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**AGENCY FOR  
AGRICULTURAL RESEARCH AND DEVELOPMENT**



**EIGHTH QUARTERLY NARRATIVE REPORT  
ON THE  
APPLIED AGRICULTURAL RESEARCH PROJECT**

**FOR THE MONTHS  
OF  
JANUARY, FEBRUARY, MARCH  
1984**

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ON THE  
APPLIED AGRICULTURAL RESEARCH PROJECT  
JANUARY, FEBRUARY, AND MARCH 1984

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## I. Introduction

The main activity during this quarter was responding to the Mid Term Evaluation Report prepared by the team composed of USAID staff, a consultant from the USA, and a staff member of AARD. Meetings were held with USAID, RMI, and the leaders of AARD. A response to the Evaluation Report was prepared and submitted to the appropriate authorities in AARD and USAID.

Based on the evaluation, both the Director General of AARD and USAID agreed to consider an extension of the AARP for a period ranging from six months to one and one half years. The first step in the approval process were meetings on the extension and the preparation of the Project Activities Completion Date (PACD) extension document. A draft of the PACD was finished during this quarter.

The major event during this quarter was the inauguration of the new auditorium for the Bogor Research Institute of Food Crops which was constructed by the AARP. This is a good example of the acceleration that has occurred in the construction program.

An innovation in the short term training program occurred when the ALIGU tests were conducted in the locations outside of Jakarta. This makes it possible to monitor the progress of the prospective candidates for training as they learn English at their Institutes.

The consultants at the Banjarmasin Research Institute for Food Crops assisted the Director in developing a master plan for the Institute during this quarter. The first draft was completed and discussions are continuing on the master plan.

At the Maros Research Institute for Food Crops, construction began during this quarter on the new buildings being supported by the AARP. This is another indication of the progress of the construction program.

## II. PERSONNEL

At the beginning of this quarter there were thirteen experts working with the AARP-RMI team providing technical assistance to the AARD. On the first day of this month the number increased to fourteen with the arrival of George Manuelpillai who will be the AARP's soil scientist at the Banjarmasin Research Institute for Food Crops. With his arrival the team at this institute is complete. To provide a brief look at the team of experts provided by the AARP/RMI, the following is their name, position, starting date and length of their contracts:

NAME OF EXPERT	POSITION	STARTING DATE	LENGTH (months)
1. William L. Collier	Chief-of-Party	March 82	42
2. Carl R. Fritz	Admin Specialist	April 82	24
3. Roland E. Harwood	Farm Station Dev.	August 82	24
4. Jerry L. McIntosh	Farming Systems	July 82	24
5. Diane M. Barrett	PostHarves Proc.	April 83	24
6. Igmidio T. Corpuz	Soil Scientist	July 82	36
7. Anwar Rizvi	Plant Pathologist	January, 83	24
8. Fritz v.Fleckenstein	Ag. Economist	January 83	32
9. Kevitt Brown	Rice Breeder	January 83	24
10. Bernardo Gabriel	Entomologist	July 83	24
11. George Manuelpillai	Soil Scientist	January 84	21

12. Greta Watson	Social Scientist	March 83	24
13. Chhorn Lim	Fish Nutritionist	May 83	24
14. William Vanstone	Fish Breeder	September 83	24
SOON TO ARRIVE:			
15. Moestadjab	Admin. Specialist	May 84	17
16. Soejindro	Construction Exp.	May 84	17
17. Hobart Peters	Reproduction Physiologist	April 84	18
18. Ruth Gatenby	Enviromental Physiologist	May 84	17

In order to get a quick look at the activities of each expert, the following are brief descriptions of their major activities during the quarter and in the appendices are detailed accounts of their activities:

William L. Collier, Chief-of-Party. His main activity during this quarter was participation in the discussions on the Mid-Term Evaluation Report and the preparation of the Response to the AARP Evaluation Report. In the Response the various possible programs and steps are suggested to carryout the recommendations of the evaluation team. The major recommendation was to extend the AARP for a period of from six months to one and one half years. Dr. Collier was deeply involved in developing the document for this extension of the project activities completion date. He also helped the Ministry of Agriculture prepare for the major international conference on Research - Extension Linkages which was held in Bali and sponsored by the Ministry and the World Bank. During this quarter he visited the Food Crops Research

Institutes at Maros and Banjarmasin.

Carl R. Fritz, Administrative Specialist. Although deeply involved in the administration of the technical assistance to the AARP, he was also very active in the short-term training program. He conducted ALIGU (English language) tests at the Institutes in Banjarmasin and Maros in order to speed up the processing of the candidates for short term training. A secondary benefit of this activity is the evaluation and monitoring of the language capability of AARD's staff. He has been conducting interviews of the candidates for training in order to effectively serve their training needs and thus locate the best training programs for their requirements. In February, as an example, he went to the Lembang Research Institute for Horticulture Crops with Ir. Wuryani to interview 13 candidates. While in March he interviewed candidates from the Research Institute for Fish Technology and the Central Research Institute for Industrial Crops. Besides these training activities, he supervised preparation of monthly rupiah expenditure reports.

Roland E. Harwood, Research Station Development Specialist. He was primarily involved in accelerating the design and preparation of the tender documents in order to initiate construction at a number of locations. In January he went to the Maros Research Institute for Food Crops to give them the plans for a laboratory and office building for Lembang. He made several trips to the site of the Banjar Baru Research Institute for Food Crops in order to assist the Director in monitoring the progress of construction. In February a group of engineers from USAID and Mr.

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Harwood visited the construction site at Banjar Baru and attended the field meeting. Construction was a few days behind schedule because of heavy rains. He also went to the Unit Tatas Experimental Farm where they took measurements for the designers' tentative site plan for construction. In March Mr. Harwood and two workers chopped lines through the brush to check the proposed building sites for the Phase II construction at Banjar Baru. He and one of the USAID engineers attended a meeting at Maros for initiating the construction at this Institute. They also visited the Lanrang and Bontobili sites for proposed construction. The construction plans for Banjar Baru Phase II Package I and for Unit Tatas are completed. Also the plan for Lanrang is finished and all of the plans are being reviewed by USAID.

Jerry L. McIntosh, Farming Systems Specialist. In his support to the activities of cropping/farming systems research during this quarter, he assisted the East Kalimantan Farming Systems project. He helped revise the Crop/Livestock project proposal, and the Upland Agriculture and Conservation Project proposal. He assisted in the planning and expansion of activities for the fertilizer efficiency and cropping systems studies. He participated in a review of all farming systems research site activities and conditions after staff had made visits. Then, discussions were held on farming systems research and research strategy in transmigration areas. He developed an outline of a paper for the IRRI meeting on Tests for Wetland Soils. He worked on the Terms of Reference for the Upland Agriculture Drought Prone Areas

Consultancy. He prepared position or review papers on Research/Extension Linkages - Research Perspective; Past, Present and Future Upland Rice Research Outline; and Direction and Strategy for FSR&D in Transmigration Areas.

Diane M. Barrett, Post Harvest Processing Specialist. During this period, she was asked by the Director of the Central Research Institute for Food Crops to shift her assigned work location to the Sukamandi Research Institute for Food Crops. At this Institute she was active in their training program. She gave seminars and individual instruction in the methodology of selecting appropriate methods of food analysis; theory of moisture, reducing sugar, starch, protein, fiber, ash, acidity, viscosity, filth, HCN, mold, whiteness, insect and organoleptic analysis; survey methodology and interview techniques; organoleptic analysis, and insect analysis. She also assisted in training with the Sorvall centrifuge. Besides this training, she cooperated with the Institute staff on a number of research projects. These were a Compilation and Analysis of Data from Fresh Cassava Storage, continuation of a cassava starch storage experiment, preparation of three cassava research proposals for 1984/1985, and the initiation of Survey and Chemical Analysis of Traditionally Processed Cassava Products. She provided assistance in organization and implementation of a Survey of Paddy/Rice (Gabah/Beras) During the 1984 Wet Season in Karawang, Bekasi, Subang, and Indramayu.

Igmidio T. Corpuz, Soil Scientist at the Maros Research Institute for Food Crops. He continued his assistance to the scientists at

this Institute in setting up field fertilizer experiments, in the generation of experimental data and in the preparation of research reports. He briefed Dr. Cezar P. Mamaril IIRI INSFFER Program Coordinator on the progress of the INSFFER Trials conducted at the Institute. Dr. Corpuz travelled with other scientists from the Institute and assisted in selecting and characterizing experimental sites. He underwent medical treatment in Singapore from February 24 to March 31. He was treated for liver inflammation, typhoid and operated on for gal' bladder.

S.Anwar Rizvi, Plant Pathologist at the Maros Research Institute for Food Crops. In cooperation with Ir. Samuel Pakan they prepared two reports and developed the necessary slides for a joint presentation at MORIF's Saturday Seminar on the Peanut Mottle Virus and the Rice Tungro Virus experiments. He assisted Ir. Syaharuddin in rewriting certain parts of a research paper in English on the use of fungicides to control sheath blight disease of rice which has been submitted for publication in the Indonesian Journal of Crop Science. He gave the necessary training and assistance to the Institute's scientists in the isolation of pathogenic bacteria, fungi and their identification from the diseased samples of nine crops. Certain virus diseases, insect pests and parasitic plants were also identified. He also made suggestions on effective control measures. As part of a three person team from the Institute, he helped conduct a survey of potato producing areas of South Sulawesi to determine the potato diseases and pests present in those areas. At the AARD/IIRI Collaborative Meeting in Padang, he presented two

reports: one on a new rice blast screening technique and the other on RTV research activities. He gave a seminar entitled "Potato Diseases and Pests in South Sulawesi" at the Lembang Horticulture Research Institute. At the request of the Institute, he visited the Makariki Sub Station of MORIF on Ceram Island in Maluku Province, surveyed the diseases present in the experimental plots of cassava, corn, sweet potato and mungbean. He made a number of recommendations on the necessary control measures to produce healthier plants. He also collected rice plants infected with RTV which were obtained from three different locations in Sulawesi to determine the presence of different strains of RTV. During this quarter he made ten official trips for the Institute.

Fritz von Fleckenstein, Agricultural Economist at the Maros Research Institute for Food Crops. His main activity during this quarter was to continue the close collaboration with Ir. Hadijah Dahlan in the intensive survey of labor utilization and material inputs and outputs on five farms in Desa Baju Badoa which is located near MORIF. Results of this research was presented in two papers given at a Saturday Seminar at MORIF. These papers were entitled "Measurement of Labor Inputs: A Comparison of Daily Record-Keeping and Longer Recall" and "Preliminary Results of a Record-Keeping Study: Some Rough Data". He provided editorial assistance on papers written in English to several MORIF researchers.

Kevitt D. Brown, Rice Breeder at the Banjarmasin Research

Institute for Food Crops. After returning from home leave in this quarter, Dr. Brown spent 25 days during this period gathering research data with the scientists of the Institute. He attended the AARD-IRRI Collaborative meetings at Sukarami to discuss the future of upland rice research in Indonesia. He also accompanied IRRI plant breeders and Dr. Harahap from BORIF in discussions and travels to the BARIF research stations. Dr. Brown helped in the re-organization of the programs in the plant breeding department and initiated a new seed storage and inventory system. He wrote a paper assessing the deepwater rice development plan of BARIF.

Greta A. Watson, Social Scientist and Farming Systems Specialist at the Banjarmasin Research Institute for Food Crops. Ms. Watson in collaboration with the staff of the agricultural economics section was involved in agro-economic surveys and collected data during six trips to tidal swamp and deepwater areas. She co-authored a paper with a BARIF staff member on farmer weed management in the tidal swamps, submitted a crop protection paper for publishing by AARD, and worked with the Director of the Institute on a paper assessing the development of the Kalimantan deepwater areas. She was also actively assisting the staff in preparing surveys and research plans for the coming season and analyzing data from last year.

Bernardo P. Gabriel, Pest Management Specialist at the Banjarmasin Research Institute for Food Crops. During this quarter Dr. Gabriel made twenty-four trips to BARIF experiment stations to monitor insect pests and predator species. He and Mr. Gula also travelled to Bogor to attend a cropping systems

conference. They also collected information on crop protection from other offices in Bogor. Dr Gabriel gave two seminars at BARIF and helped the staff to prepare their own seminars. He also served as coordinator for writing a 15 year BARI Master Plan, joined in discussions with the IRRI plant pathologists and travels to the experiment stations. He was very active in collecting reprints and equipment which will aid in BARIF crop protection research.

George Manuelpillai, Soil Scientist at the Banjarmasin Research Institute for Food Crops. He joined the AARP/RMI technical assistance team on January 1, 1984, though he had worked for AARD at the Central Research Institute for Soils in Bogor for a number of years before taking this position. In preparation for this assignment, he visited agro-scientists at the Agriculture University in the Netherlands to discuss various issues on coastal swamp soils research. He has been very active in assisting the development of a soil laboratory and procurement of soil research materials. Mr Manuelpillai has made recommendations for soil ammendments at each station, collected soil samples, and done simple laboratory analysis pending further improvement of the laboratory. He also has written a proposal for establishment of a benchmark acid sulfate site at the Unit Tatas Experimental Farm.

Thomas Gula, Volunteer Rat Control Specialist at the Banjarmasin Research Institute for Food Crops. In cooperation with the Institute's staff and under the direction of Dr. Gabriel, he has

visited a number of villages in the Sungai Tabuk area of South Kalimantan. He collected rat specimens and observed and photographed rat damage and current traditional control methods. Mr. Gula also prepared a paper for the Institute on developing the deepwater areas.

Chhorn Lim, Fish Nutritionist at the Research Institute for Inland Fisheries. He was engaged in assisting a number of the Institute's research projects. This included advising and assisting Mrs. Ningrum in conducting tests to evaluate the effect of lipid levels on the maturation, fecundity and egg hatching rate of common carp. He helped work on the experiments on milkfish maturation at a station in Japara, Central Java. He advised and assisted Mrs. Wahyudi, a researcher at the Depok sub station, in conducting three experiments which were (1) growth and survival of giant goramy larvae fed with various combinations of an artificial diet and Moina sp, (2) effect of feeding rates on the growth and survival of giant goramy larvae, and (3) growth and survival of giant goramy larvae. He formulated and prepared various diets for four different experiments. At the Institute he gave nine lectures and seminars on fish production, feed formulation, feeding practices, and research in aquaculture. During the quarter he made five trips to substations of the Institute and to the station at Japara. In addition to these activities he assisted students in designing their experiments.

William E. Vanstone, Fish Breeder at the Gondol Research Station for Inland Fisheries. He arrived in September 1983 and almost immediately built his house on the site for the Gondol station

and the house was completed in this quarter. Other than an invasion of coconut rats in the attic and goats in the yard, the house and grounds fits their needs very well. A six bedroom mess for staff housing is under construction and two guest houses are planned at the laboratory site. He was able to initiate a number of experiments in cooperation with the staff. He assisted in the preparation of fish holding facilities, provision of live fish and feeds, and maintenance of pumps and generators in order to have a functioning research program at the site before the construction of the station. He has made a number of recommendations to the construction contractor on the new complex of labs and other facilities. He is assisting three research projects which are (1) surveying the North coast of Bali for adult milkfish and fry through out the year, (2) breeding and rearing prawn, artemia culture and plankton culture, and (3) breeding finfisher and rearing the larvae to the fry stage.

### III. OVERSEAS TRAINING

Eight AARP participants were in training during the quarter. Mr. Paiman Sukartana, entomologist from the Central Research Institute for Forest Products began a six-month program on the study of the bark beetle at the University of Wisconsin on January 3, 1984. The same day Messrs. Entong Suratman and Harris Surachman, engineers from the Research Institute for Animal Production, began a three month study in the Theory of Field Machinery and related subjects at the Asian Institute of Technology in Bangkok.

During January Dr. Faizal Kasryno, Director of the Center for Agricultural Economics Research, Dr. Chairil A. Kasahan, National Coordinator for the National Panel of Farmers (PATANAS) and Ir. Hermanto, East Java Coordinator for PATANAS, underwent a short training program in the structure and concepts of the USDA Economic Research Service and in handling the collection, processing and management of large scale data collection programs which was conducted by the USDA, US Census Bureau and Michigan State University.

In late March Mr. Farid N. Saleh of the Banjarmasin Research Institute for Food Crops completed his four month on-the-job training with the IRRI research dissemination staff. In late March Mr. Suparman Karnasudirdja, Chief of the Utilization Division, Central Research Institute for Forest Products, began a six month individual research program in determining the lateral strength of fasteners of various diameters in both the parallel and perpendicular to grain direction.

Sixteen AARP participants are scheduled to begin overseas training during the April - June quarter, 13 in May and three in June. A finance officer from the Agency for Forestry Research and Development will pursue the USDA training course in Project Analysis for Agriculture and Rural Development. A team of two participants from the Central Research Institute for Animal Science and the Research Institute for Animal Production (RIAP) will pursue a three month special training program in research information management and dissemination arranged by the Winrock International Center for Livestock Research and Training. A team of five from RIAP and the Research Institute for Animal Disease

will follow a three month program in rabbit research management and production arranged by the Oregon State University International Rabbit Research Center. An officer from Sukamandi Research Institute for Food Crops (SURIF) will attend a program in On-Farm Irrigation Scheduling, Design and Evaluation at the International Irrigation Center at Utah State University. Two administrative officers of the Maros Research Institute for Food Crops (MORIF) and the Bogor Research Institute for Industrial Crops (BORII) will take the USDA training course in Management of Government Organizations in Developing Countries. Another BORII officer will attend the USDA training course in Seed Improvement. An officer of the Research Institute for Inland Fisheries will attend a ten week practical program in the Biology and Culture of Freshwater Prawn at the University of Hawaii. During June we expect three researchers from SURIF, MORIF and the Lembang Research Institute for Horticulture to attend the USDA training course in Integrated Pest Management which will be held at Purdue University.

Many more candidates would have been scheduled for this next quarter if they had passed the ALIGU test. Mr. Fritz conducted this test at Banjarmasin and Maros during March. A number of candidates from Bogor, Lembang, Sukamandi and Jakarta took the test at USAID in Jakarta. Most of them failed.

During March RMI began a 12-week pilot program of English instruction free of charge at AARD headquarters in Jakarta. Much more will need to be done to upgrade the English qualifications of AARP training candidates if we are to reach the training

targets. A proposal for extension of the Project includes the suggestion that some of the loan funds be used for English training.

As of March 31, 1984 AARP/RMI had sent 65 AARD participants abroad for short term training. They had received a total of 125.43 manmonths of training. In addition, AARP had sent seven participants outside the RMI contract for a total of 6.2 manmonths. A complete listing of the 72 participants is shown in Appendix VI.

The Administrative Specialist, Mr. Fritz, was scheduled to be replaced in this position by an Indonesian national on April 1, 1984. Accordingly he was given a new contract as Training Specialist effective from that date until September 1985.

#### IV. A COMMENT ON AGRICULTURAL EXPERIMENT STATION DEVELOPMENT BY ROLAND E. HARWOOD.

A farm shop with an adequate supply of hand tools, welding equipment, fuel and lubricant storage and handling facilities, and a record keeping system for all preventive maintenance and repair work done at the farm is an absolute necessity if any mechanical equipment is to be used. A general warehouse with an inventory system with all materials, including spare parts, properly identified and cared for is another absolute necessity for an agricultural experiment station. People, adequately trained and paid, must be available to manage these two installations. The farm shop and the general warehouse, absolutely vital to the functioning of an experiment station, can be built, equipped, and operated for a small fraction of the cost

of building laboratories and greenhouses.

With these two installations in place, a farm manager on the job, some laborers, and some field equipment, then farm development can begin. Budgets must be made available for wages, equipment maintenance and operation, and materials needed in farm development. The training obtained in building an experiment station is invaluable. For example, the people who level land and build a drainage and irrigation system will know how to maintain it. When some land is ready for use, even if only one hectare, some meaningful field research can begin. When the first plantings are made, a crops handling building with drying facilities, seed storage, and a seed laboratory should be built.

This also is an inexpensive construction as compared to laboratories and can be designed so only a part of the building may be constructed at the beginning and the building enlarged at a later date as needed.

Farm development should continue on a year around basis, weather and budget permitting. Only the land that can be used and properly maintained should be developed.

Much valuable field research could be done before any laboratory facilities are available. Budget permitting, laboratory facilities should be built as needed.

In the AARP the planning calls for all development, the training of people, construction of all buildings, and procurement of equipment to be done simultaneously. Actually, progress has been made in training and construction. Procurement and farm development have been delayed. The procurement problem

should soon be resolved, but what of farm development?

At least one hundred million rupiahs are needed for farm development during the 1984/1985 fiscal year. We are faced with the possibility of having large and costly office and laboratory facilities without adequate experimental land at some farms.

APPENDIX I

QUARTERLY ACTIVITY REPORTS FOR THE AARP/RMI SPECIALIST TEAM  
STATIONED IN BOGOR AND JAKARTA

APPENDIX I.B.

QUARTERLY ACTIVITY REPORT : JANUARY - MARCH 1984

by

Carl R. Fritz *C.R.F.*  
Administrative Specialist

I. Participant Activity

Participant activity is mainly described under Overseas Training in the main body of the Narrative Report.

1. English Language Activity

During this quarter I expanded my efforts in participant training to include the conduct of ALIGU tests in outlying areas. USAID used to perform this service, but they have run short of personnel and travel funds. They will continue to conduct the tests in Jakarta.

One of the largest obstacles we have encountered in trying to implement the training program is the lack among candidates of the English language capability required to absorb overseas training. To resolve this problem, USAID is considering the possibility of using for English language training and for proposed local technical training some of the loan funds heretofore earmarked for overseas training. A decision on this matter is still pending in connection with other matters being proposed in connection with a possible extension of the Project.

For about a year MORIF had a British volunteer serving as a language instructor. He has left, and no-one is fulfilling that function at MORIF at present. A British volunteer has been at BARIF for about a year, and expects to stay another year. During March RMI began a 12 - week course at Pasar Minggu for AARD personnel at no cost to the Project. Results of ALIGU tests to date, show that levels of capability can be raised through these means. Candidates begin at such a low level of capability, however, that additional, more intensive programs are required if we are going to qualify candidates in the numbers planned for this Project.

On March 21 - 22 Mr. Radice of RMI and I conducted the ALIGU test for 24 candidates at Banjarmasin and conducted 19 interviews. Four persons passed at the I level, three at the II level and rest failed. On March 28 - 29, Ibu Wuryani and I gave the test to 43 persons and conducted interviews with 26 candidates at Maros. Two persons passed at the I level, four at the II level, and the rest failed. In all fairness, however, it must be stated that some of the failures included persons who for one reason or another did not sit for an interview, and three total test scores did not include scores they might have added by sitting for an interview.

## 2. Other Candidate Interviews

On 11 February I interviewed Ms. Elyda Djamaludin, Chief Information Officer of the Central Research Institute for Animal Science. Subsequently I was able, with the help of RMI in Washington, D.C., to make arrangements for a three month training program with the communications staff of Winrock International, a livestock research and training institution in Arkansas, for her and for Mr. Dadang Kosasih, the person responsible for research information dissemination at the Research Institute for Livestock Production, Ciawi. Though their programs will differ somewhat, they will undertake their training at the same time beginning in early May.

During a trip to Lembang in February, Ibu Wuryani and I interviewed 13 candidates, six at LERIH and seven at the Segunung horticultural research substation. On our return to Pasar Minggu we interviewed an additional LERIH candidate. We also interviewed five candidates from the Central Research Institute for Horticulture. A number of these people subsequently took the ALIGU test in Jakarta. For those who passed, I have been arranging for training programs.

These interviews are valuable for several reasons. First, it helps identify the real training requirement which in some cases differs from the program for which the candidate has been nominated. Second, particularly where we are searching for the most appropriate institution to place the candidate, we are in a position to explain what specific training we want. Finally, we have the material necessary for completing the USAID documentation which is designed to show whether or not we can justify the training.

During March, for example, I re-interviewed six employees of the Research Institute for Fish Technology (RIFT) who had been nominated for training in refrigeration technology. The Consortium for Fisheries and Agriculture Development had asked for more information in order to design the most appropriate program. The Marshall Institute had supplied a draft syllabus but also asked for more information. During my return visit to RIFT, I talked to the candidates at more length and accompanied them on a walk through the workshop and laboratory. I found they knew much more about the subject than I previously supposed. The main problem now is to improve their English language capability. Only one of the six could possibly pass the ALIGU test at a I level, and I fear this training program will have to be postponed for some months unless we decide to employ interpreters.

On 31 March Ibu Wuryani and I visited the Central Research Institute for Industrial Crops (CRII) where we discussed the training requirements of industrial crops research with Dr. Suhardjan, CRII Director and members of his staff. They had a list of 52 candidates from CRII and the Research Institutes for Industrial Crops at Bogor (BORII), Tanjung Karang, Malang and Manado. As a result of these conversations I agreed to schedule a trip to Manado during April to conduct an ALIGU test and interviews. While visiting CRII I also held interviews with eight participant candidates from CRII and BORII, and reached agreement with Dr. Suhardjan on types of training needed.

II. Administrative and Financial Matters

USAID concurred during this quarter in my continuing with the Project as Training Specialist. Subsequently RMI and I signed a contract extending my services in that capacity until September 30, 1985.

I began looking for an Indonesian replacement for myself as Administrative Specialist in the October - December 1983 quarter, and worked on it seriously during the current reporting period. I looked primarily for three characteristics : familiarity with financial and accounting procedures, initiative and a feeling of responsibility, and an ability to talk on an equal basis with foreign experts. It was not easy to find such a person who felt free to change jobs, particularly to one which could not guarantee an income beyond September 1985. Before the end of the quarter I recommended to the Project a man currently employed by private enterprise in Sumatra. The difficulty is to move the papers fast enough so that he can give reasonable notice to his employers and join the Project before I depart for home leave in May. Prospects for this appear doubtful.

During the quarter I supervised preparation of monthly rupiah expenditure reports, prepared a summary of rupiah expenditures for the October - December period and submitted to the Project a request for rupiah funds for the current quarter. On March 17 we received Rp. 38.240.000,-. This did not appear to be enough, but was all that remained in the 1983/1984 budget.

Preparation of the monthly report on rupiah expenditures is a tedious, time consuming task. At the end of the quarter Mr. Sulaiman still had much to do on the February report as the inputs from outlying stations had somehow been misplaced in Bogor. This will put us far behind in preparation of the March report, and will delay us in submitting our budget request for the April - June quarter.

I have also been preparing a monthly financial report on Project dollar expenditures covering technical assistance, training, construction, equipment and vehicles. A copy of the March report should be located at Appendix V of this Narrative Report.

Finally, I approved bills for payment by RMI, and reviewed and edited RMI claims for expenditures against the USAID loan and grant. As of March 31, these totaled \$ 430,266 and \$ 1,845,332, respectively.

### III. The Future

Hopefully, after working initially with the new Administrative Specialist, I can devote more attention to the AARP training program.

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JANUARY 1984 - MARCH 1984

P.F. Harwood

January 11 - 12 were spent in Maros. A preliminary plan for a laboratory and office building for Lanrang was shown to D. Farid Bahar, Dr. Anwar Rizvi, Dr. I. Corpuz, and others to be sure the design of the building would best fit the users needs.

The general warehouse and the farm shop were visited with Dr. Bahar to obtain a better knowledge of their functions, and personnel. These two areas, vital to station operations, must be ready for the expanded activities and additional equipment planned for the near future.

Time was spent with Dr. Rizvi and Corpuz to better know their programs, note the amount and condition of their laboratory equipment, and to see if improved support service might be useful to their programs.

January 13 - 14 were spent in Banjarbaru. Construction is very slow due to extensive rain.

A visit was made to the site for the animal disease laboratory in Banjarbaru. There is a gorge approximately 80 meters wide and up to ten meters deep crossing this site. No one was there on Saturday afternoon to confirm the exact location of the site so further information is needed.

Several long meetings have been held to discuss the preliminary evaluation report of our project.

February 13<sup>th</sup> I went to Banjarmasin with Mr. D.O. Reordan and E. Kristiawan, USAID engineers, and we attended the field meeting at the construction site on Monday morning. Construction is eighteen days behind schedule, due largely to the rainy season. More workers are needed now as the weather has improved.

We visited the proposed site of the animal disease installations and found that the site does not have a direct access. It can be reached by crossing the D.I.C. land which forms the north boundary of

the lot, but a bridge estimated to cost 20 million rupiah would be needed. The land may be approached from the southern boundary but the lot is approximately 150 meters from the road and a right of way crossing private property would be needed.

The lot is suitable for construction if access can be found.

We tried to visit Handil Manarap, but the road was blocked due to flooding and access was only on foot. As it was already five thirty in the afternoon we returned to our hotels.

The next day, Feb. 14<sup>th</sup>, I returned to the construction site, The supervisors are working well and have the forms for cube and slump tests ready. A shortage of workers was noticed again on the job site.

Prices and availability of a back-hoe, genset, tractor, and a boat were gotten and permission has been requested to purchase the boat needed for Unit Tatas.

The work order for Phase I, Package II, which includes construction of 17 houses, was given to the contractor by Mr. Widadi. Wednesday we went to Unit Tatas. Several measurements were taken and brought back to the designers with a tentative site plan for the construction planned for this station this year. While at Unit Tatas, we visited the installations of the Extension Service next to our station.

The next day a tentative site plan for Phase II constructions at Banjarbaru was discussed with station personnel.

Farm development at Unit Tatas was discussed with Dr. Mauepillai. Also the urgente need for some equipment in the soils laboratory and the repair of existing equipment was discussed. Until certain soil data is available, it is impossible to plan all the field development at Unit Tatas. On Friday, February 17, I returned to Bogor.

On February 22 a meeting was held in Jakarta with USAID and personnel from Public Works to discuss the possibility of getting some surplus machinery from a USAID project in Banjar.

On February 29 I again returned to Banjarmasin to find the construction stopped. The reasons for this stoppage were checked and discussed and I returned to Bogor on March 2. The following Monday, March 5, Dr. Anwarhan and myself visited the headquarters of the construction company in Jakarta that is in charge of our Banjarbaru construction. After discussing the construction problems steps were taken immediately to get the work back on schedule. A new site manager was sent from Jakarta to manage the work.

Construction planning is proceeding well and much time has been spent with the architects and users and, as soon as any plans are ready, copies are taken to the USAID engineers for their review. The first equipment order has been updated and permission to use a P.S.A. is being awaited.

On March 12, I returned to Banjarbaru. Constructions are now going well and should soon be up to schedule. On March 1. I went to Banjarbaru with two workers and we chopped lines through the brush to check the proposed building sites for the Phase II constructions. Most of the proposed building sites are under water. The chopping of brush at this station costs 100,000 Rp. per hectare. There is no budget for farm development. The flooded areas were marked on the Phase II site plan and a drainage system was designed to drain this area. This information has been given to the architects and to USAID. In response to our request to drill the deep well as soon as possible the contractor now has a drill rig at the site and drilling is about to begin.

