主題図

２－２－１　土地被覆分類図・土地利用分類図

２－２－２　土壌水分図

２－２－３　バイオマス図

２－３　既存図の主題図

２－３－１　流域図

２－３－２　行政界図

２－３－３　道路図

２－３－４　かんがい施設配置図

２－３－５　森林区分図

２－４　ＤＥＭ(Degital Elevation Model: 数値地形モデル）解析による主題図

２－４－１　傾斜図

２－４－２　標高図

２－４－３　水系図

第３章　評価図の作成とその利用

「概説」で利用を位置づけた評価図の仕様（評価要因、評価基準、作成手法、利用上の留意点など）を記述。

３－１　１次評価図

３－３－１　土地生産可能図

３－３－２　農地保全図

３－３－３　道路路線選定図

３－１－４　団地性評価図

３－１－５　近接性評価図

３－１－６　水資源利用可能量評価図

３－２　２次評価図

３－２－１　かんがい事業適地評価支援図

３－２－２　農村計画事業適地評価支援図

第４章　事　例

主題図・評価図の作成事例を掲載。（センターでの実績）

なお、詳細５ヵ年計画において、「農村整備計画」「かんがい計画」「農地保全計画」のそれぞれについてガイドラインを策定する事になっているが、実際には、ガイドラインは１本にまとめられる。これは、農業立地のもっとも主要な要因である作物生産性評価が、「かんがい計画」でも「農村整備計画」でも基本的に同一である事、農地保全は「農村整備計画」、「かんがい計画」の一要素として位置づけられている事による。

