AN APPROACH TO EVALUATION FOR THE SEDERHANA IRRIGATION AND LAND DEVELOPMENT PROGRAM

Maurice V. Sorenson

Theodore R. Thompson

October 30, 1976

Foreword

This report has been prepared by Maurice V. Sorenson, Agricultural Economist, and Theodore R. Thompson, Water Resources Management Advisor, under terms of contracts with United States Agency of for International Development to meet requirements outlined in Project Implementation Order No. 298-035-3-6026 which sets forth the objective "To assist the Government of Indonesia and the USAID in determining a scope, plan and cost estimate of an evaluation suitable for the Sederhana Irrigation and Land Development Program."

The team, during the period October 6 through 30, 1976, reviewed the program; discussed the program and its ramifications with the staffs of the USAID Mission, Directorate General of Water Resources Development, Ministry of Public Works, and the Directorate General of Foods Crops and Agency for Agriculture Education, Training and Extension, Ministry of Agriculture; and examined conditions and conducted interviews in the field at all levels of implementation at locations suggested by the GOI and USAID. The findings presented were not discussed in detail prior to the departure of the team from Indonesia; therefore it is to be concluded that variance in timing and specific requirements may change dependent on the immediate purpose defined at any given time. However, the general principle involved and problems presented and effecting evaluation will remain valid considerations. The concepts followed meet USAID requirements with respect to differentiation between implementation monitoring and evaluation. In this context "Implementation monitoring is the means for assuring that resources for a given project are available and adequate, that implementation actions are occuring on schedule and that planned outputs are being achieved. Evaluation, on the other hand, seeks to answer three basic questions relevant to all forms of economic assistance:

Effectiveness	-	Are the targets for outputs and purpose being achieved? What are the reasons for success or failure?
Significance	-	Will the achievement of the targets contribute to economic development of other higher goals beyond the project purpose? To what extent? What are the activity's advantages over possible alternatives? What about side effects?
Efficiency	-	Do the benefits justify the cost? Are there more efficient means of achieving the same targets?

The team wishes to express its appreciation for the many courtesies and for the complete cooperation extended by the GOI and the USAID Mission. Further, it wishes to compliment the GOI on the cooperation between its agencies and its current and past efforts in the field of evaluation exhibited during the team's study.

Background

This project will provide assistance to the GOI in upgrading and in constructing relatively simple inexpensive small scale irrigation facilities. It will also improve related implementation activities at the farm level through training in water management and the use of adapted modern farming technology. It is estimated that there will be between 275 and 400 subprojects covering an area of 110,000 - 160,000 hectares. They will be capable of rapid execution using labor - intensive methods and are expected to have a quick impact on GOI goals for increased rice production, improve the social and economic well-being of small farmers, farm laborers and other rural poor and improve the institutional capability of GOI implementing agencies.

It is contemplated that in the future there may be an upgrading and improvement in these projects from the simple systems initially provided into more technical planned irrigation systems. About half the subproject areas planned for construction are currently used for wet rice paddy and are covered by existing village irrigation systems; the other half will permit extension of existing wet areas and bring under cultivation some completely new areas.

The total project budget is expected to be about US $59.2 million of which the GOI will provide not less than the Rupiah equivalent of US $35.4 million. In a loan agreement dated June 30, 1975 USAID/Indonesia agreed to extend a 40-year loan of US $20 million to assist in carrying out this project. An additional $3.7 million was subsequently authorized making a total loan of US $23.7 million available for this project.

Implementation of the AID financed part of the project officially started at the beginning of the 1976/77 GOI fiscal year which began April 1, 1976. There has been no disbursement of loan funds to date. This is a high priority project of the Indonesian Government and several ministries including Public Works, Agriculture, Interior, Public Health and Finance have been assigned implementing responsibilities. However, the Ministries of Public Works and Agriculture have primary responsibility. They are being assisted by two consulting groups who are providing technical advisory services, International Engineering Company, Inc. and Survey Agro Ekonomi, an Indonesian firm.

Scope of Objective

The primary objective is to prepare evaluation reports for the Sederhana project that will show whether project purposes and goals are being achieved. Specifically whether the project is effective in increasing rice production, improving the well being of poor rural families and enhancing the institutional capability of the GOI agencies implementing Sederhana.

It is expected that the evaluation will:

1. Provide direction and guidance for future policy, administrative, training and implementation activities by the GOI and USAID.

2. Identify the factors making the greatest contribution to the success of the project and those that prevent or inhibit full achievement of project goals.

3. Furnish a basis for making any needed modifications in existing implementing plans; for planning and improving future small simple irrigation activities; and for selecting proper corrective measures for any weakness or problems in the project.

4. Measure the impact of the project in terms of benefits accruing to farmers and to regional and national development.

5. Assess project effectiveness by comparing the status of farmers receiving assistance with other farmers in the area who didn't get Sederhana assistance.

6. Make a time sequence comparison and determine the degree to which predetermined goals are met.

7. Identify measures of farm family progress such as changes in crop productivity, gross or net income, net worth, size of operations, standard of living, use of improved farming technology and other related data which reflect economic and technical gains.

8. Show the effect Sederhana has on community improvements such as domestic water supplies, roads, health services, school facilities, family planning, educational levels and other public and private activities.

9. Provide needed data on funds expended, persons trained, farmer income changes and other socio-economic criteria.

10. Improve the assembly, analysis and distribution of basic information needed by GOI and USAID to make sound development plans and policy decisions as well as identify segments of development activity in which performance is lagging and in which there is a need for improvement.

Geographical Scope of Coverage

The evaluation team will need to spend some time in Jakarta assembling and reviewing baseline data in the Directorate of Programming and Planning of the DGWRD. Also other reports and data of good quality relevant to achieving the outputs of the project should be reviewed at USAID, DCFC and AAETE and other agencies and organizations in Jakarta which are involved in the implementation of Sederhana. At the same time it is expected that discussions would take place with informed individuals in all of these organizations.

Visits should be made to two or three representative subprojects selected on a random sampling basis from each of the four Regions. This would mean visits to 8-12 geographically different selected areas of Indonesia.

Sample Selection

It is recommended that the subprojects to be visited be selected using a stratified random sample. The sample will be "stratified" by selecting a predetermined number of subprojects possessing certain specific characteristics which most clearly distinguish the subprojects from one another. These characteristics which should be defined with the assistance of the GOI would probably be determined by:

- geographical location
- size and purpose of subproject
- whether transmigration was involved
- stage of development
- other special characteristics

The selection of a sample using these criteria as stratifying variables will require the preparation of a list of all the subprojects which are to be represented by the sample selected. For each project listed the values of the stratifying variable will be chosen before the sample is selected. Thus, for each subproject on the list key descriptions will be specified. Once the list has been satisfactorily specified, and subprojects grouped according to the stratifying variable, the sample subprojects will be chosen so that each of the projects with the same values of the stratifying variable has an equal probability of selection. If possible the total sample size will be proportioned among the subproject classes in proportion to their numbers.

Contacts and Communications

The names of informed contacts made by the evaluation design team are shown in appendix I. It is suggested that the AID/Indonesia project leaders, Messrs. Suyono, Mamad, Tambunan, Attamimi, Suwarso and Oesman in DGWRD, and Messrs. Otje and Effendi of Ministry of Agriculture are informed individuals who are in a position to suggest other appropriate contacts.

Proposed Team for Executing Evaluations

It is recommended that a two man contract team be recruited to participate with GOI evaluators selected by DGWRD, AAETE and other involved implementors of Sederhana. The Indonesian team members would be expected to have appropriate background in agriculture and water resource development.

The two man U.S. team should have a minimum grade of GS 14 or the equivalent of that in qualifications and experience in water resource development and agricultural economics. They should have extensive experience in administrating, directing, implementing and evaluating water resource development and agricultural development projects in tropical climates. It is important that they have the awareness and ability to assess social soundness, environmental impact, women's role in agricultural development, infrastructure needs and other interrelated factors that are essential to and contribute to an improved way of life for the rural poor.

They should be able to relate to and establish a good working rapport with host country personnel and be sympathetic to attitudes and problems of project beneficiaries. It is required that they be qualified to evaluate planning and the relevance of the planned institution building activities, including the suitability of the curriculum, training methodology and organization and management plans. It is also expected they would have had experience with farmer development and training.

Timetable for Evaluation Assistance by US Team

It is proposed that the agricultural economist team member of the US team spend four months in Indonesia during the next calendar year. His tour of duty should begin in June or July to assist in the preparation of the questionnaire to be used in the evaluation and to assist in the training of the Indonesia evaluation team. An estimated one month of time would be required during this period in Jakarta and at training center locations. For the next two months in August and September he should participate with the central GOI evaluation team and the US Water Resource Development Specialist in making an evaluation of Sederhana based on data gathered from a number of subprojects selected as described above

in the paragraph on sample selection. Following the six to eight weeks of evaluation work in the field and in making an analysis and compilation of relevant data in report form, the agricultural Economist should devote an additional month, probably in October, to help see that pertinent findings of the evaluation are distributed to and acted upon by project administrators, policy makers, implementors and others with responsibility for the success of Sederhana. Thus the agricultural Economist member would devote four months in the period June to October to the project. The Water Resource Development Specialist would devote two months in August and September assisting in making the evaluation. It is believed this time schedule meets the time requirements of GOI officials and would permit the field visits to be accomplished during the dry season, in most of the provinces, when transportation is easier and interviewees would have more time to answer questions.

An alternative to the above suggested time table, which might be affected by future unexpected developments, the need and desires of the GOI and USAID or the availability of the proposed US Team members, would be to have the agricultural economist team members visit Indonesia intermittantly during the year at time to be selected by AID/Indonesia and the GOI in accordance with their need for help to provide training, technical assistance and other services. The only relatively fixed time period when both the US Team members should be in Indonesia would be during the August - September period when field visits and the actual evaluation of Sederhana should take place.

Contract Cost Estimate for US Team

Manpower	Dollars	Rupiah
Agricultural Economist		
88 days x $160/day	14,080	
Water Resources Development Specialist		
44 days x $160/day	7,040	
In country per diem		
112 days x Rp. 22,000		2,464,000
56 days x Rp. 22,000		1,232,000
Secretary (bilingual)		
16 weeks x Rp. 40,000/week		640,000
International Travel		
2 round trip fares @ $1800	3,600	
8 days per diem @ $6 per day	48	
4 days per diem @ $50 per day	200	

Local Travel		Dollars	Rupiah
2 men x 4 trips x Rp. 90,000			720,000
Miscellaneous Expenses			
Passports, medical/etc		200	
	Total	25,156	5,056,000
	Say	25,000	5,000,000

Note: The above general estimate assumes a single round trip by each contract employee. Some minor savings could be realized through intermittent visits by the economist; however, it would not be beneficial except in the interest of recruitment.