Friday, March 16, a meeting was held with all R.M.I. staff to discuss problems and ways to improve cooperation and general working conditions for everyone. I returned to Bogor March 16.

On March 26, 1984, I went on the first flight to Ujung Pandang with Eddie Kristiawan, USAID engineer. We attended a meeting in Maros where Pak Abdullah and Pak Widadi explained the rules to be followed by the contractor, supervisors, owners, etc. who will build the main office and laboratory complex at Maros. This construction has now started. After this meeting Eddie and I went to Lanrang to make the final adjustments to the site plan. We returned to Ujung Pandang at 23.00 hrs. The following day we visited Bontobili to check the area to be used for new constructions. This is all high, well drained land and should present no problems.

Wednesday, March 28, the site plan for Lanrang was gone over with Dr. Bahar, Eddie Kristiawan, and myself and final modifications made. I spent several hours in the farm shop and later made some suggestions to Dr. Bahar that might help to improve the administration.

A check of the costs of Jeep maintenance showed several cases of overpricing of spare parts. All spare parts should be bought by one trained person who could be held responsible. I returned to Bogor on March 29.

The construction plans for Phase II, Package I, Banjarbaru, and for Unit Tatas have been completed. Also the plan for Lanrang is finished and all plans are now under review by USAID engineers.

Forestry now has land in Samarinda and a construction budget. Weekly meetings are being held with the Forestry people to determine what constructions are needed.

Phase II construction is progressing in Bogor. All finished buildings at Cimanggu, including the auditorium, have been formally turned over to Litbang.

The two generators, ordered for Gondol, are finally in place and working.

R.E. Harwood  
April 10, 1984

REH:is

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COOPERATIVE CRIFC - IRRI PROGRAM  
THE INTERNATIONAL RICE RESEARCH INSTITUTE

CABLE ADDRESS :  
IRRIAD BOGOR

MAIL ADDRESS  
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IRRI - P.O. BOX NO. 107  
BOGOR, INDONESIA

February 9, 1984

To : Mr. Walter C. Tappan  
IRRI Liaison Scientist

From : Jerry L. McIntosh   
Farming Systems Liaison Scientist

Subject : Monthly Report - January 1984

I. Principal Achievements and Activities

A. Routine support to cropping/farming systems research.

1. East Kalimantan Farming Systems Research Project.
2. Revise Crop/Livestock Project Proposal.
3. Revise Upland Agriculture and Conservation Project Proposal.
4. TOR for Upland Agriculture Drought Prone Areas Consultancy.
5. TOR for proposed extension of my services.
6. Participated in review of all farming systems research site activities and conditions after staff had made visits.

B. Position or review papers in preparation.

1. Research/Extension Linkages (Appendix I).
2. Direction and Strategy for FSR&D in Transmigration Areas (Appendix II).

II. Miscellaneous Activities

- A. Participation in CGPRT meeting with their Technical Advisory Committee.

B. Consultations with other scientists.

- Jose Ona - RMI, PDP, Nusa Tenggara Timur
- Helge Nielsen - Danish Consultant Team, Central Kalimantan
- Mike Wade  
John Thompson - Trop Soils, West Sumatra  
Carol Colfer
- Suryatna Effendi - Smallholder Rubber Research Institute,  
Sembawa, South Sumatra
- E.M.F. Grundy - Transmigration Consultant,  
Tanah Merah, Irian Jaya
- E. Edward McKennon- RMI, PDP, West Java
- Rural Development staff - USAID
- Bruce Parker - International Agricultural Entomologist,  
University of Vermont
- Rolf Jessinger - Rohm and Haas
- G. Boje-Klein - Soils Department, IRRI
- D. HilleRisLambers- Plant Breeding Department, IRRI
- Wally Falcon  
Stephen Mink - Stanford Research Group  
Doug Perry
- J. McCartney - UNDP, Special Consultant to  
G.A. Oughten Transmigration
- Jack Gershon - AVRDC and  
Retno USAID

C. Trip to Lampung and South Sumatra - January 9-12.  
Trip Report, Appendix III.

III. Problems and Constraints (or felt needs)

- A. Strengthen coordination of Cropping Systems Research among Research Institutes of CRIFC. This is true for other Centers as well.
- B. Strengthen coordination of Farming Systems Research among Research Centers of AARD.

IV. Plans

- A. Follow closely Research on Upland Agriculture in Lampung and South Sumatra. AARD/IRRI team will make visit February 14-18.
- B. Prepare discussion papers on Farming Systems Research and Research/Extension Linkages.
- C. Help prepare paper on Soil Classification and Testing.
- D. Participate in AARD/IRRI Collaborative Meetings in Sukarami.

JLM:fh

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Trip Report

January 9-12, 1984

J.L. McIntosh

**Purpose** : To inspect and review research on fertilizer efficiency and cropping/farming systems in Nakau and Way Abung, Lampung and Batumarta, South Sumatra and in Serang, West Java.

**Participants:**

Ir. Soetjipto Partohardjono  
Mr. Mahyuddin Syam  
Mr. Inu Gandana Ismail  
Ir. Soeprapto  
Mr. Soebowo  
Ir. Yunastri  
Ir. Djunainah  
Ir. Yuswadi  
Ir. Suprianto  
Dr. Brian Palmer  
Dr. Jerry L. McIntosh

**Discussion**

This was a unique trip in that staff from the Research Dissemination Section of CRIFC joined the Agronomists to get a better idea of on going research and the problems that exist in the field. The group went by mini bus and jeep overland to Merak and then by ferry to Lampung. We inspected the research plots near Serang on the way and then stayed overnight in Bandar Lampung on Monday night. The next day (Tuesday) we inspected the research in Way Abung and then proceeded to Batu Raja where we stayed overnight. The next day (Wednesday) we inspected the fertilizer efficiency studies and farmers' fields at our original research site in Batumarta. We also went to see

- 2 -

the work in the newly opened areas in Unit 12. These newly opened areas will add about 35,000 ha to the original settlement (65 000 ha). From Batumarta we began the return trip and stayed overnight (Wednesday night) in Kota Bumi. The next day we inspected the fertilizer efficiency studies at Nakau. We made two more stops -- to visit the Tegineneng Balai of the BPLPP and the Dinas Pertanian offices in Tanjung Karang.

### Observations

#### Serang

Cropping systems studies have been conducted over the past four years in the upland as well as the rainfed lowland areas. There are problems with low soil fertility, extremes of drought and flooding and labor shortages. The land appears to be under utilized. The past research has showed how to increase upland rice and corn production through improved cropping patterns and fertility management. Gogo rancah (direct seeded rice on aerobic soil and later flooded) has been used as a technique for planting earlier and saving enough time to get two rice crops where previously only one was grown. The present research trials are simply component studies to characterize varietal responses to fertilizer materials when the rice is grown as gogo rancah. As would be expected, there were consistent responses to nitrogen. Later differences among varieties will likely be seen. At this point the most striking thing was the rapid and differential percolation of water under these unpuddled conditions. This kind of water movement, in addition to the water loss, leaches nutrients, retards chemical reduction and encourages weed growth.

There are topographic, soil and climatic conditions that are not compatible for gogo rancah rice. On the other hand, there are conditions where gogo rancah is the most useful management system for rice. These conditions need to be clearly identified and described. This kind of information is useful for BIMAS recommendations and the Extension Service.

- 3 -

### Way Abung

The roads within the Transmigration area have been repaired to a certain extent. But there are many places where one can barely pass. These conditions affect marketing of produce and make it difficult for merchants and farmers to purchase seed and fertilizers.

In general the plots looked good. Way Abung is serving the role of an Experimental Farm rather than as a Cropping Systems Site. In a Cropping Systems Site the Site Coordinator would be actively involved in the design and management of the plots and analysis of data. Presently, Mr. Imol is doing a good job but is overloaded. He has about 18 experiments.

Long term lime x phosphate study. Without phosphate the rice and corn plants simply will not grow. There appears to be a slight lime response for corn but none for upland rice. Within the next two or three years these plots should be very useful for determining lime needs for these kinds of soils. Similar plots are needed in other selected locations in Sumatra, Kalimantan, Sulawesi and Irian Jaya to provide a transect of plots for crop response and soil characterization studies.

Fertilizer efficiency studies. These plots look good. There is some unevenness which probably results from weed problems. These year around studies include studies on lime x phosphate, nitrogen sources (slow release) and partial acidulation of rock phosphate. This is the first year for these plots and previous management effects still show. These plots are very important for developing fertilizer management strategies and require precision in their management.

Other trials. The varieties x fertilizer management trials were still too young to show differences. The micro-nutrient studies also did not show any particular response patterns. We did not have time to see the studies on farm implements. The studies on blast and fungicide application should provide some idea of the value of fungicides for blast

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control. For early planted rice, blast was not a serious problem this year and it will be difficult to test the fungicides satisfactorily. However, for later planted rice all varieties showed blast.

#### Batumarta

Fertilizer efficiency studies. The same series of plots were planted here as in Way Abung. They were planted later and leaf blast is very serious. Fungicides should be applied as soon as possible to protect these experiments and plans were made to do this.

Farmers' fields - research impact. Crops all look good. The impact of past research in terms of terracing, interculture (perennial crops in food crops) and animal production is very impressive.

Newly opened lands under Trans III. The research is being carried out on land to be opened from forest in Phase II of Batumarta. Phase I was mostly opened from along. This research is under the direction of Dr. Suryatna from Sembawa Smallholder Rubber Research Institute but the research is being carried out by BORIF staff. The research includes studies on methods of land clearing, post clearing management and farming systems. Soybeans planted on land that had been opened by a minimum of disturbance (no scraping) looked good. The germination was good and the growth even and green. Phosphate fertilizer had been placed in row with the seed at time of planting as recommended based on previous research.

Across the road from the soybean studies land was opened in a similar fashion except that there had apparently been more winnowing and burning of the tree trunks and limbs. Various studies on cropping patterns, insect management and terracing were established. These plots were much less even -- there were both uneven stands and growth. Part of the problem was that furadan was not used in some of the insect management studies.

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In some instances the phosphate for corn was banded (in this case actually dibbled by the seed). Where soils are very low in phosphorus banding of phosphate is not satisfactory. Many times the plants can not get enough phosphorus to meet the plants needs before the roots contact the fertilizer band. This gives uneven growth and is inefficient.

There is another possibility for the uneven growth. The burning of the debris was not necessarily even. There were spots in the field where the organic layer was burned and the subsurface soil exposed to high temperature. This process can form "brick" particles which have lost their nutrient and water holding capacities. If the soil is not cultivated a problem of uneven growth of crops can occur. The implication of this phenomenon is that delays in burning to get better or more even burning may cause temporary soil problems. This will be considered in land clearing research presently being planned.

Nakau

These research plots were established by the Center for Soil Research as part of the collaborative AARD/IFDC Project on Fertilizer Efficiency. These are companion studies to those in Way Abung and Batumarta. The plots are well managed. Soil and plant analyses from these plots will provide a good basis for understanding the crop/soil relationship. But these plots must continue for at least 5 and hopefully 10 years. Other locations need to be identified and trials established as soon as possible.

#### Comments

1. The plots in general looked good but closer senior staff management would be desirable so that the field conditions can be observed and monitored more scientifically and appropriate action can be taken quickly.

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2. Soil fertility is not a problem on a year to year basis. But the long term effects of cropping and management practices to ameliorate the soil need to be studied and quantified. For example soybeans grow well in soils at each of the research sites described (chemical analyses) in the following table even though there is considerable variation in Al content.

Analysis of soil samples from some research sites in Indonesia<sup>1</sup>

Sample Site <sup>2</sup>	Truog	Bray 2	pH	pH	N.KCl	CEC	Ca	Mg	Na	K
	P	P	(H <sub>2</sub> O)	(KCl)	(ext Al)					
	ppm	ppm				(meq/100 g)				
1. Sitiung, West Sumatra	3.35	1.98	4.31	3.71	2.77	14.02	0.05	0.11	0.02	0.03
2. Baturaja, South Sumatra	5.91	2.05	4.75	3.86	1.75	10.13	0.25	0.34	0.06	0.12
3. BUK, Lampung, Sumatra (limed)	13.78	5.58	4.78	4.15	0.18	15.41	2.20	0.84	0.05	0.03
4. BPMD, " " "	6.69	2.72	5.12	4.55	0.13	14.53	1.64	1.00	0.07	0.26
5. Nakau, " " "	6.30	2.50	5.36	4.70	<0.01	13.82	1.04	0.07	0.06	0.18
6. Way Abung, Lampung, Sumatra	6.69	4.83	4.71	4.06	0.87	7.64	0.46	0.31	0.05	0.11
7. Puriala, Southeast Sulawesi	4.53	1.76	5.15	3.80	1.66	11.68	0.76	0.96	0.04	0.13
8. Rimbayu, East Kalimantan			4.20	4.10	4.58					0.20

<sup>1</sup>Analyses were made through the courtesy of the Benchmark Soils Project, University of Hawaii for 1-7, sample 8 by TAD.

<sup>2</sup>Samples were taken from the upper 20 cm of the soil profile. The plant nutrient content below this zone is not sufficient to sustain plant growth.

3. We need to develop an integrated management system for blast control. Management strategies must include resistant varieties, time of planting, fertilizer management and fungicides. Each site in our "transect of sites" must be monitored for climatic data -- rainfall, sunshine period, relative humidity, solar radiation and wind speed.
4. Weeds are a major problem and mechanical weed control must be used more effectively. Varieties that have fast early growth and drooping leaves have a decided advantage for shading the soil for reducing moisture loss and control of weeds.

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5. Late planted Sentani rice was severely attacked by blast. The variety also shows yellowing of the leaves, especially during the booting stage. But this variety has performed well in trials. We need to develop a systematic rotation of tolerant varieties.
6. We observed no brown plant hoppers in the field. Last year at this time the upland rice was heavily infested in both Batumarta and Way Abung. Many fields were destroyed by hopper burn. However, Messrs. Inu and Trip have reported heavy infestations on upland rice in Kuamang Kuning and Kubangijo, Jambi at this time.

## Copies sent to:

Participants  
Dr. I. Manwan  
Dr. I.N. Oka  
Dr. B.H. Siwi  
Dr. M. Sudjadi  
Balai Directors  
Mr. Walter C. Tappan  
Mr. Achmad Abdullah  
Dr. W.L. Collier  
Mr. C. Fritz

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THE INTERNATIONAL RICE RESEARCH INSTITUTE

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March 7, 1984

To : Mr. Walter C. Tappan  
IRRI Liaison Scientist

From : Jerry L. McIntosh *Jerry L. McIntosh*  
Farming Systems Liaison Scientist

Subject : Monthly Report - February 1984

I. Principal Accomplishments and Activities

A. Routine support to Cropping/Farming Systems research.

1. Revisions in Crop/Livestock Research Project Proposal.
2. Further discussions and revisions of Agriculture and Conservation Project Paper.
3. Planning and expansion of activities for Fertilizer Efficiency and Cropping Systems Studies.
4. Outline of paper for IRRI meeting on Tests for Wetland Soils.
5. Discussions on Farming Systems Research and research strategy in Transmigration Areas.
6. GEU meeting.

B. Position and review papers

1. Research/Extension Linkages-Research Perspective (Appendix I).
2. Past, Present and Future Upland Rice Research Outline (Appendix II).

C. Trips

1. Lampung and South Sumatra.
2. Sitiung.

Specific reports will be submitted later by Dennis Garrity, Michael Arrauveau and Mike Bonman. There are some general observations that should be made.

- Local varieties of upland rice in farmers' fields and in trials looked good this year. There should be no problem in stabilizing yield at 2.5 - 3.0 tons per hectare.
- Improved varieties of upland rice developed from adapted local materials generally looked good.
- Lines of upland rice developed in places with favorable soil conditions were in general, suffering from poor adaptation in Sumatra.
- Brown planthoppers were not a problem in Lampung and South Sumatra this year. They were a problem in Jambi and Riau.
- Where crop land is not used intensively the broad leaf weed *Boreria* becomes a very serious problem. It is important that mechanical weeding devices (wheel hoe, for example) be used to uproot weed seedlings before they are fully rooted. This will mean weekly weedings. This would be much easier than hand weeding larger plants.
- To further help control weeds, upland rice varieties should have early vigor and be leafy.
- The long term plots established in Nakau, Way Abung and Batumarta for lime x phosphate and fertilizer efficiency studies are beginning to show differences in crop response among treatments and locations. Soil and climate characterizations will be very useful for understanding why.
- Crops in Sitiung looked much better than expected. The soils in Sitiung in many respects have more potential than soils in Lampung and South Sumatra. To ensure good and even crop stands it is imperative that phosphate fertilizer be placed in the row with the seed on newly opened lands. Later when the general phosphorus content of the soil is increased it may not be necessary, even though practical, to continue this practice.
- The strategy advocated by Cropping/Farming Systems Research to limit food crops production to 0.5 hectare of land (enough for food self sufficiency) appears most practical and rational after visiting the project areas this month. There are two main research issues: (1) Improve and stabilize upland rice yields at 2.5 - 3.0 tons of gabah per hectare; (2) determine which perennial crops to incorporate in the farming systems for different Transmigration Areas and to develop planting and financing strategy.

## II. Miscellaneous Activities

- A. Participation in the P3MT (Agricultural Support for Transmigration) Meeting at Cisarua on February 27 - March 1. Presented paper (see last month report) and then left meeting early to go to AARD/IRRI Collaborative Meeting in Sukarami.
- B. Participated in AARD/IRRI Collaborative Meeting. There were two days of review of collaborative research and work group sessions. I participated in the Upland Rice/Farming Systems group meetings. It was the concensus of the group to promote the development of a collaborative Upland Rice Research project within the context of Farming Systems Research. The stability of upland rice production is the key to self sufficiency in food crop production while animal and perennial crops provide cash and economic stability.
- C. Visitors and consultation

Dr. G. Boje-Klein	IRRI
Mr. Borema	IBRD/Public Works
Dr. C.P. Mamaril	IRRI-INSFFER
Mr. Enrique Barrau	USAID
Mr. Frank Gillespe	USAID
Dr. William Patrick	Louisiana State University
Dr. Francois Dauphin	ESCAP
Dr. A. Syarifuddin K.	SARIF
Dr. Gerry Soto	World Bank
Mr. Van Haderlie	USAID
Dr. Dennis Garrity	IRRI
Dr. Mike Bonman	IRRI
Mr. Michael Arraudeau	IRRI

## III. Problems and Constraints

Same as last month.

## IV. Plans

1. Prepare paper on Tests of Wetland Soils for Crop Production with Dr. Sudjadi for meeting at IRRI on Characterization, Classification and Utilization of Wetland Soils.
2. Help prepare review papers for collaborative research in Cropping/Farming Systems Research.
3. Follow-up work on Crop/Livestock and Upland Agriculture and Conservation research Project Proposals.

*Quarterly Report*

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March 26, 1984

Dr. W.L. Collier  
Chief-of-Party  
R.M.I.  
Jl. Pangrango 6  
Bogor

Dear Bill,

Please find enclosed Dr. J.L. McIntosh's Monthly Report  
for March 1984.

Sincerely,

*Walter*

Walter C. Tappan  
IRRI Liaison Scientist

cc: Dr. J.L. McIntosh  
Dr. B.H. Siwa  
Dr. I.N. oka  
Mr. Carl Fritz

WCT:fh

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- B. A paper was prepared jointly with colleagues from the Center for Soils Research on Tests of Wetland Soils for Crop Production for the Workshop on Characterization, Classification and Utilization of Wetland Soils held at IRRI, March 26 - April 5, 1984. See Appendix I.
- C. Drs. Sudjadi, Fagi, Momuat and McIntosh were scheduled to attend the Wetlands Workshop.
- D. The Asian Farming Systems Network Coordinator, Dr. V.R. Carangal from IRRI visited Indonesia from March 9-19. Discussions were held with Indonesian scientists concerning future research collaboration for varietal testing and crops/livestock. Plans were finalized for the Soybean Monitoring Tour and Workshop to be held in July. This will be a meeting held in Indonesia collaboratively among AARD, IRRI, INTSOY and AVRDC.
- E. Routine collaboration with colleagues.

## II. Miscellaneous Activities

### A. Consultations

Dr. F. Dauphin OSTOM	ESCAP - Soybean research French - Farming Systems Research in Central Kalimantan
Mr. Van Haderlie Dr. Bevin	USAID - Soil Management Support Service FAO - World Bank - Review Transmi- gration projects
Mr. van Lidt Jeude	EuroConsult - Farming Systems Research in Jambi
Dr. Kidd	CIDA - Farming Systems Research in Sulawesi
Dr. Awan	FAO - World Bank - Review of Transmigration projects.
Dr. V.R. Carangal	IRRI - Above

B. Project proposal review and editing for Upland Farming Systems and Conservation Project.

C. Crop/Livestock Project Proposal and planning.

## III. Constraints

A. Project status after June 30, 1984.

## IV. Plans

A. Help prepare review paper on Water Use Efficiency.

B. Assist in planning and implementation of Upland Farming Systems and Conservation and Crop/Livestock projects.

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BOGOR, INDONESIA

March 24, 1984

To : Mr. Walter C. Tappan  
IRRI Liaison Scientist

From : J.L. McIntosh   
Farming Systems Liaison Scientist

Subject : Monthly Report - March 1984

### Principal Accomplishments and Activities

#### A. AARD/IRRI Collaborative Meeting

Others will report on the overall outcome of the meeting. After the plenary sessions four work groups were formed to discuss and develop plans for the coming year. These groups were upland rice/farming systems, brown planthoppers, water management and research management. I was in the first group.

Dr. Syarifuddin was selected chairman of the upland rice/farming systems group. It was the general consensus of the group that upland rice breeding must be considered in the context of the farm system, and that the breeding effort should be focused on yield stability using existing adapted varieties and then gradually add genetic traits to increase and further stabilize yields. It was kept in mind that food crops production should be directed toward food subsistence (if not on farm at least within each region) but that animal and perennial crops would in most instances be the major source of farm income and would provide economic stability to the farm family.

There was general agreement that inter disciplinary long term trials should be established across the red-yellow podzolic soils of Indonesia. This transect of sites would be used to generate technology for long term soil and crop management and provide a place for testing of advanced lines of the major food crops. The success of this research would be dependent upon adequate site description so that the results of trials could be thoroughly interpreted and that the results could be transferred for use in other places with similar site descriptions.

Hopefully, the Collaborative Upland Rice Research Project Proposal will receive active support and be implemented this year. The output from this project will be very important to the future development of upland agriculture in Indonesia.

QUARTERLY REPORT  
TUBER CROPS POSTHARVEST PROCESSING SPECIALIST  
DIANE M. BARRETT  
JANUARY - MARCH 1984

During January the consultant's work was based in Bogor, in conjunction with the "Postharvest Evaluation of Tubers and Fruits" which was to be carried out in January and February. Due to the death of one of the evaluation team members this evaluation was stopped as of January 20 and postponed until a replacement could be found. In the interim, the consultant's work base was changed from Bogor to the Food Crops Research Institute in Sukamandi. Activities during the January - March quarter included the following :

1. Organizational

- a. Finalizing a "Plan of Work" for the postharvest evaluation (see Appendix 1).
- b. Initiation of the postharvest evaluation. This included meetings with Pak Sadikin (Head, AARD), Dr. Ibrahim Manwan (Head, AARD Secretariat), Dr. Siwi (Head, Central Research Institute for Food Crops), officials from the Department of Agriculture, BULOG, BPS, etc.
- c. After the death of one evaluation team member in January, attempts were made to find a replacement. As of the end of this quarter (March) these attempts were not successful.
- d. Assisted Dr. Djoko Damardjati (Head, Postharvest Research program, SURIF) in preparation of the 1984/85 research titles for both Sukamandi and Karawang.
- e. In collaboration with Dr. Djoko Damardjati and Dr. Roberto Soenarjo

(Head, Cassava program, BORIF), wrote 3 proposals for cassava research, as follows :

- 1). Storage of fresh cassava roots in moist rice husks to stimulate root "curing".
- 2). Survey and chemical analysis of traditionally-processed cassava products.
- 3). Evaluation and characterization of chemical and physicochemical properties of selected Indonesian cassava varieties.

These proposals are included as Appendices II, III and IV.

f.. Assisted Ir. Sri Widowati (SURIF) and Ir. Yati (SURIF) in preparation of 3 pigeon pea research proposals :

- 1). Characterization of the chemical and physicochemical properties of selected pigeon pea varieties.
- 2). Production of fermented food products from pigeon peas.
- 3). Production of new food products from pigeon peas.

## 2. Training

### a. Scientists

- 1). Methodology of selecting appropriate methods of food analysis
- 2). Theory of moisture, reducing sugar, starch, protein, fiber, ash, acidity, viscosity, filth, HCN, mold, whiteness, insect and organoleptic analysis
- 3). Survey methodology and interview techniques
- 4). Organoleptic analysis
- 5). Insect analysis
- 6). Assisted with Sorvall centrifuge training (1 day)
- 7). Assisted with HPLC training ( 4 days).

b. Technicians

- 1). Moisture analysis
- 2). Acidity analysis
- 3). Assisted with installation of new equipment

3. Research

- a. Compilation and analysis of data from fresh cassava storage project (November 1983 - February 1984) with Ir. Soeharmadi (Sub-BPIP-Karawang).
- b. Continuation of cassava starch storage experiment (October 1983 - April 1984) with Ir. Suismono (Sub-BPTP-Karawang)
- c. Preparation of 3 cassava research proposals for 1984/85 (see Appendices II, III, IV).
- d. Initiation of "Survey and chemical analysis of traditionally processed cassava products" with Ir. Suismono and Ir. Widowati project (SURIF) i.e. :
  - 1). Survey of traditional cassava processing and storage in Kabupaten Gunung Kidul, Central Java (see trip report , Appendix V).
  - 2). Sampling of 5 types of processed products from farmers and traders in Gunung Kidul, i.e. "gaplek", "tepung gaplek" (for "tiwul"), "gogik", "bahan gatot" and "kabluk".
  - 3). Initial sample preparation
  - 4). Moisture analysis
  - 5). Appearance analysis
  - 6). Mesh size analysis
  - 7). Analysis of farmer and trader questionnaires.

- e. Preparation of 4 types of questionnaires to be used for surveys of gabah/beras processing during the 1984 wet season in Bekasi, Karawang, Subang and Indramayu, i.e.
- 1). farmer
  - 2). head of farmer group
  - 3). head of KUD
  - 4). trader
- f. Assistance in organization and implementation of a "Survey of Paddy/Rice (Gabah/Beras) during the 1984 Wet Season in Karawang, Bekasi, Subang and Indramayu".
- g. Assistance in survey data analysis and coding.

4. Miscellaneous

- a. Wrote 2 research articles, in collaboration with Dr. Djoko Damardjati, for Indonesian agricultural research journals, i.e. :
- 1). "Maintenance of Cassava Quality in Indonesia"
  - 2). "Improving the Awareness and Maintenance of Rice Quality in Indonesia"
- b. Initiated co-editorship of an Indonesian language book on cassava with Dr. Roberto Soenarjo (BORIF), to be sponsored by IDRC.
- c. Assisted with reports on the ASEAN/EEC rice drying project.
- d. Consultations with :
- |                                     |   |                 |
|-------------------------------------|---|-----------------|
| 1. Dr. Rod Cooke<br>Microbiologist  | Tropical Product<br>Institute (TPI),<br>London. | HCN analysis    |
| 2. Dr. Bruce Parker<br>Entomologist | Univ. of Vermont,<br>USA                        | Insect analysis |

- |                                      |                                 |                 |
|--------------------------------------|---------------------------------|-----------------|
| 3). Dr. Chris Haines<br>Entomologist | TPI/BIOTROP<br>Bogor, Indonesia | Insect analysis |
| 4). Dr. Rick Hodges                  | TPI/BULOG<br>Tambun, Indonesia  | Insect analysis |

APPENDIX V  
TRIP REPORT  
TRADITIONAL CASSAVA PROCESSING SURVEY  
GUNUNG KIDUL, CENTRAL JAVA  
FEBRUARY 20 - 25, 1984  
DIANE M. GARRETT

From February 20 - 25, Ir. Sri Widowati (BPTP-Karawang), Ir. Suismono (Sub-BPTP Karawang) and I carried out a small survey, or case study, of traditional cassava processing methods and final cassava products in Kabupaten Gunung Kidul, Daerah Istimewa Yogyakarta (D.I.Y.). Gunung Kidul is one of the major cassava producing areas on Java and also is an area with extremely poor soil. Cassava is a principal staple in the diet in this area.

The objectives of this survey were the following :

1. assessment of the typical postharvest activities taking place with respect to cassava in Kabupaten Gunung Kidul
2. analysis of marketing channels for cassava products
3. evaluation of farmer's awareness of postharvest technology
4. sampling typical processed cassava products sold at the farmer and village, kecamatan and kabupaten village levels.

(1). Assessment of typical postharvest activities, marketing channels and farmer awareness

These objectives were carried out by means of interviews with randomly selected farmers and traders in the Kecamatan Tepus, Kabupaten Gunung Kidul area. Nine farmers and nine traders were interviewed with

prepared questionnaires in order to delineate postharvest activities.

Rough results were as follows:

a) Farmer interviews

- 1) Most farmers owned their own land, with the average size being 0.5-1.0 hectares.
- 2) Sweet, local cassava varieties were planted.
- 3) Average production was 1.5 tons fresh cassava/ha.
- 4) All roots were harvested by hand with the assistance of some tools.
- 5) Tubers were cleaned, peeled and dried whole in the field following harvest.
- 6) All tubers were sun-dried on the soil without a drying mat, for an average of 7-8 days, without turning.
- 7) Following drying, tubers were cleaned of soil by wiping and stored.
- 8) All farmers stored "gaplek" in bamboo containers, approximately 130 cm x 150 cm.
- 9) Storage areas were generally dark, unventilated and showed signs of rats, insects and often mold.
- 10) Average storage time was 4.5 months.
- 11) Following storage, "gaplek" was usually further processed into "tiwul".
- 12) In addition to "tiwul", other minor products made from gaplek included "doqik", "tape gaplek" and "gatot".
- 13) Almost all farmers sold their products to small traders.

Prices were as follows:

	<u>Average</u>	<u>Range</u>
a) gaplek/gatot	75 Rp/kg	50-100 Rp/kg
b) gogik	55 Rp/kg	25- 80 Rp/kg

15. In the market, "bahan gatot" or moldy gaplek is never distinguished from "gaplek"

16. Consumption and sale of cassava and cassava products were as follows :

Cassava Product	C o n s u m p t i o n		S a l e	
	Average	Range	Average	Range
	(%)	(%)	(%)	(%)
a). fresh cassava	14	3-25	0	0
b). dried cassava	38.7	22 - 65	47.3	22-65

17. All tiwul produced is consumed whereas all gogik and kabluk are sold.

b. Trader interviews

- 1). The most common cassava product sold at village, kecamatan and kabupaten markets was gogik, the second most common was gaplek.
- 2). Most traders at the village market sold cassava products they had processed from their own cassava, whereas traders at kecamatan and kabupaten markets bought from a variety of sources.
- 3). Average buying and selling prices were as follows :

Market and Product	Avg. buying price (Rp./kg)	Avg. selling price (Rp./kg)	Profit Rp./kg
<b>a. Village</b>			
1. gaplek	-	92	-
2. gaplek flour	-	97.5	-
3. qogik	-	111.5	-
4. gatot	-	112.5	-
5. kabluk	-	-	-
<b>b. Kecamatan</b>			
1. gaplek	85	96.7	5
2. gaplek flour	-	-	-
3. qogik	60	71	11
4. gatot	82.5	95	12.5
5. kabluk	-	-	-
<b>c. Kabupaten</b>			
1. gaplek	91.7	110	18.3
2. gaplek flour	110	120	10
3. qogik	85*	70	-5
4. gatot	85*	70	-5
5. kabluk	30	30	0

\*data questionable, from only one respondent.