Ⅳ　プロジェクト延長の場合のガイドライン策定工程（案）

プロジェクトを93年度末まで延長、メンバーは農業開発、システム開発、業務調整の３名と想定した場合のガイドライン策定工程は、以下のとおりとなる。

１月　ワーキンググループ全体会議開催（ガイドライン企画書の提出）

・会議資料作成

２月　主題図作成手法のとりまとめ

〃　・主題図作成手法の総括、一部手直し、

４月　・ガイドライン第２章の執筆

１週間×６主題図　：土地被覆分類図・土地利用分類図、土壌水分図、バイオマス図、傾斜図、標高図、水系図

0.5 週間×６主題図　：フォルスカラー画像、流域図、行政界図、道路図、かんがい施設配置図、森林区分図

合計　９週間

評価調査団対応（１週間）、セミナー開催（２週間）を間にはさむため、

合計　12週間

５月　分野別（機関別）ワーキンググループ小会議開催

〃　・下記、８機関における土地評価体系調査

８月　・ガイドライン第１章執筆

・機関別評価図作成法の検討

(1) 公共事業省水資源総局かんがい事業計画

(2)　〃　住宅総局空間計画

(3) 公共事業省道路総局道路建設事業計画

(4) 移住省移住事業計画

(5) 林業省森林計画

(6) 国土庁空間計画

(7) 人口・環境庁空間計画

(8) 州政府(BAPEDA:内務省) 空間計画

２週間×８機関　　合計16週間

９月　評価図作成手法のとりまとめ

〃　・評価図作成手法の総括、一部改良

12月　・第３章執筆

・第４章参考図集の画像作成

１週間×６評価図：１次評価図の改良とガイドライン執筆

４週間×２評価図：２次評価図の改良とガイドライン執筆

４週間　　：画像作成

合計　　18週間

１月　ガイドライン第１次案検討のためのワークショップ開催

２月　ワークショップ検討結果のとりまとめ、オーソライズ方針の検討

３月　帰国報告書作成、帰国準備

（注）本スケジュールはプロジェクト案であり専門家の人数、分野等を含め評価調査結果とはやや異なる

(10) 業務受託実績（主題図、評価図の作成）

LIST OF ACTIVITIES OF REMOTE SENSING DIVISION
PUSDATA, MINISTRY OF PUBLIC WORKS 1988/1989

1988年度

NO.	AREA	KIND OF INPUT DATA	QUANTITY	KIND OF ANALYSA	PERIOD 作業期間	INSTITUTION 発注(依頼者)	SCALE
1.	NORTH PART OF SUMATERA	LANDSAT MSS	11 SCENES	FALSE COLOR	JAN-MARC.1988	CIPTA KARYA, MINISTRY OF PUBLIC WORKS JICA	1:250.000
2.	JATILUHUR (WEST JAWA)	LANDSAT MSS SPOT	2 SCENES	- FALSE COLOR - SUSPENDED-MATERIAL	APR-JUNE.1988	PUSLITBANG OF WATER DPMA	1:100.000
3.	SUMATERA ISLAND KALIMANTAN ISLAND JAWA ISLAND SULAWESI ISLAND MALUKU ISLAND NUSATENGGARA ISLAND IRIAN ISLAND	MAP OF RIVER AREA UNIT	7 EXS	DIGITIZING	JUL-SEPT.1988	F A O	1:1000.000
4.	NEGARA RIVER (SOUTH KALIMANTAN)	LANDSAT	4 SCENES	- FALSE COLOR - LAND COVER - SOIL MOIS-TURE	JUL-SEPT.1988	NEGARA RIVER PROJECT. JICA	1:250.000
5.	BATANG KUHU (RIAU)	LANDSAT	150.000 HA	- FALSE COLOR - LANDCOVER - BIOMAS - SOIL MOIST. - SOIL COLOR	AUG-OCT. 1988	JICA & BAKT-NATION MINISTRY OF PUBLIC WORKS	1:100.000
6.	TELUK RATAI - PADANG CERMIN (LAMPUNG)	SPOT	90.000 HA	- FALSE COLOR - LANDCOVER - BIOMAS - SOIL MOIST.	SEPT-DEC.1988	ITB & DPPT & INT AL.	1:100.000 1: 50.000
7.	KETAHUN - BENGKULU LEBAU (BENGKULU)	LANDSAT	200.000 HA	- CRITICAL LAND - FOREST AREA	NOV. 1988 - JAN. 1989	BALKT MINISTRY OF FORESTRY	1:500.000 1:250.000
8.	BARUMUN (NORTH SUMATERA)	LANDSAT	329.813 HA	- LANDCOVER	NOV. 1988 - JAN. 1989	BALKT MINISTRY OF FORESTRY	1:500.000 1:250.000
9.	MAMPU (NORTH SUMATERA)	LANDSAT	576.815 HA	- LANDCOVER	NOV. 1988 - JAN. 1989	BALKT MINISTRY OF FORESTRY	1:250.000
10.	PULA MALANAE (SOUTH SULAWESI)	LANDSAT	91.000 HA	- LANDCOVER	JAN-FEB. 1989	BALKT MINISTRY OF FORESTRY	1:500.000

LIST OF ACTIVITIES OF REMOTE SENSING
DIVISION PUSDATA, MINISTRY OF PUBLIC WORKS
1989/1990

1989年度

NO.	AREA	KIND OF INPUT DATA	QUANTITY	KIND OF ANALYSIS	PERIOD	INSTITUTION	SCALE
1	Air Selagan (Bengkulu)	LANDSAT MSS	18.000 ha.	False Color Landcover Landcover changing Biomass Soil Moisture Soil Color	Nov.1989 - Mar.1990	JICA & Irrigation Ministry of Public Works	1 : 250.000

LIST OF ACTIVITIES OF REMOTE SENSING
DIVISION PUSDATA, MINISTRY OF PUBLIC WORKS
1990/1991

1990年度

NO.	AREA	KIND OF INPUT DATA	QUANTITY	KIND OF ANALYSIS	PERIOD	INSTITUTION	SCALE
1	Nias Island	LANDSAT TM.	5,400 Km2	Color Composite (4.3.2)	August Sep.1990	JICA & Irrigation Ministry of Public Works	1 : 250.000 1 : 50.000
				Landcover			
				Soil			
				Moisture			
				Elevation			
				Slope			
2	Indragiri (Riau)	LANDSAT TM.		Color Composite (4.3.2)	October 1990 - march 1991	JALDA	1 : 250.000 1 : 50.000
				Color Composite (5.4.2)			
				Landcover			
				Soil			
				Moisture			
				Elevation			
				Slope			
				Landcover changing			
3	Negara (South Kalimantan)	SPOT LANDSAT MSS		Color Composite	October 1990	JALDA	1 : 250.000 1 : 50.000
				Landcover	march		
				Soil	1991		
				Moisture			
				Elevation			
				Slope			
				Landcover changing			