Questionnaire Material

The following questions have been prepared to assist and guide a Sederhana Evaluation team. Based on the Evaluation design teams limited review of available baseline data and field operations and discussions with the project implementors. We believe the following type of information is needed by the GOI and USAID to evaluate Sederhana and determine progress in reaching project goals.

A. Progress in Institution Building

1. Do implementing officials have the knowledge and capabilities required in management and technical fields to properly perform their assigned functions.

2. Is the project staff effectively administering and managing the project and are responsibility and authority closely linked.

3. Have the different agencies involved in Sederhana been successful in establishing unitary management and demonstrating institutional viability.

4. Do existing institutions provide a satisfactory base on which to build or should new ones be established.

5. Is adequate technical backstopping being furnished to the implementors of the project.

6. Is there good organization, management and enthusistic support and acceptance of Sederhana by target groups in the village where there are subprojects.

7. Do the project implementors have the capacity to train farmers in proper water use and management, and are farmers learning the technical skills of good water management.

8. Is the scheduling of transmigrants to coincide with Sederhana subproject construction a problem.

9. Is DGWRD properly organized and fully committed to carry out plans, designs and construction on schedule.

10. Are qualified contractors available to do work at reasonable cost on a timely basis and is the quality of the work satisfactory.

11. Have adequate criteria been developed for the selection of Sederhana projects; have any projects failed.

12. Are design and construction methods appropriate to the farmers need and the water supply.

13. Are survey and design targets being met.

14. Is the construction schedule realistic of accomplishment and are construction targets on major works being met.

15. To what extent does the required approval of design by AID contribute to delays in the construction of Sederhana subprojects.

16. Has adequate provision been made for O&M including the reduction of leakage losses from laterals.

17. Is adequate assistance provided to farmers for land levelling, terracing, land shaping, tertiary canals, on farm service outlets and drainage; is this construction being accomplished in the planned time.

18. What is the number of farmers levelling and shaping fields to improve irrigation efficiency and extend the land to be irrigated.

19. Is sufficient funding available when needed for personnel, buildings, training, equipment, supplies, transportation and other capital needs.

20. Do plans and designs need to be made for drainage.

21. Are there any shortages of equipment, material, labor, technical expertise or other bottlenecks to implementation and if so have plans been made to eliminate them.

22. Are there coordination and communication problems between the various national, provincial and local organizations involved in Sederhana development; are the responsibilities of each of the participating organizations clearly understood and are each of them properly discharging their responsibilities.

23. Should consideration be given to requests by provincial authorities for further decentralization of responsibility and more local authority.

24. Is the organizational structure of AAETE including field personnel, subject matter specialists and "contact" farmer adequate to bridge the gap between researchers and the farmer.

25. Is AAETE effectively reaching and guiding the farm population in conjunction with other supporting government and others who provide essential supporting services.

26. What more should be done to strengthen farmers organizations and to assure farmers obtain sufficient credit and agricultural production inputs and that they can effectively market their produce.

27. Are water user associations with are being organized by AAETE functioning properly; has an equitable schedule for water useage been developed, and is it being followed in each subproject; are there other services expected from them and should charges be made for their services.

28. Have arrangements been made to meet the storage, drying and milling requirements for the projected increase in rice production taking into consideration the procurement area, market outlets, roads, communications, private and public services and other locational criteria.

29. What other donors are involved or expect to be involved in project which will enhance the project for success; is AID participation consistent with and coordinated with other donors.

30. Is the proposed training program properly designed to meet administrative, engineering, agricultural, organizational and other criteria institutional building needs that are essential for the success of the project.

31. Does the training program specifically identify what skills need to be taught to personnel to effectively manage and implement Sederhana subprojects and analyse the results; will the absence of implementating officials for training adversely effect field operations.

32. Has a training curriculum been developed that will enable personnel to actually participate in solving real problems in stimulated cases which are likely to be repeated in their own work.

33. With the training assistance that has been planned in the project will there be an institutional base with the capability of effectively developing the management needed; will there be sufficient instructors with the necessary capabilities.

34. Does the training plan cover evaluation as required in AID Implementation Letter No.1

35. Have adequate plans been made for further developing the evaluation capacity of officials in DGWRD and AAETE.

36. Does the baseline data for the target groups of farmers obtained initially for project analyses and subsequently through questionnaires and the mid-term review need to be further supplemented.

37. Is the computer program developed by the Directorate of Programming and Planning satisfactory for collecting and maintaining time series data on farm costs and returns, price of inputs and outputs, labor use, social improvement and other relevant data needed in evaluations.

38. Does the evaluation system of the Directorate of Programming and Planning supply sufficient data to effectively measure the economic and social progress of Sederhana farmers from the time the project starts until it is completed; does it include proper forms and reports, with the right content and frequency and any summaries necessary for easier evaluation.

39. Do reports quantify improvements in rice production and show the number of farmers using recommended practices such as chemical fertilizer, high yielding seed and pesticide.

40. Is the DGWRD regularly supplying AID with quarterly reports covering the 14 items listed on page 10 of AID Implementation Letter No.1.

41. Are evaluation reports being properly distributed and used for any policy, organizational or procedural changes which appear necessary to assure proper project implementation; the development of an effective reporting and project analysis system for measuring the social-economic progress of Sederhana participants; and to assure that leadership and monitoring responsibilities at local and national levels are properly delegated.

42. Is there baseline, progress or other report data now being accumulated that can be eliminated without adversely affecting project evaluation.

B. Social-Economic Improvements

1. Is this project deserving and getting high priority attention because it is effective in increasing the productivity and income of farmers who are on the lower end of the income scale; is this evidenced in the attitude and input efforts of the various GOI agencies involved in the project.

2. What quantifiable evidence is available that shows planned social and economic targets and goals are being achieved and that lower income farmers are enjoying an improved way of life.

3. How much greater are the benefits than the cost of the project as evidenced by benefit-cost and internal rate of return calculations; based on presently available data. Was this realistically calculate

4. Were assumptions that farmers would use adapted modern farming technology to expand and intensify rice production and increase farm incomes justified.

5. What, if any, is the effect of variation in capital cost, input costs, crop yields and crop prices on economic returns.

6. Have adequate financial resources been made available by the GOI and USAID for planned project development including major works, institutional building, training, land levelling and shaping and the production input requirements of the farmer considering the recurring escalations in cost.

7. Is the present poor repayment record of farmers on BIMAS loans apt to affect the future availability of production loans.

8. To what extent has project development been handicapped by the farmers inability to readily obtain land certificates and BRI loans for land levelling and shaping; what action can be taken to overcome this handicap.

9. Is the baseline data developed by the Directorate of Programming and Planning sufficient and of good enough quality to us in a "before and after" or "with or without" analysis of benefits from the project; is this kind of analysis contemplated.

10. Are available land and water resources being used more productively and profitably in Sederhana project areas.

11. Has the physical environment, educational and health facilities, farm roads and other social benefits improved more in Sederhana project areas than those with similar resources not included in Sederhana.

12. Has adequate consideration been given to drainage, soil erosion and other problems that might adversely effect environment in Sederhana areas; are problems developing.

13. Is the scheduled disbursement period for the loan appropriate considering the initial delays in implementing the project.

14. Has the project involved women more actively in the development process, more effectively utilized their capabilities and benefited them.

15. Are the income and price and cost data upon which the financial returns from the project were based realistic.

16. Have the income and cost effects of using irrigation, more intensive and extensive cropping, infrastructure improvements and other related improvements realistically quantified and analyzed; has the <u>real</u> income of project beneficiaries been calculated.

17. Are the increased land taxes which are imposed on farmers in Sederhana subprojects properly based on benefits received and repayment ability.

18. Are projected increases in the consumption of grain grown produce sales and increased farm income actually being achieved.

19. Is the return to the farmer from the use of fertilizer sufficient to encourage its proper use; is its use accompanied by good water and weed control without which it is not economic.

20. Has the economic use of pesticides as a preventive as well as a cure been demonstrated, also the effect of its use on possible fish mortality and other environmental damage.

21. What evidence is there that Sederhana has had a beneficial impact on unemployment, underemployment and work for women.

22. What is being done to identify the principal risk factors both on subprojects and for farmers.

23. Is the financial and technical assistance provided by the GOI adequate and are the disbursement policies and procedures suitable for the need.

24. When transmigration is involved are the selected settlers provided with adequate land, capital goods, crop production inputs and family living requirements to become successfully established.

25. Are the production inputs supplied in the BIMAS package adapted to the farmers need; might it be desireable to vary the package content in different geographical areas where soil conditions and pest problems may differ.

26. Are land use patterns before and after construction the same as was projected.

27. Are short-term employment opportunities as great as expected and is there any evidence new jobs are being created.

28. Are more agricultural products reaching the market place and is the nutrition of the family improving.

29. Are there farmers who were carrying out "slash and burn farming" converting to a more permanent type agriculture.

C. Increased Rice Production

1. Are projected increases in crop yields and crop sales being achieved; is there reliable statistical evidence to support this finding.

2. Are the farmer problems of determining when and how much water, fertilizer and pesticide to apply, which dry season crops to grow; and where he can market his produce being satisfactorily resolved.

3. Is the current system used by AAETE for disseminating good farming technology in a form that can be readily understood and implemented by farmers.

4. Are adequate seed supplies of new high yielding non-rice varieties available for dry season plantings.

5. Is there an opportunity to improve BIMAS fertilizer mixes by adding or reducing the amounts of N-P-K or adding some trace elements especially where double cropping is involved?

6. Is the division of small farms into smaller than economic units through inheritence likely to adversely affect the achievement of Sederhana production goals and can anything appropriately be done to overcome this problem?

7. Are the production input and market needs of farmers on Sederhana project being adequately met?

8. Do the GOI rice pricing, production input subsidies and other agricultural policies encourage the use of adapted modern farming technology?

9. Are the improve practices identified in water and crop research and demonstration practical of accomplishment by Sederhana farmers and likely to be accepted by them?

10. Would yield contests with prizes be a practicable way of encouraging farmers to use improved farming practices?

The answer to the above questions will require on site observations at Sederhana subprojects, interviews with AAETE, DGWRD, Transmigration, Interior, Health and Welfare, BRI, BIMAS, and other involved government personnel in Jakarta and field offices; discussions with officials in water user associations, farmers and local government officials.