- 4). In order to better establish buying/selling prices, more interviews should be done. It is not possible to draw adequate conclusions from this data.
- 5). Most traders at the village and kecamatan levels do not utilize quality classification of cassava products, while most (67%) at the kabupaten level do. Classification is based on color and moisture content.
- 6). None of the traders cleaned their products prior to sale.
- 7). All traders used some sort of storage for products, usually in order to await high market prices, or as need for money developed.
- 8). Average storage time was :
  - a). village traders (producers) 108 days
  - b). kecamatan traders 124 days
  - c). kabupaten traders 24 days
- 9). Most traders did not dry their cassava products, either before or after storage.

APPENDIX I.F  
QUARTERLY ACTIVITY REPORT  
JANUARY - MARCH, 1984

CHHORN LIM

I. PRINCIPAL ACTIVITIES

1.1. Research activities

- 1.1.1. Advised and assisted Mrs. Ningrum in conducting the experiment to evaluate the effect of lipid levels on the maturation, fecundity and egg hatching rate of common carp. This experiment has been conducted for a period of two months and will continue for another two months.
- 1.1.2. Continued the on-going experiments on milkfish maturation at the BADC, Japara. The reports on the progress of the experiments are given in Appendixes I.F1 and I.F2.
- 1.1.3. Advised and assisted Mrs. Noveni Wahyudi, researcher at the Depok substation, in conducting three experiments :
  - Growth and survival of giant goramy larvae fed with various combinations of an artificial diet and Moina sp. (Appendix I.F3).
  - Effect of feeding rates on the growth and survival of giant goramy larvae (Appendix I.F4).
  - Growth compensation of giant goramy larvae.
  - Formulated five isocaloric diets containing various levels of protein (20,25, 30, 35 and 40%) for Mrs. Haniah. These diets will be used to determine the quantitative protein requirement of Macrobrachium sp.

- 1.1.5. Formulated six isonitrogenous and isocaloric diets to contain various levels of fish meal. These diets will be used for an experiment to determine the optimum level of fish meal in common carp diet.
  - 1.1.6. Formulated and prepared an artificial diet for larvae utilizing laboratory prepared ingredients. The diet was finely ground and sieved to obtain particle sizes of less than 180  $\mu$ , between 180 and 250  $\mu$  and between 250 and 425  $\mu$ . The feed was to for the experiments in larval rearing of giant goramy and common carp.
  - 1.1.7. Prepared vitamin and trace mineral mixes needed for milkfish broodstock experiments at BADC, Japara.
- 1.2. Lectures/Seminars
- 1.2.1. Five lectures/seminars, each lasted from 2 to 2½ hours were given at RIIF, Bogor. The subjects discussed were principles of fish production, feed formulation, feeding practices and the culture of Clarias sp.
  - 1.2.2. Three lectures of 2 to 2½ hours each was given at Depok substation. The topics offered were feeding practices and research in aquaculture.
  - 1.2.3. A 4-hour seminar on feed and feeding was given at P.T. SINTA PRIMA FEEDMILL upon the request of its manager and approved by the Director of RIIF.

### 1.3. Travels

- 1.3.1. Trip to BADC, Japara. Two trips were made to Japara to sample the experimental fish, and check the progress and problems encountered in milkfish broodstock experiment. The reports are given in Appendixes I.F.1 and I.F.2.
- 1.3.2. Trip to SBPPD, Depok. Eleven trips were made to Depok, substation. The activity report is given in Appendix I.F5.
- 1.3.3. Trip to P.T. SUBUR GOLD COIN INDONESIA, Bekasi with Mr. Hidayat. The trip report is described in Appendix I.F6.
- 1.3.4. Trip to Kamal substation was made on March 13, 1984 with Mr. Zafril Imran Azwar (see Appendix I.F.7)
- 1.3.5. Trip to Pasar Minggu with Mr. Hidayat and Mrs. Ningrum on March 30, 1984. The trip report is shown in Appendix I.F8.

## 2. MISCELLANEOUS ACTIVITIES

- 2.1. Informal discussion and consultation by research staff.
- 2.2. Assisted students in designing the experiments.
- 2.3. Assisted Mr. Sudadi from the Yogyakarta provincial fisheries in determining the equipment required for a small pilot feed mill.
- 2.4. Attended seminars and meetings.
- 2.5. Consulted by private sectors.
- 2.6. Assisted Mrs. Ningrum in the procurement of feed ingredients, individual vitamins and minerals.
- 2.7. Attended to the guests/visitors.

### 3. CONSTRAINTS

Lack of some equipment and research facilities as has been indicated in the October-December 1983 Quarterly Activity Report.

A few travels for survey on the status and problems of common carp culture in running water, and visits to private feed mills planned for the quarter were postponed due to the lack of fund. For the same reason, a research study planned for February was also postponed.

### 4. PLAN FOR NEXT QUARTER

- 4.1. Continue the survey on the status and problems of common carp culture in running water.
- 4.2. Continue milkfish broodstock experiments.
- 4.3. Give lectures/seminars.
- 4.4. Conduct experiments in collaboration with the BPPD staff.
- 4.5. Consultation trips to substations.
- 4.6. Assist the institute in feed formulation and testing for Penaeus monodon.
- 4.7. Take a one -month home leave.

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APPENDIX I. F1  
TRIP REPORT  
TRIP TO BADC, JAPARA  
January 16 - 18, 1984  
CHHORN LIM

The purposes of this trip were to sample the experimental fish, change the feed allowances, and check the progress and problems encountered in conducting these milkfish maturation experiments.

Samplings were done on January 16 with Mr. Alie Poernomo, Mr. Tadjuddin, and the staff of BADC, Japara. Dr. Vanstone arrived in the evening of the same day. The water in each tank was lowered to about half the original level. The fish were sampled by the use of a seine. The numbers of fish sampled were 4, 5 and 7 from tank A, B and D, respectively. They were individually measured for lengths (standard, fork and total lengths) and weights. Gonadal samplings were done by cannulation. However, due to immaturity of the gonad, this sampling technique was not successful. Thus, 2 fish from each tank A and B, and 4 fish from tank D were sacrificed and dissected. The sexes were determined, and the gonads were weighed and preserved in Bouin's solution for further histological studies. Data obtained from sampling are given in Table 1.

On November 26, 1983 two fish from tank B died due to the failure of the electrical power. On December 13, one fish from tank A died. The fish was in very poor condition. On December 23, there was a few day brown out. Total mortality occurred in tank C and 7 fish in tank B died. Data of the dead fish are presented in Table 2.

The ranges and averages of the water physico-chemical parameters from various tanks for the period December 19, 1983 to January 14, 1984 is given in Table 3.

On January 17, estimation of the total biomass of fish in each tank was made. The daily feeding rate was reduced from 3% to only 2%. The daily feed allowances for each tank were also calculated (Table 4).

On the same day, instructions were given to Mrs. Anindiastut' for her to get 8 and 17 fish from pond to restock in tank B and C, respectively and installed five 40-watts fluorescent lamps over tank C. Fish in tank C will be feed at a rate of 3% (DM) per day. Instructions were also given to her on the method of computation of daily feed allowance.

Table 1. Length, weight, condition factor, sex and gonad weight of milfish broodstock sampled on January 16, 1984.

Treatment (TANK)	Sample No.	Length (cm)			Weight (g)	Condition factor*	Sex	Gona Weight (g)	Remarks
		SL	FL	TL					
A	1	60.0	61.5	74.0	3380	0.83			
	2	54.0	56.5	67.0	2680	0.89	F	3.8	Sacrificed
	3	55.0	56.4	70.0	3000	0.87	F	17.0	Sacrificed
	4	55.0	56.2	65.0	2200	0.80			
				AV	2815	0.85			
B	1	56.2	57.0	70.0	3200	0.93			
	2	58.0	59.0	70.0	3200	0.93			
	3	57.0	58.0	71.0	3100	0.87	F	9.8	Sacrificed
	4	55.0	56.4	68.0	2900	0.92			
	5	56.0	57.0	66.0	2600	0.90	F	7.5	Sacrificed
			AV	3000	0.91				
C	1	50.4	51.2	62.0	2050	0.86			
	2	53.2	54.6	65.0	2200	0.80	F	11.8	
	3	55.0	56.4	68.6	2400	0.76			
	4	57.0	58.4	69.4	2900	0.90	M	9.7	
	5	50.0	51.0	61.0	2000	0.88			
	6	51.2	52.4	61.0	2100	0.93	F	6.5	
	7	54.0	55.0	66.0	2250	0.79	F		Early storage of development.

\* Condition factor was computed as follow :

$$C = \frac{W}{TL} \times 10^2, \text{ where } W = \text{weight in gram}$$

TL = Total length in centimeter.

Table 2. Length weight, condition factor, sex and gonad weight of milkfish broodstock died on various date.

Treatment (Tank)	Date died	Fish No.	Length (cm)		Weight (g)	Condition factor	Sex	Gonad weight (g)
			SL	TL				
A	12-13-83	1	52.0	62.0	950	0.40	M	0.47
B	11-26-83	1	-	-	-	-	-	-
		2	-	-	-	-	-	-
	12-23-83	1	53.0	61.0	1450	0.64	M	0.65
		2	57.0	66.0	2400	0.83	M	2.01
		3	54.5	64.5	2000	0.75	M	1.76
		4	57.0	66.0	2650	0.92	M	6.36
		5	58.0	69.0	3000	0.91	M	8.32
		6	55.0	66.0	2450	0.85	M	5.47
		7	57.0	66.0	2300	0.80	M	3.42
		AV.				2321.4	0.81	
C	12-23-84	1	56.0	69.0	2600	0.79	M	1.75
		2	53.0	65.0	1750	0.64	F	4.08
		3	53.0	58.0	2000	1.03	F	4.50
		4	57.0	69.0	3200	0.97	M	2.10
		5	55.0	65.0	2400	0.87	F	2.80
		6	55.0	65.0	2500	0.91	M	1.00
		7	50.2	58.0 ?	2800	?	F	46.50
		8	54.0	64.0	2600	0.99	M	1.20
		9	55.0	62.0	2300	0.97	F	9.00
		10	59.0	69.0	2600	0.79	M	1.80
		11	55.0	66.0	2400	0.83	M	2.10
		12	60.0	72.0	2750	0.74	F	13.10
		13	54.0	63.0	2250	0.90	F	13.80
		14	50.0	62.0	1600	0.67	M	2.00
		15	54.0	63.0	2100	0.84	M	1.00
		16	56.0	68.0	2300	0.73	F	6.70
		17	56.0	68.0	2450	0.78	F	9.70
		18	58.0	70.0	2300	0.67	M	2.80
		19	51.0	58.0	1950	1.00	M	3.60
		20	55.0	65.0	2500	0.91	M	2.90
		AV.			2367.5	0.91		

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Table 3. Ranges and averages of the water physico-chemical parameters in various tanks for the period December 19, 1983 to January 14, 1983.

Treatment (Tank)	Temperature (°C)*		DO (ppm)*		Salinity (ppt)
	AM	PM	AM	PM	
A	27.0-29.0 (28.3)	27.0-29.0 (28.3)	1.2-5.8 (4.6)	3.2-6.9 (4.6)	30.0-32.0 (31)
B	27.0-29.0 (28.3)	27.0-29.0 (28.3)	1.6-6.3 (5.3)	3.1-7.7 (5.4)	30.0-33.0 (31.0)
C	27.0-28.0 (27.8)	27.0-28.0 (27.9)	1.9-5.5 (4.4)	2.2-5.2 (3.9)	30.0-32.0 (31.5)
D	27.0-29.0 (28.3)	27.0-29.0 (28.3)	3.8-6.8 (5.7)	4.1-7.0 (6.1)	30.0-33.0 (31.0)

\* The numbers in parentheses represent the averages.

Table 4. Number, average weight and total weight of fish in various tanks and the daily feed allowances.

Tank	No. of fish present	Av. wt. (g)	Total wt. (kg)	Daily feed allowance(kg)*	
				AM	PM
A	17	2815	47.85	0.53	2.1 <sup>**</sup>
B	9	3000	27.00	0.30	0.30
C	-	-	-	-	-
D	45	2271.4	102.20	1.14	1.14

\* Air dry weight of pellet

\*\* Wet weight of trash fish.

APPENDIX 1.F2  
TRIP REPORT  
TRIP TO BADC , JAPARA  
MARCH 14 - 16, 1984  
CHHORN LIM

The purposes of this trip were to sample milkfish broodstock, change the daily feed allowances and check the progress and problems encountered.

I arrived Japara about 11:20 AM of March 14 due to cancellation of the early morning fly. Upon my arrival fish in tank A, B and C have been sampled by Dr. Vansone, Mr. Tadjuddin with the assistance of Japara staff. In the afternoon of the same day we sampled fish in tank D. Sampling was done by lowering the water and used of seine. Four fish from each tank A, B and C were sampled while 6 fish were collected from tank D. Benzocain was used to anesthetized the fish prior to length and weight measurement. This anesthetic seemed to precipitate the slime which came off easily when handled. No gonad sampling was done and all the fish were returned back to the tanks where they belong. Data obtained from samplings are given in Table 1.

On March 15, new daily feed allowances were computed based on estimated total biomass obtained from sampling and the daily feeding rate of 2% (see Table 2). Discussion was made with Mrs. Ivonne on the problems of feed preparation. The major problems are the high cost of fish meal and its availability and difficulty in purchasing dicalcium phosphate. Assistance was also given in repairing and testing of a laboratory model California Pellet Mill (CPM).

Except for some problems in the procurement of fish meal and dicalcium phosphate, the experiment has progressed well. Four 40-watts fluorescent lamps have been installed over tank C, and 20 and 7 new fish have been transferred from pond and stocked in tanks C and B, respectively. The water physico-chemical parameters in various tanks are summarized in Table 2.

Table 1. Length, weight and condition factor of milkfish broodstock sampled on March 14, 1984.

Treatment (Tank)	Sample No.	Length (cm)			Weight (g)	Condition factor	Remark
		SL	FL	TL			
A	1	54.8	56.4	70.6	3920	1.11	Right eye is blind
	2	56.8	58.6	72.2	4470	1.19	
	3	54.2	55.0	59.4	3800	1.85	
	4	51.0	53.0	60.5	3090	1.40	
				AV.	3820	1.39	
B	1	55.6	57.4	69.0	5640	1.72	
	2	51.4	52.0	63.2	3090	1.22	
	3	50.6	52.0	57.8	2960	1.53	
	4	55.0	57.0	59.0	3320	1.62	
				AV.	3752	1.52	
C	1	55.6	57.0	70.0	3580	0.99	
	2	55.0	57.4	71.0	3480	0.97	
	3	53.0	55.0	67.0	2760	0.92	
	4	51.8	53.4	65.0	3370	1.23	
				AV.	3297	1.03	
D	1	51.8	53.8	68.0	2050	0.65	
	2	51.8	53.2	66.0	2080	0.72	
	3	48.2	50.0	59.4	1700	0.81	
	4	48.0	49.8	61.4	1920	0.83	
	5	48.7	51.4	62.0	2000	0.84	
	6	56.6	58.8	70.0	3625	1.06	
			AV.	2235	0.82		

Table 2. Number, average weight and total weight of fish in various tanks and the daily feed allowances.

Tank	No. of fish present	Av. wt. (g)	Total wt. (kg)	Daily allowance(kg)*	
				AM	PM
A	17	3820	64.94	0.72	2.88**
B	17	3752	63.79	0.71	0.71
C	20	3297	65.95	0.73	0.73
D	45	2235	100.57	1.10	1.10

\* Air dry weight of pellet

\*\* Wet weight of trash fish.

Table 3. Ranges and averages of the water physico-chemical parameters in various tanks for the period from February 3 to January 10, 1984

Tank	Temperature ( $^{\circ}$ C)*		D.O. (ppm)*		Salinity (ppt)
	AM	PM	AM	PM	
A	27.0-29.0 (27.9)	27.0-29.0 (27.8)	4.5-6.3 (5.6)	4.7-6.3 (5.5)	29.0-30.0 (29.4)
B	27.0-29.0 (27.8)	27.0-29.0 (27.8)	3.8-7.0 (5.6)	3.8-7.0 (5.6)	29.0-30.0 (29.4)
C	27.0-28.0 (27.7)	27.0-28.0 (27.8)	3.3-6.3 (5.5)	3.9-6.2 (5.3)	29.0-30.0 (29.4)
D	27.0-28.0 (27.8)	27.0-28.0 (27.8)	5.7-7.5 (6.6)	5.6-7.8 (6.8)	29.0-30.0 (29.4)

\* The numbers in parentheses represent the averages.

APPENDIX I. F6.  
TRIP REPORT  
TRIP TO P.T. SUBUR GOLD COIN INDONESIA  
February 13, 1984  
CHHORN LIM

A trip was made with Mr. Hidayat to P.T. Subur Gold Coin Indonesia, Bekasi. The purpose of this trip was to gather information on the availability of fish feed.

During this visit, a meeting was held with the General Manager, Mr. Sam Hok Man. The tour of the facilities was done after the discussion.

P.T. Subur Gold Coin Indonesia was designed for manufacturing terrestrial animal feeds. The plant possesses various equipment required for producing sinking pellet utilizing a continuous system with computer control panels. The capacity of the plant is about 30 tons/hour. This feed mill is very recent. According to Mr. Sam, commercial production of feeds was started in 1981. P.T. Subur Gold Coin Indonesia produces about 7,000 tons of animal feeds per month. Approximately 40 to 45% of the total production is in crumble or pellet forms. The rest is in meal form.

The production of fish feed was started only in 1983. Three formulae are available for fish feed but only one formula is being used for production. The proximate nutrient composition of fish feed produced as described by Mr. Sam are :

Crude protein	- 25 - 28%
Crude fat	- 3%
Crude fiber	- 5.5%
Ash	- 10%

The feed materials being use are :

- Fish meal
- Soybean meal
- Meat and bone meal
- Wheat pollard
- Rice bran

Corn

Ipil-ipil leaf meal

Sorghum

Cassava

Palm oil

Vitamins

Minerals and other trace elements and  
additive.

The quantity of fish feed sold are negligible (5 tons/month) compared to the total amount of feed produced. At present, fish feed is produced only based on order.-

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APPENDIX I. F7  
TRIP REPORT  
TRIP TO KAMAL SUBSTATION

March 13, 1984

CHHORN LIM

A trip was made to Kamal substation with Mr. Zafril Imran Izwar upon the invitation of Mr. Rustami, Senior Researcher of the RIIF who is actively involved in shrimp culture projects.

Upon arrival, while waiting for the arrival of Mr. Rustami and Mr. Asmin Ismail, I took the opportunity of discussing with the technicians of the substation with the assistance of Mr. Zafril as interpreter.

Kamal substation is a brackishwater substation of the RIIF. The total area of the station is about 50 ha. This substation has only a small office building (a new building is in the process of construction during the time of this visit) and 50 ponds of various sizes : 30 of  $\frac{1}{2}$  ha size, 15 of 1 ha and 5 of 2 ha. However, some ponds have recently been converted into smaller units for experimental purposes. The soil texture and pH are quite suitable for pond construction. However, the water supply, both quality and quantity seem to be the major problems. The water supply is drawn from an area heavily populated and used as loading or unloading docks for fish, stones and others. The salinity is quite high during dry season and drop to about 15 - 20 ppt during rainy season. The tidal range is quite low. Thus, for good water management, a pump must be installed.

This substation has a substation Head (Mr. Asmin Ismail) and five technician. The activities were mainly devoted to milkfish culture, both nursery and growth out, using the standard extensive methods. Only organic fertilizers (especially chicken manure) is used. Fertilization is done only once during pond preparation. The amount of chicken manure applied was about 1 ton/ ha.

The works on shrimp, Penaeus monodon, were started only in 1983. Five ponds, each having approximately an area of  $500 \text{ m}^2$  have been constructed. One pond is used for water storage or reservoir. The other four are being used by Mr. Rustami in semi-intensive culture of P. monodon testing the effect of stocking rates, and comparing the efficacy of the locally made paddle wheel aerator and air blower as means to increase D.O. and shrimp production.

During this trip, on site discussion and suggestions were made with Mr. Rustami. This include the improvement of the culture ponds, water supply, canal, screen, culture methods, feed and feeding practices.

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APPENDIX I. F 8.  
TRIP REPORT  
TRIP TO PASAR MINGGU SUBSTATION  
MARCH 30, 1984  
CHHORN LIM

This trip was made together with Mr. Hidayat and Mrs. Niogrum upon the request of Mr. Rustami for the discussion the on the P. Monodon culture especially nutrition, feed and feeding. Presented during this meeting were also two other research staff which are involved in the shrimp culture projects.

There, we were briefed by Mr. Rustami about the results of his experiments conducted at Kamal substation. The culture management was also explained. The pellet used for these experiments were prepared at the Nutrition and Feed Technology subdivision of the RIIF at Bogor. Feed formula was provided by Mr. Rustami. The culture period lasted for four month. Shrimps were fed at rates of 40, 20, 10 and 5% of the body weight per day for 1st, 2nd, 3rd and 4th month respectively. The water exchanges were done at every 12 to 14 days during high tide. Total exchanges of water were done twice during the 4 month culture period by the use of pump. Aeration with paddle wheel and air blower was started on the 3rd month. Wild collected postlarvae was used as experimental animals. The stocking rates varied from 2.3 to 5.6 postlarvae per m<sup>2</sup>.

Mr. Rustami briefed us also about the outcomes of his meeting with Vice Minister for Fisheries and Animal Husbandry. He indicated the urgency of the needs for technology on intensive shrimp culture especially on feeds and feeding techniques.

After the briefing, the discussion was centered mainly on the nutrition, feed and feeding for P. monodon. I was requested to provide information concerning these matters. I explained to the group about the available information on shrimp nutrition. Based on the limited existing information, feeds can be formulated but it is suggested that they should be tested prior to the release of information to the private sectors. I suggested

that we should have 3 formulae, one for postlarvae to juvenile (10 g), one for juvenile to marketable size and another one is for the adult broodstock. However, according to Mr. Rustami, President Feed Ltd., Taiwan produces six (6) different types of feed for shrimp. Thus, we decided that we should have four (4) feeds instead of three. The followings are my recommendation concerning the proximate nutrient composition of various feeds :

Recommended proximate composition of shrimp diets, their uses and pellet form/size.

D i e t	Percent nutrient(Dry matter basis)					M.F (Kcal/kg)	Shimp size/ stage	Pellet	
	C. Protein	C. Fat	Choles- terol	C. Fiber	Ash			Form	Size
I	42 - 45	8-10	1	≤ 4	≤ 13	3700- 4000	PL - 2g	Crumble#1	2 mm
II	38 - 40	7-8	1	≤ 5	13	3600- 3800	2g-10/ 15 g	crumble#2 or pellet	∅=2.5mm L=2.5- 3.0 mm
III	32 - 35	6-8	1	≤ 5	≤ 12	3400- 3600	10/15g- market size	Pellet	∅=2.5mm L=4-6mm
IV	35- 38	6-8	1	≤ 5	≤ 12	3500- 3700	Brood- stock	Pellet	∅=2.5mm L=4-6mm

The available ingredients suitable for use in shrimp pellet were also reported. These are :

- Shrimp meal
- Shrimp head meal
- Fish meal
- Meat and bone meal
- Soybean meal
- Ipil ipil leaf meal
- Wheat flour
- Rice bran
- Corn meal
- Cassava flour
- Wheat pollard
- Sago palm starch
- Sorghum

It was agreed that I will search for more information required for feed formulation and will provide the feed formulae, give recommendation on feeding practices and information on feed processing to obtain a water stable diets.

APPENDIX II

QUARTERLY ACTIVITY REPORTS FOR THE AARP/RMI SPECIALIST TEAM AT  
THE MAROS RESEARCH INSTITUTE FOR FOOD CROPS

*Quarterly Report*

QUARTERLY ACTIVITY REPORT: SPECIALIST TEAM AT MAROS

JAN - MAR 1984

General Situation

The work of the specialist team at Maros continues to be hampered by the fact that not one piece of the equipment ordered by the project has yet arrived on site. Equipment has been improvised from locally available supplies, and, in the case of the computer, a microcomputer personally owned by Dr. von Fleckenstein has been put freely at the disposal of the Institute staff. Such private efforts, however, are no substitute for equipment properly purchased by the project and in place at the Institute itself.

The logistical problems involved in getting people and computer together, for example, have created many stresses and strains in the project, which would have been completely unnecessary if the project computers had been installed 6 to 9 months ago, as would have been reasonable. One should not be lulled by the ingenuity of the specialist team into assuming that the present state of affairs is desirable. It is not. If the equipment is to be properly integrated into the working life of the Institute, it must arrive in time for the specialist team to have some time to work together with Institute staff in using it. Ideally, this means that the equipment should already have arrived.

In addition, a number of health problems have bedevilled specialists at Maros. In this quarter alone, two staff members were evacuated to Singapore, one for chronic debilitation which

proved to be malabsorption of Vitamin B12 and Folic Acid, the other for an acute attack of what proved to be typhoid fever, inflammation of the liver and gallstones.

On a happier note, construction of the new building has begun, and the recent ALIGU test conducted at Maros at the end of March resulted in four I's and four II's, not all of them easily predictable beforehand. Thirty-five of those taking the test were in Group III, but even within this group, some notable improvements occurred.

#### Individual Activities

Dr. Fritz von Fleckenstein, agricultural economist.

Dr. von Fleckenstein continued to work closely with Ir. Hadijah Dahlan on the intensive survey of Desa Baju Bodoa. During the quarter, they finished a comparison of labour data collection methods, produced a paper showing the results of this comparison, entered approximately half of the backlog of data into the computer, produced a preliminary analysis of some of the data so far collected, produced a paper showing these preliminary results, and presented these papers in a seminar on 31 March 1984.

Dr. von Fleckenstein also assisted in the training of interviewers for the South Sulawesi PATANAS, helped edit research papers written in English by MORIF staff members, helped staff members prepare for the ALIGU test, and attended Saturday Seminars at MORIF. He was away for a week of medical treatment in

Singapore in late January, also spending a few days in Bogor to assist in the preparation of plans for microcomputer and other training.

Dr. Igmidio T. Corpuz, Soil Scientist.

When Dr. Corpuz was still in the Philippines during the early part of January he briefed Dr. Bonifacio C. Felizardo, a possible new consultant on Farming System Research in the Transmigration areas in Southeast Sulawesi on the general agro-climatic conditions in Southeast Sulawesi, the major soil problems in the area, on the results of field fertilizer experiments conducted at Puriala and Onembute areas, and on the Cropping System which was demonstrated in the area to be stable and viable.

He continued assisting his counterparts in setting up field fertilizer experiments, in the generation of experimental data and in the preparation of research reports.

He briefed Dr. Cezar P. Mamaril, IRRI INSFFER Program Coordinator on the progress of the INSFFER Trials conducted at the Maros Research Institute for Food Crops.

Dr. Corpuz had travelled with his counterparts and assisted in selecting and characterizing experimental sites.

He assumed the responsibility of administering the business affairs of the RMI-MORIF office when Dr. Fritz von Fleckenstein left for Singapore for medical treatment.

He underwent medical treatment in Singapore from February 24, to March 31, 1984. He was treated for liver inflammation, typhoid and operated on for gall bladder.

Dr. Corpuz reported back to his work on April 2, 1984.

Dr. Rizvi

1. Assisted his counterpart (Ir. Samuel Pakan) in writing, preparing necessary slides and jointly presenting, during Saturday Seminar Series at MORIF on 24th of March 1984, two research papers on peanut mottle virus (PMV) and rice tungro virus (RTV) experiments.
2. Assisted Ir. Syaharuddin in translating from Bahasa Indonesia with the help of Mr. Nurdin Salam, and re-writing certain parts of a research paper in English on the use of fungicides to control sheath blight disease of rice. The paper has been submitted for publication in the new Indonesian Journal of Crop Science.
3. Provided necessary training and assistance to his counterparts regarding the isolation of pathogenic bacteria, fungi and their identification from the diseased samples of the following crops. Certain virus diseases, insect pests and parasitic plants were also identified. Control measures were suggested.
  - a) Potato (Solanum tuberosum): Five fungi, one bacterium, two viruses and five insect pests.
  - b) Sweet Potato (Ipomoea batatas): Two fungi.
  - c) Cassava (Manihot esculenta): Two fungi.
  - d) Taro (Colocasia esculenta): One fungus.
  - e) Pepper (Capsicum spp): One fungus.
  - f) Peanut (Arachis hypogaea): Four fungi and one virus.
  - g) Rice (Oryza sativa): One bacterium and six fungi.
  - h) Cabbage (Brassica oleracea): One fungus.
  - i) Parasitic plant-Dodder (Cuscuta spp).
4. Dr. Rizvi and two of his counterparts (Ir. Amran and Mr. Syahrir) conducted a survey of potato producing areas of South Sulawesi to determine the potato diseases and pests present in those areas. Dr. Rizvi presented the report of this survey to ISNAR's Review Committee on Horticultural Crops in Indonesia during a meeting organised by AARD and held in Ujung Pandang on February 08, 1984.

5. Participated in the 5th AARD/IRRI collaborative meetings in Padang from February 28 to March 03, 1984 and presented two reports, one a new rice blast screening technique and the other on RTV research activities being conducted at MORIF during 1983. Plans for the future collaboration between MORIF and IRRI including a workshop on tungro to be held in Indonesia during 1985 were also discussed.
6. Helped in the organisation and provided the necessary assistance to Ir. Amran Muis from MORIF in getting started a special 2-month training program to learn virological techniques and the purification of rice tungro virus at BORIF.
7. Presented a seminar entitled: "Potato diseases and pests in South Sulawesi" at the Lembang Horticultural Research Institute on March 08, 1984. Made arrangements for the introduction of new potato germplasm in South Sulawesi in an effort to increase the potato production and resistance against potato diseases and pests.
8. Visited Makariki sub-station of MORIF at the Seram island in Maluku Province, surveyed the diseases present in the experimental plots of cassava, corn, sweet potato and mungbean. Necessary control measures were suggested in order to obtain healthier plants.
9. Assisted Ir. Samuel Pakan in making all the necessary preparations to conduct the rice tungro virus nursery experiments at Lanrang for the second semester of 1983/84.
10. Assisted Ir. Amran Muis in the collection of leaves from the rice tungro virus (RTV) infected plants to take them to Bogor for the purification of tungro virus.
11. Rice plants infected with RTV were collected from three different locations in Sulawesi to determine the presence of different strains of RTV.
12. Participated in all of the Institute's Saturday Seminars, special meetings and other activities.
13. Continued assisting and encouraging the Pathology staff members to improve their English language proficiency.
14. On Dr. Rizvi's suggestion, a program of monthly meetings has been started to review and discuss the progress made in the departmental experiments during each month by the staff members of the Plant Pathology and to recommend ways to overcome if there were any difficulties.