LIST OF ACTIVITIES OF REMOTE SENSING
DIVISION PUSDATA, MINISTRY OF PUBLIC WORKS
1990/1991

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NO.	AREA	KIND OF INPUT DATA	QUANTITY	KIND OF ANALYSIS	PERIOD	INSTITUTION	SCALE
4	Cidurian (West Java)	LANDSAT MSS		-Color Composite -Landcover -Slope Map -Topographi Factor Map -Drainage Composite -Feves Zoning Map -Index Ero-sion Map	Nov - Dec 1990	BRLKT Ministry of Forestry	1 : 250.000
5	Rokan (Riau)	LANDSAT TM			Jan - Mar 1991	JICA & Irrigation Ministry of Public Works	1 : 250.000 1 : 50.000

LIST OF ACTIVITIES OF REMOTE SENSING DEVISION
PUSDATA, MINISTRY OF PUBLIC WORKS
1991/1992

1991年度

NO.	A R E A	KIND OF INPUT DATA	QUANTITY	KIND OF ANALYSIS	PERIOD	INSTITUATION	SCALE
1.	Cipunagara River Basin West Java Province	- LANDSAT MSS Data - Morphological Factor Map - Slope Factor Map - Drainage Pattern - Administrative Boundary	1 scene	- Critical Land Analysis - Forest Zoning Analysis	December 1991 to Feb. 1992	Ministry of Forestry	1 : 250.000
2.	Jatiluhur West Java Province	- SPOT Data - Soil Type Map - Slope Map - Rain Intensity Map	2 scenes	- Sediment Analysis - Chlorophyl Analysis - Forest Zoning Analysis - Critical Land Analysis	August 1991 to October 1992	The Jatiluhur Authority Services (POJ)	1 : 100.000
3.	Bintan Island Riau Provincial	- LANDSAT TM Data - Topographic Map - Catchment Area Map - Spatial Planning Map	2 scenes	- Land Cover Analysis - Land Suitability for Agriculture Analysis.	January to March 1992	Regional and Spatial Planning Project (RSTP)	1 : 100.000
1992年度		1992 / 1993					
1.	A Part of Java Island	- SPOT Data	30 scenes	- Forest Inventory	June to Sept. 1992	Ministry of Forestry	1 : 100.000
2.	Jragung, Tuntang, Serang, Lusi, Juana (Jratunseluna River Basin) Central Java	- LANDSAT TM Data - Topographic Map - Catchment Area Map	2 scenes	- Land Cover Analysis - Land Cover Changing Analysis - Irrigation Net Work Analysis - Laudation of Kedung Osbo Dam Analysis - Suspended Material of Kedung Osbo Dam Analysis - Urban Monitoring	January to March 1993		1 : 100.000
3.	Kampar : Pulau Burung, Riau Province	-LANDSAT TM Data	1 scene	- Land Evaluation for Spatial Planning on Transmigrations Settlement	December 1992 to March 1993	Ministry of Transmigration.	1 : 100.000

↓現在作製中のもの

(11) プロジェクト関係者の成果発表実績

List of Presentation to Seminar

1. 'Land Evaluation Method for Agricultural Development Using Landsat Data in Swamp Area ' ; Ir.Hariyatno Sumarman, Ir.Naniek Siti Murdjiati, Sri Yumadiati, [International Conference on Engineering Applications for the Development of Agriculture in The Asia and Pacific Region], Bogor, 1989