Suggested Study Approach

The US evaluation team should assemble and review all available data of good quality which is relevant to achieving the outputs of the project upon their arrival in Indonesia. It will also be important for them to meet with designated staff of DGWRD, AAETE and other involved GOI official to discuss specific details of the work, agree on and prepare a report outline and organize specific work assignments. It is expected that AID/Indonesia, the Directorate of Programming and Planning in DGWRD, AAETE, SAE and others who are involved in the project

would make available project papers, policy statements, reports and other relevant data which is available to determine the current status, plans and progress of Sederhana. In cooperation with evaluation team members from the GOI methods of obtaining all the data needed to measure farmers progress and the impact of the Sederhana loan would be discussed and plans made for obtaining it. This would include the selection of a random stratified sample of subprojects which would be visited by the evaluation team. The questionnaire material included in this report would be used as a guide in determining what data to collect and assess.

Following the completion of the fact gathering visits to the selected subprojects and a careful compilation and analysis of the data obtained, a report of the findings would be prepared and distributed to appropriate officials in AID/Indonesia, DGWRD and others with Sederhana implementing responsibilities.

Evaluation Background and Current Status

The need for an evaluation system to determine whether planned targets and goals are being achieved is well recognized by the Government of Indonesia (GOI) implementing agencies of Sederhana. The Directorate of Programming and Planning (DPP) in the Office of the Directorate General of Water Resources Development (DGWRD) with assistance from the Agency for Agricultural Education, Training and Extension (AAETE) and the Directorate General of Food Crops (DGFC) have the primary responsibility for evaluation of Sederhana. As a prerequisite to the establishment of a regular monitoring and reporting system the DPP is compiling baseline data on each subproject. Much of these data were obtained to show the subprojects met the necessary selection criteria and in the designing, planning and construction process. These data were supplemented with additional data obtained from three questionnaires that were completed in the field. A significant amount of relevant baseline data on each subproject has reportedly been key punched on cards for computer use. Printouts of these data have not been made available to AID/Indonesia, but it is expected that it will be in the near future.

It is expected that the existing data will be supplemented by information obtained in mid-term review of Sederhana which has been funded and scheduled to be completed before April 1, 1977. This review will be conducted under the direction of consultants from "Survey Agro Ekonomi" (SAE). An English translation of the very comprehensive questionnaire they expect to use is attached as Appendix III. There are also a number of other reports including a regular monthly report from the Provinces showing the progress of construction and some other relevant data on each subproject. Copies of these reports have been obtained from DGWRD and are available in AID/Indonesia RD files together with

the most recent DGWRD organizational chart, relevant maps and other Working Papers.

The DPP said it expected to continue its practice of having SAE consultants make a yearly evaluation report on a selected number of subprojects in different geographical areas of the country, In each of the last two GOI fiscal years SAE has visited a sampling of Sederhana subprojects, monitored and made records of development progress and identified the problems they thought were inhibiting successful development. Reports of these evaluations can be found in the following publications which are available in the files of the Office of Rural Development.

1. Laporan Kerja, Team Assistensi untuk Proyek-Proyek, Irrigasi/Reklamasi Sederhana Tahap I, Tahun 1974/75, Laporan No. 01/TA/1974, 06-03.75

2. Laporan No. 02/TA 1975, 04-07.75

3. Laporan No. 03/TA/1976, 20-05-76

It is our understanding that SAE will make a similar review of selected Sederhana projects this fiscal year. It is unfortunate that most of the above report forms and data have not been translated into English and a good assessment if its pertinence and the sufficiency of its coverage was not possible by the evaluation design team. It is recommended that some bilingual person from the AID program office or Rural Development review and make summary of the relevant data in these reports or that a translation of them be made for use by the evaluation team before its arrival in Indonesia.

A. Current Reporting Systems

Limited review of current reporting forms and conversations related to their use indicates that current systems are directed essentially to implementation of activities felt to be the responsibility of the central government. More general letter type reports are utilized to convey a picture of general conditions applying to what are considered to be provincial responsibilities. Specific studies are entered into from time to time as illustrated by current efforts in the field of evaluation and by SAE reports presenting evaluations of the Sederhana Program on a sample basis in 1974/75 and 1975/76 fiscal year to focus on specific problems or needs.

Given this situation any immediate evaluation effort must continue to rest on specific efforts during the coming two years. However, this situation should not be permitted to continue as it is both

costly and time consuming and does not provide the detailed and timely information required for informed decision making. It is essential therefore that a uniform reporting system with related defined channels and applicable to the project operation and development state be established. Such a system must provide for inputs by the Ministry of Agriculture at all levels yet retain the focal point of responsibility for final analyses and presentation, in so far as water resource development projects are concerned, in the Directorate General of Water Resources. The system should provide, in addition to necessary technical and financial information, for measurement of success and/or failure of projects in terms of economics and environmental and sociological change. Since "before project" conditions are established in the project planning and/or project appraisal stage, continued annual reporting should be based on the same factors and reflected in the same terms.

A reporting system of this nature can be developed and established through the International Engineering Company advisory contract and would provide a firm convenient basis for analyses and/or evaluation for any purpose in the future.

B. Training

The scheduled in country training program for Sederhana implementors has not yet gotten underway. An outline of the training program has been prepared in the DGWRD Office and a draft copy of it is attached as Appendix IV. However, it has not received the approval of the Director General nor AID/Indonesia. Thus the scheduled start of training beginning November 1, 1976 is unlikely to take place. A training officer who is expected to offer advice on the curriculum and training methods will be provided under the IECO contract. He is expected in Jakarta within the next month.

The International Engineering Company, Inc. (IECO) which currently has an advisory team working with DGWRD expects to provide advice and assistance among other things on program reviews; subproject selection criteria; economic analysis of subprojects; design criteria; engineering, economic and financial standards; environmental analysis standards; and monitoring procedures. It will assist DGWRD, DGFC and AAETE perform their monitoring duties and in meeting the requirements of the AID loan agreement. It will also advise and assist DGWRD in training its staff to make evaluations. Part of the IECO staff will be working with field personnel and will advise them on the preparation of reports and questionnaires. It is expected these reports will be simply worded and within the ability of local officials to complete. IECO is also expected to see that any needed explanations required

to complete reports and on the job training of field personnel in report preparation will be provided by them. Thus it is reasonable to believe that reports, data assessments and compilations and evaluation performed by DGWRD will continue to improve and become more meaningful and useful tools in administration and policy making.

It is evident from the above that the need for and importance of evaluation in Sederhana is appreciated and understood and that considerable attention is currently being devoted to it. However, the evaluation design team was unable, within the working time it has to complete its assignment and without translations of materials, to determine whether the reporting system was sufficiently comprehensive and operating in a timely and effective manner or whether report data were being properly evaluated, distributed and used to measure the impact of Sederhana, and to identify problems and guide project managers and implementors.

Possible Problem Areas

The evaluation design team in its limited discussions and observations on Sederhana subprojects found evidence that some problem area might be developing. The following are identified not as a basis for criticism but for the future guidance of project administrators and implementors:

1. Operation and maintenance of the irrigation system. It was reported that only Rp. 2,000 per hectare were budgeted for O&M but studies by the World Bank and the Ministry of Public Works show that Rp. 3,500 to Rp. 3,800 per hectare are required for proper maintenance.

2. BRI loans to farmers for land levelling and land shaping. Some farmers reported they had submitted applications for loans for this purpose as long ago as 6 months but it was reported that although the making of such loans had been approved in principle, no farmer had yet obtained one.

3. Delays in making land certificates available. A major problem in this connection is the need of the farmer to raise the funds, reported to range from Rp. 10,000 to Rp. 30,000 to pay for the certificates. The certificate is needed when and if BRI starts disbursing land-levelling and land-shaping loans.

4. Delays in getting DGWRD and AID approval of subproject designs is causing Sederhana development to fall behind schedule. Provincial official report that periods as long as six months elapse between their sub-mission of project designs and the time it is acted on in Jakarta. A large part of this delay is because of the failure of DGWRD officials to submit cost estimates, construction specifications

selection criteria and other required documentation.

5. Local extension agents (PPL's) find it difficult to serve properly the large number of farmers assigned to them. It was reported the average number of families per agent on Sumatra was about 1100; in one instance the local agent on the outskirts of a city reported he was expected to serve more than 5,000 families. Moreover, they are handicapped because the only transportation made available to them is a bicycle.

6. Many of the farmers on Sederhana subprojects are not using available water efficiently. Farmers using traditional irrigation methods tend to use too much water although demonstrations show much higher crops yields can be obtained if water depths are maintained at lower levels. The services of subject matter specialists in water management are not available in many areas and on the provincial level the responsibilities of AAETE and DGWRD officials for water management training need to be more specifically defined and the necessary coordination and synchronization of effort planned.

7. The curriculum for the in-country training program, an integral part of institution-building, has not been finalized or approved by the DGWRD or AID. It was planned that in-country training would begin in November 1976, but this appears unlikely at this late date. Thus, another part of the planned program will probably fall behind schedule.

8. It was reported that the Sederhana project in South Sulawesi had to be curtailed because of a shortage of farm labor.

9. There is reason to think that the projections of income used in the evaluation of some subprojects may have been overly optimistic because where land clearing, levelling and shaping have taken place, the actual production is reported to be less than before irrigation.

10. The established government minimum price for rice was reported by some officials and farmers as too low to economically use and assume the risks involved in applying fertilizer, pesticides and other modern farming practices.

11. It was reported that farmers on Sederhana subprojects have repaid less than 50% of maturities on BIMAS loans; this is

likely to limit the amount of production credit available to them in the future and cause them to curtail the use of high yielding seeds, fertilizers and pest control methods that make irrigation economically viable.

12. Some farmers reported an interest in diversifying their cropping operations but they had not done so because of a lack of established market outlets for crops others than rice. This suggests a need to organize production so sufficient amounts of adapted produce is grown in a limited geographical area to support a market. Cost of assembly and procurement are exorbitantly high and the availability of high quality standardized products demanded for processing and marketing are usually too limited when production is in small lots scattered over a large area.

13. The land tenure problem in older settled areas is reported to be worsening because of inheritence customs which cause the division of farm lands into units that are too small to be operated economically.

14. SAE officials who participate in evaluation of Sederhana could have a built-in bias because they also have positions in AAETE which has a major part of the implementing responsibility on Sederhana subprojects.

Summary

The need and value of evaluation for the Sederhana project is appreciated and subscribed to by the GOI. The Directorate of Programming and Planning in DGWRD has taken the initiative of assembling baseline data on the program which has been key punched for computer use. "Survey Agro Ekonomi" under a contract with DGWRD has been assisting in evaluating the GOI Sederhana Program since its beginning and three reports of its findings have been published and distributed. Provisions have been made in the planned institution building program, financed in part with the USAID loan, to provide training in reporting and project analyses.