15. Several official trips (summary follows) were made to the various sub-stations and experimental farms of MORIF, other Indonesian Research Institutes and farmer's fields to help improve or develop the phytopathological work.

Official Travel made during the months of January - March 1984

<u>Date (Duration)</u>	<u>Place/Purpose:</u>
1. Jan. 6-9, 1984	<u>Amboq (Makariki, Masohi)</u> Site orientation and an as cassava and other crops diseases at MORIF's sub-station Makariki.
2. Jan. 14, 1984	<u>Bontobili</u> To monitor cassava and peanut diseases.
3. Jan. 16, 1984	<u>Lanrang</u> To plant rice nursery and inoculate RTV.
4. Jan. 21, 1984	<u>Bantaeng/Desa Loka</u> Monitoring and to collect data on potato and cabbage diseases.
5. Jan. 26-27, 1984	<u>Enrekang/Desa Baroko</u> Monitoring and to collect data on potato and cabbage diseases.
6. Feb. 11, 1984	<u>Lanrang/Sidrap/Pinrang and surroundings.</u> To collect rice tungro virus (RTV) infected plants from several locations.
7. Feb. 28 - March 3, 1984	<u>Padang</u> To attend IRRI-AARD collaborative meetings and to present reports on Tungro and Blast work.
8. March 3-11, 1984	<u>Bogor</u> To arrange the training of Amran Muis in virological techniques for RTV at BORIF
9. March 7-8, 1984	<u>Lembang</u> Seminar on "Diseases and Pests of Potato in South Sulawesi" Transfer of potato germplasm from Lembang to MORIF
10. March 31, 1984	<u>Lanrang</u> To collect data and prepare slides on rice Tungro Nursery Experiment

## QUARTERLY ACTIVITY REPORT: JAN - MAR 1984

Dr. Fritz von Fleckenstein, Agricultural Economist, MORIF

### I. Accomplishment

#### A. Field work training

During this quarter I continued to work closely with Ir. Hadijah Dahlan in the intensive survey of labour utilization and material inputs and outputs on five farms in Desa Baju Bodoa near MORIF. Ir. Hadijah showed increasing skill in organizing the work, coding the data and putting them into the computer.

An important aspect of the Baju Bodoa study is to compare the accuracy of various methods of data collection. In order to compare one to three week recall with record keeping, we conducted a series of lengthy interviews during the period, February 11 to February 22. We asked our record-keeping farmers to recall what they had done since our last visit. We then compared this with their records for the same period. The results of this comparison were presented in a seminar at MORIF on March 31 in the paper entitled "Measurement of labour inputs: A Comparison of Daily Record-Keeping and Longer Recall". It is hoped that this will be the first in a series of papers produced at MORIF on problems of methodology in farm studies.

For this seminar on March 31, Ir. Hadijah and I were also asked to provide some information on inputs and outputs for the farms we had been studying in Baju Bodoa. This was a difficult task. For one thing, the data collected from June through October, when the computer was not yet available, had not yet been entered into the computer. For another, the FARMAP

Programme for data analysis was not yet available. We finally decided to provide information on material inputs and outputs for dry-season crops and animal husbandry for our three most economically active farmers. Because our time was limited, we used the dBASE II report form to produce simple totals and subtotals and then used a word processor to edit these into usable tables. We were pleased with the convenience of this procedure, but felt that a bit of work on a dBASE II command file for input/output display could result in even more interesting and attractive tables. While I worked at "number crunching", Ir. Hadijah wrote up the anecdotal material about the farmers' activities and experience. I then helped her edit this into the attached paper, "Preliminary Results of a Record-Keeping Study: Some Rough Data".

The seminar was well-received, although Ir. Hadijah became ill and I had to make the presentation alone. The presentation aroused the interest of some of the staff in the use of FARMAP-type coding forms and the use of dBASE II for data storage and retrieval. Ir. Hadijah and I found the exercise useful to point up changes needed in further phases of the study and interesting questions that needed exploring.

#### B. Other training activities

On February 22 and 23, the PATANAS team for South Sulawesi was training enumerators. Along with some of the MORIF staff members, I participated in these training sessions.

During the quarter I provided editorial assistance on papers written in English to several MORIF staff members, including Ir.

Christine Momuat, Ir. Lukman Gunarto, M.Sc., and Drs. Yusuf Ma'amun, M.Sc. I also helped a number of MORIF staff members with problems of English grammar when they were preparing for the ALIGU Test.

I attended several of the Saturday Seminars at MORIF this quarter, and I was quite impressed by the improvement in quality since my arrival here. Individuals are now presenting their own research instead of having the department chairman do it. The discussions are lively, and the visual aids have improved markedly.

### C. Travel

Jan. 19-23 and Feb. 5-10 Bogor. Trip report enclosed.

Jan. 24-Feb. 4 Singapore. Medical treatment. I am happy to say that this treatment was successful and I am now feeling fit and energetic.

Feb. 24 Went to Jakarta to assist with the medical evacuation of Dr. Corpuz.

### II. Plans

I have agreed with Ir. Hadijah and Drs. Yusuf that the data collection in Baju Bodoa will continue through the end of June. By that time we will have a year's data on most of the farmers for economic analysis, and we will also have more information for methodological analysis. As various members of the economics department have free time, they will be encouraged to participate in order to get experience using this type of data collection.

Some members of the economics department would like to use the FARMAP coding scheme to re-analyze data already collected. This seems like an excellent plan, and we hope to implement it in

the next two months.

We are still awaiting the arrival of the computers for MORIF. When they arrive I will have a lot of work, checking them and training people to use them. We are also still awaiting the arrival of a FARMAP program that can be used on the new MORIF computers.

I hope to have time to visit many of the field sites of members of the economics department, possibly in June or July. In the past I was prevented from doing so by my poor health.

I plan to take recreational leave from May 15 to June 15.

## Trip Report: Bogor, January 19-23 and February 5-10, 1984

Fritz von Fleckenstein

The period from January 19 to 23 was spent testing various pieces of computer software on an IBM PC like those which are being acquired for AARD. The program Lotus 1-2-3 successfully combines the attributes of a spreadsheet program, such as Supercalc, with those of a database management system. This makes it a very powerful tool for applications such as accounting, inventory control and personnel. Wordstar works very well on the IBM PC, and the IBM function keys make it very easy to use. dBASE II, which we have been using for many applications at MORIF on my Basis 108, also works very well on the IBM PC. This will allow us to transfer our data and command files to the new computers very quickly.

The period from February 5 to 10 was spent writing plans for future training activities of the Applied Agricultural Research Project, including the following:

1. Guidelines for Microcomputer Use and Training
2. Outline for Workshop in Agroecosystems Research for Dryland Dry Climate Areas.
3. Outline for Workshop in Rice Tungro Virus Research (based on information provided by Dr. Anwar Rizvi)

These documents form part of Appendix I of the Proposal for Extending the Applied Agricultural Research Project produced by the AARP on 10 February 1984.

Quarterly Report of Activities for the months  
of January to March, 1984

IGMIDIO T. CORPUZ

Activities:

1. Discussed with Dr. Bonifacio C. Felizardo who was finally considered to assume the long term consultant position on Farming System Research in the Transmigration Areas in Southeast Sulawesi, another RMI Project.

Dr. Felizardo was briefed on the general Agro-Climatic conditions in Southeast Sulawesi, the major soil problems in the area and on the results of field fertilizer experiments conducted at Puriala and Onembute areas. He was also briefed on the Cropping System which was demonstrated in the area to be stable and viable.

Dr. Felizardo expressed his intention of visiting Maros Research Institute for Food Crops sometimes in March, 1984 for further orientation on other possible problems in the transmigration areas including socio-economics.

2. Assisted in setting up the following field fertilizer experiments at Maros Experimental Farm.
  - a) Long Term Soil Fertility Trial (INSFFER)
  - b) Residual Effect of Azolla Application on Wetland Rice.
  - c. Residual Effect of Organic and inorganic Fertilizers on wetland rice.
3. Discussed with Ir. Lukman Gunarto, MS the results of his pot liming experiment. The pH of the soil without any treatment (control) decrease in pH at the average of 0.5 pH unit, from pH 5.4 to 4.9. Although there was no statistical analysis made on the data a decrease of 0.5 pH unit is considered already significant not in statistical terms but as it affects nutrient availability.

Since it was under pot condition there was no possibility of the bases to be leached out. There could however be faster mineralization of the organic matter contributing to the the formation of organic acids because of higher temperature.

4. Discussed with Mr. Arbi Mappé, Assistant to the Manager of the Maros Experimental Farm the importance of maintaining uniform plant population in the experimental plots. This discussion came about of the present conditions in some of the experiments of the Department of Soil and Soil Fertility. There were many missing hills in all of the plots. These missing hills were definitely not due to the treatments being tested. They are mainly due to in proper transplanting.

To fill up the missing hills mainly in the harvestable area of the plots, the plants from the border rows of the same plot were used. In many plots almost all the plants from the border rows were transferred to fill up the missing hills.

5. Discussed with Mr. Hatibu, SPMA, field technician assigned at Sinjai on a very important steps in the proper management of the experimental plots in the area. This is the need to construct drainage canals between replication and between treatments to prevent surface runoff from flowing a cross treatments. There were definite indications of the occurrence of soil erosion. These are the presence of rills or small channels criss-crossing the experimental plots.
6. Assisted Ir. Agustina Buntan in selecting and characterizing the site for her fertilizer experiment upland rice in high elevation area. A more detailed discussion is presented in the Trip Report to Malino (Appendix C).

7. Discussed with Ir. Christine J.S. Momuat the plans to make site characterization including soil profile description of some of the areas where soils for her previous experiments were collected. These additional data are necessary in writing up the results for publication.
8. Attended and participated in the regular Saturday Seminar except from the time I left to Singapore for medical treatment.
9. Travels made:
  - a) On January 18 to Sidrap and Bone with Ir. Saleh Pandang, Head Agronomy/Physiology Department to assist evaluate and take observations on lam-toro gung trials. (Appendix A, Trip Report).
  - b) On January 19 and 20 to Sinjai and Bone with Ir. A.M.P Dg Mattiro to assist evaluate and take observations on fertilizer experiments on sweet potato and cassava (Appendix B, Trip Report)
  - c) On January 25 to Malino with Ir. Agustina Buntan to assist select and characterize site for upland rice fertilizer experiment on high elevation area (Appendix C, Trip Report).
  - d) On January 30 to Malino with Ir. Agustina Buntan and Mr. Haruna to assist in setting up upland rice fertilizer experiments (Appendix D, Trip Report).
  - e) On February 1 to 3 to Bone-Bone with L. Singgih, A and Ir. Reginald le Cerff to gather data from on-going experiments and to evaluate soil problems in a farmer's farm. (Appendix E, Trip Report)
  - f) On February 11 to Lanrang with Dr. Cezar P. Namaril, IRRI, INSFFER Coordinator, Ir. Lukman Gunarto MS, Ir. Singgih A, MS, and Ir. Agustina Buntan to observe and gather data from on-going INSFFER trials (Appendix F, Trip Report).

10. Assumed the administrative responsibility of the RMI-MORIF business matters after the departure of Dr. Fritz von Fleckenstein to Singapore for medical treatment. A drastic change in running the business was adapted. Mr. Nurdin Salam, Administrative Assistant (full time) was given responsibility for all the routine business matters. This was possible by reverting back to the classical way rather than using the computer. The use of the computer was not necessary since the volume of business under the RMI-MORIF Program is very small with only Rp.3,000,000,-- to account for and with only eight people.

II. Problems and Solutions:

There were no problems encountered during the quarter related to my official work.

III. Had medical treatment in Singapore from February 24 to March 31, 1984 for liver inflammation, typhoid and operated on for gallbladder.

IV. Plans for next quarter:

1. Will assist in writing up the results of experiments for publication.
2. Will assist in preparing the research program of the department.
3. Will assist in the generation of experimental data on the ongoing experiments.
4. Will assist in the site characterization including soil profile description of the areas where soils for previous pot experiments were collected.

Dr. Igmidio T. Corpuz  
Soil Scientist/Agronomist  
MORIF.

Trip Report

Igmidio T. Corpuz/Soil and Soil Fertility

When : January 18, 1984  
Where : Sidrap and Bone  
With : Ir. Saleh Pandang, Head Agronomy/Physiology Department  
Why : To assist in evaluating and in taking observations on the lamtoro gung trials.

Observations:

1) At Sidrap.

The trial was designed to use lamtoro gung as green manure for palawija crops in a stony area very low inorganic matter content.

The lamtoro gung were planted in rows two meters apart. Corn was planted between the rows of lamtoro. The lamtoro plants were already cut to a height of about one meter. The cut portions were supposed to be spread over the area planted to corn. They were however laid along the rows of lamtoro. They were not used for the purpose for which the lamtoro was planted. There was a serious miscommunication. Apparently the instruction was not properly understood. The results on the growth of the corn plants were very poor. They did not receive the benefits of using green manure from lamtoro leaves.

2) At Bone.

The trial at Bone was designed to help minimize soil erosion. It was established in an area with a slope of about 38%. The lamtoro gung were planted on the contour with the aid of an "A-frame" at a horizontal distance of two meters apart. For soil erosion control measures the lamtoro should be closely planted. The results however was not as expected. There were only few trees growing in each row. Other materials were used as substitute.

Trip Report

Igmidio T. Corpuz/Soil and Soil Fertility

When : January 19 to 20, 1984  
Where : Sinjai and Bone  
With : Ir. A.M.P Dg. Mattiro  
Why : To assist in evaluating and in taking observations on the  
fertilizer experiments on cassava and sweet potato.

Observations

Cassava experiments - As of January 19, 1984 the plants were 43 days old. From the growth and stand of the plants there was visible difference due to treatment. The no phosphorus treatments in all the three replications were consistently shorter than the treatments with phosphorus. The height of five plants from each plot were measured.

Sweet potato experiments - As of January 19, 1984 the plants were 42 days old. There was indication of potassium response in terms of the general growth of the plants. There were more growing stems in the potassium fertilized plants compared with the control and no potassium application. The number of growing stems in 5 plants per plot were counted.

Trip Report

Igmidio T. Corpuz/Soil and Soil Fertility

When : January 25, 1984 (0900 hr) - (1800hr)  
Where : Malino (Kab. Gowa)  
With : Ir. Agustina Buntan  
Why : To assist in selecting and describing site for upland rice  
fertilizer experiment on area of high elevation.

Observations:

Initially a basic question had to be answered. This is the transferability of the technology of growing upland rice in high elevation areas. It is a general practice of the farmers in the high elevation areas to grow vegetables especially green onions and cabbage and markisa. No farmer had ever tried planting upland rice.

In 1982 we had opportunity of working with a progressive farmer who is willing to try new technologies. In his farm variety trial on oats was set-up. The results however were not encouraging. There was no transfer of technology.

He was contacted for the second time whether he is interested to cooperate again on upland rice fertilizer trial. Without further discussion he brought us to his farm. He had actually tried planting upland rice. The problem was there. The rice plants were poorly looking and this we believed was because of soil problem. A decision was made that an upland rice fertilizer trial (minus one test) will be set up in his farm.

Trip Report

Igmidio T. Corpuz/Soil and Soil Fertility

When : January 30, 1984 (0800 hr) - (2330 hr)

Where : Malino (Kab. Gowa)

With : Ir. Agustina Buntan and Mr. Haruna

Why : To assist in setting up upland rice fertilizer trial.

Observations:

The farmer had already prepared the field. It was previously arranged during the first visit (Jan 25) that the trial will be set-up on Jan 30. Additional area had to be prepared because what he had already prepared is not sufficient. The experiment was finally established.

The variety that was used showed good performance at high elevation (1,100 meters above sea level) under wetland condition. Using this variety under dryland condition is not really critical. It had been very well demonstrated that wetland rice variety can give a comparable yield under dryland condition as long as there is no drought (moisture stress).

Trip Report

Igmidio T. Corpuz/Soil and Soil Fertility.

When : February 1 to 3, 1984

Where : Sengkang and Bone-Bone

With : Ir. Singgih A, MS and Ir. Reginald le Gerff.

Why : To evaluate the soil problem in a farmer's farm and to gather data from on-going experiments.

Observations:

1) At Sengkang - Soil problems in farmer's farm.

The soil problem in the farm is more related to soil erosion. The farm is rolling which was originally under grassland vegetation. It is now being cultivated for food crops like corn, sesame, peanut, soybean, cassava and sweet potato. Soil conservation practices are not being employed. Most of the crops were planted in rows along the slope.

Ways and methods to conserve the soil were discussed. These are contouring (this was demonstrated) terracing and construction of diversion canals.

We suggested that he brings back the original grass vegetation using possibly improved grass species and pasture legumes and then raised animals like cows or goats.

2. At Talongsari, Bone-Bone.

The experiments on corn and soybean showed definite response to phosphorus. The other variable in the experiment is on the sources of nitrogen (urea and ammonium sulfate). There was no distinct visual difference between the urea and ammonium sulfate fertilized corn plants. Two tentative conclusions could be drawn: (a) urea and ammonium sulfate are equally effective sources of nitrogen for corn (b) there is no sulfur problem in the area.

It is true the experiment was not set-up to evaluate the sulfur status of the soil. However, the second conclusion is valid.

Where sulfur is deficient definitely the ammonium sulfate treated plants showed perform better than the urea treated plants, in which case it is not valid to conclude that ammonium sulfate is a better source of nitrogen than urea. If sulfur is a problem in the area the experiment would have a serious short coming. In other words it is not valid to compare urea and ammonium sulfate as designed. To correct the serious short coming one treatment should be included in the experiment. This is a treatment on urea plus elemental sulfur. The amount of elemental sulfur to use is based on the amount of ammonium sulfate used to meet a given nitrogen rate.

Trip Report

Igmidio T. Corpuz/Soil and Soil Fertility

When : February 11, 1984  
Where : Lanrang sub-station  
With : Dr. Cezar P. Mamaril (IRRI INSFFER Program Coordinator),  
Ir. Lukman Gunarto MS, Ir. Singgih A, MS and Ir. Agustina Buntan.  
Why : To observe and generate data from on-going INSFFER Trials.

Observations:

The on-going experiments (N-Fertilizer Efficiency and Long Term Fertilizer Trials) were again destroyed by rats. The damage was apparently made during the vegetative stage. The panicles were maturing unevenly. The panicles with immature grains are from second generation tillers while the panicles with mature grains are from the first generation tillers. The pattern is very distinct. The panicles with immature grains are concentrated in the middle portion of the plots while the panicles with mature grains are found in the border portion of the plots. It is hard to understand why rats prefer to attack the plots, leaving the plants in the border area of the plots.

Because of this problem the question of what to do with the experiment was raised. The comment of Dr. Mamaril was it is not possible to obtain yield data which will reflect the effect of treatments. These was the opportunity to demonstrated how to save experiments partially damaged. This is by following what I called selective harvesting. Harvest only the hills that are damage-free. To avoid confusion a definite number of the damage-free hills should be harvested from each plot. The number of hills harvested per plot times the distance of planting will be equal to the harvestable area. For example, 25 damage-free hills are harvested and the distance of planting is 20cm x 20cm. Then harvestable area (sq.m) =  $25 \times (.20 \text{ m} \times .20 \text{ m})$ , =  $25 \times 0.04 = 1.00 \text{ sq.m}$

QUARTERLY ACTIVITY REPORT  
JANUARY - MARCH 1984

BY

DR. SYED ANWAR RIZVI  
PLANT PATHOLOGIST/VIROLOGIST

MAROS RESEARCH INSTITUTE  
FOR FOOD CROPS (MORIF)

APRIL 1984

Appendix II.C  
Quarterly Activity Report  
January - March 1984

by

Dr. Syed Anwar Rizvi - Plant Pathologist (MORIF)

1. Past Activities and Accomplishments:

1.1. Training of Personnel:

1.1.1. Demonstrated the procedures to all of the Pathology staff members including Ir. Burhanuddin from Makariki sub-station of MORIF, who was visiting Maros at that time, on how to prepare in the laboratory the samples of diseased leaf tissue to isolate on media and later identifying pathogens causing diseases in food and horticultural crops using microscope.

1.1.2. Assisted Ir. Burhanuddin in the on site identification of diseases of sweet potato, cassava, corn and mungbean present in the experimental plots of Makariki sub-station on the island of Seram. Diseased samples were brought to Maros for isolation and identification of causal organisms. Necessary control measures were suggested.

1.1.3. Assisted the staff of the Bontobili experimental station of MORIF and 2 counterparts from Maros (Ir. Samuel Pakan and Ir. Yulis) in the identification of the soil-borne diseases of peanut and the air-borne diseases of cassava present at the station. I explained the symptoms of diseases and suggested necessary control measures. Later the same day, a farmer's orchard in Desa Lana was visited to recommend him various methods including use of proper fungicides and insecticides to control diseases and pests of pappaya and mango present there.

1.1.4. Provided the on site training and assistance to Ir. Amran

(cont.....p.2)

and Mr. Syahrir - two of my counterparts from the Pathology Department - to conduct a survey for the assessment of disease incidence, yield losses, and identification of potato and cabbage diseases and pests present in the two major vegetable producing areas of South Sulawesi namely:

- a) Bantaeng (Desa - Loka)
- b) Enrekang (Desa - Baroko)

The chemical control measures and proper cultural practices to control diseases and pests were suggested to the farmers at both the locations in order to increase their yield production and income by producing healthier plants.

1.1.5. Provided necessary assistance and training to my counterparts in the isolation and identification of pathogenic fungi and bacteria from the diseased samples of the following crops. Certain virus diseases, insect pests and a parasitic plant were also identified:

A) POTATO (Solanum tuberosum)

I. Fungal Diseases:

- i) Potato late blight-(Phytophthora infestans)
- ii) Potato early blight-(Alternaria solani)
- iii) Fusarium dry rot or wilt-(Fusarium spp.)
- iv) Black Scurf or stem canker-(Rhizoctonia solani)
- v) Pink rot-(Phytophthora erythroseptica)

II. Bacterial Diseases:

- i) Bacterial wilt or brown rot-(Pseudomonas solanacearum)

III. Virus Diseases:

- i) Potato virus Y-(PVY)
- ii) Mosaic viruses

IV. Insect Pests:

- i) Potato tuber moth,
- ii) Aphids,
- iii) Mites,
- iv) Mealybugs and
- v) Leaf feeding beetles (Epilachna spp.)

R) SWEET POTATO (Ipomoea batatas):

I. Fungal diseases:

- i) Leaf spot-(Epicoccum spp.)
- ii) Wilt/Stem rot-(Fusarium oxysporium f. batatas)

C) CASSAVA (Manihot esculenta)

I. Fungal diseases:

- i) Brown leaf spot-(Cercosporidium henningsii)
- ii) Cercospora leaf blight-(Cercospora viscosae)

D) TARO/DASHEEN/COCOYAM (Colocasia esculenta)

I. Fungal disease:

- i) Leaf Blight-(Phytophthora colocasiae)

E) RED PEPPER (Capsicum spp.)

I. Fungal disease:

- i) Fruit rot-(Colletotrichum capsici)

F) PEANUT (Arachis hypogaea)

I. Fungal diseases:

- i) Early leaf spot-(Cercospora arachidicola/  
Mycosphaerella arachidicola.
- ii) Leaf spot-(Cercospora personata/Mycosphaerella  
berkeleyi)
- iii) Crown Rot-(Aspergillus niger)
- iv) Stem rot-(Sclerotium rolfsii/Corticium rolfsii)

II. Virus disease:

- i) Peanut mottle virus-(PMV)

G) RICE (Oryza sativa):

I. Fungal diseases:

- i) Blast-(Pyricularia oryzae)  
ii) Sheath blight-(Rhizoctonia solani)  
iii) False smut-(Ustilaginoidea virens)  
iv) Brown leaf spot-(Helminthosporium oryzae/  
Cochliobolus miyabeanus)  
v) Narrow brown leaf spot-(Cercospora oryzae)  
vi) Leaf scald-(Rhynchosporium oryzae)

II. Bacterial disease:

- i) Bacterial leaf streak-(Xanthomonas  
translucans f.sp oryzicola)

H) CABBAGE (Brassica oleracea)

I. Fungal disease:

- i) White leaf spot-(Cercospora brassica)

I) CORN (Zea mays)

Fungal diseases:

- i) Smut (Ustilago maydis)  
ii) Rust (Puccinia spp.)

J) PARASITIC PLANT

- i) Dodder (Cuscuta spp.)

1.1.6. Staff Training at BORIF: Organised and assisted in a special 6-week training program for Ir. Amran Muis (staff member of the Pathology Department at MORIF) in Bogor at the Virology laboratory of the Plant Pathology and Entomology Department of BORIF to learn various virological techniques used in the

purification and identification of plant viruses. Ir. Amran will learn the use of many laboratory equipment such as different types of centrifuges, incubators, sucrose density gradient equipment, Spectrophotometer, preparing of samples (grids) for electron microscope (EM), operations of EM and SEM etc. Rice tungro virus has been successfully purified using one of the three available purification methods with certain modifications. Ir. Amran will also test the other two methods of RTV purification. Tungro infected leaves used for the purification were collected from the naturally infected rice fields at 2 locations in South Sulawesi.

1.1.7. Research Paper for Publication: Assisted Ir. Syharuddin in the selection, translation and writing up one out of many of his research papers from Bahasa Indonesia into English. The paper is entitled, "Efficacy of fungicides in controlling rice sheath blight (Rhizoctonia solani Kuhn)" and has been submitted for its publication in the first issue of a new English language Indonesian Scientific Journal i.e. Indonesian Journal of Crop Science.

1.1.8. Research Papers and Weekly Seminar: Participated with Ir. Samuel Pakan at all the stages in conducting and the completion of two experiments on peanut and rice viruses including the designs of the experiments, data collection, slides preparation, writing up of research papers and their presentation during the Saturday Seminar at MORIF on March 24, 1984. The titles of these papers written in Bahasa Indonesia were as follows:

1.1.8.1. Evaluasi Ketahanan Varietas/Galur Padi Terhadap Penyakit Tungro (RTV).

1.1.8.2. Evaluasi Ketahanan Varietas/Galur Kacang Tanah Terhadap Penyebab Penyakit Belang (PMV).

1.1.9. Rice Tungro Virus Nursery Experiment: Reviewed and discussed with Ir. Pakan (Maros) and Ir. Koesnang (Laurang) about our plans to conduct the rice tungro virus (RTV) nursery experiment at Laurang during the second semester of 1983/84. Assisted and explained the procedures to Ir. Pakan for the preparation of RTV infected TNI seedlings to be used as the source of RTV infection in this experiment. Also provided the necessary help in the data collection and made slides at different stages of the experiment.

1.2. Participation in Meetings, Preparation of Reports and Presentation of Seminars.

1.2.1. Meetings and Reports: Participated in the 5th AARD/IRRI collaborative meetings held at Padang, West Sumatera from February 28 to March 03, 1984 and presented two reports, one on a new rice blast screening technique and the other on RTV research activities being conducted at MORIF during 1983. Plans for the future collaboration between MORIF and IRRI including a workshop on tungro to be held in Indonesia during 1985 were also discussed.

1.2.2. Report: After surveying two major vegetable producing areas in South Sulawesi, a report on potato and cabbage diseases present at those locations was prepared. Dr. Rizvi presented this report to ISNAR's Review Committee on Horticultural Crops in Indonesia during a meeting organised by AARD and held at the KANWIL office in Ujung Pandang on February 08, 1984.

1.2.3. Seminar: Presented a seminar entitled: "Potato diseases and pests in South Sulawesi" at the Lembang Horticultural

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Research Institute on March 08, 1984. Made arrangements for the introduction of new potato germplasm in South Sulawesi in an effort to increase the potato production and resistance against potato diseases and pests.

(Appendix: II.C - A).

1.3. Miscellaneous Activities:

1.3.1. Preservation of diseased tissue: Assisted in the preparation of a preservative solution to preserve diseased samples of stems, leaves etc. in display bottles for laboratory use with the special emphasis to select samples with most typical disease symptoms. A handout was prepared with materials and method required to prepare the solution for general distribution to the interested counterparts at Maros or from other Agricultural Organizations i.e. Agricultural Extension and Plant Protection Department.

1.3.2. Rice Tungro Virus Strains: A new research project was initiated to determine the presence of different strains of Tungro in Sulawesi. Rice plants naturally infected with RTV were collected from three different locations in Sulawesi. These tungro cultures have been transferred and being maintained in the young seedlings of cv. TNI in the greenhouse for strain evaluation. Contacts have been made with IRRI to acquire the seed of two differential rice cultivars (FK135 and Achech) essential for Tungro's strain identification studies.

1.3.3. Greenhouse evaluation of IRRI's IRTN 1983: Work continued in the Maros greenhouse to evaluate 196 lines of IRRI's IRTN 1983 for their resistance to RTV using plastic cages to inoculate each test line individually with RTV carrying green leafhoppers. Evaluations were carried out in small groups of 25 test lines at a time. Data has been collected on the reaction of most of the test lines to RTV inocula-

(cont.....p.8)

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tions and the experiment is near completion.

- 1.3.4. Review of Departmental Research Projects: Assisted Ir. Hasanuddin, Head of the Pathology Department at MORIF, in organising a general staff meeting to review the situation of all the research projects undertaken by the Department since 1981 and to develop the strategies to initiate and complete all these research projects on which no work has been started so far i.e. 5 projects from 1981/1982 and 5 projects from 1982/1983. Detailed plans and procedures were discussed and the incomplete research projects were assigned to the appropriate staff members for completing these projects on the top priority basis.
- 1.3.5. Seed-borne fungi of Peanut: Assisted Ir. Syharuddin in the isolation and identification of seed-borne fungi from peanut seeds. A laboratory experiment was designed to test the efficacy of 5 fungicides in controlling the seed-borne fungi of peanut by treating (dressing) seed with the tested fungicides. Necessary observations were taken and slides were made to prepare a report and seminar on the experiment.
- 1.3.6. Diseased Leaf Samples of Taro from Irian Jaya: Dr. Farid Bahar, Director of MORIF brought diseased leaf samples of Taro plant from Irian Jaya. A fungal Pathogen causing Taro leaf blight was isolated and identified as Phytophthora colocasiae. A memorandum was prepared explaining the disease symptoms and various methods to control the Taro leaf blight were also recommended (Appendix II.C.B).
- 1.3.7. Monthly Meeting: On Dr. Rizvi's suggestion, a program of monthly meetings has been started to review and discuss the progress made in the departmental experiments during each month by the staff members of the Plant Pathology and to recommend ways to overcome if there were any difficulties.