2. ' Study on Land Sutability Analysis for Wetland Rice Using Satellite Image and G.I.S ' ; Ir.Muhammand Dimyati, Mr.Satoshi Uchida, Mr.Ryota Nagasawa, PUSDATA, Dep.PU, [International Conference on Engineering Applications for the Development of Agriculture in The Asia and Pacific Region], Bogor, 1990

3. ' Contribution of Satellite Data and Geographical Infomation System for Irrigability and Water Availability Appraisal '; Ir.Joko Setiyono, Ir.Guridono Wardoyo, Dr.Shintaro Kobayashi, PUSDATA, Sep.PU, [International Conference on Engineering Applications for the Development of Agriculture in The Asia and Pacific Region], Bogor, 1990

4. ' Contribution of Satellite Data and Geographical Infomation System for Irrigability and Water Availability Appraisal '; Ir.Joko Setiyono, Ir.Guridono Wardoyo, Dr.Shintaro Kobayashi, PUSDATA, Dep.PU, [Seminor on The Role of Remote Sensing Technology And G.I.S (Geographic Information System) For Spatial Planning],Jakarta,December 17- 18, 1990

5. 'Remote Sensing and G.I.S Application for Road Site Selection in Swampy Lowland' ; Ir.Adi Sasutji, Mr.Ryota Nagasawa, PUSDATA, Dep.PU,[Indonesian Society for Remote Sensing],Jakarta, September 10,1991

6. 'Remote Sensing and G.I.S Application for Selection of Agricultural Area' ; Ir.Sri Yumadiati. Ir.Adi Sasutji, PUSDATA, Dep.PU, [Indonesian Society for Remote Sensing],Jakarta, September 10,1991

7. 'Monitoring of forest fire site by using LANDSAT TM data and MSS data' ; Mr. Kenichiro Kamimura, PUSDATA, Dep.PU., [Second Seminar on the Role of Remote Sensing Technology & G.I.S (Geographic Information System) for Infrastructural Development Planning], Jakarta, February 26,1992,

8. 'Ground surface temperature analysis base on LANDSAT TM data BAND 6' ; Ir.Naniek Siti Murdjiati, PUSDATA, Dep.PU., [Second Seminar on the Role of Remote Sensing Technology & G.I.S (Geographic Information System) for Infrastructural Development Planning], Jakarta, February 26,1992,

9. ' Application of Geographic Information System to Land Evaluation for Agricultural Infrastructure Development ' ;Ir.Sri Sarwoasih, Mr.Kazumi Suwabe,Mr.Kenichiro Kamimura,Mr.Masao Okajima, PUSDATA,Dep.PU,[International Conference on Engineering Applications for the Development of Agriculture in The Asia and Pacific Region], Bogor, October 12,1992

10. 'Study of Landcove Changing Caused by 'Forest Fire' by Using Satellite Data ' ; Ir.Sri Yumadiati, Mr.Kenichiro Kamimura,PUSDATA,Dep.PU,[International Conference on Engineering Applications for the Development of Agriculture in The Asia and Pacific Region], Bogor, October 12,1992

(12) カウンターパートへ移転された技術一覧 (英)

23,Jan,92

Technical transfer to Indonesian Counterparts

1、Dr. Soenarno

Recommendation for Project Management
Suggestion for fundamental understanding of R/D 4 Items
Recommendation for the way of sustainability

2、Drs. Suroso

Advice for Project Implementation
Advice for the way to achieve R/D 4 Items
Advice for the planning of annual activity
i.e. Despatch of short term expert,
Provision of equipment,
Trainee acceptance,
Middle level trainnee's training,
Seminar and Guidance team acceptance
Fundamental idea for application of R/S,GIS to land evaluation system for development of agricultural infrastructure

3、Hariyatono

Production of thematic maps for development planning
i.e. False color image
Land cover map
Soil-moisture map
Peat depth estimation in swamp area (Unv.Chiba)
Field survey planning