In general GOI and AID/Indonesia subscribe to the same evaluation objective. However, there currently appears to be a need to improve the quality of Sederhana evaluations and the evaluation design teams effort was devoted largely to this end. Likewise the proposed follow on assistance from U.S. agricultural economist and water resources development specialist is designed to accomplished this purpose by providing assistance in training, designing evaluation questionnaires, evaluation is properly analyzed and distributed to program implementors, administrators and

policy makers.

On the basis of the evaluation design teams limited discussions and observations it appears that a number of problem areas that could affect the success of the program are developing. There have been discussed briefly in the report and point out the need for timely high quality subproject reports and evaluations.

APPENDIX I

tacts and Communications

October 6, 1976

A. USAID/Jakarta

Mr. John B. Smith, Hydraulic Engineer Advisor (Sederhana Project Officer), Office of Rural Development

Working arrangements and outline of project considerations.

B. USAID/Jakarta

Mr. Walter C. Tappan, Chief of Agricultural Development, Office of Rural Development.

General discussion to gain understanding of Indonesian Agriculture.

October 7, 1976

A. USAID/Jakarta

Mr. William C. Larson, Chief of Rural Development
Mr. John B. Smith, Sederhana Project Officer

General discussion relating to program goals, engineering and arrangements.

B. Directorate General of Water Resources Development

Drs. M. Attamimi, Chief Foreign Aid Division
Drs. Redha, Foreign Aid Division
Drs. Tambunan, Chief of Program Planning, Directorate of Planning and Program
Ir. Mamad Ismail, Chief, Sub Directorate Construction II, Directorate of Irrigation (Small projects and Sederhana)
Ir. Ngerti Ginting, Planning and Information Division
Mr. John B. Smith, USAID

Discussion to acquaint all concerned with evaluation system proposal, "Sederhana" Program and organizational relationships and to established schedule.

C. Sub Directorate Construction II

Ir. Mamad Ismail, Chief Sub Directorate Construction II
Mr. Carroll E. Aksamit, Principle Water Resources Engineer, International Engineering Company, Leader Advisory Team
Mr. John B. Smith, USAID

Discussion of "Sederhana" construction and IECO operations and responsibilities.

October 8, 1976

A. USAID/Jakarta

Mr. Louis Mitchell, Rural Development Advisor (GOI contract)
Mr. R.J. Bergquist, Rural Development Advisor (GOI contract)

Discussion of methodology relating to a recently completed evaluation.

B. USAID/Jakarta

Mr. Thomas C. Niblock, Director USAID Mission
Dr. Kenneth M. Kauffman, Deputy Director
Mr. William C. Larson, Chief, Office of Rural Development
Mr. John B. Smith, Sederhana Project Officer
Mr. Robert F. Zimmerman, Evaluation Officer, Office of Program

Discussion of work goals, status of work and program.

October 9, 1976

A. Directorate of Irrigation, DGWRD, Jakarta

Ir. Oesman Djojoadinoto, Director of Irrigation
Ir. Mamad Ismail, Chief of Sub Directorate Construction II

Discussion directed to goals and purposes of "Sederhana" program, irrigation organization and program, and reporting channels.

B. Sub Directorate of Construction II, DGWRD, Jakarta

Ir. Mamad Ismail, Chief
Mr. Carroll E. Aksamit, IECO

Follow-up discussion relating to reporting channels, field responsibilities and potential for IECO advisory assistance in refining reporting and related channels to relate progress to Sederhana appraisal base line information.

C. Directorate General of Water Resources Development, Jakarta

Ir. Suyono Sosrodarsono, Director General
Drs. M. Attamimi, Chief, Foreign Aid Division
Drs. Suwarso, Project Assistance, Foreign Aid Division
Ir. Mamad Ismail, Chief, Sub Directorate Construction II
Drs. Tambunan, Chief of Program Planning
Ir. Ngerti Ginting, Planning Information Division
Mr. John B. Smith, USAID

Discussion with emphasis on DGWRD needs, value of evaluation in management and possible support of existing reporting system.

October 12, 1976

A. Sub Directorate of Soil and Water, Directorate General of Food Crops

Ir. Otje Bratamidjaja, Chief Directorate of Soils and Water
Mr. Dahlan Widjajadipura, Chief of Land Development
Mr. Effendi Pasandaran, Chief of Water Management
(also works with Survey Agro Ekonomi - SAE)
Mr. Arifin Mukaddas, Chief of Division of Instruction Development AAETE (Agency for Agriculture Education, Training and Extension)
Mr. Syakbrun Yunan, Counterpart IECO Headquarters Team in Agriculture (Directorate General of Food Crops)
Mr. Sitanggang, Sub Directorate of Construction II, DGWRD
Mr. Carroll E. Aksamit, IECO
Mr. John B. Smith, USAID

Discussion of purpose of evaluations and related organizational responsibilities and methodology as well as familiarization with evaluation program of Survey Agro Ekonomi, training and reporting systems; and organizational relationships.

B. USAID/Jakarta

Mr. Steven P. Mintz, Area Development, Office of Rural Development
Mr. John B. Smith, Sederhana Project Officer

Discussion of preliminary plan for Sederhana Development prepared by Mr. Mintz, April 12, 1976.

October 14, 1976

A. Directorate General of Water Resources Development, Jakarta

Drs. Tambunan, Chief, Program Planning
Drs. Suwarso, Project Assistance, Foreign Aid Division

Ir. Ngerti Ginting, Planning and Information Division
Mr. Effendi Pasandaran, Chief Water Management, DGFC (also SAE)
Mr. Sitanggang, Sub Directorate of Construction II
Mr. C. E. Aksamit, IECO
Mr. Robert F. Zimmerman, USAID

Discussion of organization of "Survey Agro Ekonomi" (SAE) and its operations under contract with DGWRD relating to improvement of appraisal base line data an approved Sederhana projects and evaluation of operating projects on sample basis 1976/77 (10 provinces - 3 projects each province)

October 15, 1976

Lampung Province, Public Works Office, Telukbetung, Sumatra

Ir. Sigit Rahardja, Chief of Public Works
Ir. Nusjirwan, Chief of Agriculture Service (Outgoing)
Ir. Kusnadi, Chief of Agriculture Service (Incoming)
Mr. Karip, Chief of Regional Office of Transmigration
Mr. Bintoro, Chief of Water Resources, S. Lampung Kabupaten
Drs. Suwarso, DGWRD, Jakarta
Ir. Ngerti Ginting, DGWRD, Jakarta
Mr. Syakbrum, FCPD, Jakarta
Mr. Robert S. Queener, Development Loan Office, AID/Washington

Discussion of field program, problems, relationships and conditions followed by field inspection of three completed project areas.

October 16, 1976

Lampung Province, Public Works Office, Telukbetung, Sumatra

Ir. Sigit Rahardja, Chief Public Works
Ir. Nusjirwan, Chief of Agriculture Service (Outgoing)
Ir. Kusnadi, Chief of Agriculture Service (incoming)
Mr. Darlan, Chief of Water Resources, S. Lampung Kabupaten
Mr. Sudarsono, Chief General Affairs, Section Office
Mr. Syahrir Mukhtar, Coordinator of Agricultural Field Workers (PPLs)
Mr. Wathoni, Land Productivity Division Agriculture Service
Drs. Suwarso, DGWRD, Jakarta
Mr. Syakbrum Yunan, FCPD, Jakarta
Mr. Robert S. Queener, Development Loan Office, AID/Washington

Discussion of agricultural field services and problems, credit, training, and related problems of issuance of Land Certificates, work load, prices and field research.

October 18, 1976

West Sumatra Province, Public Works Office, Padang, Sumatra

Mr. T.M. Izam, Chief of Irrigation Division, Public Works
Mr. Zafri, Chief of Agriculture Services
Mr. Mustafa Bakri, Chief of Agriculture Technical Bureau
Mr. Zainal Kian, Water and Land Conservation Division, Agriculture Services
Drs. Suwarso, DGWRD, Jakarta
Ir. Ngerti Ginting, DGWRD, Jakarta
Mr. Dachland Widjajadipura, FCPD, Jakarta

Discussion of Sederhana program progress and plans, labor, yield, PPl work load, fertilizer and credit, project operation and maintenance and problems. Field trip to Lumpo Limau Gadanga illustrated difficult conditions faced by field staff during project formulation and initial construction and desirability of injection rural development programs particularly road improvement to support construction and marketing activities and improve environmental conditions.

October 19, 1976

West Sumatra Province, Public Works Section and Kabupaten Administrative Office, Solok Kabupaten (District)

Mr. Rustam, Assistant to Chief of Kabupaten
Mr. Muksis, Chief Public Works Section (Section all corresponds with administrative and agricultural district)
Mr. Syafei, Chief of Water Resources Division, Public Works Section Office
Mr. Kasim, Chief of Agriculture Extension Service of Kabupaten
Mr. T.M. Izam, Water Resources, Public Works, Pedang
Mr. Mustafa Bakri, Agriculture, Padang
Drs. Suwarso, DGWRD, Jakarta
Ir. Ngerti Ginting, DGWRD, Jakarta
Mr. Dahlan Widjajadipura, FCPD, Jakarta

Discussion of organizational relationships, Bandar Kuck project (a better project) and problems; credit and land certificates situation; availability of agricultural inputs; water users

association; responsibilities and local views relating to desirability of Sederhana program and its implementation. Observed Bandar Kuck area and works. The project (964 ha) involving a diversion and bench flume in addition to distribution works was initiated under another program in 1971 and would appear too extensive for a normal Sederhana project. The area looks excellent, but serious leakage problems in the flume area were noted. Rural works inpress funds are being utilized for road improvement. Field discussions were conducted with Agricultural Extension Field Worker (PPL) Public Works water master and diversion attendant.

October 20, 1976

West Sumatra Province, Irrigation Pilot Demonstration Area, Kecamatan Pouh, Padang/Pariaman Kabupaten

Mr. Bukhari, Head of Village
Mr. Ismet Noer, Chief of Agriculture Kecamatan Pouh
Mr. Syair, Secretary to Chief of Agriculture Kecamatan Pouh
Mr. Zubir, Chief of Water Users Association
Mr. Muslim Syarif , Manager of Village Cooperative Kecamatan Pouh
Mr. Amirudin, Secretary of Youth Association
Mrs. Maryam, Chairperson of Women's Association
Mr. Darmani, Farmer
Mr. Nazar, Farmer
Mr. Ahrisman Agus, PPL for BIMAS program
Mr. T.M. Izam, Water Resources, Public Works, Padang
Mr. Mustapha Bakri, Agriculture, Padang
Ir. Ngerti Ginting, DGWRD, Jakarta
Mr. Dachlan Widjajadipura, FCPD, Jakarta

The purpose of the demonstration area, covering some 290 hectares in a major DGWRD system, administered by Agriculture and subsidized financially by DGWRD was explained by Mr. Bakri and the program and results were explained by Mr. Agus. The Water Users Association had financed two thirds of the construction cost of a headquarters building with the remaining one third contributed by DGWRD. Results of field trials relating to depths of irrigations and to application of fertilizers were discussed as were problems indicated in meeting previously listed.