(cont.....p.9)

1.3.8. Plant Disease Monitoring: Several official trips with various counterparts were made to the various sub-stations and experimental farms of MORIF, other Indonesian Research Institutes and farmer's fields to help improve or develop the phytopathological work, to assist my counterparts in evaluating on-going experiments, and to familiarize the counterparts on several disease problems affecting the food and horticultural crops.

1.3.9. English Language Training: Continued assisting and encouraging the Pathology staff members to improve their English language proficiency.

1.3.10. MORIF Activities: Participated in all of the Institute's Saturday Seminars, special meetings and other daily activities at MORIF.

1.4. Travel Activities: The following official trips were made during this quarter:

<u>Date (Duration):</u>	<u>Place/Purpose:</u>
<u>1.4.1.</u> January 6-9, 1984 (Appendix: II.C - C)	<u>Ambon (Makariki, Masohi)</u> Site orientation and an assesment of cassava and other crops diseases at Makariki sub-station of MORIF.
<u>1.4.2.</u> January 14, 1984 (Appendix: II.C - D)	<u>Bontobili</u> To monitor cassava and peanut diseases.
<u>1.4.3.</u> January 16, 1984 (Appendix: II.C - E)	<u>Lanrang</u> To plant rice tungro nursery experiment and inoculate TN1 seedlings with RTV.
<u>1.4.4.</u> January 21, 1984 (Appendix: II.C - F)	<u>Bantaeng/Desa Loka</u> Monitoring and to collect data on potato and cabbage diseases.

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| <p><u>1.4.5.</u> January 26-27, 1984<br/>(Appendix: II.C - G)</p>          | <p><u>Enrekang/Desa Baroko</u><br/>Monitoring and to collect data on potato and cabbage diseases.</p>  |
| <p><u>1.4.6.</u> February 11, 1984<br/>(Appendix: II.C - H)</p>            | <p><u>Lanrang/Sidrap/Pinrang and surroundings.</u><br/>To collect rice tungro virus (RTV) infected plants from several locations for the identification of tungro strains.</p> |
| <p><u>1.4.7.</u> February 28 - March 3, 1984.<br/>(Appendix: II.C - I)</p> | <p><u>Padang/SURIF/Sitiung</u><br/>To attend IRRI-AARD collaborative meetings and to present reports on Tungro and Blast work being conducted at MORIF during 1983.</p>        |
| <p><u>1.4.8.</u> March 3-11, 1984<br/>(Appendix: II.C - J)</p>             | <p><u>Bogor</u><br/>To arrange the training of Amran Muis in virological techniques for RTV at BORIF.</p>  |
| <p><u>1.4.9.</u> March 7-8, 1984<br/>(Appendix: II.C - K)</p>              | <p><u>Lembang</u><br/>Seminar on "Diseases and Pests of Potato in South Sulawesi" and the transfer of potato germplasm from Lembang to MORIF.</p>                              |
| <p><u>1.4.10.</u> March 31, 1984<br/>(Appendix: II.C - L)</p>              | <p><u>Lantang</u><br/>To collect data and prepare slides on rice Tungro Nursery Experiment.</p>  |

2. Problems and Proposed Solutions:

No significant problems were encountered in this quarter.

3. Plans for the Following Quarter:

3.1. Provide assistance whenever and wherever it is needed by MORIF and

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its staff members.

- 3.2. Assist Ir. Amran to prepare the report on his training program at BORIF and to present it jointly during the Saturday Seminar Series at MORIF.
- 3.3. Continue assisting my counterparts in setting up their field, green or greenhouse and laboratory experiments, collection of experimental data, interpretation and writing up of reasearch results.
- 3.4. Continue the isolation and identification of pathogens causing diseases in food crops.
- 3.5. Assist and encourage the Pathology staff members to write research papers both in Bahasa Indonesia and English for seminars/conferences and publication in scientific journals.
- 3.6. Rice plants infected naturally with tungro virus will be collected from at least 2 more locations in Sulawesi to include in the experiment on tungro strains identification.
- 3.7. Take my R/R and annual leave starting June 05, 1984.

Dr. Syed Anwar Rizvi

Plant Pathologist/Virologist - MORIF.

January - March, 1984.

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M E M O

Appendix: II.C - B

To : Dr. Farid A. Bahar, Director of MORIF.  
From : S. Anwar Rizvi and Syaharuddin Rahamma,  
Plant Pathology Department, MORIF.  
Date : February 26, 1984.  
Subject : Diseased leaf samples of Taro (Colocasia esculenta)  
from Irian Jaya.

I. Burned leaf symptoms:

After a careful visual observation of the leaf symptoms and microscopic examination of the pathogen isolated from the infected leaf areas of Taro (C. esculenta) plant, we confirmed that the Taro leaf samples were infected with one of the most destructive diseases of Taro caused by the fungal pathogen: Phytophthora colocasiae. This disease is commonly known as Taro Leaf Blight. Diseased plants give rise to infected corms. Such corms will give rise to new diseased plants and result in the further spread of Leaf Blight.

Control:

1. Clean cultural practices:

Wide spacing of Taro plants minimises spread of the disease due to rain splashing. Wide spacing together with interplanting and open sides to the Taro field help improve the air flow and thus keep the humidity down. Farmers should avoid walking through the field when it is wet as this encourages the spread of spores. Where possible the Taro should be cultivated on higher land. Crop remains should be burnt after harvest.

In cases of mild infection of young plants (up to two or three months) leaf roguing can be effective in controlling or delaying the build-up of the disease. Rogued leaves should be burnt and care should be taken to avoid spreading spores from diseased leaves to healthy ones.

2. Use of resistant varieties if available:

Generally the search for Taro cultivars resistant to leaf blight has been unsuccessful. However, resistant cultivars are available in India.

(cont.....p.2)

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3. Chemical control:

Various fungicides have been evaluated for control of Taro leaf blight. Zineb and mancozeb have been shown to give effective control. The best control with mancozeb was obtained with sprays of 2.24 or 4.48 kg/ha at intervals of 5-7 days. Strict hygiene should be observed at planting and infected leaves should be removed twice a week for 80-90 days after planting, or until a dense canopy is formed. Great care should be taken to avoid spreading spores to healthy leaves. Furthermore, use of newer fungicides like Ridomil and Benlate can also provide very effective control against Taro late blight when used according to the instructions on the labels.

II. The leaves with interveinal chlorosis:

These symptoms resembled with the symptoms usually caused by virus diseases of plants but virus infection commonly accompanied with the deformation or abnormalities of the infected leaves. Taro leaves were normal looking. Our feeling is that these chlorotic symptoms were the result of some soil problem(s) accompanied by imbalanced supply of nutritional needs of the Taro plant. A good soil examination of Taro fields and studies on the nutritional requirements of Taro plants are recommended to control this situation.

Reference:

Anon. (1982). Pest control in Tropical Root Crops.  
PANS Manual 4: 177-185. COPR, London.

TRIP REPORT  
LAPORAN PERJALANAN

This report must be typed or filled out neatly in longhand for all trips (field trips, meetings, congresses, etc). If necessary, use additional sheet(s) to complete the report.

Laporan ini harus diketik atau ditulis tangan dengan rapi dan berlaku untuk semua laporan (perjalanan dinas, rapat, kongres dll.) Jika perlu, gunakan lembaran tambahan untuk melengkapi laporan ini.

Name: Dr. Syed Anwar Rizvi

Department: Plant Pathology

Nama

Kelompok

Date of Departure: January 06, 1984

Return: January 09, 1984

Tanggal berangkat

Tanggal kembali

Principal Locations Visited: Ambon (Agricultural Extension office) and Masohi - Makariki  
Tempat-tempat yang dikunjungi sub-station of MORIF).

Accompanied by: Ir. Shagir Sama

Pengikut

Purpose of trip: Site orientation and an assessment of cassava and other crops  
Maksud perjalanan diseases present at Makariki sub-station of MORIF.

Observations (factors requiring action, new items, etc.)

Hasil pengamatan (faktor-faktor yang memerlukan penanganan, hal-hal baru, dll.)

Based on the field symptoms in the hosts, diseases present in the sub-station's experimental plots of sweet potato, cassava, mungbean and corn were identified and the symptoms were explained to the staff members of the sub-station. Necessary control measures were also suggested. Samples from diseased plants were collected and brought to Maros for the purpose of isolation and identification of pathogens causing diseases in these crops.

\* Original: to Mr. Carl R. Fritz,  
Asli kepada RMI-JKT.

\* Copy: to Director MORIF and AARP personnel.  
Tembusan

TRIP REPORT  
LAPORAN PERJALAHAN

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Name : Dr. Syed Anwar Rizvi

Department : Plant Pathology

Nama

Kelompok

Date of Departure : January 14, 1984

Return: January 14, 1984

Tanggal berangkat

Tanggal kembali

Principal Locations Visited : Bontobili Experimental Farm of MORIF and Desa Lana ( a farmer's  
Tempat-tempat yang dikunjungi orchard)

Accompanied by : Ir. Samuel Pakan and Ir. Yulis Sayang.

Pengikut

Purpose of trip : To monitor cassava and peanut diseases (Bontobili) and to advise farmer

Maksud perjalanan on how to control the papaya and mango diseases present in his  
orchard situated in Desa Lana.

Observations (factors requiring action, new items, etc.)

Hasil pengamatan (faktor-faktor yang memerlukan penanganan, hal-hal baru, dll.)

- In Bontobili three soil-borne and air-borne fungal diseases and one virus disease of peanut; and two air-borne diseases of cassava were found.
- At Desa Lana, in farmer's orchard, in addition to leaf spot diseases on papaya and mango, we also found severe mite infestation on papaya trees causing serious damage to fruits.
- At both places, the necessary control measures were recommended to maintain the experimental plots and orchard in healthier condition.

\* Original: to Mr. Carl R. Fritz,  
Asli kepada RMI-JKT.

\* Copy: to Director MORIF and AARP personnel.  
Tembusan

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TRIP REPORT  
LAPORAN PERJALANAN

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Name : Dr. Syed Anwar Rizvi

Department: Plant Pathology

Nama

Kelompok

Date of Departure : January 16, 1984

Return: January 16, 1984

Tanggal berangkat

Tanggal kembali

Principal Locations Visited : Lanrang sub-station of MORIF

Tempat-tempat yang dikunjungi

Accompanied by: Ir. Samuel Pakan

Pengikut

Purpose of trip : To plant rice tungro nursery experiment and inoculate TNI seedlings

Maksud perjalanan with RTV.

Observations (factors requiring action, new items, etc.)

Hasil pengamatan (faktor-faktor yang memerlukan penanganan, hal-hal baru, dll.)

Rice breeding lines from Maros (886) and from IRR's IRTN 1983 (196) were planted to conduct rice tungro nursery experiment for the second semester of 1983/1984. Small plots of one week old and actively growing seedlings of cv. TNI which were covered with a nylon cloth screen cage or a large metal screen cage were inoculated by releasing, inside the cages, the rice tungro virus (RTV) carrying green leafhoppers (GLH). Later, the RTV-infected TNI plants were used as the source of tungro infection (as the infectors) in the rice tungro nursery experiment at Lanrang.

Original: to Mr. Carl R. Fritz,  
Asli kepada RMI-JKT.

\* Copy: to Director MORIF and AARP personnel.  
Tembusan

TRIP REPORT  
LAPORAN PERJALANAN

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Name: Dr. Syed Anwar Rizvi  
Nama

Department: Plant Pathology  
Kelompok

Date of Departure: January 21, 1984  
Tanggal berangkat

Return: January 21, 1984  
Tanggal kembali

Principal Locations Visited: Bantaeng/Desa Loka  
Tempat-tempat yang dikunjungi

Accompanied by: Ir. Amran Muis and Mr. Syahrir.  
Pengikut

Purpose of trip: Monitoring and to collect data on potato and cabbage diseases.  
Maksud perjalanan

Observations (factors requiring action, new items, etc.)  
Hasil pengamatan (faktor-faktor yang memerlukan penanganan, hal-hal baru, dll.)

Many diseases and insect pests of potato (Please, refer to Appendix II.C.A for details) and only one disease of cabbage i.e. WHITE LEAF SPOT caused by the fungus Cercospora brassica were present in the farmer's fields. Necessary control measures including the proper cultural practices, use of fungicides and insecticides were suggested to the farmers to improve the health (quality) and yield production (quantity) of their vegetable

\*Original: to  
Asli kepada Mr. Carl R. Fritz,  
RMI-JKT.

\*Copy: to  
Tembusan Director MORIF and AARP personnel.



TRIP REPORT  
LAPORAN PERJALANAN

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Name : Dr. Syed Anwar Rizvi

Department : Plant Pathology

Nama

Kelompok

Date of Departure : February 11, 1984

Return: February 11, 1984

Tanggal berangkat

Tanggal kembali

Principal Locations Visited : Lanrang/Sidrap/Pinrang and surroundings.

Tempat-tempat yang dikunjungi

Accompanied by: Ir. Amran Muis.

Pengikut

Purpose of trip : To collect rice tungro virus (RTV) infected plants from several locations for the identification of tungro strains.

Maksud perjalanan

lokasi untuk identifikasi tungro strain.

Observations (factors requiring action, new items, etc.)

Hasil pengamatan (faktor-faktor yang memerlukan penanganan, hal-hal baru, dll.)

Most of the farmers' fields in the areas visited were found free of tungro infection. A similar situation was observed at Lanrang sub-station. However, leaves from tungro infected rice plants and six whole plants were collected from the only one available infected field in the town of Baranti, district Sidrap. Leaves were taken to BORIF for tungro purification and plants were brought to Maros greenhouse to determine the strain of tungro virus present in these infected plants.

\*Original: to  
Asli kepada Mr. Carl R. Fritz,  
RMI-JKT.

\*Copy: to  
Tembusan Director MORIF and AARP personnel.

TRIP REPORT  
LAPORAN PERJALANAN

\* This report must be typed or filled out neatly in longhand for all trips (field trips, meetings, congresses, etc), not exceeding 100-150 words.

\* Laporan ini harus diketik atau ditulis tangan dengan rapi dan berlaku untuk semua laporan (perjalanan dinas, rapat, kongres dll.), tidak lebih dari 100-150 kata.

Name: Dr. Syed Anwar Rizvi

Nama

Department: Plant Pathology

Kelompok

Date of Departure : February 28, 1984

Tanggal berangkat

Return: March 3, 1984

Tanggal kembali

Principal Locations Visited : Padang, Sukarami Research Institute for Food Crops (SURIF).  
Tempat-tempat yang dikunjungi

Accompanied by : Dr. Farid A. Bahar, Ir. A. Hasanuddin and Ir. Shagir Sama.

Pengikut

Purpose of trip : To attend IRRI-AARD collaborative meetings and to present reports

Maksud perjalanan on Tungro and Blast, work being conducted at MORIF during 1983.

Observations (factors requiring action, new items, etc.)

Hasil pengamatan (faktor-faktor yang memerlukan penanganan, hal-hal baru, dll.)

Please refer to item # 1.2.1 (page 6) of the enclosed QAR -II.C.

During the field tour of the transmigration area in Sitiung II and the Upland Rice and Dryland Farming Research Plots at the Sitiung Sub-research Institute for Food Crops of SURIF, the following rice diseases were noticed:

1. Leaf blast (Pyricularia oryzae),
2. False smut (Ustilagoidea virens),
3. Leaf scald (Rhynchosporium oryzae), and
4. Leaf spots of many kinds due to certain undetermined causes.

Soils were being treated with lime to control the high acidity problem.

Inter-cropping with different types of plants was also studied to improve the soil conditions and increase yields of crops under investigation.

\* Original: to  
Asli kepada Mr. Carl R. Fritz,  
RMI-JKT.

\* Copy: to  
Tembusan Director MORIF and AARP personnel.

TRIP REPORT  
LAPORAN PERJALANAN

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Laporan ini harus diketik atau ditulis tangan dengan rapi dan berlaku untuk semua laporan (perjalanan dinas, rapat, kongres dll.), tidak lebih dari 100-150 kata.

Name: Dr. Syed Anwar Rizvi

Department: Plant Pathology

Nama

Kelompok

Date of Departure : March 3, 1984

Return: March 11, 1984

Tanggal berangkat

Tanggal kembali

Principal Locations Visited : Bogor (BORIF).

Tempat-tempat yang dikunjungi

Accompanied by : Ir. A. Hasanuddin and Ir. Amran Muis.

Pengikut

Purpose of trip : To arrange the training of Amran Muis in virological techniques for  
Maksud perjalanan RTV at Bogor Research Institute for Food Crops (BORIF).

Observations (factors requiring action, new items, etc.)

Hasil pengamatan (faktor-faktor yang memerlukan penanganan, hal-hal baru, dll.)

Please, refer to item # 1.1.6.(pages 4-5)of the enclosed QAR-II.C.

A joint meeting was held in the office of Dr. Tantera, Head of the Department of Plant Pathology and Entomology at BORIF. Present in the meeting were Dr. Tantera from BORIF; Dr. Syed Anwar Rizvi-Plant Pathologist/Virologist, Ir. A. Hasanuddin-Head of the Plant Pathology Department, and Ir. Amran-Plant Pathologist Research Staff and the prospective trainee from MORIF. During this meeting Ir. Amran was officially accepted by Dr. Tantera to start a 6-week special training program to learn various virological techniques at BORIF with special emphasis on the purification and identification of rice tungro virus.

\* Original: to  
Asli kepada Mr. Carl R. Fritz,  
RMI-JKT.

\* Copy: to  
Tembusan Director MORIF and AARP personnel.

TRIP REPORT  
LAPORAN PERJALANAN

\* This report must be typed or filled out neatly in longhand for all trips (field trips, meetings, congresses, etc), not exceeding 100-150 words.

\* Laporan ini harus diketik atau ditulis tangan dengan rapi dan berlatar untuk semua laporan (perjalanan dinas, rapat, kongres dll.), tidak lebih dari 100-150 kata.

Name: Dr. Syed Anwar Rizvi

Department: Plant Pathology

Nama

Kelompok

Date of Departure : March 7, 1984

Return : March 8, 1984

Tanggal berangkat

Tanggal kembali

Principal Locations Visited : Lembang - Horticultural Research Institute.

Tempat-tempat yang dikunjungi

Accompanied by : -

Pengikut

Purpose of trip : To deliver a seminar on "Diseases and Pests of Potato in South Sulawesi"  
Maksud perjalanan wesi" and to make arrangement for the transfer of potato germ-plasm from Lembang to MORIF.

Observations (factors requiring action, new items, etc.)

Hasil pengamatan (faktor-faktor yang memerlukan penanganan, hal-hal baru, dll.)

Please, refer to item # 1.2.3.(pages 6-7) of the enclosed QAR-II.C.

Contacts were made for the transfer of the tubers of 18 new advanced breeding lines/varieties from the Breeding Department of the Lembang Horticultural Research Institute to MORIF, for their introduction, multiplication, field evaluation to select the best adapted lines in the vegetable producing of South Sulawesi.

\* Original: to Mr. Carl R. Fritz,  
Asli kepada RMI-JKT.

\* Copy: to Director MORIF and AARP personnel,  
Tembusan

TRIP REPORT  
LAPORAN PERJALANAN

This report must be typed or filled out neatly in longhand for all trips (field trips, meetings, congresses, etc), not exceeding 100-150 words.

Laporan ini harus diketik atau ditulis tangan dengan rapi dan berlaku untuk semua laporan (perjalanan dinas, rapat, kongres dll.), tidak lebih dari 100-150 kata.

Name : Dr Syed Anwar Rizvi  
Nama

Department: Plant Pathology  
Kelompok

Date of Departure : March 31, 1984  
Tanggal berangkat

Return : March 31, 1984  
Tanggal kembali

Principal Locations Visited : Lanrang.  
Tempat-tempat yang dikunjungi

Accompanied by : Ir. Samuel Pakan and Ir. Koesnang.  
Pengikut

Purpose of trip : To collect data and prepare slides on rice Tungro Nursery Experiment.  
Maksud perjalanan

Observations (factors requiring action, new items, etc.)

Hasil pengamatan (faktor-faktor yang memerlukan penanganan, hal-hal baru, dll.)

Please, refer to item # 1.1.9.(page 6)of the enclosed QAR-II.C.

A general review of the rice tungro nursery experiment at Lanrang sub-station was made. Tungro free breeding lines were identified for further testing of their possible resistance to rice tungro virus under the control conditions of greenhouse. Slides of the infected-with clear tungro symptoms (susceptible) and symptomless (possible resistant) lines were also prepared for future use during Saturday Seminar Series of MORIF.

\*Original: to  
Asli kepada Mr. Carl R. Fritz,  
RMI-JKT.

\*Copy to  
Tembusan Director MORIF and AARP personnel.

APPENDIX III

QUARTERLY ACTIVITY REPORTS FOR THE AARP/RMI SPECIALIST TEAM AT  
THE BANJARMASIN RESEARCH INSTITUTE FOR FOOD CROPS

12/8

Appendix III

QUARTERLY ACTIVITY REPORT  
AARP/BARIF Specialist Team Banjarmasin  
January 1 - March 31, 1984

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A. SUMMARY OF GROUP ACTIVITIES

1. Group Consultations : (other consultations include in individual reports).

27/1-28/1 13/1-16/3	Mr. Roland Harwood, AARP-RMI Construction Specialist
30/1- 3/2	Dr & Mrs. Derk HilleRisLammers, IRRI Deepwater Rice Breeder
22/2-25/2	Dr. Dennis Garrity, IRRI IRTP Head
	Dr. Michel Arraudeau, IRRI Upland Rice Breeder
5/3	Dr. Syarkani Musa, Unlam Soybean Breeder
13/3-16/3	Dr. T.W. Mew, IRRI Plant Pathologist
	Dr. Tsuy fumi Ogawa, IRRI Plant Pathologist
	Dr. Tsuyoshi Yamamoto, TARC Plant Pathologist
15/3-16/3	Dr. William Collier, AARP-RMI Head of Party
20/3-22/3	Mr. Carl Fritz, AARP-RMI Administrator
	Mr. Michael Radice, RMI English Instructor
	Mrs. Wurjani, AARP
27/3-30/3	Dr. Z. Harahap, Rice Breeder Balittan Bogor

2. BARIF Master Plant :

Mr. Gabriel led consultants and BARIF Staff in the preparation of 15 year master plan for the institute. The final draft will be completed next quarter.

### 3. Training :

The BARIF seminar series continued this quarter including a talk given by Mr. Gabriel. The monthly rice and secondary crops meeting was terminated for lack of time and interest. The publication and organization of research training seminar series was successfully terminated, however.

Also this quarter, more than twenty BARIF Staff took the ALIGU test. Several candidates for training were interviewed by Mr. Fritz. Mr. Suhaimi Sulaiman was nominated for a PhD training in the USA pending successful completion of intensive English training in Bogor. Ms. Mahrita Willis was nominated for Msc in UK. Several new BARIF Staff members were added this quarter and others returned from training at IRRI.

### 4. Trips :

Numerous trips were taken by consultants with counterparts to survey farmers and to observe wet season experiments. Mr. Brown also attended the AARD-IRRI collaborative meetings in Sukarami and Mr. Gabriel and Mr. Gula attended transmigration meetings in Bogor. Mr. Manuelpillai visited Wageningen University on route to Indonesia.

### 5. Administration :

The office welcome Mr. R. George Manuelpillai, soil science consultant on 16 January, 1984. Also Mr. Gabriel and Mr. Brown returned from home leave and Ms. Watson left for R & R this quarter. Mr. Collier visited our office in March to help solve problems which have arisen in communication between consultant and between consultants and BARIF administration.

#### B. ACTIVITIES OF KEVITT D. BROWN (Appendix III. A)

Mr. Brown returned from home leave on 18 January. He spent 25 days this quarter taking data with counterparts at BARIF research stations. He also attended the AARD-IRRI Collaborative meetings in Sukarami to discuss the future of upland rice research in Indonesia. He also hosted IRRI plant breeders and Dr. Harahap from Balittan Bogor in discussions and travels to BARIF research stations. Mr. Brown began a re-organization of the programs in the plant breeding department and initiated a new seed storage and inventory system. He also discussed with Dr. Collier and Dr. Anwarhan ways to improve communication and implementation of research at BARIF. He also wrote a paper assessing the deepwater rice development plans of BARIF.

#### C. ACTIVITIES OF GRETA A. WATSON (Appendix III. B)

Ms. Watson conducted agro-economic surveys and collected data during six trips to tidal swamp and deepwater areas. She co-authored a paper with a BARIF Staff member for publishing on farmer weed management in the tidal swamp, submitted a crop protection paper for publishing by AARD, and wrote a paper for Dr. Anwarhan assessing the

development of the Kalimantan deepwater area. Ms. Watson was also busy this quarter with counterparts preparing surveys and research plans for the coming season and analyzing data from last year. She began her R & R 22 March.

D. ACTIVITIES OF BERNARDO P. GABRIEL (Appendix III. C)

Mr. Gabriel returned from home leave on 7 January. He took 24 trips this quarter to BARIF experiment stations to monitor insect pests and predator species. He and Mr. Gula also travelled to Bogor to attend a Cropping Systems Conference. They also collected information on crop protection from other offices in Bogor. Mr. Gabriel also gave two seminars at BARIF and helped counterparts to prepare their seminars. He also served as coordinator for writing a 15 year BARIF master plan, hosted the visit of IRRI plant pathologists in discussions and travels to experiment stations, and collected reprints and equipment which will aid in BARIF crop protection research.

E. ACTIVITIES OF GEORGE MANUELPILLAI (Appendix III. D)

Mr. Manuepillai joined our project 1 January, 1984. He first stopped to visit agro-scientists at the Agriculture University at Wageningen in the Netherlands to consult about coastal swamp soils research. He arrived in Indonesia 9 January and has since been active in BARIF experiment station orientation, development of a soil laboratory, and procurement of soil research materials. Mr. Manuepillai has made preliminary recommendations for soil amendments at each station, collected soil samples, and done simple laboratory analysis pending further improvement of the laboratory. He also has written a proposal for establishment of a benchmark acid sulfate site in Unit Tatas for which outside funds will be sought.

F. ACTIVITIES OF VOLUNTEERS

1. Thomas Gula, volunteer rat control specialist

Under the responsibility of Mr. Gabriel, Mr. Gula, visited villages in the Sungai Tabuk area of S. Kalimantan. He collected rat specimens and observed and photographed rat damage and current traditional control methods. Mr. Gula also wrote his perspective of developing the deepwater area and submitted it to Dr. Anwarhan.

Dr. Kevitt D. Brown  
Deepwater Rice Breeding  
Consultant  
AAKP/BARIF  
27 February, 1984  
-----

A Modified Proposal for Development of Deepwater  
Rice for the Lebak Dalam Area of South Kalimantan

Background

There are an estimated 600,000 ha of land in Indonesia which are potentially suited for growing deepwater rice varieties. Only 15% of the land is currently used for growing rice. The areas known as "lebak dalam" are characterized by maximum water depths of more than one meter during the rainy season. Most of the people in this area are fishermen but may grow rice in the dry season. Their system, known as "sawah rintak", involves 6-7 month varieties transplanted when the water recedes. A wet season traditional crop known as "sawah surung" may also be grown in these areas but only rarely. In dry years or years in which the previous dry season was long, some farmers try the sawah surung crop on a portion of their land. Extreme water depths and rapid water increase can completely devastate the crop. Rats and stem borer infestations are also severe, according to farmers.

Large areas of Bangladesh, India, and Thailand have conditions similar to the lebak dalam areas of Kalimantan. Use of deepwater rice varieties which can withstand water in excess of one meter are stably grown in these countries. Varietal introductions from these countries and IRRI have shown great promise for Kalimantan. With a proper development strategy it appears likely that large portions of the little used lebak dalam area could be made productive for rice. Development of such a large area of potentially utilize land would be a tremendous help to the local and national economy.

The current plan to develop the deepwater areas of Kalimantan involves the release of Indonesia's first deepwater rice variety by October, 1984 and the concurrent establishment of a 1000 ha project area involving 1000 or more farmers to grow the new variety in the wet season 1984-85. This project is to be backed by research from BARIF and Lambung Mangkurat University (Unlam), and extension efforts of Dinas Pertanian, as well as support by the Provincial Planning Board (BAPPEDA), the governor's office and others. The project will begin just eight months from now.

### Purpose

As deepwater rice breeding consultant for AARP at BARIF, I am writing this paper to give an idea of the current state of our deepwater rice research, point out some of the difficulties of the October, 1984, 1000 ha development plan, and to propose ideas which would better improve the chances of successful development of the area.

I have also asked Ms. Greta Watson, AARP consultant for socio-economics, and Mr. Tom Gula, volunteer consultant for rat control research at BARIF to write short papers describing their perspectives on the current development plan.

### Problems

Unfortunately, there are certain risks associated with a too rapid development of the deepwater area. While, in my opinion, there is no doubt that deepwater rice varieties can be developed which are suited to the area, the exact development strategy is crucial. Efforts to develop the lebak dalam area of Kalimantan must be well conceived and executed from all aspects of research and extension.

The problems inherent in the October 1984, 1000 ha program can be summarized as follows : to much, too soon. One main reason for advising caution is that the current research base is weak and does not support such an ambitious project and it will be difficult to extend technologies for which confidence is lacking.

The BARIF program in the lebak dalam area was initiated in 1977 and has been conducted during six of the seven succeeding years. Research has almost exclusively centered around plant breeding with selections made in non-lebak areas and in lebak areas in farmer's fields. Very little work has been done either on agronomic practices, soils, pests, diseases, or the socio-economy of the area. This deficiency of research information is extremely serious considering the 1000 ha scope of the current project. Furthermore, surveys of the area which are proposed for this year may not allow enough time to modify the project, which is scheduled to begin in October.

Even from the standpoint of the BARIF plant breeding program, which is the most experienced program in the lebak area, I must advise caution because our research base is also weak. This current wet season is the first adequate test of deepwater lines since our program began seven years ago. In previous years there was either too little water (less than one meter) so that all materials did well, too much water too fast so that all the materials died, or the rats and birds completely destroyed the nursery before harvest. Furthermore, very few breeding lines have been tested in two or more years and some of the duplicated lines which performed well the first year are not considered suitable this year. Our confidence is further reduced in that varietal selection has occurred in several different sites, most of which were dropped in subsequent years. Also the data on field water depths and other environmental measures are few or non-existent.

Another problem with development of 1000 ha by October, 1984 is varietal release. This year's crop of deepwater rice is still in the field. We are testing in two locations and the water stress is good for selection, however, we are not presently sure how representative our field sites are with respect to the entire lebak dalam area. Twenty-four breeding lines appear suitably adapted this year out of 77 lines tested. Unfortunately only seven of the adapted lines have been tested in previous years. Information compiled on the performance of one of these breeding lines as candidate for varietal release is rather limited.