4、Dra. Setyaningshi

Production of thematic maps for development planning
i.e. False color image
Land cover map
Soil-moisture map
Mass image processing for "ATLAS" satellite image collection
Huge image geometric correction
Image quality control
Slash-burn scale analysis
Field survey planning
Seminar arrangement and implementation
Fundamental idea for application of R/S,GIS to land evaluation system for development of agricultural infrastructure
Schedule control of thematic map or evaluation map production
Fundamental idea of Data Base System

Data registration to Data Base System
System maintenance (SUN,ERDAS,ARC/INFO)
Data Base (Unv.Tsukuba,Unv.Chiba)

5、Ir. Nanik
Thermal image data utilization
Field survey planning
Arrangement of Middle Level Training
Fundamental idea for application of R/S,GIS to land evaluation system for development of agricultural infrastructure
Biomass estimation map production (recovery of Phase I function)
Dam catchment area monitoring (Dr.Miyana)
Swampy land analysis by thermal image data (Hokkaido Agr.Inst.)

6、Dra. Yumadiati
Field survey planning
Land evaluation system for land conservation
(Ministry of Forestry, Ministry of Pubric Works)
Theory of land erosion
Critical land analysis by USLE
UNIX OS operation
Schedule control of thematic map or evaluation map production
Material production management
Fundamental idea for application of R/S,GIS to land evaluation system for development of agricultural infrastructure
Biomass estimation map production (recovery of Phase I function)
Soil moisture map production (recovery of Phase I function)
Selection of suitable area for transmigration (Ms.Yamamoto)
Land erosion analysis for land conservation (Mr.furuya)

7、Drs. Joko
Field survey planning
Seminar arrangement and implementation
Planning scheme of irrigation project
Fundamental idea for application of R/S,GIS to land evaluation system for development of agricultural infrastructure
Water balance modeling for paddy development (Dr.Kobayashi)
Swamp analysis (Pasco,Inst.Agri.Env.)

8、Dra. Adi Sasutji
Production of thematic maps for development planning
i.e. False color image
Land cover map
Soil-moisture map
Field survey planning

Critical land analysis by USLE
OS (UNIX MSDOS) operation
Schedule control of thematic map or evaluation map production
GPS operation
Fundamental idea for application of R/S,GIS to land evaluation system for development of agricultural infrastructure
Examination of Data Base Items
Advanced vector data handling (area estimation, huge area)
System maintenance (SUN,ERDAS,ARC/INFO)
Selection of suitable area for road construction site
Data Base (Unv.Tsukuba,Unv,Chiba)

9、Dra. Rinny
Production of thematic maps for development planning
i.e. False color image
Land cover map
Soil-moisture map
Algorithm of geometric correction program
MSS data bulk processing (recovery of Phase I function)
LAPAN MSS data format conversion
IBM Dump format MT data recovery
Image quality control
Land cover change and area estimation
Management of developed program
Field survey planning
Schedule control of thematic map or evaluation map production
Management of material information
Fundamental idea for application of R/S,GIS to land evaluation system for development of agricultural infrastructure
Data Base system design
Attribute information handling for vector data
System maintenance (SUN;ERDAS,ARC/INFO)
Arrangement and classification of evaluation criteria (Mr.Ogawa)
Software conversion (Dr.Onuma)
Dam catchment area monitoring (Dr.Miyana)
Software development (Unv.Chiba,Pasco)

10、Dra. Sarwoashi
Production of thematic maps for development planning.
i.e. False color image
Land cover map
Soil-moisture map
MSS data bulk processing (recovery of Phase I function)
LAPAN MSS data format conversion
IBM Dump format MT data recovery

Image quality control
Land cover change and area estimation
Slope map production
Interpolated elevation map production
Land cover plot scale map production
Land cover plot aspect map production
Field survey planning
Planning scheme of rural development (RePPProT,FAO)
Land Capability Map Production
Social economic information analysis (accessibility)
OS (UNIX,MSDOS,NETWORK) operation
Schedule control of thematic map or evaluation map production
GPS operation
Fundamental idea for application of R/S,GIS to land evaluation system for development of agricultural infrastructure
Data Base system design
Attribute information handling for vector data
Attribute information handling for luster data
System maintenance (SUN,ERDAS,ARC/INFO)
Thermal image data to temperature conversion
Examination of geometric correction accuracy by numbers of GCP data
Arrangement and classification of evaluation criteria (Mr.Ogawa)
Dam catchment area monitoring (Dr.Miyana)
Auto scanner. GIS (Unv.Tsukuba,Pasco)