October 28, 1976

Directorate General of Water Resources Development, Jakarta

Drs. Suwarso, Project Aid, Foreign Aid Division
Mr. Otje Bratamidjaja, Chief Rural Irrigation Service, Dir. Gen. of Food Crops, Ministry of Agriculture
Drs. Suryanto, Directorate of Planning and Programming
Mr. Effendi Pasandarun, Chief of Water Management (also SAE)
Mr. S. Hadiwijono, Directorate of Irrigation

Preliminary discussion of evaluation teams observations prior to preparation of draft report including objectives, timing of evaluation operations, need and desire for assistance, and current staffing at SAE assistance and current staffing at SAE field operation.

APPENDIX II

Evaluation Plan and Cost Estimates Reviewed

Alternative I

A. Project Description

The project involves evaluation of the Sederhana (Simple) Irrigation, Reclamation and Development Program in terms of:

1. Institutional development,
2. Increased rice production,
3. Improved well being of the rural poor, and
4. Project technical and financial implementation and development.

The program includes upgrading and/or new construction of diversion structures, delivery facilities; and farm level distribution facilities as well as land preparation, production inputs and training together with training and contract advisory assistance essential to central and provincial staff improvement necessary to implement and sustain the program. Some 275-400 development areas covering 110,000 to 160,000 hectares located in 24 of 26 of Indonesia's provinces are involved. Sederhana development areas are visualized as simple to design and construct, capable of rapid execution using labor intensive methods and relatively inexpensive. They are expected to have quick impact on rice production.

The large majority of Sederhana development areas cover an area of 100 to 2000 ha. Almost all areas involve irrigation and a few require swamp reclamation. About half the area involved is in wet rice production much of it presently in village irrigation systems. The remainder consists of extension of existing wet rice areas and bringing new areas under production. Land clearing is involved in some 20% of new areas. The program initiated by the GOI in 1974 received assistance in the form of a loan of $20 million in 1975 which is curently approved at a level of $23.7 million. Potential expenditures under the loan had been confined to employment of an advisory assistance team through September 1976. It is expected that development meeting loan criteria will be well underway by late 1977. The need for continuing assistance and expertise in evaluation and the complementary needs of AID and the GOI for program evaluation justifies technical assistance in early 1977, field data collection in mid 1977 and analysis and presentation of results in late 1977 or early 1978.

B. Objective of Services

The primary objective of services to be provided by the United States is to:

1. Determine the effectiveness of GOI and United States efforts in terms of program goals (points 1 through 3 in A above),

2. Determine progress, problems of implementation and effectiveness in reaching solution (point 4 above), and

3. Provide a basis for further assistance if deemed productive.

The GOI interest extends to include:

1. The requirement for administration and technical action related to implementation and

2. the determination of the place of the program in GOI development priorities.

C. Plan and Scope of Services

It is proposed that a team be selected consisting of:

1. An agricultural economist with experience in socio-environmental aspects of development and

2. a water resources development specialist with engineering and agricultural background.

The team, over a period of approximately 5 months, mid-May through September 1977, perform the following services in the sequence noted.

1. May 15 - June 1. Review results of the evaluation completed by Survey Agro Ekonomi in 1976 and related methodology including field team selection and training, selection of subprojects, questionnaires used and analysis procedures (Agricultural Economist - 2 weeks)

2. June. Prepare recommendations and participate in refinement and revision of questionnaires and other materials required for field program; participate in development of subproject selection criteria and selection of areas, participate in selection and training of field staff. (Agricultural Economist - 1 month)

3. July-August. As members of a team selected by GOI under the Supervision of Directorate of Planning and Programming, DGWRD and including responsible personnel who participated in the 1977 evaluation, team DGWRD, DGFC, AAETE and provincial groups proceed to examine in the field the results of field reports on representative subprojects involving some 8-12 subprojects in 4-5 provinces; to examine planning, design, construction, and operation and maintenance and development procedures, reporting systems and results to determine efficiency and adequacy; and prepare relevant recommendations. (Agricultural Economist and Water Resources Development Specialist - 2 months)

4. September. Participate in initiation of analysis of field reports to provide a basis of evaluation required by GOI and by USAID; complete analysis and reports required by USAID in accordance with AID's established formats; and prepare recommendations relative to future activities and scheduling necessary to adequate evaluation including utilization of uniform annual reporting systems. (Agricultural Economist - 1 month).

D. Support

It is proposed that team members will be officed in DGWRD, but with desk space and bilingual secretarial service in USAID Jakarta and air transportation supplied by USAID. As indicated above the GOI would provide a team expected to continue activities of this nature in the future and necessarily would provide translations of materials required including questionnaires, training materials, report forms, and informational materials, would provide training facilities, and would provide local transportation in the field.

E. Cost Estimate

	Dollar	Rupiah
US Team		
Salary		
1 Agricultural Economist 90 days x $160/per day	21,600	
1 Water Resources Development Specialist 40 days x $160/per day	9,600	

Appendix II
Alternative I

	Dollar	Rupiah
International Travel		
2 round trip fares @ $1800	3,600	
4 days per diem at $6/day	24	
2 days per diem at $50/day	100	
Local Travel		
2 men x 4 trips @ Rp. 90,000		720,000
In country per diem		
1 man x 126 days x Rp. 22,000		2,772,000
1 man x 56 days x Rp. 22,000		1,232,000
Secretary		
18 weeks x Rp. 40,000		720,000
Sub Total	34,924	5,444,000
Training of GOI Field Personnel		
Travel to training facility		
20 men x Rp. 90,000		1,800,000
Instructors		
37 hrs x Rp. 3,000/hr		111,000
Field Costs		
20 men x 7 weeks x Rp. 42,000/week		5,880,000
Sub Total		7,791,000
Grand Total	34,924	13,235,000
Say	35,000	13,300,000

APPENDIX II

Evaluation Plan and Cost Estimates Reviewed

Alternative II

A. Project Description

The project involves evaluation of the Sederhana (Simple) Irrigation, Reclamation and Development Program in terms of:

1. Institutional development,

2. Increased rice production,

3. Improved well being of the rural poor, and

4. Project technical and financial implementation and development.

The program includes upgrading and/or new construction of diversion structures, delivery facilities; and farm level distribution facilities as well as land preparation, production inputs and training together with training and contract advisory assistance essential to central and provincial staff improvement necessary to implement and sustain the program. Some 275-400 development areas covering 110,000 to 160,000 hectares located in 24 of 26 of Indonesia's province are involved. Sederhana development areas are visualized as simple to design and construct, capable of rapid execution using labor intensive methods and relatively inexpensive. They are expected to have a quick impact on rice production.

The majority of Sederhana development areas cover an area of 100 to 2000 ha. Almost all areas involve irrigation and a few require swamp reclamation. About half the area involved is in wet rice production much of it presently in village irrigation systems. The remainder consists of extension of existing wet rice areas and bringing new areas under production. Land clearing is involved in some 20% of new areas. The program initiated by the GOI in 1974 received assistance in the form of a loan of $20 million in 1975 which is currently approved at a level of $23.7 million. Potential expenditures under the loan had been confined to employment of an advisory assistance team through September 1976. It is expected that development meeting loan criteria will be well underway by late 1977. The need for continuing assistance and expertise in evaluation and the complementary needs of AID and the

GOI for program evaluation justifies technical assistance in early 1977, field data collection in mid 1977 and analysis and presentation of results in late 1977 or early 1978.

B. Objective of Services

The primary objective of services to be provided by the United States is to:

1. Determine the effectiveness of GOI and United States efforts in terms of program goals (points 1 through 3 in A above),

2. Determine progress, problems of implementation and effectiveness in reaching solution (point 4 above), and

3. Provide a basis for further assistance if deemed productive.

The GOI interest extends to include:

1. The requirement for administration and technical action related to implementation and

2. The determination of the place of the program in GOI development priorities.

C. Approach and Scope of Services

It is proposed that a team consisting of:

1. An agricultural economist with experience in socio-environmental aspects of development and

2. A water resources management specialist with engineering background be selected with qualifications consistent with USAID Grade FSR-2 level, and proceed as indicated below.

   a. The agricultural economist would proceed to Jakarta prior to preparation of GOI plans for evaluation in CY 1977 review previous evaluation efforts, by Survey Agro Ekonomi and progress reporting systems participate in selection of representative subprojects, preparation of questionnaires and training in evaluation and related analysis; and depart on completion of this work. (May - June, 6 weeks)

b. The economist, accompanied by a water resources management specialist, would return during August and join responsible GOI officer in spot checking evaluation field operations involving some 8-12 subprojects in 3-4 provinces; review effectiveness of planning, design, construction, operation and maintenance, and advisory assistance efforts to subprojects being checked; and submit comments and recommendations to the GOI and USAID. (August - September, 5 weeks)

c. The agricultural economist would return prior to completion of analysis of field data and participate in final analysis of data for GOI use in program and budget preparation; proceed to complete evaluation presentation in conformance with AID requirement for USAID's operational program and budget and prepare comment and recommendations relative to methodology, purposes, sequence and refinements applicable to future evaluation activities (Approximately October - November, 6 weeks).

D. Support

It is proposed that the personnel selected be officed with GOI counterparts in the Directorate of Planning and Programming, DGWRD but with desk facilities, billingual secretarial assistance and in country transportation furnished by AID; that they work with teams selected from SAE, DGFC, AAETE, DGWRD and University personnel on each step of evaluation (training through analysis).

E. Cost Estimate

	Dollar	Rupiah
US Team		
Salary		
Agricultural Economist 85 days x $160/day	13,600	
Water Resources Management Specialist 25 days x $160/day	4,000	
International Travel		
4 round trip fares @ $1800	7,200	
8 days per diem x $6/day	48	
4 days per diem x $50/day	200	

Local Travel		Dollar	Rupiah
2 men x 4 trips x Rp. 90,000			720,000
In country per diem			
1 man x 119 days x Rp. 22,000			2,618,000
1 man x 35 days x Rp. 22,000			770,000
Secretary			
17 weeks x Rp. 40,000			680,000
	Sub Total	25,048	4,788,000
Training of GOI Field Personnel			
Travel to training facility 20 men x Rp. 90,000			1,800,000
Instructor 37 hrs x Rp. 3,000/hr			111,000
Field Costs 20 men x 7 weeks x Rp. 42,000/week			5,880,000
	Sub Total		7,791,000
	Grand Total	25,048	12,579,000
	Say	25,000	12,580,000

APPENDIX III

DIRECTORATE OF PLANNING AND PROGRAMMING

QUESTIONNAIRE

SEDERHANA IRRIGATION/RECLAMATION PROJECT

YEAR : 197...../197.....