Our program is further constrained by a limited seed increase. Our single best candidate for release is the line IR 11288-B-B-118-P. There are only 1653 m<sup>2</sup> of this line now growing in the field. Assuming 2 ton/ha harvested and 30 kg/ha for planting, there will only be seed available for 700 ha of transplanted rice or 200 ha of direct seeded rice by next October. This is short of the 1000 ha previously proposed. Other suitable breeding lines for release with large area of seed increase now growing are : Habiganj Aman II (68 m<sup>2</sup>), Pankaish (95 m<sup>2</sup>), Chamara (80 m<sup>2</sup>), IR11141-6-1-4 (201 m<sup>2</sup>), and SPR7232-2-3-1-0 (967 m<sup>2</sup>).

In addition to problems of a limited research base, development of 1000 ha of deepwater area by October, 1984 is a risky development strategy in my estimation. Farmers in the area are generally not aware of the new technology. Very few have observed the practice of growing a deepwater variety and there is little time to train them adequately. Even the extension workers do not have any experience or training with the new crop. Also, the development of a new crop where there was essentially none before increases the likelihood of unforeseen socio-economic problems. Smaller scale and slower but sustained development is a wiser strategy. There is no crisis which would suggest taking risks now that could be avoided by some additional caution. I feel certain that deepwater rice will succeed in Kalimantan, but if failure were to occur for whatever reason, development of the area would be set back for a long time to come.

## Recommendations

I strongly agree with the idea that the lebak dalam area of Kalimantan should be developed for deepwater rice varieties in the near future. The strategy to involve many government agencies in the plan, such as BARIF, Unlam, Dinas Pertanian, BAPPEDA, and the Governor's office is good because it will share the responsibility, work, and benefits of the project. However, I do not recommend the strategy to develop 1000 ha by October, 1984.

To better accomplish the development objective I propose that a smaller scale, pilot project be attempted in October, 1984 rather than the 1000 ha program. This could be conducted in a 50 ha area through cooperation between the research and extension services, to both test and demonstrate the deepwater rice crop. The same effort that would have been given to the 1000 ha area could be focussed on a smaller area and the situation could be closely monitored for problems that may arise with the farmers and crops. Extension agents would be trained and further research conducted during the 1984-85 season in order to better develop a series of plans and practices for future expansions of the program. Development would then be slower but sustained as more is learned about the area and applied to improving the chances of farmer adoption of the technology.

The following is an outline of steps needed to be taken by BARIF to develop the lebak dalam area through a 50 ha pilot project scheme :

### A. Before the October, 1984 Pilot Project

1. Work with other government agencies to write a detailed strategy to manage the 50 ha pilot project area.
2. Compile available agro-meteorological data on the lebak dalam area and make recommendations for an area suitable for project.
3. Complete a reconnaissance agro-economic survey of the lebak dalam area and an in depth survey of the project area to make recommendations to enhance farmer adoption of deepwater rice varieties.

4. Compile available soil data on the lebak dalam area and analyze soils in the pilot project area to make recommendations for soil management practices for the project.
5. Conduct rat and insect surveys of the pilot project area to make recommendations of control measures.
6. Continue to increase seed of the 6 best deepwater rice varieties at BARIF stations and possibly in a fully irrigated area in Sungai Tabuk.
7. Meet with farmers in the 50 ha pilot project area to discuss the project and hear their ideas to improve the program.
8. Hold a deepwater rice development workshop in Banjarmasin with invited experts and participants from Kalimantan, Sumatra, and Java to discuss the development strategy.
9. Re-write the development plan for the pilot project based on the workshop findings, farmer meetings, and new data collected from surveys.

**B. During the Pilot Project (October, 1984 to April, 1985)**

1. Cooperate with Dinas Pertanian and other government agencies to conduct the 50 ha pilot project.
2. Aid in monitoring the progress and problems encountered in the pilot project with the farmers and crops.
3. Make final selection of the best deepwater rice breeding line for varietal release.
4. Continue to do field research in the deepwater area in plant breeding, agronomy, pests and diseases, and socio-economics in order to improve the recommendation for deepwater rice development.
5. Cooperate with Dinas Pertanian to hold training sessions for extension workers in the lebak dalam areas inside and outside the project area.
6. Hold a joint farmer field day with Dinas Pertanian to explain the costs and benefits of growing a deepwater rice crop to local farmers.

**C. After the Pilot Project**

1. Conduct follow-up surveys of farmers in the pilot project area to establish a better set of recommendations for further development of the lebak dalam area of Kalimantan.
2. Release one deepwater rice variety for the Kalimantan lebak dalam area.
3. Hold an evaluation meeting with other government agencies involved in development of the area.
4. Write a detailed proposal for further development of the lebak dalam area over the next few years.

## Final Note

One of the main benefits of the pilot project just proposed is that its smaller scale would reduce risk to all the parties involved and would improve the quality of the development effort. With more attention focussed in a smaller area, the project can be better monitored and adjustments more easily made. The other main benefit of the program would be to give more time to the concerned parties. The researchers would have more time to do the necessary surveys, release the best variety with more confidence, and establish a better set of recommendations for agronomic practices and insect and rat control. The extension workers would have more time to be trained and to train farmers. The government support services for fertilizers, credit, etc. would have time to get better established. And the farmers would have more time to look at and make objective decisions about growing the new crop.

Of course any development effort involves some risk, but slower development on a smaller scale initially is more certain to succeed. Given the present interest of the local government leaders to develop the area it appears that a 50 ha pilot project beginning this October is a reasonable and fairly safe starting point. This balance of development and caution is my best recommendation for such an effort.

I respectfully submit all these ideas for your consideration, and trust that you will make the necessary changes in the current development plan based upon your good judgement.

APPENDIX III. A. 1

Banjarmasin Research Institute for Food Crops : (BARIF)  
Applied Agricultural Research Project

**TRIP REPORT**  
**LAPORAN PERJALANAN**

TR-001

This report must be typed or filled out neatly in longhand for all trips (field trips, meetings, congresses, etc), not exceeding 100-150 words.

Laporan ini harus diketik atau ditulis tangan dengan rapi dan berlaku untuk semua laporan (perjalanan dinas, rapat, kongres, dll.), tidak lebih dari 100-150 kata.

Name Dr. Kevitt Brown Department Plant Breeding  
Nama Kelompok

Date of Departure 25 January, 1984 Return 26 January, 1984  
Tanggal berangkat Tanggal kembali

Principal Locations Visited - Handil Manarap Experiment Station (BARIF)  
Tempat-tempat yang dikunjungi

Accompanied by Ir. Sutami, MSc, Ir. Syaiful, Ir. Thamberin, Ir. Fatimah.  
Pengikut

Purpose of trip To take plant vigor scores of experiments and to train staff.  
Maksud perjalanan

Observations (factors requiring action, new items, etc.)  
Hasil pengamatan (factor-factor yang memerlukan penanganan, hal-hal baru, dll.)

The plants and fields were in good condition with about 25 cm water depth. Only the seed increase suffered any submergence this season because of late planting. Plants ranged from maximum tillering to anthesis and several showed excellent plant vigor. Staff were enthusiastic to learn how to do the scoring and did quite well. I suggested days to 50% heading be taken rather than 20% and 80% as was done in the past.

## APPENDIX III. A. 2

No. : TR- 002  
To : AARP - GOI Project  
From : Dr. Kevitt D. Brown  
Locations  
& Date : 30 January, 1984 - Handil Manarap Expt. Station BARIF  
31 January, 1984 - Binuang Expt. Station BARIF  
31 January - 1 February 1984 - Sungai Buluh and Alabio  
1 February 1984 - Banjarmasin Expt. Station, BARIF  
2 February 1984 - Belandean Expt. Station, BARIF

---

### Party

Dr. Derk HilleRisLambers, IRRI deepwater rice breeder  
Ir. Suhaimi, Msc, BARIF, plant breeder  
Ir. Sutami, Msc, BARIF, plant breeder

### Purpose

To observe BARIF breeding trials and discuss improvements in the rice breeding program.

### Handil Manarap

Dr. HilleRisLambers sent us a nursery of vigorous, submergence tolerance lines which we observed. Many of the lines are photoperiod sensitive and looked good this season but without much submergence stress. We will use these materials and traditional varieties in a special photoperiod sensitive program next year. Selection will be made for yield and other qualities better than the local check.

### Binuang

Several plant selections in the upland nursery were performing well. We will select those with good ground cover, rice blast resistant, and high yielding. The deepwater rice seed increase field was highly variable with spots of yellowing and stunted plants. It appears there is a soil problem, possibly Zn toxicity or P deficiency. The soils will be studied by Mr. Manuelpillai. The most promising entries in our current deepwater nurseries will be further increased in Binuang by separating tillers at the vegetative stage and replanting.

### Sungai Buluh

The water in this site was 116 cm and the local variety had nearly died. Only true elongating rices were doing well, Dr. HilleRisLambers instructed us to look for types with the upper-most ligule just above or below the water surface. Many lines looked good because they were beginning to flower so added height and escaped damage but these may be poor selections if water continued to rise. In deeper areas later flowering until the water begins to decline is better. In shallower areas the tall non-elongating types do quite well so we should not discard them but put them in a shallower Nursery. Phosphate fertilizer and earlier seeding are ways to improve the chances of getting a good deepwater rice crop.

### Alabio

The water depth was 94 cm and most lines had survived. Here both tall and elongating types are adapted and semi-dwarf lines with elongating genes may do best. The better lines were from Thailand. There was some rat damage so the rat fence was fixed.

### Banjarmasin

Dr. HilleRisLambers suggested we construct a deepwater tank to test submergence tolerance of breeding material such as backcross generations. Also he gave suggestions to improve our seed storage system and crossing program.

### Belandean

Dr. HilleRisLambers who is also IRRI's problem soils breeder, was pleased with the level of acid stress encountered in Belandean. Many lines did not survive transplanting well because of highwater and acid conditions. He stressed the use of more frequent check varieties and not relying too much on % seedling survival since the main focus of this nursery is plant growth not establishment.

Appendix III. A  
Quarterly Activity Report by Dr. Kevitt D. Brown  
Rice Breeder  
January 1 - March 31, 1984

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A. Activities

1. Consultations

28/2 - 4/3      AARD-IRRI Collaborative Meeting in Sukarami  
led by Dr. Swaminathan, Director of IRRI  
and Mr. Sadikin.

Other consultations included in general report

2. Field Trips

a. R & R : 1 - 18/1

b. Belandean Expt. Station (BARIF) : 24/1, 2/2, 24/2, 22/3

c. Handil Manarap Expt. Station (BARIF) : 25/1, 26/1, 30/1,  
23/2, 15/3, 17/3,  
31/3.

d. Sungai Buluh and Alabio : 28/1, 31/1 - 1/2, 21/2, 13 - 14/3,  
28/3.

e. Pleihari Expt. Station (BARIF) : 7/2, 23/2, 12/3.

f. Binuang Expt. Station (BARIF) : 13/2, 21/2, 10/3, 28/3.

g. Tilang Expt. Station (BARIF) : 15/2

h. Tanggul Expt. Station (BARIF) : 26/3

i. Sukarami Food Crop Research Institute, Sumatra : 28/2 - 4/3.

3. Helped my counterpart, Mr. Suhaimi, to complete the forms necessary for attending an American University for PhD. and wrote letters of recommendation.

4. Began talks with Mrs. Sutami, my new counterpart to acquaint her with her new duties as rice breeding coordinator and to make changes in the objectives and priorities of the rice breeding program.

5. Helped the breeding staff to write plans for 39 experiments for 1984/1985.

6. Hosted the visits of IRRI scientists in visits to breeding experiments and discussions about the breeding program.

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7. Wrote a modified deepwater rice development proposal and discussed this with Dr. H. Anwarhan.
8. Almost completed data taking and selection in wet season field experiments with counterparts.
9. Gave a lecture on breeding methodologies to BARIF S aff.
10. Attended a lebak development seminar in Alabio given by Dr. H. Anwarhan to local officials and farmer leaders.
11. Began discussions to implement a new seed storage and inventory system at BARIF.
12. Returned from home leave on January 18.

B. Plans for Second Quarter, 1984

1. Finish wet season experiments and plant dry season experiments.
2. Work on some publications with breeding staff.
3. Complete setting up of new seed storage system.
4. Initiate new plant breeding discussion group instead of former rice meetings to improve communication and thinking ability of breeding staff. Also to initiate a research training paper series on simple aspects to standardize research operations.

C. Problems and Proposed Solutions

1. Poor quality of research in all aspects continues to be the biggest obstacle to the development of BARIF. At present there is little incentive for laborers, technicians, farm managers, or researchers to work harder or do better quality work. The result is that better workers are overburdened, often doing the work of others while the institute as a whole is plagued with absenteeism, low morale, and experiments are poorly watched and managed with data often missing or unreliable. These matters were discussed with Dr. Anwarhan and ideas were given to him including the distribution of budgetary control to each department and to provide financial and other incentives for workers who do more or better quality work. Next quarter I plan to write these ideas on paper in the form of a proposal to submit to Dr. Anwarhan for implementation of appropriate ideas.
2. Last quarter Mr. Watson, Mr. Gula, and I wrote down our perceptions of the problems we foresee in the BARIF plan to release a deepwater rice variety and begin a 1000 ha development scheme with other local government offices. We said the plan is too much too fast. The plans are moving ahead so we are still concerned about this.

3. Our breeding program is now being divided into sub-programs with clearer objectives and priorities to make quicker and more certain progress in the short and long term.
4. No progress was made on publishing last quarter because of the lack of time but we hope that several breeding staff will begin writing this quarter.



APPENDIX III. A. 2

No. : TR- 002  
To : AARP - GOI Project  
From : Dr. Kevitt D. Brown  
Locations  
& Date : 30 January, 1984 - Handil Manarap Expt. Station BARIF  
31 January, 1984 - Binuang Expt. Station BARIF  
31 January - 1 February 1984 - Sungai Buluh and Alabio  
1 February 1984 - Banjarmasin Expt. Station, BARIF  
2 February 1984 - Belandean Expt. Station, BARIF

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Party

Dr. Derk HilleRisLambers, IRRI deepwater rice breeder  
Ir. Suhaimi, Msc, BARIF, plant breeder  
Ir. Sutami, Msc, BARIF, plant breeder

Purpose

To observe BARIF breeding trials and discuss improvements in the rice breeding program.

Handil Manarap

Dr. HilleRisLambers sent us a nursery of vigorous, submergence tolerance lines which we observed. Many of the lines are photoperiod sensitive and looked good this season but without much submergence stress. We will use these materials and traditional varieties in a special photoperiod sensitive program next year. Selection will be made for yield and other qualities better than the local check.

Binuang

Several plant selections in the upland nursery were performing well. We will select those with good ground cover, rice blast resistant, and high yielding. The deepwater rice seed increase field was highly variable with spots of yellowing and stunted plants. It appears there is a soil problem, possibly Zn toxicity or P deficiency. The soils, will be studied by Mr. Manuepillai. The most promising entries in our current deepwater nurseries will be further increased in Binuang by separating tillers at the vegetative stage and replanting.

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### Sungai Buluh

The water in this site was 116 cm and the local variety had nearly died. Only true elongating rices were doing well, Dr. HilleRisLambers instructed us to look for types with the upper-most ligule just above or below the water surface. Many lines looked good because they were beginning to flower so added height and escaped damage but these may be poor selections if water continued to rise. In deeper areas later flowering until the water begins to decline is better. In shallower areas the tall non-elongating types do quite well so we should not discard them but put them in a shallower Nursery. Phosphate fertilizer and earlier seeding are ways to improve the chances of getting a good deepwater rice crop.

### Alabio

The water depth was 94 cm and most lines had survived. Here both tall and elongating types are adapted and semi-dwarf lines with elongating genes may do best. The better lines were from Thailand. There was some rat damage so the rat fence was fixed.

### Banjarmasin

Dr. HilleRisLambers suggested we construct a deepwater tank to test submergence tolerance of breeding material such as backcross generations. Also he gave suggestions to improve our seed storage system and crossing program.

### Belandean

Dr. HilleRisLambers who is also IRRI's problem soils breeder, was pleased with the level of acid stress encountered in Belandean. Many lines did not survive transplanting well because of highwater and acid conditions. He stressed the use of more frequent check varieties and not relying too much on seedling survival since the main focus of this nursery is plant growth not establishment.





Banjarmasin Research Institute for Food Crops  
Applied Agricultural Research Project : (BARIF)

**TRIP REPORT**  
**LAPORAN PERJALANAN**

TR-005

This report must be typed or filled out neatly in longhand for all trips (field trips, meetings, congresses, etc), not exceeding 100-150 words.

Laporan ini harus diketik atau ditulis tangan dengan rapi dan berlatu untuk semua laporan (perjalanan dinas, rapat, kongres, dll.), tidak lebih dari 100-150 kata.

Name	Dr. Kevitt D. Brown	Department	Plant Breeding
Nama		Kelompok	
Date of Departure	6 March, 1984	Return	6 March, 1984
Tanggal berangkat		Tanggal kembali	

Principal Locations Visited - Tilang Expt. Station (BARIF)  
Tempat-tempat yang dikunjungi

Accompanied by Ir. Sutami, Msc. (plant breeding), and Ir. Nasrullah (statistics)  
Pengikut

Purpose of trip To make selections of upland rice varieties and observe neck blast  
Maksud perjalanan

Observations (factors requiring action, new items, etc.)

Hasil pengamatan (factor-factor yang memerlukan penanganan, hal-hal baru, dll.)

The early maturing portion of the upland nursery was maturing. A few entries in the late planted IRRI upland observational nursery looked quite good with little damage from leaf or neck blast or rice bug damage. Nearly all of the other lines including Kalimantan local varieties were either damaged or too short. Our current local check variety Si Buyung was just booting so is too late to make an accurate comparison with earlier varieties. Since our aim is to release 4 month varieties with suitable resistance to pests, soils, and diseases, we will use Bicol as our check variety next year. Bicol is a local variety from the Philippines but is earlier maturing (4 months) and looked quite good in our test. It is also sometimes grown in Kalimantan by transmigrants. Si Buyung was badly infected with leaf blast in some reps where the plants grew most vigorously.

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Appendix III. B

Quarterly Activity Report by Greta A. Watson  
Social Scientist/Agroeconomist  
January 1 - March 31, 1984

I. Activities

A. Field and Research Visits

1. Gudang Hirang and Pinang River Villages, South Kalimantan. Tidal and Inland Swamp Survey on the Economics and Management of Fruit Tree-Rice-Secondary Crop Intercropping. Presurvey 5-6 January, 1984\*. Survey. Survey 16-17 and 20 January\*.
2. Pematang Panjang and Gudang Hirang Villages, South Kalimantan. Presurvey to assess potential for double cropping. January 24-25, 1984.\*
3. Sungai Buluh and Hambuku Tengah Villages, South Kalimantan. Assessment of lebak deepwater and polderized monotonous swampy inland regions. General socioeconomic assessment in relation to deepwater rice project in 1984/85. January 28, 1984\*.
4. Amuntai, Hulu Sungai Utara Province and Alabio Village HSU, South Kalimantan. Interview with Mr. Rasdiono Paul, head of Dinas Pertanian, HSU Province. Attendance at meeting with farmers concerning deepwater rice project in the Alabio region. 13-14 March 1984\*.
5. Collection of traditional rices, Lok Buntar Village, indirect tidal region South Kalimantan. Twelve traditional rice varieties were collected and sent to BARIF, BORIF and IRRI. 17 January 1984.\*
6. Survey of agroeconomic and farming system literature resources Library of the Faculty of Agriculture, Lambung Mangkurat University, South Kalimantan. Interview with Dr. Sarkani Musa concerning upcoming BARIF breeding program for beans. 24-27 February, 1984\*.

B. Consultations

1. Dr. Harwood 27-28 January, 13-16 March. Building and equipment.
2. Dr. William Collier 15-17 March. Role of AARP consultants in BARIF-AARP project.
3. Dr. Michel Arrandeau and Dr. Dennis Garhety, IRRI. 23 February 1984. Environmental and social aspects of South Kalimantan monotonous swamps regions.

4. Dr. HilleRisLambers, IRRI breeder. 30 January 1984. Development prospects and environmental characteristics of tidal and deepwater rice agriculture in Indonesia.
5. Ms. Hafni Zahara, Litbang, Jakarta. Aspects of technology transfer from AAR. Consultants to BARIF researchers.

C. Working Reports

1. Two short report : Rice Varieties - Some Clarifications and Suggestions and Benefits and Deficits of Using Tractors to Till Land in Coastal Swamp Areas.\*
2. Consultancy paper : Agroeconomic and Ecological - Considerations in the Development of Agriculture Using Deepwater Rice in South Kalimantan : Review and Suggestions. 14 p.

D. Technology Transfer

1. Coauthored paper with Hidayat Djumhana entitled Farmer Management of Weeds in Tidal Swamp Rice Cultivation, South and Central Kalimantan Indonesia. We hope to present this paper at the BIOTROP Weed Symposium 10-12 April 1984, Bogor, Indonesia.
2. Edited paper written with Mahrita Willis as coauthor on Farmers Knowledge of Plant Protection and submitted in to AARD Journal for consideration of publication.
3. Concluded the two seminar series on Research Proposal Writing and Writing Articles for Publication. Submitted these seminars to Dr. Bill Collier for his comments and suggestions for later publication with an Indonesian coauthor.
4. Worked with the agroecconomics department of BARIF.
  - a. helped organize, define and reference research proposals for the agroecconomics department for the 1984/84 year.
  - b. survey questionnaire on double cropping potential in tidal swamps with Ir. Yanti Rina.
  - c. tabulations and analysis of data for Ir. Noorginayuwati's survey (she is on leave).
  - d. geeneral analysis and organization of data for socioeconomic research.
  - e. compiled questions of cropping systems, management and environment for a presurvey on lebak areas to be in May.

## Quarterly Activity Report

Greta A. Watson

January - March, 1984

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- f. helped organized plan of activities April/May 1984 during my leave of absence.
  5. Obtained tentative approval from Dr. Anwarhan and began an outline for a 10 week seminar to begin in June or July entitled Socioeconomic and Ecological Aspects of Swampy Lands.
  6. Made photocopies and inserted into BARIF-AARP files all directly relevant bibliographic data in my possession as of February 1984. Provided the new soil scientist, Mr. Manuelpillai with all soils and water research data which I had on hand at the time.
  7. Began organization of a AARP-BARIF card catalogue of references on all aspects of agroeconomic, ecological and other disciplinary research.
  8. The BARIF Bulletin has been approved for publication.
- E. Miscellaneous
1. AARP-BARIF has acquired a small portable tape recorder. This will make it considerably easier to interview farmers and review their information.
  2. I will be taking a leave of absence to write my doctoral dissertation from 22 March to 18 May 1984. This includes my vacation time for my first year's consultancy and one month leave of absence (one of two allotted in my contract). My husband, Tom Gula will be accompanying me during this time.
  3. Two boxes of books and articles lost since last year were found in RMI offices in Bogor and returned to me.

## II. Suggestions

- A. AARP-BARIF consultant-administrative research relations might be considerably improved if AARP consultants were more often informed of and invited to discussions, workshops and conferences concerning projects and research. In this way we can better aid BARIF.
- B. We are in the initial stages of BARIF upgrading and Kalimantan area investigation. It is necessary at this point for consultants to work as an interdisciplinary team and exchange information. Limiting disciplinary domains and excluding some consultants from others' information and work with BARIF researchers can only be detrimental to all. Dr. William Collier has agreed to work with us on this.

<sup>1</sup>barring further exigencies.

Appendix III. B. 1

No. : TR-007  
To : AARP-GOI Project  
From : Greta A. Watson  
Subject : Trip to Kecamatan Sungai Tabuk.  
Date : 5-6 January 1984.

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Party

Ir. Eddy Purwanto, agroecology department.  
Ir. Abdul Basit, agroecology department.

Purpose

This trip was made to assess characteristics of villages within the county for their inclusion or exclusion in an agroecology survey on secondary intercrops of citrus and/or coconut groves.

Summary

General Description :

Kecamatan Sungai Tabuk (Tabuk River County) is located in South Kalimantan along the Martapura River and its tributaries. Most villages are only accessible by river transportation. The villages in this county are the primary exporters of citrus fruits and vegetables to the Banjarmasin area. Depending on their location along major and/or minor rivers, the villages may or may not be directly or indirectly tidally influenced, or stagnant or freeflowing rainfed. Some of the area has recently been incorporated into an irrigation project.

The history and geography of the area has lead to a widespread diversification in cropping patterns. Originally (60-70 years ago) much of the area was planted to coconut and tidal swamp rice. The growing market for oranges and rambutan prompted farmers to plant these crops, in some areas to 40 years ago. Expansion of this market prompted more and more farmers in lower lying areas to plant citrus. These trees were flood prone and many were killed during flooding 6 years ago. Farmers in effected regions switched to expanding vegetable production and supplanting

tree crops with banana. This both decreased risk and improved income.

In other, higher lying areas of the swamp government-sponsored BIMAS programs for establishment of orange tree groves have been widely accepted.

Rice is grown throughout the region and is basically a subsistence crop. Depending on drainage and irrigation farmers may grow 1) one crop of traditional long-maturing rice 2) a high yielding rice then the traditional rice, or 3) two crops of high yielding, shorter maturity rice. Rice is occasionally grown as a monocrop, but more often between raised mounds which are used as fruit tree or vegetable beds. Two types of rice seed beds are made : 1) palai in which rice seed is spread upon a soft mud layer which either is floated in the river on banana logs or is located on the flood area along river banks and 2) taradakan in which seed is grown in shallow holes in the ground. The seedlings are then transplanted three times in increasingly large areas. These stages are ampakan, lacakan and tanam (final planting). The increasing seedling height allows for transplanting into progressively more inundated areas. Yields are about 2.5 ton/ha.

Vegetable crops are grown at the very beginning and at the end of the rainy season. Bitter cucumber, long bean, string bean, eggplant, cucumber, chili and cooking peppers, squash, loofa, corn and taro are among the major crops grown. The differential moisture and inundation tolerances of these plants dictates time of planting, associated height of planting mound, and location in the field. Profitability of various crops, difficulty in growing and available labor for weeding also influences the choice of crop.

Green manuring is practiced in both rice and vegetable cropping. Before rice planting, weeds are hacked, rotted and chopped up. Some of these composted weeds are left in rice fields to fertilize that plot. Another portion of these weeds are hauled to the top of the vegetable mounds to fertilize this site. Inorganic fertilizer is only used in backswamp areas which are relatively stagnant and infertile, or where rice is cropped twice a year. Agrotin, which farmers refer to as "ant" poison is used in dry years to reduce pest populations.

Mandarin orange groves may either be widely spaced with permanent rice fields in between or more densely planted with no or only transitory rice fields between. Trees are spaced along mounded rows at intervals of from 3 to 4½ meters. Vegetables are frequently planted along the edges of these mounds and banana is occasionally cropped. Farmers assert that vegetables can be planted throughout the life of the trees since 1) mounds are increasingly widened and heightened to provide more growing medium for the trees and 2) unlike coconut, citrus roots do not spread across mounds but grow down, allowing more soil for vegetable growth.

#### Survey Villages :

The survey group first met with Mr. Hanafiah, Secretary of Tabuk River County. We explained that our agroeconomic survey was to assess secondary crops in tree groves both in relation to their added productivity and in reducing pay back period time and break even point for rows planted to citrus. We asked him to suggest specific villages for our study. Mr. Hanafiah was kind enough to supply us with a guide, Mr. Amat.

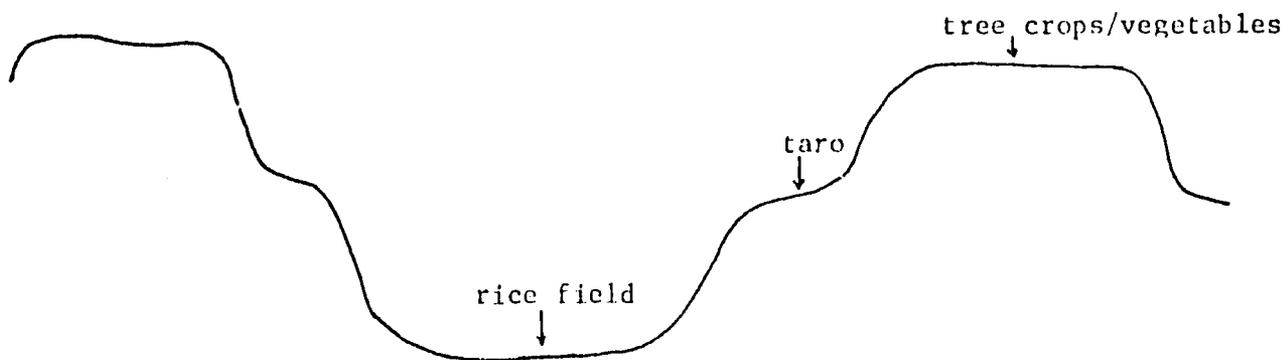
Gudang Hirang Village. The village head, Mr. Utuh Nasri escorted us on a tour of the village. Gudang Hirang is divided into two regions. One, along the Madang River is tidally influenced and is primarily planted in citrus intercropped with traditional rice between mounds. The other is rainfed and irrigation controlled with 319 ha. planted to two crops of high yielding and traditional rice each year. Vegetables are only planted in the dry season. A group farmer interview was conducted. We found that many farmers had chopped down old coconut groves in the Madang River area to plant more profitable citrus trees and vegetable-rice intercrops. This village was chosen as a survey site.

Luk Buntar Village. This village is indirectly tidally influenced and is located in extremely low lying swamp on a tributary of the Martapura River. It has been settled and cropped in rice for at least 60 and perhaps 100 years. Mr. Kardi, the village head, told us that villagers specialize in vegetable production : during vegetable harvesting season (May-August), boatloads of squash, bitter cucumber, eggplant,

longbeans, cucumber and more are sent for sale both to Banjarmasin, South Kalimantan and as far as Palangkaraya and Muara Tewe, Central Kalimantan. However, there is little tree cropping, and what citrus there was destroyed by flood some years ago. We were able to obtain 3 new varieties of traditional rice which will be sent to IRRI and Bogor for further evaluation. We decided that this village was not pertinent to the aims of our survey.

Luk Baintan/Paku Alam Village. This village is located on the Martapura River but is only directly tidally influenced (brackish) for a small part of the year. Although both rice and fruit tree cropping is practiced, monocropping is the norm. Citrus and rambutan groves abound. Guava is planted along the banks of drainage canals to prevent their erosion. Traditional rice varieties are used. This village was not chosen for the survey.

Pinang River Village. This village is located along 5 km. of the Martapura River. It was originally planted in coconut at least 60 years ago. Much of the land is still in coconut, but some land has been transformed to citrus-rice groves with vegetable intercrop. Approximately 50% of the population plants rice within the village, but almost all households own riceland : others farm in nearby villages also. Eggplant, longbean, stringbean, cucumber and cooking pepper are primary vegetable exports. Crops are grown using a multilevel systems :



There is great variety in the kinds and types of tree, root and vegetable crops which are planted. This village was chosen for future study.