1 1、Mr. Heru

Equipment management
Installation of P.C.hardware and software system
System maintenance of P.C. system

1 2、Mr.Mukmin

Photoprinter parameter setting adjusting to the film type
OS (UNIX) operation
Advanced vector data handling (area estimation)
Photoprinter maintenance (Mr.Yoshino)
Electro-static plotter maintenance. (Mr.Yasuda)
ARC/INFO operation (Pasco)

1 3、Mr. Wagiyo

Photo paper print color balance and quality control
Photo consumption acquisition planning
Photo equipment maintenance (Mr.Igari)

1 4、Drs. Katamsi

Field survey planning
Annual scheduling
R/S advanced training (RESTEC)

15、Ms. Hayrita
Documentation

16、Mr. Gunant
Office environment management

17、Ms. Henny
Documentation

18、Mr. Suhady
Material and information management

19、Mr. Win
Data handling of vector data

20、Drs, Dimyaty
Selaction of suitable area for paddy field

(13) 日本人専門家の作成した報告書一覧

報告書番号	報告者名	指導科目	内容
RSII-88-1	星　仰	ソフトウエア	農業開発のためのリモートセンシングのデータベース
-88-2	〃	〃	〃
-88-3	〃	〃	〃
-88-4	〃	〃	〃
-88-5	猪狩　俊雄	ハードウエア	写真機材メンテナンスに関する報告（ＰＩ供与機材）
-88-6	〃	〃	〃
-88-7	年次報告書		
-89-1-8	木村貞太郎	ソフトウエア	農村整備計画ガイドライン
-89-2-9	〃	〃	〃
-89-3-10	江森　康文	〃	解析モデル改良、データベース・ＧＩＳについて
-89-4-11	〃	〃	〃
-89-5-12	吉野　道夫	ハードウエア	ドラムスキャナー、フォトプリンターのメンテナンス
-89-6-13	大橋　真	ハードウエア	ＥＲＤＡＳ、ＡＲＣ／ＩＮＦＯの指導報告
-89-7-14	年次報告書		
-90-1-15	谷元　順一	ハードウエア	Ｅ．Ｗ．Ｓ設置、メンテナンス指導報告
-90-2-16	安田　基和	ハードウエア	カラー静電プロッター設置、メンテナンス指導報告
-90-3-17	山崎　紘一	チームリーダ	帰国報告書
-90-4-18	〃	〃	〃
-90-3-19	小林慎太郎	ソフトウエア	水田における水収支解析報告
-90-4-20	池西　登	〃	インダラギリ川下流域に於ける道路路線選定解析報告
-90-6-22	田中　英統	業務調整	帰国報告書
-90-7-23	山本由起代	ソフトウエア	ｲﾝﾀﾞﾗｷﾞﾘ川中流域に於ける移住地域のための土地評価
-90-8-24	年次報告書		
-91-1-25	石田　弘	農業開発	帰国報告書
-91-2-26	内田　諭	ソフトウエア開発	〃
-91-3-27	長澤　良太	システム開発	〃
-92-1-28	古谷　保	ソフトウエア	農地保全のための土壌侵食に関する報告
-92-2-29	小川　茂男	〃	評価図作成に関する報告
-92-3-30	岡嶋　雅夫	〃	農業開発のための土地評価システム開発報告
-92-4-31	大沼　和彦	〃	ソフトウエアコンバージョン（バルク処理）報告
-92-5-32	深山　一弥	〃	Ｒ／Ｓ、ＧＩＳによるダム流域と灌漑用ダム管理
-92-6-33	山田　康晴	〃	農業開発のための市場近接性評価