NAME OF PROJECT : .....

PROVINCE : .....

DISTRICT : .....

SUB-DISTRICT : .....

VILLAGE : .....

DIRECTORATE OF PLANNING AND PROGRAMMING

DIRECTORATE GENERAL OF WATER RESOURCES

DEPARTMENT OF PUBLIC WORK & ELECTRIC POWER

Project No. :

Development Center :

Province :

1. Name of Project :

2. Program :

2.1 New Irrigation network construction program.
2.2 River basins and swamps rehabilitation and reclamation program.

3. Location and Area of Planned Project

3.1 Location

3.1.1 District
3.1.2 Sub-district
3.1.3 Village
3.1.4 Nearest town:.....
Distance from Project: ..... km.
3.1.5 Geographical location: ..... latitude
..... longitude
3.1.6 Area of planned project:..... ha.

4. Project Environment

4.1. Topographical condition

4.1.1 Elevation above: Sea level..... m
4.1.2 Topography: 1. flat 2. mountainous
3. hilly 4. swampy 5. other
4.1.3 Is there a problem regarding topography?
1. yes 2. no

4.2 Climate

4.2.1 Type of climate .....
4.2.2 Wet month: Jan. Feb. Mar. Apr. May Jun
Jul. Aug. Sep. Oct. Nov. Dec.

4.2.3 Name of rain fall station:.....
Distance from project area: .....
4.2.4 Temperature: daily average: .....^{o}C
average daily maximum:.....^{o}C
average daily minimum:.....^{o}C
4
4.2.5 Wind
- Wind direction during rainy season:
wind speed.....km/hour
wind character: warm/dry/moist
- Wind direction during dry season:
wind speed.....km/hour
wind character: warm/dry/moist

4.3 Land Situation

4.3.1 Land use in catchment area/sub-district
- forest : ..... ha.
- grass/thatch-grass: ..... ha.
- lake/swamp : ..... ha.
- rice-field : ..... ha.

* irrigated (with total control): ..... ha.
* irrigated (with partial control):..... ha.
* village irrigation (with no control)..... ha.
* rain fed:..... ha.
* depression:..... ha.

- upland/dry land: ..... ha.
- residential area:..... ha.
- plantations:..... ha.
- fish ponds: ..... ha.

4.3.2 Soil type in catchment area/sub-district: .....
.....
4.3.3 Soil characteristic in catchment area/sub-district:
- Cultivatable land is generally:
1. difficult to cultivate
2. moderately difficult to cultivate
3. easily cultivated
Soil chemical composition
* test date
* laboratory

* ph: .....
* organic content: 1. high 2. medium 3. low

* CaCo3 content: 1. high 2. medium 3. low

- Soil physical character:
  * "top soil" layer
    - depth: ..... cm
    - structure : 1. loose 2. dense 3. prismatic
    - texture : 1. fine 2. medium 3. coarse

  * "sub soil" layer
    - structure: 1. loose 2. dense 3. prismatic
    - is there any negative element to crop growth:
      1. yes 2. no

4.3.4 soil color: 1. black 2. grey 3. yellow
4. brown 5. red 6. other

4.3.5 List in sequence the most suitable crop grown in catchment area/subdistrict:

1. rice-corn 2. corn-cassava
3. cassava 4. others

4.4. Agriculture

4.4.1 Crop pattern of ricefield
.....

4.4.2 Crop pattern of upland
.....

4.4.3 Farmers average land holdings:
- total :..... ha.
- ricefield :..... ha.
- upland :..... ha.
- home garden/estate:..... ha.

4.4.4 Average yield (100 kg/ha) and harvested area in the last three years:
- irrigated paddy rice : ..... (100 kg)/ha.
- depression paddy rice/ rain-fed paddy field:..... (100 kg)/ha.
- upland rice :..... (100 kg)/ha.
- corn in rain-fed paddy field/depression :..... (100 kg)/ha.
- upland corn :..... (100 kg)/ha.
- peanut in irrigated paddy field: ..... (100 kg)/ha.
- peanut in depression/ rain fed paddy field :..... (100 kg)/ha.'
- upland peanut:..... (100 kg)/ha.

4.4.5 Application of fertilizer, pesticide, etc.
% of farmers using them.

- Urea : 1.easy to obtain 2. difficult to obtain..%
- Pesticide : 1.easy to obtain 2. difficult to obtain..%
- Insecticide: 1.easy to obtain 2. difficult to obtain..%

4.4.6 Seed
- Local high yielding variety : .....
- National high yielding variety:.....

4.4.7 Agriculture Extension service
- Distance to Agricultural Extension service:..... km.
- Service provided: 1. seldom 2. regularly
- Farmers response to extension service:
1. receptive 2. doubtful 3. reluctant

4.4.8 Land preparation
1. manpower 2. manpower + animal 3. machine

4.4.9 Manpower used in agriculture field:
- outside labours used by farmers:.....%
- outside labours used in:
1. land preparation 2. planting
3. harvesting 4. pest-rodent control
- average working hours per day:..... hour/day
- total manday/ha used by farmers:..... (manday)

4.5 Marketing of Agricultural products

4.5.1 Market
- number of market places in catchment area:.....units
- the nearest market place to project site:.....km.
- market day: 1. every day 2. certain day only

4.5.2 Disposal of Agricultural Products:

	Consumed by the farmers	Sold in local market
Rice	.....%	.....%
Corn	.....%	.....%
Peanut	.....%	.....%

4.5.3 Price pof Agr. products per kg in the last year (19...)
Paddy Rp.....
Corn Rp.....
Peanut Rp.....

4.5.4 Road
- traffic density: 1. low 2. medium 3. high
- accessible road to project site: 1. exists 2.none exists
  distance from project to public road:,,,.....km.
- road condition: 1. accessible by car through all seasons
  2. accessible by car during dry seasons only.

4.5.5 Means of transportation:
1. carrying pole 2. bicycle 3. horse-cart/wagon
4. vehicle 5. train 6. waterways/boat

4.6 Population

4.6.1 Total of population by age category in catchment area/ subdistrict. Based on the latest census.
Age:
0-15 years male ..... persons
female..... persons

16-45 years male..... persons
female..... persons

beyond 45 years male..... persons
female..... persons

4.6.2 Average annual population growth.
Population increase due to: 1. birth
2. transmigration 3. birth & transmigration

4.6.3 Population density:
- by geography :.....persons/km2
- by arable land :.....persons/km2

4.6.4 Population grouping based on source of income:
farmer :.....persons(.....%)
trader :.....persons(.....%)
labour :.....persons(.....%)
gov't officials:.....persons(.....%)
fisherman :.....persons(.....%)

4.6.5 Number of farmers as:
land owner :.....persons(.....%)
tiller :.....persons(.....%)
owner/tiller :.....persons(.....%)
farm labour :.....persons(.....%)

4.6.6 Situation of transmigration
1. not yet 2. planned 3. existing
- Number of transmigrants in the project area (.....)

. Status of proposed project

5.1 Reconnaissance Survey: 1. completed 2. in progress 3. not started
5.2 Specific survey : 1. completed 2. in progress 3. not started

5.2.1 Land survey : 1. completed 2. in progress 3. not started
5.2.2 Geological survey : 1. completed 2. in progress 3. not started
5.2.3 Hydrology survey : 1. completed 2. in progress 3. not started
5.2.4 Water quality survey : 1. completed 2. in progress 3. not started
5.2.5 Land use survey : 1. completed 2. in progress 3. not started

5.3. Surveying & Mapping (1:5,000)
1. completed 2. in progress 3. not started

5.4 Topographical mapping and canal route survey
1. completed 2. in progress 3. not started

5.5 Design

5.5.1 Dam : 1. completed 2. in progress 3. not started
5.5.2 Intake structure : 1. completed 2. in progress 3. not started
5.5.3 Diversion structures: 1. completed 2. in progress 3. not started
5.5.4 Crossing structures : 1. completed 2. in progress 3. not started
5.5.5 Energy dissipators : 1. completed 2. in progress 3. not started
5.5.6 Primary canal : 1. completed 2. in progress 3. not started
5.5.7 Secondary canal : 1. completed 2. in progress 3. not started
5.5.8 Drainage canal : 1. completed 2. in progress 3. not started

. Implementation Plan

6.1 Estimated benefit with the Project.....
.....

6.2 Project area planned
6.2.1 Size of project area:..... ha.
6.2.2 Ricefield in existence:..... ha.
6.2.3 Extended area (already in existence):..... ha.
6.2.4 New area :..... ha.
6.2.5 Target area for first year:..... ha.

ote: If the project construction work is finished in one year, then point 6.2.5 is the same as point 6.2.1.

6.3 Present land use of the project area:

- forest :.....ha.
- grass land/thatch grass:.....ha.
- upland :.....ha.
- ricefield :.....ha.
- swamp :.....ha.
- depression :.....ha.
- plantations :.....ha.

6.4 Size of cultivated land in project area (ha.)

rainy season	Irrigation rice field	Rain fed	Upland
- paddy	.....	.....	.....
- corn	.....	.....	.....
- peanut	.....	.....	.....

Dry season	Irrigated rice field	Rain fed	Upland
- peanut	.....	.....	.....
- paddy	.....	.....	.....
- corn	.....	.....	.....

6.5 Expected yield (100 kg)/ha. after project completion

	Rainy season (100 kg)/ha.	Dry season (100 kg)/ha.
- paddy	.....	.....
- corn	.....	.....
- peanut	.....	.....

6.6. Land status of project:

1. privately owned 2. traditional 3. state ownership

6.7 Water resource

6.7.1 Name of river/lake/water source
.....

- river length;.....km
- maximum discharge:.....m3/sec.
- minimum discharge:.....m3/sec.
- average discharge:.....m3/sec.
- maximum water level:.....m
- minimum water level:.....m

Appendix III

6.7.2 Forest situation in catchment area
- destruction/deforestation
  1. extensive 2. moderate 3. low
- sediment content
  1. high 2. moderate 3. low
- reforestation
  1. necessary 2. not necessary

6.7.3 Swamp

- Name:.....
- Size:.....km2
- Depth in rainy season:.....m
- Depth in dry season:.....m
- Surface area during dry season:...km2
- Tide difference:.....m

6.8 Water Quality:

- Inspection performed: 1. yes 2. no
- Date : .....
- Laboratory : .....
- PH : .....
- Are there negative elements to crop growth?
  1. yes 2. No.

6.9 Water supply

- Rainy season : ..... m3/sec.
- Dry season : ..... m3/sec.
- Ricefield that could be irrigated:
  * rainy season:.....ha.
  * dry season :.....ha.