Land Ownership and Usage. According to Mr. Hanafiah, up to 75% of the households in Tabuk River County do not own or farm their own land. Especially in villages which have long established tree crop production or access to irrigation water for double cropping, tenant farming is frequent. The owners have become rich enough to move to wealthier areas of Banjarmasin and become landlords.

For the most part, tenancy follows two policies which are called in the Banjarese language karunakan. The tenant farms the site, and the landlord comes at harvest time to collect the harvest from half the land. Rice seed and inputs are generally provided by the landlord. Alternatively, the tenant farms the site, harvests the whole crop, and gives one third (1/3) of the production to the owner. Such arrangements can also be carried out in regard to vegetable cropping or fruit tree production. Apparently both parties feel this is a profitable arrangement.

Sago Palm Production. Tabuk River county has the highest production of sago palm that this researcher has encountered in the tidal/coastal swamp area.\* The sago palm is utilized in a number of ways. Its fronds are woven into roofs and walls of houses. The young umbut or pith of the tree is eaten as a vegetable. The older pith of the tree is used for duck feed or leached and made into sago flour. The midrib and fronds are used to construct temporary fences for palai rice seedling beds. Sago palms also reduce erosion. The nipah palm, which is also used for roofing is quickly becoming extinct to these areas. The sago palm provides a good alternative. It also provides a source of food in years when rice crops are low, and a source of added income.

### Conclusions

Tabuk River County and surrounding counties within the Banjarmasin tidal or coastal swamp area have been insufficiently studied. They can provide additional information about types of cropping systems adapted

\*The village of Margasari in Taken County is said to be a greatest producer of this crop, however.

to microgeographical regions. Additionally, they are a source of information about changes in profitability of various economic strategies with shifts in land ownership and tenancy and increases in sales to a wider market.

The fact that such variability in cropping strategies exists is evidenced in the four villages encountered. Each of these villages had such different cropping systems that only two could be accepted for the agro-economic research during this month. A second agro-economic study will be conducted in February in this region, however, concerning the environmental and social constraints to double cropping.

Banjarmasin Research Institute for Food Crops  
Applied Agricultural Research Project : (BARIF)

**TRIP REPORT**  
**LAPORAN PERJALANAN**

TR-008

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Name Greta A. Watson Department Agroecconomics  
Nama Kelompok

Date of Departure 16 January 1984 Return 17 January 1984  
Tanggal berangkat Tanggal kembali

Principal Locations Visited - Kecamatan Sungai Tabuk, KalSel (Tabuk River County,  
Tempat-tempat yang dikunjungi South Kalimantan), Gudang Hirang Village and Lok Bultar  
Village.

Accompanied by Tom Gula, Ir. Rosita Galib, Ir. Eddy Purwanto,  
Pengikut Ir. Yanti Rina, Ir. Abdul. Basit.

Purpose of trip To conduct an agroeconomic survey concerning the potential of  
Maksud perjalanan secondary crop intercropping and rice cultivation in orange,  
coconut, and other tree groves.

Observations (factors requiring action, new items, etc.)

Hasil pengamatan (factor-factor yang memerlukan penanganan, hal-hal baru, dll.

The consultant helped interview farmers and carry out ancillary village documentation in Gudang Hirang Village. This included group and individual meetings with farmers, observations in the field, and secondary information compilation. The consultant also visited Lok Buntar Village to gather traditional rice varieties and examine the rice farming system in depth. (See Trip Report 6-7 January 1984 for additional information).

APPENDIX III. B. 3

Banjarmasin Research Institute for Food Crops : (BARIF)  
 Applied Agricultural Research Project

TRIP REPORT  
 LAPORAN PERJALANAN

TR-009

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Name Greta A. Watson Department Agroecconomics  
 Nama Kelompok

Date of Departure 20 January 1984 Return 20 January 1984  
 Tanggal berangkat Tanggal kembali

Principal Locations Visited Sungai Pinang Village, Tabuk River County,  
 Tempat-tempat yang dikunjungi South Kalimantan.

Accompanied by Ir. Eddy Purwanto, Ir. Rosita Galib, Ir. Yanti Rina,  
 Pengikut Ir. Abdul Basit.

Purpose of trip To finish an agroeconomic survey on secondary crop intercrops  
 Maksud perjalanan between tree crops, Interview with county head on double  
 cropping and irrigation.

Observations (factors requiring action, new items, etc.)  
 Hasil pengamatan (faktor-faktor yang memerlukan penanganan, hal-hal baru, dll.)

I first interviewed the county head on success of the new irrigation system in Tabuk River County for double cropping. He described a number of present difficulties:

- 1) unevenness of land, causing some areas to undergo flooding while others remain dry
- 2) shallow and/or uneven construction of field mounds or dikes promoting uneven water distribution
- 3) unstable construction of these mounds
- 4) lack of viability in high yielding rices (only 15-20% viable)
- 5) some asynchronous planting with attendant rat damage
- 6) inappropriate use of fertilizers and pesticides by farmers
- 7) farmer persistence in use of traditional logic which is not appropriate to modern conditions.

I also helped the agroeconomy group complete it's survey of Sungai Pinang Village.

Appendix III. B. 4

No. : TR-010  
To : AARP-GOI Project  
From : Greta A. Watson  
Subject : Presurvey to Pematang Panjang and Gudang Hirang Village,  
Tabuk River County, South Kalimantan.  
Date : January 24 and 25, 1984

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Party

Dr. Bernardo P. Gabriel  
Ir. Yanti Rina  
Ir. Eddy Purwanto

Purpose

Examination of fields and interviews with farmers were made to assess the potential for double cropping in areas outlying the Tabuk River irrigation scheme. The county head provided information on problems in rice agriculture.

Summary

The Tabuk River irrigation scheme regulates flooding and drainage through a system of high canal dikes and flap gates. Water can be supplemented by the Riam Karan Dam during dry spells within the rainy season. During the dry season, little water is available since it is needed for hydroelectricity output. The system is a water regulating rather than an irrigating one. Farmers within the system are able to grow two crops a year. Farmers outside the system but bordering it do not fare so well. During the construction of the dikes, natural drainage systems within the surrounding areas were cut off or detoured. The effect is that outside farmers now experience severe flooding (70 - 100 cm) which prevents them from transplanting their traditional rices to their fields. They are either forced to plant modern varieties with short growing seasons which can be harvested before water deepens, or in some cases plant nothing at all.

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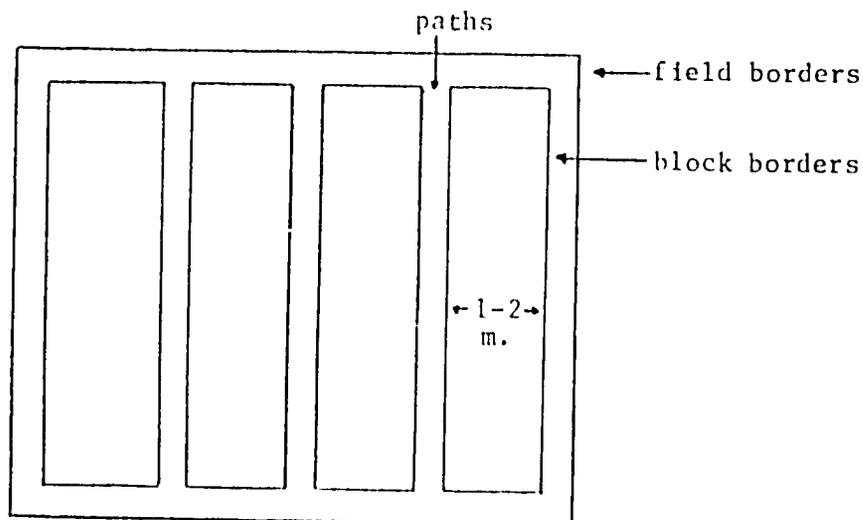
County Head Mr. Hadi Supian. The county head (camat) Mr. Hadi was receptive to our visit. He elaborated on some of the problems within the new irrigation system, and problems in implementing double cropping. He described these in terms of 3 areas : farmer implementation, government programs and environment. Problems in the environment include 1) unevenness of land, with which results in different water levels and some dry areas. There is some asynchrony of planting because of it; 2) individual variation in tertiary canals which promotes uneven water distribution 3) shallow, uneven, non-parallel or discontinuous construction of field mounds and foot paths and quaternary canals. They may not regulate water because porosity of mounds, inadequate mound height, or too high mounds which cut off water completely, 4) stagnant water.

Some of the above environmental problems are a product of farmer agricultural systems. Some problems are: 1) farmers build their quaternary canals according to land ownership and not environmental contingencies 2) farmers do not have adequate working knowledge of the function of irrigation networks. This extends to spread of fertilizer. If water gates are closed water will not flow and fertilizer can be spread and absorbed evenly. 3) farmers do not clear canals properly which impedes water flow; 4) soil management and preparation is still in initial stages, 5) there is inefficient and inappropriate use of insecticides and fertilizer, 6) asynchronous planting of rice is promoting more rat predation. Mr. Hadi stressed that 7) farmers had to be better informed of the economics and profit margins of the new double cropped rice culture since they were presently operating under the traditional orientation of "most profits - least risk".

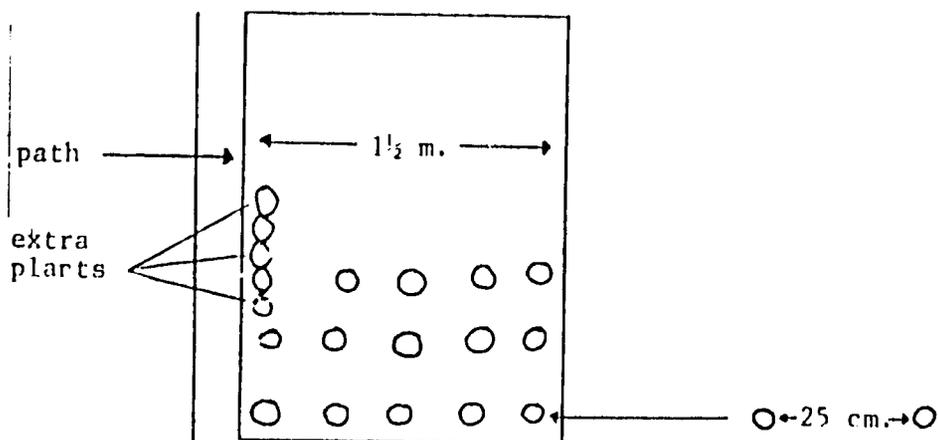
Some problems in government programs were also mentioned. It was evident that 1) government workers were overestimating potential yields in the system through sampling areas on the edge of fields rather than many areas in different microenvironments in the field. This lead to inflated expectations on the part of the farmers for profits; 2) high yielding rice seeds provided by extension agents this year were not properly preserved and only 15-20% viable; 3) farmers were not adequately informed of possible risks and drawbacks. One problem is the risk of submergence with too quick onset of rainy season. 4) complete credit and input packages are still lacking.

One new planting system which Mr. Hadi described and which we saw in the field was the "fence system" (sistem pagar). The basic system originates from Java but was initiated in Kertak Hanyar County, South Kalimantan by Pak Machrus. This system uses a block system of planting in fields with 50 cm cleared paths between each 1-2 meter or more wide block. Block length varies according to length of farmers' fields or other criteria. Rice plants are planted each 25 cm; however, the edges of blocks are planted more densely to compensate for the empty space between the rows. This method allows easier access to all parts of field for weeding, fertilization, spray, and harvest and greater accuracy in input distribution. The paths give farmers a place to compile weeds. Denser planting on block borders does not reduce yield and may provide an additional barrier to rat entry into the center of fields. See diagrams below.

Figure 1. The Fence or Block System of Planting Rice



Fence System



Close-up of Block

Group Farmer interviews in double rice cropping area, Gudang Hirang Village. Land in this area is type C, that is, water does not rise and fall with tidal influence, but drainage is affected. We first had an intensive interview with Mr. Bahrún, the farmers' group head for the area. He has been using modern varieties since 1976. He no longer uses C-4, B462C and IR28 because the taste is less than good, or IR38 because rice plants are still green after harvest and more difficult to control. He planted IR36 two times in one season in 1982, but this year has switched to IR50 which he says has a better response to insecticides. He uses an integrated system for rat control which includes the use of Klerat (anticoagulant) directly after harvest, Temek (systemic acute poison) in early rice development, and coordinated farmer group killing of rats in their nests (gropiokan) during rainy season. He does not use the plastic sheet fencing system due to its high costs and the adequacy of other methods. He said rats are already becoming shy of Temek baits. He uses Furadan for stemborer, and combats leafhopper by using resistant rices, Diazinon and Sipin. He uses the calendar system. The pipit bird ravages rice in its doughy or milky stages, and strings and bird scares are used to rout them. He uses 210 kg. urea and 175 kg TSP per hectare. He usually harvests almost 4 tons of clean unhusked rice per hectare except under severe leafhopper or other predation when yields are reduced to 3 tons/ha.

Farmers in the Suadaya farming group have three planting patterns: 1) modern variety - modern variety (two crops a year); 2) modern variety-local variety (2 crops a year); 3) local variety only (one crop per year). About 50% of farmers are planting twice a year. Farmers use a number of modern varieties including IR8, 36, 38, 42, 50, 52, 54. Most farmers plant IR36 and 38. Rice is seeded in October/November, final planted after 20-30 days, and harvested in February. The traditional variety undergoes sending in November and 2 transplants before final planting in March. It is harvested in August or September and yields about 2.5 tons/ha. Fertilizer is used only with modern varieties. Because modern varieties demand a low, controlled water level, many farmers cannot use them this year with its high water levels. Traditional crops are then used

exclusively. Tractors are sometimes rented for land preparation.

The primary problem which farmers cite is lack of water control. The farmers are outside the present irrigation system and experience the same problems mentioned earlier. Their natural drainage system was rerouted and drains the area slower than before. Much of the modern variety has already died in the field because of flooding. They mention that in rice field economics the situation is now very risky. They said that unlike coconut, rice does not provide an "old age pension" That is, it must be planted every year.

Farmers in this area are primarily tenant farmers: 75% of land owned is through owners who live outside of the village. Land can be "rented" for about 770 Kg. unhusked rice per hectare. The tenant can also divide his or her yield with farmer and receive 50-66% of rice for him or herself.

Pematang Panjang Village group farmer interview with farmers in double cropped area. Farmers in this village here recently begun to try double cropping (1982-83 season). Mr. Shuyud, the head of the farming group originally participated in the use of modern varieties under the Bimas program carried out in 1976-1977. PB8 was used. This project failed because of planthopper infestation and because there was no synchronous planting. Insecticides were not made available, although urea fertilizer was supplied.

The 35 farmers in Mr. Syuyud's group decided to plant a double crop of rice this year after seeing the results of other nearby farming groups who also double cropped. IR38 was planted last year. This year farmers are planting IR50 and 54 as well to compare yields. PPL agricultural technicians are very involved and consult with farmers each two weeks.

Farmers obtained seed from other farmers' groups. This seed was 80% viable. Farmers also obtain pesticides through their group but buy fertilizer individually.

Farmers make modern variety seedbeds in December, final plant after 3 weeks, and harvest in March-April. Traditional variety seedbeds are sown in January, transplanted twice, final planted in March-April, and harvested in July-August. Farmers note that pay scale for harvesting and planting labor is higher in March-April than July August. During

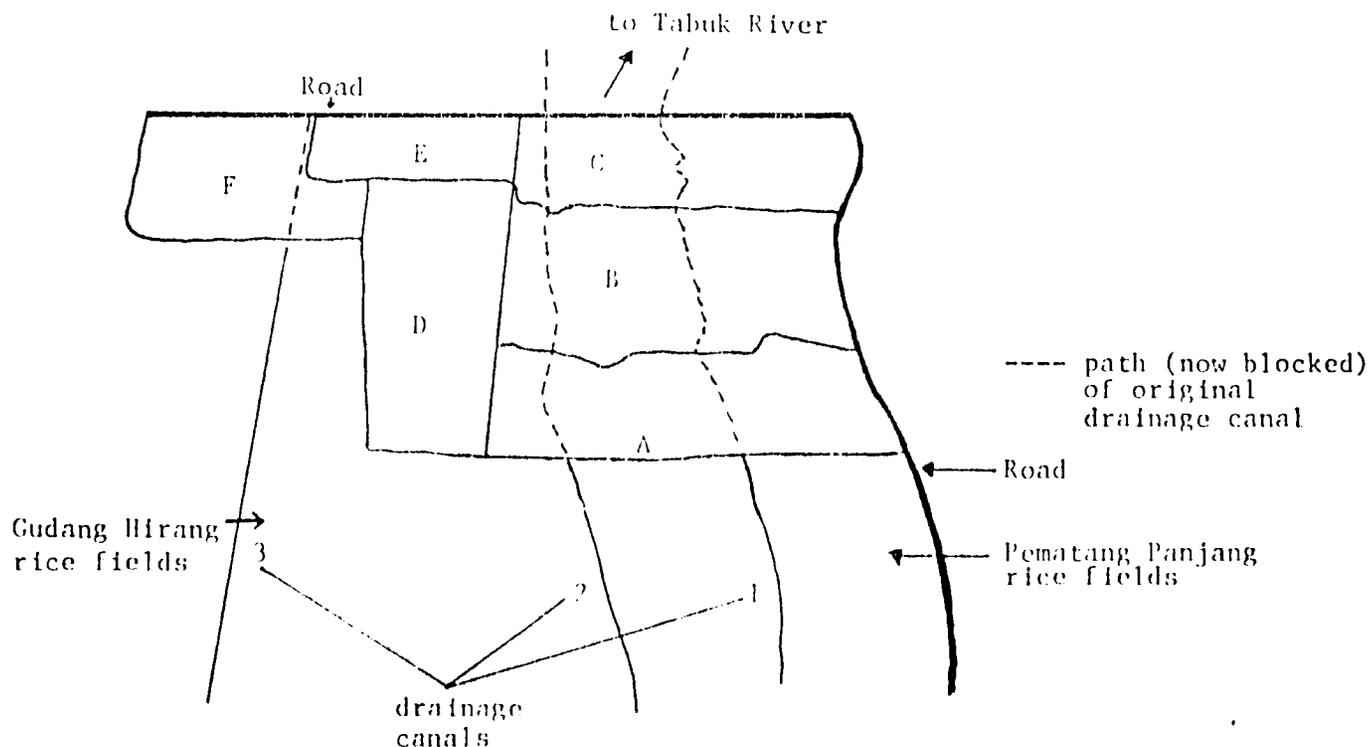
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this time, modern varieties must be harvested while traditional or modern ones are again planted. Rice is weeded once. Farmers see no difference in yields between traditional and modern varieties. Farmers use acute rodenticides in fields after planting (Temek) and Klerat anti-coagulants before planting. Gropiokan bush beating for rats is also practiced. Libacid is used to combat stemborer. Farmers concede that they often use any insecticide available, and if possible use the **calender system** of spraying. In case of tungro only spraying takes place.

Farmers who did not double crop were asked why they did not. Answers were varied. Farmers noted 1) in areas where many farmers did not double crop, rats would ravage the crops of the one or two that did; 2) that too great water depth precluded the use of modern varieties; 3) that systems of rental under a double crop system have not been worked out and the farmer may still have to pay the same portion of his or her crop to the land owner even though he or she must shoulder the added cost of fertilizer, seed and insecticides. Other farmers wished to observe the double cropping system longer to better determine its benefits and deficits.

Water control problems were more severe in Pematang Panjang than in Gudang Hirang.

Figure 2. Tabuk River Irrigation System and Outlying Areas



Farmers pointed out that, in a swampy area like this, they need a good drainage system. They had one, including two major canals (Figure 2, nos. 1 & 2) and one minor one. These, as well as a canal at Gudang Hirang (3) were completely cut off by the irrigation scheme (see picture of previous pathways). Drainage canals were routed to a point 5-7 km. away as compared to the original 1-3. This has caused such severe water backup in the rainy season that much of the outlying land has been flooded for the past 2 years during planting season. Some farmers have been able to borrow land from government agencies inside the network, but this amounts to only 1/7 ha. per. farmer. Since approximately 50% of the farmers in the area do not own their own land and rely on tenancies to survive, the situation is doubly bleak. Some farmers have reacted by seeking government help, but no immediate solution has been forthcoming. One farmer simply broke down the dikes to allow for drainage of his field and was severely reprimanded. Farmers estimate that over 1000 ha. of riceland has been adversely affected. Farmers entreated us for help, but we are not in a position to modify this problem.

#### Conclusions.

There are a number of agricultural problems, both environmental and technical, which immediately present themselves. Lack of water control has worsened as a side effect of the new irrigation project. We saw many of the problems described by the country head, Mr. Hadi. In addition, farmers need additional training and group work in farming practices. Land must be more evenly prepared. Instead of being left in fields, tungro-infected plants must be removed from field to prevent infection of further plants by planthoppers. Insecticide sprays must be adjusted to occur only if plants need it when insect counts are high. Temek, a systemic poison now used on rats must be discontinued and a new system of rat control relying to a greater extent on barriers and anticoagulents must be instituted. Flap gates should optimally be constructed to allow for drainage of outlying areas. Farmers must plant more synchronously. It is only when these methods are instituted that double cropping can proceed adequately and risk of failure can be reduced.

In future planning of irrigation systems, planners should take care that the successful water regulation in one area is not a detriment to another.

Appendix III. B. 5

No. : TR-011  
To : AARP - GOI Project  
From : Greta A. Watson  
Subject : Trip to Sungai Buluh and Hambuku, lebak and polder areas, South Kalimantan.  
Date : 28 January, 1984

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Party

Dr. Bernardo Gabriel  
Dr. Kevitt D. Brown  
Mr. R.G. Manuelpillai  
Ir. Sutami, MA.

Purpose

This trip was conducted to assess traditional agricultural techniques and other aspects of farming systems. Dr. Brown and Ir. Sutami evaluated the growth and characteristics of hundreds of deepwater rice plant lines. Dr. Gabriel collected insects and gathered data on pests in agriculture and Mr. Manuelpillai made inferences about soil conditions.

Summary

General Description

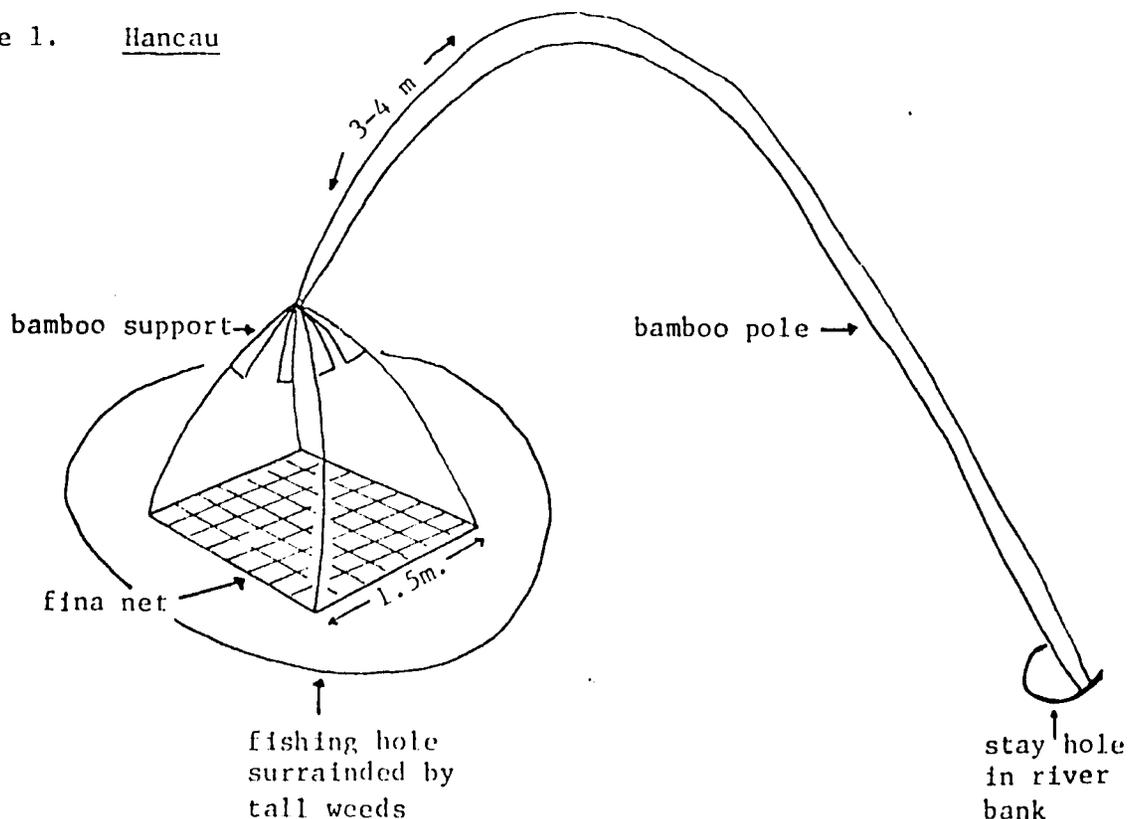
The sites visited were moderately deep to deepwater (80-200 cm) monotonous swamp sites which drain dry during the dry season. Farmers are presently able to grow only one crop of rice a year in these areas, either before prolonged onset of the rainy season or after waters recede sufficiently. This ensures that rice seedlings will not be flooded out. At the end of the rainy season or during the 'dry' season farmers may plant secondary crops in the old rice beds. When the depth of water makes it impossible to plant fields, farmers may farm in another district or seek employment as farm laborers, fish the "lake" that their ricefield has become, or turn to other activities. Very little land is used for tree cropping, as higher ground only exists along the sides of roads or on isolated mounds. The introduction of deepwater rice varieties to these areas has the potential to substantially increase

household economies by providing an extra crop of rice each year.

Sungai Buluh Village - Monotonous Swamp with Uncontrolled Water Conditions (Lebak)

An April 1983 trip to this site describes rice field conditions. During this month the fields have become a swampy flooded morass. Cassava and banana, coconut, bambu and water apple are planted along the roadsides. Water depth in fields is 1 meter at 17 meters from the roadside and becomes progressively deeper. Weeds cover most of the swamp lake surface, except along faster flowing deeper rivers. Many people were fishing using hancau by the side of the road. This tool (see below) is used to catch sepat and papuyu fish varieties. The hancau is lowered into a pool trap cleared of surface weeds. Fish swim over its surface and are captured when hancau is lifted. Gabus Toman, Siyam and biawan fish species are captured with poles or traps. Farmers obtain fishing rights the land they farm. Communal fishing rights obtain in the deepest sreas of the lebak where rice farming is not yet feasible. Many farmers depend on fishing for their livelihood, especially if their rice harvest was small due to pests and diseases.

Figure 1. Hancau



The farmers interviewed transplanted rice to lebak fields when the water receded in depth at the end of the rainy season. IR22 and Teringan, a local variety were said to produce 3.75 tons and 3.0 tons of clean unhusked padi per hectare in a good season. Last year the water receded rapidly and the dry season was moderately prolonged. Rat damage was higher than usual and both varieties only yielded about 2 tons/ha. Farmers mentioned that rat predation was the foremost problem in rice cultivation. Zinc phosphide baits are used along the edge of fields but rats can swim to rice fields and cut tillers. Plastic sheet fencing was considered too expensive for the average farmer to afford.

Another problem was inavailability of rice seed. According to one police officer, villagers had been promised improved, short-lived rices to plant at the beginning of the rainy season. This rice supply never came.

All farmers were interested in prospects for the use of deep-water rices.

Hambuku Tengah Village - Monotonous Swamp with Polderized and Partially Controlled Water Conditions.

Hambuku Tengah Village is located along the Buluh River. The area is extremely lowlying, but due to polders or water barriers (built 1952) in fields is 80-200 cm deep during the average rainy season depending on location. During the growing season, water depth is never more than 80-100 cm. Rice is seeded at the end of the rainy season in June, transplanted to fields and harvested in November or December, depending on variety.

Rice. According to Mr. Bastra, the village head, two major traditional varieties are used but high yielding varieties have not yet gained wide acceptance. The local rice Kencana takes 5 months to mature is 1.25 m tall, and yields an average of 2.25 tons/ha. Langkara rice is a 6 month variety which is planted in deeper water, is 1.5 m tall, and yields almost 3.5 tons/ha. Both types are first raised in a palai seed bed for 3 weeks, transplanted once for 7-10 days (ampak), in shallow water then final planted in fields when water recedes to 10-25 cm in July.

The ampak stage encourages individual plant rooting. Since lodging can reduce yields substantially in the Langkara variety (down to 2.0 tons/ha or less) planting in an early stage can firmly establish the crop. Late harvests can reduce yields through both flooding (in December) and rat predation (beginning in November). Farmers say two crops of shortlived rice cannot presently be grown (at end and beginning of rainy season) because of lack of rat control. Rice is synchronously planted and harvested in November and December. In 1982-83 there was no harvest because of early flooding in October/November.

Four types of rat control are frequently practiced : 1) zinc phosphide baits (predominant method), 2) plastic sheet fencing 3) gropiokan, or clubbing of rats in nests on higher ground during flood season 4) hollowed bambu pole traps (rats enter to sleep, tubes are emptied and rats killed by day).

There is almost no use of insecticide. Insect predation is minimal although there are rice bugs. Sepin and Diazinon are promoted by farm extension workers. The system of weeding is worth noting, since it is unlike that practiced in coastal swampy areas. Purun tikus, teratai/batang tanding, bundung, suntilang and kukusut/bulu bai are the predominant weed species. Weed control occurs in three phases. In April or May, long after harvest, when water is still high but beginning to recede, weeds are cut down to approximately 15 or 20 cm above ground level (babat/tebas) with a long machete. Cut weeds are allowed to lie on the surface of the water for one month. This accomplishes two goals : 1) cut weeds rot 2) remaining weed stems cannot regenerate since cut weeds form a cover which blankets out light. In June rotted weeds are removed to high border paths of field and the few regenerated weeds are pulled up by hand (menggulung). After rice is planted, weeding (merumput) may be carried out if ground does not become dry quickly enough to suppress weed regrowth.

Farmers mentioned that stagnant water promotes acidity. Overlying alluvial loamy layer is approximately 25 cm deep. A "bluish" layer containing weed root debris is said to extend to 100 m, and white/gray clay soils underlie this. Soils 3-4 meters under ground is "bluish-black"

and when dry develops crystals resembling salt. No plants can grow on it. Farmers maintain water is not very acid at onset of the rainy season.

Vegetable and fruit production. Vegetables are planted in June through August and survive using the residual soil moisture. They are planted along the sides of polder canals on the edges of rice fields, and in built up home gardens. Cucumber, eggplant, chili, green beans, squash, corn, and ubi Alabio (root crop) are sold at market. Cassava and bitter cucumber are also grown.