（参考資料：評価調査終了後の経過）

参考１：フォローアップに関する要請書（1993.4.2）

参考２：フォローアップに関する討議議事録（R／D）(1993.4.27)

参考１：フォローアップに関する要請書(1993.4.2)

REPUBLIC OF INDONESIA
NATIONAL DEVELOPMENT PLANNING AGENCY
JAKARTA, INDONESIA

No. : 1402/D.IV/4/1993 Jakarta, 2 April 1993

Mr. T. Sano
First Secretary
Embassy of Japan
Jakarta

Dear Mr. Sano,

With reference to the joint evaluation meeting on 3 February 1993 regarding project type Technical Cooperation the Remote Sensing Engineering for Development of Agricultural Infrastructure Phase II, we herewith would like to inform you that in principle Bappenas has no objection to the extension of the said project from June 1993 to June 1994.

We are looking forward to your favourable Government's consideration.

Thank you for your kind cooperation.

Yours sincerely,

Mrs. Fuly O. Sarjaatmadja
Deputy Chairman

Cc.:

1. Head, Bureau of Foreign Technical Cooperation, Secretariate Cabinet
2. Head, Bureau of Monitoring of Development Project Implementation, Bappenas
3. Head, Bureau of Planning, Ministry of Public Works

remote.ws6/sk-xxxii

参考２：フォローアップに関する討議議事録（Ｒ／Ｄ）（1993.4.27）

THE RECORD OF DISCUSSIONS BETWEEN
JAPAN INTERNATIONAL COOPERATION AGENCY
AND
THE AUTHORITIES CONCERNED OF THE GOVERNMENT
OF THE REPUBLIC OF INDONESIA
ON
THE FOLLOW-UP PROGRAM OF TECHNICAL COOPERATION
FOR
THE REMOTE SENSING ENGINEERING PROJECT PHASE II
FOR THE DEVELOPMENT OF AGRICULTURAL INFRASTRUCTURE

With regard to the Remote Sensing Engineering Project Phase II for the Development of Agricultural Infrastructure (hereinafter referred to as "the Project") scheduled to terminate its cooperation period on June 5, 1993, Japan International Cooperation Agency (JICA) had a series of discussions, based on the Joint Evaluation Report signed on February 3, 1993, through the representative of JICA Indonesia Office with authorities concerned of the Government of the Republic of Indonesia on the follow-up program of technical cooperation for the Project.

As a result, both sides agreed to recommend to their respective Governments to take necessary measures for the follow-up program of the Project from June 6, 1993 to June 5, 1994 according to the Annex attached hereto in order to complete the remaining activities of the Project shown in the Joint Evaluation Report.

April 27 ,1993
Jakarta, INDONESIA

Japan International Cooperation Agency JICA INDONESIA

Mr. Akira Takahashi
Resident Representative,
Indonesia Office,
Japan International Cooperation Agency

REPUBLIK INDONESIA DEPARTEMEN PEKERJAAN UMUM

Ir. Kustaf Diwirjo
Secretary General,
Ministry of Public Works

ANNEX

Terms of Reference

I. Activities of technical cooperation in the follow-up program

Technical guidance for establishment of guidelines as follows:

1) Rural development plan;

2) Irrigation and drainage plan.

The activities are concentrated to fix the methodology of map provision and to describe the established scheme, based on the output already accomplished.

II. Assignment of Japanese experts

- System Evaluation
- Agricultural Development Planning
- Short term experts will be dispatched as necessary arises

III. Assignment of Indonesian counterparts and administrative personnel

- Project Head
- Project Manager
- Agricultural Development Planning
- Other fields necessary for the establishment of guidelines

IV. Preparation for follow-up program by Indonesian side

1) Land, building and facilities

2) Allocation of running cost for the follow-up activities

V. All matters other than those mentioned above concerning the follow-up program will be conducted according to the provisions in the Attached Document of the Record of Discussion (R/D) signed on June 6,1988.