6.10 Is the project classified as swamp area?

6.10.1 Totally flooded in rainy season and partially during dry season: 1. yes 2. no

6.10.2 Totally flooded in rainy season and dry in dry season:
1. yes 2. no

6.10.3 The flood/swamp was caused by:
1. regular flood 2. tide 3. low land
4. depression 5. naturally swamp areas

6.11 Project Organization

6.11.1 Is there any farmers' organization managing water distribution in project area?
1. yes 2. no

6.11.2 Such organization is willing to undertake the operation and maintenance of tertiary irrigation:
1. yes 2. no

6.11.3 Project planning is coordinated with

- Agric. Extension Service : 1. yes 2. no
- Local Authorities : 1. yes 2. no
- Farmers : 1. yes 2. no

6.12 Materials, manpower and special construction equipment:

6.12.1 Natural construction materials
1. difficult 2. easy to obtain
- Distance for procurement:.....km

6.12.2 Material for industrial construction:
1. difficult 2. easy to obtain
- Distance for procurement:.....km

6.12.3 Farmers
- Number of farmers needed in catchment area during rainy season:.....persons
- Number in existence:.....persons
- Number of transmigrants needed:.....persons

6.12.4 Construction workers
- Number of workers needed through project completion (mandays).....persons
- Number of workers needed during peak period of implementation:.....persons
- Number of transmigrants needed:.....persons
- Number of workers available:.....persons
- Average workability per person/day.....m3
- Average salary of unskilled worker per day:Rp. .....

6.12.5 Special construction equipment:

- water pump : 1. needed 2. not needed
- concrete mixer : 1. needed 2. not needed
- generators : 1. needed 2. not needed
- others : 1. needed 2. not needed

6.13 Constraints in construction techniques:

.....

.....

6.14 Construction budget estimated (million rupiah)

Simple Irrigation:

- Dam : Rp. .....
- Intake : Rp. .....
- Diversions : Rp. .....
- Crossings : Rp. .....
- Energy dissipators : Rp. .....
- Primary canal : Rp. .....
- Drainage canal : Rp. .....
- Other costs/administration : Rp. .....

Simple reclamation:

- water supply : Rp. .....
- drainage canal : Rp. .....
- control gate : Rp. .....
- crossings : Rp. .....
- embankment : Rp. .....
- ..... : Rp. .....
- other costs/administration : Rp. .....

6.15 Estimated budget until completion:

PROPOSED budget for:

6.15.1 Fiscal year 197 /19 Rp. .....
197 /19 Rp. .....
197 /19 Rp. .....

6.15.2 Duration of implementation: ..... years

6.15.3 Estimated budget:

- budget approved for 197 /19 Rp. .....
- proposed budget for 197 /19 Rp. .....

6.15.4 Estimated cost for the construction and O&M of tertiary unit per hectare (1,000 rupiah)

- Construction cost of dam, intake, primary canal, secondary canal, drainage canal, road, Rp. .....
- Construction and maintenance cost of tertiary canal per hectare Rp. .....
- O&M of each tertiary unit per hectare Rp. .....
- Describe expected fund resources to finance the O&M of tertiary canals.
  1. Central gov't 2. From President (INPRES)
  3. Local gov't (IPEDA) 4. Community

ADDITIONAL QUESTIONNAIRE

7. SOCIAL-LIFE AND CULTURE

Influence of outside labour and transmigrant

The outside labour required for project construction work and transmigrant required for tiller, influence on existing social-life environment, among other thing:

7.1 Education: a. decrease b. static c. increase

7.2 People handycraft:
a. decrease b. static c. increase

7.3 Art: a. decrease b. static c. increase

7.4 Order and Security:
a. decrease b. static c. increase

7.5 Solidarity: a. decrease b. static c. increase

7.6 Religion obediency:
a. decrease b. static c. increase

7.7 Hygienic and health conditions of houses and villages:
a. decrease b. static c. increase

8. Market condition

8.1 Is there a location of INPRES fund:
a. yes b. no

8.2 After project finished, market condition:
a. decrease b. static c. increase

8.3 Possibility of increasing new market, after project finished
a. yes b. no

8.4 After project finished transportation of daily commodities, especially for food/rice:
a. decrease b. static c. increase

9. Health and environment

9.1 Rodent carrying disease (plague)

9.1.1 Disease spread from areas surrounding project:
a. yes b. no

Attention: If no disease not necessary to fill blank

9.1.2 Kinds of efforts to prevent and exterminate disease:

a. vaccination : 1. yes 2. no
b. quarantine : 1. yes 2. no
c. to exterminate rodents : 1. yes 2. no
d. other methods: mention in short explanation

9.2 Schistosomiasis disease:

9.2.1 Disease spread from areas surrounding project
a. yes b. no

Attention: If no disease not necessary to fill blank

9.2.2 Kinds of efforts to prevent and exterminate disease:

a. vaccination : 1. yes 2. no
b. to exterminate snail : 1. yes 2. no
c. other methods: mention in short explanation

9.2.3 Patient condition
a. decrease b. static c. increase d. none

9.3 Malaria disease

9.3.1 Disease spread from surrounding project

a. yes b. no

Attention: If no disease not necessary to fill blank

9.3.2 Kind of efforts to prevent and exterminate disease:

a. vaccination : a. yes b. no
b. to increase ditch water flow and eliminate stagnant water areas: a. yes b. no
c. spraying of house : a. yes b. no
d. other methods: mention in short explanation

9.3.3 Patient condition

a. decrease b. static c. increase d. none

9.4 Sanitation

9.4.1 Distance between project location and polyclinic or Public Health Centre is ..... km

9.4.2 Agency for care of Mother & Baby: ..... (number)

APPENDIX IV

Draft of Training Program for Sederhana (Simple) Irrigation and Land Development Project.

Training Program Introduction

Continuous training and procedural reviews are essential to successful program implementation. Even though employees have had a thorough initial education and on-the-job training, without periodic reviews and training, their job performance tends to become so variable that in a few years they lose sight of organizational objectives and standard procedures and practices.

The complexity of projects is increasing each year and the expertise requirement to implement projects is becoming greater. Project management, communication, documentation, evaluation and administration is complex for the Sederhana Project and all of these aspects as well as that of technical expertise should be considered within the Training plan to maintain acceptable performance.

Recognizing these needs, the Sederhana Irrigation Project has planned a reasonably substantial training program to improve and upgrade the entire technical and management staff as well as to provide training for the water-user association leaders.

The training program will include overseas training in the United States and Asian countries for around ten (10) senior management and technical officials of the Directorate General of Water Resources Development (DGWRD) and around ten(10) of the Ministry of Agriculture (MOA), the Directorate General of Food Crops (DGFC), and the Agency for Agriculture Education, Training and Extension (AAETE); and around fifty (50) senior DGWRD provincial officials and around fifty (50) senior MOA provincial officials, will receive overseas training, primarily in Asian countries.

The program's in-country training includes graduate engineers, engineers (BIE), and technical high school graduates of DGWRD. MOA will train graduate agriculturalists, provincial and kabupaten officers, field extension workers, and water-user association leaders.

The training program will cost $285,400 for the overseas training, and $726,300 for in-country training, for a total of $1,011,700.

The in-country training courses will be conducted at existing training centers, colleges or universities. Training requirements will be matched

with facilities which serve the needs nearest to the office which requires training.

The program will be conducted during the Indonesian fiscal years 1976-77 and 1977-78.

The long and short-term consultant technical advisors, in conjunction with the training institutions and agencies of the trainees, will assist in making detailed plans, collecting and/or preparing training manuals, course materials, selection of location for training, scheduling, costing, etc. The consultants scopes of work include appropriate roles in conducting and evaluation the program in its entirety for appropriateness and adequacy.

In addition to actual scheduled training courses, the consultant will provide a knowledge transfer to the provincial working staffs, designed and planned to improve both the technical and the managerial competence at the provincial levels.

The outlines and general course descriptions included herein are designed from a general understanding of skills and technical knowledge required for a program of the nature of the Sederhana Project, its required schedule, and of the development of a staff to meet these requirements.

Training outlines and course descriptions have been designed to provide a uniform training program of high quality and should assist the training officers who will develop the course materials.

It is expected that the course emphasis as the program progresses and continuous evaluation is made.

In-Country Training

Project Planning and Design

The objective of this course is to teach graduate engineers and engineers (BIE) of the Directorate General of Water Resources Development (DGWRD) an advanced course in project planning that emphasizes the engineering planning and design requirements of small, inexpensive, high impact irrigation projects. Complete or totally accurate technical information normally available to the planning engineer may not always be available in these projects. In addition, the course will include training in the environmental and health aspects of irrigation development and how they affect project feasibility or project design.

For Graduate Engineers (4 to 5 years of college)

Training period 1½ to 2 months
Training course in project planning and design
Place of training - ITB (Bandung) or at a Traing Center

Irrigation Project Management and Development

The objective of this course is to teach graduate engineers of the Directorate General of Water Resources Development (DGWRD) and advanced course in managing and developing irrigation projects. The course is designed to improve the administrative and technical capability of project managers and provincial operation and maintenance (O&M) engineers and will emphasize the complete scope of project management and development In addition, the course is structured to incorporate training on the agricultural production inputs that are essential for successful project development. Water-user association formation and administration and environmental and health aspects of irrigation development are included in the course. If necessary this course will be combined with the project planning and design course.

For Graduate Engineers (4 to 5 years of college)

Training period 1½ to 2 months
Training course in project management and development
Place of training - ITB (Bandung) or at a Training Center

Construction Supervision and Monitoring

The objective of this course is to teach engineers (BIE) and graduate engineers of the Directorate General of Water Resources Development (DGWRD) an advanced course in construction supervision and monitoring to prepare them for the administrative and technical procedures and requirements for construction and interrelated duties and authorities.

The course also includes training in project evaluation and documentation that is necessary to adequately evaluate a contractor's overall performance and to insure that the interests of the government are adequately protected and the project is satisfactorily completed in a timely manner.

Graduate Engineers

Engineers (BIE) - (Senior H.S. plus 3 years)
Training period 1½ to 2 months
Training course in construction supervision and monitoring
Place of training - ITB (Bandung) or at a Training Center

Irrigation Project Operation and Maintenance and Water Management

The objective of this course is to teach graduate engineers and engineers (BIE) of the Directorate General of Water Resource Development (DGWRD) and advanced course in project operation and maintenance (O&M) and water management. The engineer will then be knowledgeable of DGWRD's O&M responsibilities on the primary system, and be capable of using sound judgement and procedures in improving O&M programs. In addition, the engineer will receive training in the principles, pratices, and problems that are unique to the operation, maintenance, and water management of tertiary canals and on-farm irrigation systems. The course also includes the environmental and health aspects of irrigation development.

Engineer (BIE) - (Senior H.S. plus 3 years)
Training period 1½ to 2 months
Training course in project operation and maintenance and water managemet management
Place of training - MPW Training Center Surabaya

Construction Surveying and Construction Inspection

The objective of this course is to teach Technical High School graduates (STM) of the Directorate General of Water Resources Development (DGWRD) a course in construction surveying. Additional training will be given on construction inspection. The technician can then assist the project engineer and contractor with the construction of main and secondary canals, appurtenant structures, and the construction assistance DGWRD provides to the water-user associations for tertiary canal construction.

The training course is composed of two phases, (a) two months of formal classroom lecture and training, and (b) one month of construction surveying on-the-job training on a Sederhana project that is under construction. The supervised training will be directly related to the formal training course in construction surveying and additional construction inspection.

Technical High School graduate
Training period three months
Training course and supervised on-the-job training in construction surveying and construction inspection
Place of training - selected project and or other regional training facilities

Principle and Practices of Operation and Maintenance

The objective of this course is to teach Technical High School graduates (STM) of the Directorate General of Water Resources Development (DGWRD)

a course in operation and maintenance (O&M). The technician can then assist the Project O&M Engineer with the operation and maintenance of the main diversion structures and canals and the technical assistance DGWRD provides the water user associations for tertiary canals.

The training course is composed of two phases; (a) two months of formal classroom lecture and training and (b) one month of supervised on-the-job training on an operational Sederhana Project. The supervised training will be directly related to the formal training course in O&M.

Technical High School graduate
Training period three months to 3½ months
Training course and supervised on-the-job training in principles and practices of operation and maintenance
Place of training - DGWRD Training Center, Surabaya or other regional training facilities

Construction of Tertiary and Farm Irrigation and Drainage Systems

The objective of this course in construction is to teach graduate agriculturalists the basic principles of constructing tertiary canals, appurtenant structures, and on-farm irrigation and drainage facilities. The technician can then assist irrigation water-user associations and farmers in installing tertiary canals, planned and designed by the Provincial Public Works Office and assisting farmers with their on-farm systems. In addition, the course will include training in the environmental and health aspects of irrigation development.

Senior PPS Agriculture graduates
Training period three months
Training course in construction of tertiary and farm irrigation and drainage systems
Place of training - ITB (Bandung)

Water-User Associations and Water Management

The objective of this course is to teach Agricultural High School graduates (SPMA/PPL) the basic organization and development aspects of water-user associations and the principles and practices of water management. The technician can then use sound judgement in assisting water users with their organizing associations and implementing a water management program.

Provincial and Kabupaten Agriculture Officer
Training period one month
Training course in water-user associations and water management
Place of training - provincial universities or training centers

Principles and Practices of Irrigation and Operation and Maintenance of Tertiary Systems and On Farm Irrigation

The objective of this course in irrigation and project operation and maintenance is to teach graduate agriculturists the basic principles of irrigation, operation and maintenance, and water management. The technician can then use sound judgement and procedures in the operation of irrigation systems. The technician can also teach technical associates and farm leaders the basic principles of irrigation, operation and maintenance, and water management.

Senior PPS Agriculture graduates
Training period one month
Training course in principles and practices of irrigation and operation and maintenance of tertiary systems
Place of training - Surabaya Training Center or other Training Center

Irrigation Water Management

The objective of this course in Irrigation Water Management is to teach technicians of the provincial and kabupaten offices how to evaluate a farmer's irrigation procedures and methods. The technician can then determine the changes needed to obtain optimum beneficial use of the available water supply. The technician can also teach the farmers he work with the basic principles of irrigation water management.

Field Extension Workers (PPL)
Training period half month
Training course in irrigation water management
Place of training - provincial universities training centers

Water-User Association Leader Training

The objective of this course is to teach the basic organizational and development aspects of water-user associations to potential or elected leaders. The leaders can then use sound judgement in implementing their associations' programs, and develop the irrigation projects to their full potential. The course will include water management, tertiary canal construction, on-farm irrigation practices.

Association leaders
Training period half month
Training course in water-user association leader training and water management
Place of training - kabupaten training center or equivalent facility

Training Facilities

Adequate training facilities are available for the in-country training programs. The program will require the use of the Ministry of Public Works and Electric Power (MPWP) Training Centers at Surabaya, Bandung and Yogyakarta, and AAETE. In-Service Training Centers (13), Rural Extension Centers (355), and Agriculture Information Centers (2). In addition, the Universities at Ujung Pandang, Surabaya, Medan, and Bandung plus the Institutes at Bandung (ITB) and Bogor (IPB) can provide engineering and agriculture courses, course material and/or instructors.

Training courses in surveying, water management, and operation and maintenance are essentially standard courses and, when appropriate, DGWRD and MOA personnel will be trained together. Combined training will lessen course costs and enhance the quality of the course by utilizing integrated planning, course material, instructors, and DGWRD and AAETE will organize the training program to require a minimum of travel time/costs, and will centralize the training activities to closely coordinate with the regional consultant team locations.

The four proposed regions are:

1. Bandung for Planning Design Project Management and Construction Supervisor courses

2. Yogyakarta for Surveying/Mapping and Construction Supervisor courses

3. Surabaya for O&M courses

4. Or other Training Centers

The facilities available in the regions are:

1. Medan

    i. Sumatra Utara University - Medan
    ii. Tanjung Morawa In-Service Training Center
    iii. Tanjung Morawa Information Center

2. Bandung

   i. Institute Technolique (ITB)
   ii. Institute Pertanian Bogor (IPB)
   iii. Pajajaran University - Bandung
   iv. Cihea In-Service Training Center
   v. Lembang In-Service Training Center

3. Yogyakarta

   i. Gajah Mada University - Yogyakarta
   ii. Soropadan In-Service Training Center
   iii. Unggaran In-Service Training Center
   iv. MPWP Training Center - Yogyakarta

4. Surabaya

   i. Airlangga University - Surabaya
   ii. MPWP Training Center - Surabaya
   iii. Surabaya Information Center
   iv. Bedali In-Service Training Center
   v. Ketindan In-Service Training Center

5. Ujung Pandang

   i. Hasanuddin University - Ujung Pandang
   ii. Batangkaluku In-Service Training Center

In addition, the following facilities are available if needed:

   i. Binuang In-Service Training Center - Kalimantan
   ii. Denpasar In-Service Training Center - Bali
   iii. Sare Aceh In-Service Training Center - Aceh

The in-service training centers have an average student capacity of 50 each. The MPWP Training Centers have a capacity of 25 each and the information centers approximately 25 each. The engineering courses will be taught at the MPWP Training Centers or the universities or institutes. Agricultural courses can be taught at the in-service training centers and the universities. This will include the water management and operation and maintenance courses. The water-user association leader program will be conducted in the rural extension center (REC). Almost every kabupaten has one or more REC.

Appendix IV

In-Country Training Program Total Costs

Directorate General of Water Resources Development (DGWRD) $324,000
and Ministry of Agriculture (MOA) $402,300

Total In-Country Training Costs $726,300

Overseas Training

The overseas training will be carried out at Universities, training centers and in-service training locations in the USA and Asian countries. Wherever possible the overseas training will include visits to irrigation/reclamation projects; irrigation and agricultural research centers; engineering, soils and water laboratories; and suppliers of irrigation and agricultural equipment in the USA and Asian countries to accomplish the following.

- To gain a comparative evaluation on how the project works, how they were constructed and how they are maintained.
- To serve technical know how and new ideas on irrigation/ reclamation engineering and Agriculture
- To exchange ideas and experience and discuss problems of mutual interest with host technicians, especially on irrigation/reclamation and agricultural problems.
- To obtain technical papers and reports for future study and use.

The Directorate General of Water Resources Development (DGWRD) part of the overseas training program will cost $142,700 and the Ministry of Agriculture (MOA) will cost the like amount of $142,700.

The category and number of participants in the overseas training program and the agency involved are given in the tabulation below:

Participants	Total Number	Break Down by Agency			
1. Senior Official	8	DGWRD	4	MOA	4
2. Division Chiefs and Deputies	12	DGWRD	6	MOA	6
3. Senior Technical Officials	± 100	DGWRD	± 50	MOA	± 50
Total	± 120		± 60		± 60

The following is a general outline of the overseas training program for the participants listed in the foregoing tabulation:

Senior Officials

The objective of the overseas training program for Senior Officials is to gain additional knowledge on the development, administration and management or water resources projects. The training program will be structured to include project management seminars, observation study programs and visits to irrigation/reclamation projects and other related facilities.

1. Training period 3 weeks in USA and/or Asian countries
2. Number of participants (8)
3. Training program may include

    i. Environmental protection and health impact course
    ii. Senior project management seminar
    iii. Observation and study of irrigation technical engineering for rice cultivation and visit US Gov. Soil Conservation Services, East West Center
    iv. Project evaluation program.

Division Chief and Deputies (Senior Engineers and Agriculturalists)

The objective of the overseas training program for Division Chiefs and Deputies is to gain additional knowledge in the development, management and operation and maintenance aspects of irrigation/reclamation and agricultural projects. The training program will include project management seminars, water management and operation and maintenance study programs and visits to irrigation/reclamation project and research centers for observation, field inspection and short study programs.

1. Training period of 3-4 weeks in USA and/or Asian countries
2. Number of participants (12)
3. Training program may include

    i. University or U.S. Government in-service training course
    ii. Project management and operation and management seminars
    iii. Observation and study of irrigation technical engineering and for rice cultivation, visit U.S. Gov. Soil Conservation Services, East West Center, operating projects and research facilities.

Senior Technical Officials

(Provincial Chief, Deputies, Senior Engineers and Agriculturalists)

The objectives of the overseas training program for Senior Technical Officials is to gain additional knowledge in water resources engineering, water management and the development, operation and maintenance of irrigation/reclamation and agricultural projects. The training program will include water resource engineering and water management courses, operation and maintenance workshops and visits to irrigation/reclamation and agricultural projects for first-hand observations and field inspections.

1. Training period 3 to 4 weeks in Asian countries and/or USA
2. Number of participants (± 100)
3. Training Program

    i. Water resource engineering course - U.S. Universities/Asian countries
    ii. Water management course - University of Hawaii, East West Center, plus field trips in the Philippines and Taiwan
    iii. Soil Conservation Course - Taiwan
    iv. Observation and study of irrigation technical engineering of rice cultivation in the Philippines, Taiwan or other Asian countries existing projects and research facilities.

4. Course prerequisite by the institution concerned, both academic and language, must be met by all nominated participants. An English language test will be given at regionally located provincial government offices prior to selection of participants.