Ubi Alabio is a specialty of the lebak region. The plant has a viney leaf growth which resembles some sweet potatoes while the root is similar in appearance to cassava. It is reproduced asexually through planting of tuber pieces. One stake serves as a climbing stick for 5 or 6 plants. By 4-6 months it can be harvested. Ubi Alabio sells for Rp. 200 per kilogram - only slightly less than rice. Farmers like it because it remains fresh, without processing for 5 to 6 months after harvest, and yields up to 17 tons per hectare.

Tree crop production is minimal. Most fruit trees cannot survive prolonged inundation of their roots that occurs here. No rambutan, citrus, sawo, or jambu can be grown. Banana bears poorly: fruits do not fill adequately. Only mango species bear, and must be planted in the limited higher ground around houses.

Fish. Like Sungai Buluh Village, Hambuku Tengah becomes a fish producing village during the rainy season. Sepat, papuyu, gabus, sepat-siyam and biawan varieties are captured. Hambuku Tengah does not have high production, however.

Problems in village economy. At least 50% the 119 households in the village do not own their own land and are tenants. Original land owners have moved away from village. The system presently in use is the "divide yields" (bagi hasil) system. At harvest, the rice yield is divided so that the land owner receives 40% of the crop while the tenant farmer receives 60%. Tenant farmers retain 100% of their

vegetable production.

While rice is the major source of income in the village, production is not stable. Every planting season carries the risk that the crop will be destroyed by flooding before harvest. Farmers cannot fall back on tree crop production, and fish production is not too high. A large proportion of farmers and their families (especially tenants) migrate every year to other areas, especially the rice producing area of Palingkau, Central Kalimantan. Here they also work as tenant farmers and divide rice yields with owners. Over 40 farmers work as school teachers in surrounding areas.

Conclusions. Wet and marshy conditions during the greater part of the year preclude many work activities in the lebak and polder areas which are available to farmers in tidal or tidally influenced regions. Double cropping of rice using a deepwater rice with a local or high-yielding variety could provide a solution. This is because the alluvial, loamy soils are quite fertile.

## Appendix III. B. 7

No. : WR-013  
To : AARP-GOI Project  
From : Greta A. Watson  
Subject : Benefits and deficits of using tractors to till land in coastal swamp areas.  
Date : 2 February 1984

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### Purpose

To assess farmer perceptions on the practicality of tractor use in coastal swamp areas from an socio-economic and environmental perspective.

### Summary

Until 45 years ago the Tabuk River region was cropped for rattan and damar. Since then this inland coastal swamp region has been planted to rice. The soils are no longer peaty, but are clayey loams. Water depth in field at the height of the rainy season ranges from 50-100 cm. During the dry season fields are dry. Traditional land preparation includes the hoeing of land, slashing down of weeds, their compositing, and spread over and into the soil or transfer to the edge of the rice field. Recently farmers have been able to rent mini-tractors to till the soil. These tractors are used twice before rice planting: once in the dry season and again in the wet season before planting, when water is between 10 and 35 cm in depth.

Farmers have mixed opinions on whether tractors use is worthwhile. They are aware that it saves time in fields. They contend, however, that it may not always conserve labor at certain points in the cropping cycle since farmers must even out their fields after tractor use. They also think it does not profit them much. They content that money is saved in initial work. However, within-village sources of labor are reduced. Additionally, farmers say that the tractors now used make deep furrows in soil. This is opposite traditional methods which overturn about 15 cm. of soil. Deep tractor furrows bring less fertile soil to soil surface which may be more acidic. Although tractors mix rice straw and weed regrowth into soil, this does not provide the same fertilization

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a composted green manure. I inspected two adjacent plots planted by a farmer himself comparing differential effects of tractor use and traditional methods. All sprays and fertilization water control and planting methods (aside from composting or tractor use and weed incorporation) were the same. The rice plants in the traditionally prepared plot were far more fertile : greener, with more tillers and luxuriant growth.

The social and economic costs and benefits are presented below. These time and money figures are rough, and are meant to provide only a generalized picture of the two situations.

Problems with tractor furrowing may not necessarily preclude tractor use. Rather, tractor furrow depth should be adjusted or smaller power tillers used. These could be bought and controlled by the community instead of outside owned (presently the case). Soil analysis should be conducted to determine mineral makeup of overlying and underlying soil layers.

Land Preparation, Tabuk River County, South Kalimantan,  
Indonesia

Traditional Method			Method with Tractor		
Activity	Cost Per ha (\$US)	Time (days)	Activity	Cost Per ha (\$US)	Time (days)
hoeing	120	30	plowing/2x	120	2
slashing weeds	35	17	evening soil	35	17
composting and spreading weeds	10	10	pulling out weeds	6 ??	6
	165	57		141	25
amount paid to workers within area	165		amount paid to workers within area	41	

Additional cost of fertilizer application needed with use of tractor estimated to be a 2 times amount and cost without tractor.

Yields : Not available at present.





APPENDIX III. B. 10

Banjarmasin Research Institute for Food Crops : (BARIF)  
 Applied Agricultural Research Project

**TRIP REPORT**  
**LAPORAN PERJALANAN**

TR-016

This report must be typed or filled out neatly in longhand for all trips (field trips, meetings, congresses, etc), not exceeding 100-150 words.

Laporan ini harus diketik atau ditulis tangan dengan rapi dan berlaku untuk semua laporan (perjalanan dinas, rapat, kongres, dll.), tidak lebih dari 100-150 kata.

Name Greta A. Watson Department Agroeconomy  
 Nama Kelompok

Date of Departure 13 March 1984 Return 13 March 1984  
 Tanggal berangkat Tanggal kembali

Principal Locations Visited Alabio and Amuntai, Dinas Pertanian, Kecamatan Alabio,  
 Tempat-tempat yang dikunjungi South Kalimantan.

Accompanied by Ir. Abdul Basit, agroeconomy  
 Pengikut

Purpose of trip To listen to BARIF proposal for the 1000 ha. project in deepwater  
 Maksud perjalanan rice in lebak areas of South Kalimantan.

Observations (factors requiring action, new items, etc.)

Hasil pengamatan (faktor-faktor yang memerlukan penanganan, hal-hal baru, dll.)

This was the first time I as a BARIF consultant was informed as the deepwater rice project plans by BARIF. Plans are to supply farmers in 1000 ha. of lebak land with deepwater rice seed at little or nominal cost and let them take the risks for the projects success. This type of project has potential for success like any other. Over anxiousness to implement the project may, however, give farmers more sense of success that could actually be accomplished. Furthermore, planting strategies and schedules which are adapted to particular lebak and polder areas and their cropping systems must still be devised. Collected information from Mr. Rasdiono Paul, head of Dinas Pertanian. The project will be carried out in Alabio.

APPENDIX III. B. 11

Banjarmasin Research Institute for Food Crops : (BARIF)  
 Applied Agricultural Research Project

**TRIP REPORT**  
**LAPORAN PERJALANAN**

TR-017

This report must be typed or filled out neatly in longhand for all trips (field trips, meetings, congresses, etc), not exceeding 100-150 words.

Laporan ini harus diketik atau ditulis tangan dengan rapi dan berlaku untuk semua laporan (perjalanan dinas, rapat, kongres, dll.), tidak lebih dari 100-150 kata.

Name	Greta A. Watson	Department	Agroeconomy
Nama		Kelompok	
Date of Departure	15 March 1984	Return	15 March 1984
Tanggal berangkat		Tanggal kembali	

Principal Locations Visited	University of Lambung Mangkurat, Banjarbaru, South Kalimantan.
Tempat-tempat yang dikunjungi	Meeting with Dr. Ismet Achmatd, head of the Faculty of Agriculture and economist at BAPPEDA.

Accompanied by	-
Pengikut	

Purpose of trip	To inquire about Dr. Ismet's recent research on lebak deepwater areas of South Kalimantan. To talk about the current BARIF-BAPPEDA sponsored deepwater rice project for these regions.
Maksud perjalanan	

Observations (factors requiring action, new items, etc.)	
Hasil pengamatan (factor-factor yang memerlukan penanganan, hal-hal baru, dll.)	

Dr. Ismet Achmad, and his staff at Unlam is presently collection data from 55 counties in the lebak monotonous swamp region concerning food production, population and potential for deepwater rice agriculture. His preliminary data indicates that the Tapus village in Amuntai Tengah county, Kelampung village region and Daha Utara and Danau Panggang regions appear to have the least risk for a deepwater pilot project. He was surprised that the project planners have already chosen the Alabio region for the proposed project since it has a high risk of flooding and does not appear to be representative of the lebak region. Since the Hulu Sungai Utara district has definitely been chosen for the project, he would rather see it carried out in an area such as Tapus, which is representative, easily accessible, near a population center too. His ideas seemed well taken. However, project location has already been established and may be impossible to change. We will do our best to see that the program performs optimally wherever it is sited.

No. : TR-018  
To : AARP-GOI Project  
From : Greta A. Watson  
Subject : Consultation with Dr. Ismet Achmad, Director, Faculty  
of Agriculture, University of Lambung Mangkurat,  
South Kalimantan.  
Date : 15 March, 1984

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Summary

Dr. Ismet described the research presently being carrying out in lebak monotonous swamp areas of South Kalimantan. He contributed to the knowledge of the agriculture of lebak areas and their accompanying water conditions. He noted several representative areas of the lebak region.

Description

Dr. Ismet Achmad is presently conducting a general survey of 55 counties in the primarily lebak regions of Hulu Sungai Utara, Hulu Sungai Selatan, Tapin and Tabalong. The collected data will be used to determine the first, second and third priority areas for lebak development and will be analysed by the Department of Agriculture and Sociology and the Economic Census Division of the Faculty of Agriculture, Unlam. The data includes soils potential, potential area for deepwater rice, water, population, work, land ownership and general planting patterns. Data on land use (ha.) in each crop type, and area presently under rice intensification programs is also noted. Mr. Bob Hussien is in charge of analysis. All South Kalimantan lebak areas high water levels are below 3 meters.

Dr. Ismet noted that he has little detailed data on cropping systems or the seasonal use of labor. These areas should be covered by the BARIFF survey to be conducted.

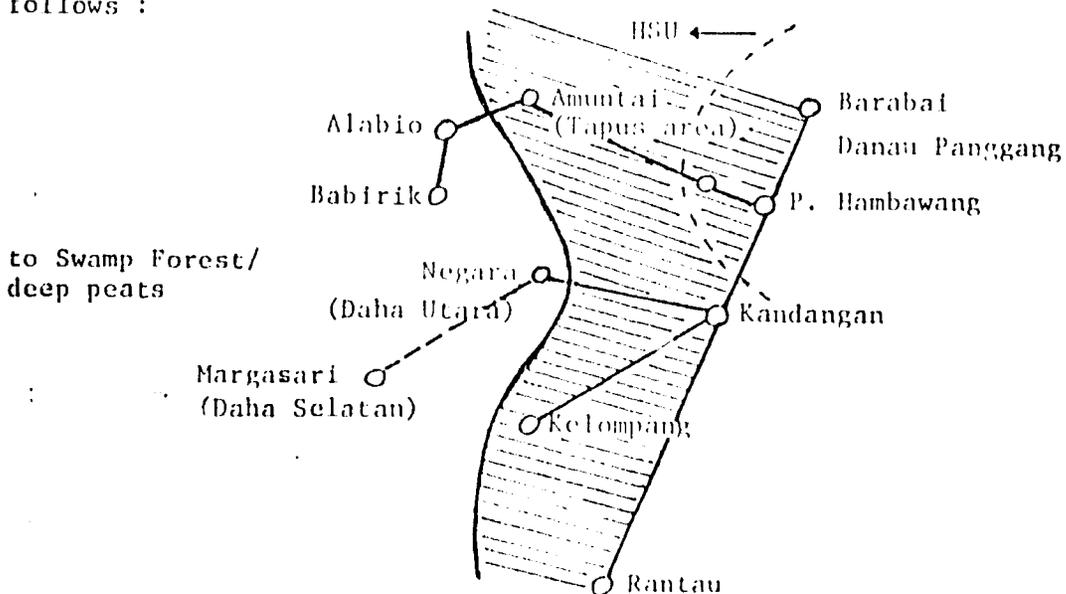
The province with the most lebak area is the Hulu Sungai Utara district. For the five kecamatan, the hectarage under lebak is as follows :

Danau Panggan	9694
Sei. Pandan (Alabio)	9509
Amuntai Selatan	1255
Amuntai Tengah	2954
Amuntai Utara	2044

Dr. Ismet stressed that in choosing a site for a pilot project or survey it is a good idea if that village or site satisfies certain requirements. Some of these requirements are :

- 1) representativeness. A survey site should stand as an example of the region which it represents. In the lebak area of HSU this would be a region which has moderately high water in the rainy season - not particularly deep or shallow.
- 2) accessibility. For projects as well as surveys it is important that sites be easy to get to by car or other vehicle. This insures that researchers can maintain observations of sites or with cooperators or informants.
- 3) nearness to population center. The more people visit a pilot project, the more they will be able to decide for themselves whether they want to adopt it.

Dr. Ismet then talked of some representative, accessible and populated lebak areas which BARIF agroeconomists might consider for our presurvey of lebak areas. He sketched a rough map of the HSU area as follows :



Hulu Sungai Utara District Lebak and Swampy Region

- Alluvial Area - not flooded
- Sawah timur area - east monsoon- little chance of flooding deeply
- Sawah barat area - west monsoon- deepwater flooding

He had originally suggest a study in the Tapus area in Amuntai Tengah county because it is representative, deepwater, and near the roads and population, and standing water is not above 2 meters. He also suggested that Daha Selatan county or Kelompok may also be good regions.

Dr. Ismet made some important points about previous agriculture in Daha Selatan and Kelompok (he comes from this region). In the 1940s and early 1950s this area was a gudang beras or big rice producing area. At that time, waters in the region were often 1½ meters in depth. However, production was often risky with a 75% change of success for west monsoon rice (sawah barat). He attributes part of the success to the fact that standing water at this time was only 1-1½ m for most years. This was due in part to some water control in the form of a canal between Negara, Kelompong and Margasari villages out to the Barito River. During the mid to late 1950s, this canal was allowed to erode. At this time there was also much forest cutting. Erosion of soil into canals cut down drainage in the area and the water table rose. By the end of the 1950's most of the land was abandoned in the wet season because water was too deep to plant rice : only 1 year in 4 was there a chance of harvest.

Dr. Ismet can recall a harvest in 1953 in the Daha Selatan region in Negara village. He says that the rices used were a 5-6 month very tall (not kneeing) variety which may have been almost 2 meters tall. It was harvested by boat (jukung). The rice was planted in October or November and harvested in February to April. At some times standing water could be 1-1½ meters deep. Much of this area is presently abandoned. He thinks that more information on this deepwater agriculture using tall rices is available. He suggests talking to older farmers in Kelompong village, in Kandangan area, and by inquiring at Dinas Pertanian the Kabupaten Hulu Sungai Selatan rice production reports for the 1950's and early 1960's. He was the head of a BAPPEDA team in 1977, who published a BAPPEDA report entitled.

Faktor-Faktor Strategi Pembangunan Pertanian, Kabupaten  
Hulu Sungai Selatan.

In conclusion, Dr. Ismet cautioned that the deepwater rice project scheduled for 1984/85 in Alabio may not be representative of the potential for success in other villages. He pointed out that in the Alabio area they

generally plant rice corresponding to the east monsoon (sawah timur). He was surprised a project area was not chosen where farmers could not plant in the rainy season. He mentioned that land now planted to rice in the dry season will have deeper standing water in the wet season than areas planted to corn or other secondary crops. Alabio is planted to secondary crops in the dry season. His suggested that sites chosen also must not be flooded in October or November. His immediate ideas for sites were Danau Panggan, Tapus village (Amuntai Tengah county), or Garis Village (Negara district) as well as perhaps Daha Selatan or Kelompang. This seems to suggest the BARIF agroecology should carefully select its site to correspond to the representativeness of the region. The villages Dr. Ismet mentioned or villages nearby seem to be good choices.

He also warned that pilot projects have to be large to be successful (eg. 500 ha or more) merely to offset the effects of rat predation.

I suggest we begin to work more directly with government agencies such as BAPPEDA to keep up communication and exchange of knowledge. It is only through concerted group effort that such projects as deepwater rices in lebak areas can succeed.



Appendix III. C  
Quarterly Activity Report by Dr. Bernardo P. Gabriel  
Entomologist  
January 1 - March 31, 1984

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A. Activities

1. Trips :

Twenty four trips were made during the quarter (see trip reports enclosed). Twelve of these trips were biweekly trips to two experiment stations Handil Manarap and Binuang, primarily for observations and taking of experimental data on crop protection experiments on rice and peanut. The other trips were on assessment of pest infestation in the different experiment station either as requested or part of a general survey of pests in the area and making the corresponding recommendations for solutions of problems encountered. One trip was made to Bogor for attending the cropping system conference.

2. Seminars and Conferences attended :

- a. Attended all BARIF Monday seminars and at the same assisted BARIF Staff presenting seminar on crop protection.
- b. Presented the following seminars to BARIF Staff
  - 1) "Sampling and Measurement in Insect Pest Management" - 23 January, 1984 - part of seminar series on research methodology coordinated by Ms. Greta Watson
  - 2) "Economic threshold level in Pest Management". - 19 March, 1984.
- c. Attended a Conference on Cropping System, sponsored by Agricultural Support for Transmigration at Cisarua, Bogor - February 27 -29, 1984.

3. Consultations and Meetings :

10 January 1984 - Balittan Bogo Staff on crop protection activities for purpose of cooperative activities with Balittan Banjarmasin. (with E. Ruhendi, Ir. Dandi Soekarna, Ir. Rochman, Ir. Tengkan, Ir. Suartini).

- 1 March, 1984 - Biotrop (Seameo Regional Center for Tropical Biology) staff - on pest management (Dr. Joedojono, Dr. Machmud Thohari, Mr. Kasno, Dr. Situmpil).
- 1 March, 1984 - Staff of National Zoology Museum - on insect and vertebrate identification (Dra. Noerdjito, Dra. Hanna, Dr. Kadarsan, and other personnels).
- 1 March, 1984 - National Agricultural Library - (with Dr. Sulastuñi Sophia).
- 2 March, 1984 - Tidal Swamp Project - (with Dr. I. Manwan, Dr. Collier, Dr. Effendi, Mr. McCauley, Mr. Knowland, Dr. P. Gejer, Mr. Sarimin, Dr. Rachman and Mr. T. Gula).
- 15-16 March 1984 - Dr. Mew (IRRI) and Dr. Yamamoto (Tropical Agricultural Research Center (TARC) - on diseases of rice during their visit to Banjarmasin.

4. Equipment and reprint acquisitions :

- Brought back from the Philippine the FARMCOP (an equipment for rapid and thorough sampling of insects on rice) obtain through the courtesy of Dr. Peter Kenmore, FAO Pest Management Advisor). This equipment is now fully operational for use in our rice experiments on crop protection.

Also brought back IRRI Kerosene light trap - for monitoring rice insects.

Reprints :

Through my request we received 200 publication on rice insects and crop protection in cropping system from IRRI, and 25 reprints from staff of the Entomology Department, University of the Philippines at Los Banos. We have now a sizeable reprint collection on insect pests, weeds and rodents. A good number of publications on rats come last quarter as per my personel request from the National Crop Protection Center of the Philippines.

5. Insect Collection :

Continue expanding collection of beneficial and pest species of arthropods and weeds for the Balittan reference collection.

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B. : Problems and Solutions

1. Lack of research funds and laboratory facilities. This has hampered some of our important research in crop protection and varietal improvement. For example we need more money for better rat controls. We have wasted a lot of our experiment to rat damage. There must be some ways of facilitating the acquisition of some equipments and supplies.

C. Future plan for the next quarter (April - June, 1984)

- a. Conduct more seminars on pest management
- b. Continue insect survey and conduct of research projects
- c. Prepare materials for pest identification for insect monitoring and surveillance in experimental tations.
- d. Assist Balittan staff in publications.
- e. Finalize the Master Plan for BARIF.

APPENDIX III. C. 1

Banjarasin Research Institute for Food Crops  
Applied Agricultural Research Project : (BARIF)

**TRIP REPORT**  
**LAPORAN PERJALANAN**

TR-019

This report must be typed or filled out neatly in longhand for all trips (field trips, meetings, congresses, etc); not exceeding 100-150 words.

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Name	Dr. Bernardo P. Gabriel	Department	Crop Protection
Nama		Kelompok	
Date of Departure	14 January 1984	Return	14 January 1984
Tanggal berangkat		Tanggal kembali	

Principal Locations Visited Handil Manarap Experiment Station (BARIF).  
Tempat-tempat yang dikunjungi

.....

.....

Accompanied by Ir. Muchlis, Ir. Mahrita Willis, Ir. M. Thamrin and Ir. Arif Budiman.  
Pengikut

Purpose of trip To observe and sample for insect pests and its natural enemies in  
Maksud perjalanan crop protection experiment.

.....

.....

Observations (factors requiring action, new items, etc.)  
Hasil pengamatan (factor-factor yang memerlukan penanganan, hal-hal baru, dll.)

- Insect Pests of rice observed :
1. white rice stem borer (Scirpophaga innotata) - adults, egg masses, larvae, medium infestation.
  2. rice leaf folder (Cnaphalocrosis medinalis) larvae, damage, adults light to medium infestation.
  3. leaf rollers, green leafhoppers, brown planthoppers - present but rare

- Natural enemies of rice insect pests observed predator :
1. Damsel flies : Ischnura senegalensis Rambu, Agrioenemis femina femina (Brawer) (Odonota, Coenagrionidae).
  2. Carabid beetles : ophionea incorea thunkerg, Ophionea ishii ishii Habu (Coleoptera, Carabidae).
  3. Staphylisid beetle : Paederus fusciper curtis (Staphylinidae: Coleoptera)

Trip Report

4. Luatu stridae : Limnogonus spp. (Hemiptera : Serridae).
5. Water scorpion - Ranatra sp (Hemiptera Mepidae)

Parasits.

6. Egg parasites of rice stem borer.

We also brought an IRRI designed lantern using resouce for fuel an insect light traps for testing at the station.



Trip Report  
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Agriopidae) and Ophionea nigrofasciata, (Carabidae, Coleoptera).

Corn - Very few infestations of the corn borer, Ostrinia furnacalis Guenée (Pyraustidae, Lepidoptera). Some natural enemies of corn pests like lady beetles, Menochilus sexmaculatus (Fabr.) (Coccinellidae, Coleoptera) were collected.



Interview with farmer in

A. Gudang Hirang

Rat is the foremost pest problem in the area. They control rats by fenceng with plastic and baiting. Bait use is Klerat.

Chemical insecticide used were Diazinon, Furadan, and Lebacid, for insect control. These chemicals were applied 2-4 times during the growing season .

Farmers recognize some natural enemies of insect pests such as frogs and ducks, but not the smaller arthropoda.

B. Pamatan Panjang

Control rats by baiting and beating. Rat poison used were Temik, Racumin and Klerat. They use Temik quite often although this is essentially an insecticide.

For insect pest control they either do calendar spraying or through economic level of pests. Extension workers help in determining economic threshold levels. Sprayers are usually borrowed from crop protection office. Insecticide used were Lebaycid, Diazinon and Furadan however also kills fish. They usually spent more in protecting improved variety from local variety.



APPENDIX III. C. 5

Banjarmasin Research Institute for Food Crops : (BARIF)  
Applied Agricultural Research Project

**TRIP REPORT**  
**LAPORAN PERJALANAN**

TR-023

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Name Dr. Bernardo P. Gabriel Department Crop Protection  
Nama Kelompok

Date of Departure 1 February 1984 Return 1 February 1984  
Tanggal berangkat Tanggal kembali

Principal Locations Visited Unit Tatas Expt. Station  
Tempat-tempat yang dikunjungi

Accompanied by Ir. Muchlis, Ir. Thamrin, Ir. Syaiful  
Pengikut

Purpose of trip To observe insect pest infedation on rice and other crops and  
Maksud perjalanan provide recommendation for solution.

Observations (factors requiring action, new items, etc.)  
Hasil pengamatan (factor-factor yang memerlukan penanganan, hal-hal baru, dll.)

Insect pest on rice : Very heavy infestation of black bug, Scotinophora vermiculata  
Voll. (Pentatomidae, Hemiptera). The affected rice plants appear yellowing.  
Several natural enemies were present including damselflies, carabid beetles,  
staphylind beetles and some hymenoptereterous parasite.

Recommendations : Infested plants may be sprayed with chemical pesticides such  
as Dimecron 50 SCW, or Lebaycid 550 DC.

Other observation : Rat damage was evident in spite of the plastic fence.

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Trip To Barambai  
Dr. Bernardo Gabriel  
11 Feb. 1984, page/2  
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according to the station leader Mr. Caswa Sulacman, is due to late planting, the rice plants' being drowned with water. There could also be some soil problem.

Angular leaf spot disease and were mites observed on cassava.

Banjarmasin Research Institute for Food Crops  
Applied Agricultural Research Project (BARIF)

**TRIP REPORT**  
**LAPORAN PERJALANAN**

TR-026

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Name	Dr. Bernardo P. Gabriel	Department	Crop Protection
Nama		Kelompok	
Date of Departure	21 February 1984	Return	22 February 1984
Tanggal berangkat		Tanggal kembali	

Principal Locations Visited Barambai  
Tempat-tempat yang dikunjungi

.....

.....

Accompanied by Mr. Thomas Gula, Ir. Thamrin  
Pengikut

Purpose of trip To observe pest infestation and assess rat problem.  
Maksud perjalanan

.....

.....

.....

Observations (factors requiring action, new items, etc.)  
Hasil pengamatan (factor-factor yang memerlukan penanganan, hal-hal baru, dll.)

Rice : Rice plants are in different growth stages from the seedbed to harvest. Insect pests observe were rice stem borers, rice bugs, rice leaf folder, black bug, and various species of grasshoppers.

Natural enemies of pests found in abundance were various species of spiders, ichneumonid parasites, carabid beetles, staphylinid beetles, damselflies and dragon flies.

Disease of rice observe were rice blast, Helminthosporium leaf spot, and probably cercospora leaf spot.

There were evidence of rat damage although rat trap set at night did not yield any catch.

Other observations : There seem to be some chemical toxicity in the soil as evidence by poor growth of plants and brownish deposits could be seen not the lower part of vegetations reached by water levels. The plants who appear brownish just like the water in the canals and paddies.



Trip report to Tanggul  
Dr. Bernardo P. Gabriel  
25 February 1984  
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fungicide for anthracnose container.

For citrus, natural enemies are abundant which feed, on aphids, scale insects, and other pests of citrus. The use of chemicals is not advisable on aphids. If virus occurs the plants have to be removed as it declines and then change to a virus free stock if possible.

Appendix III. C. 11

No. : TR- 030  
To : AARP-GOI Project  
From : Dr. Bernardo P. Gabriel  
Date : 27 February - 3 March, 1984  
Subject : Trip report to Bogor and Jakarta

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Accompanied by : Mr. Thomas Gula

Purpose

To attend Cropping Systems Conference and to visit institutions and people involved in crop protection research and related subjects.

Notes and Observations

1. February 27 to 29, 1983

Attended Cropping Systems Conference, "Penelitian Pola Usaha Tani Menunjang Transmigrasi" sponsored by the Agricultural Support for Transmigration (Proyek Penelitian Pertanian Menunjang Transmigrasi). This was held at Cisarua, Bogor.

About seventy to a hundred peoples attended the conference of which 30 papers were presented on the following subjects :

- 1) Results of cropping system research in different localities
- 2) Soil management in transmigration area
- 3) Pest and disease management in cropping systems
- 4) Agroecosystem research
- 5) Agricultural economics

During the last day of the conference the participants were divided into two groups to discuss the two types of cropping areas namely : upland and tidal swamps. After the discussion in each group, a plenary session was held to discuss the recommendations of each group.

As a whole the conference was successful. It was also very informative and provided opportunities to exchange ideas and

with fellow researchers related to cropping systems and pest management.

2) March 1, 1984

Visited the following Institutions 1. BIOTROPS (Scameo Regional Center for Tropical Biology). At this center we meet the following personnels :

- a) Dr. Ir. Joedojono Wiroatmodjo - Tropical Pest  
Biology Manager
- b) Dr. Machmud Thohari - Weed Scientist
- c) Mr. Kasno - Entomologist
- d) Dr. Dana Manalad Situmpil - Publication Information  
Officer

We discussed some aspects of their pest management program and the possibilities of having some weeds we collect in Kalimantan identified. We also talk about attendance to the Weed Science Symposium in April. We were given a list of their publication and we were able to acquire a copy of the Proceedings on a Pest Ecology and Pest Management and a photo copy of some their training material on rat control.

3) National Zoology museum

Meet the following people :

- a) Dra. Woro A. Noerdjito - Entomologist (specialist on  
Chrysomelidae: Coleoptera)
- b) Dra. Anita Hanna - Entomologist (specialist on a  
quarter insects)
- c) Drs. Samporno Kardarsan - Acaralogist and formerly  
head of the museum.
- d) Dr. Adisoemarto - Head of the zoology museum.
- e) Two other personnels of the museum whose names I  
forgot.

We look at their mammal collection especially some species of rats and then Tom Gula went to the bird collection and I went to the insect collection. We discussed also about the possibilities of their helping us identify some of insect species that we collected in Kalimantan.

W

4) National Agricultural Library

I was ably assisted by Dra. Sulastuh Sophia in search of pertinent references I needed for some of our studies in crop protection. I was also given a list of their serial holdings which will enable us to select periodicals whose table of contents we need to be send photo copies of regularly, so that from these table of contents we can request also the particular articles we need for our research.

5) March 2, 1984

We were invited by Dr. Ibrahim Manwan, Secretary of AARD to a meeting discussing the research proposals for tidal swamp to be funded by USAID. The meeting was attended by the following people Dr. Manwan, Dr. S. Effendy, Dr. Bochari Rachman, Dr. Putu Gejer, Dr. William Collier, Mr. Tairan Sarimin, Mr. David McCauley, Mr. William Knowland, Mr. Tom Gula and myself.

The discussion centered on reviewing the titles and integrating and regrouping the different proposals according the different proposals according to agricultural type and commodity. Unfortunately I was not able to finish attending the meeting since I have to leave for Jakarta in the afternoon.

In Jakarta, I met Mr. Carl Fritz, RMI Administrative Specialist.

Banjarmasin Research Institute for Food Crops  
Applied Agricultural Research Project : (BARIF)

**TRIP REPORT**  
**LAPORAN PERJALANAN**

TR-031

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Name Dr. Bernardo P Gabriel

Department Crop Protection

Nama

Kelompok

Date of Departure 20 March, 1984

Return 20 March, 1984

Tanggal berangkat

Tanggal kembali

Principal Locations Visited K.P. Unit Tatas

Tempat-tempat yang dikunjungi

Accompanied by Ir. Mukhlis.

Pengikut

Purpose of trip To examine disease problem on rice and make the necessary

Maksud perjalanan recommendations.

Observations (factors requiring action, new items, etc.)

Hasil pengamatan (factor-factor yang memerlukan penanganan, hal-hal baru, dll.)

Local varieties and Mahakam were affected by two fungal diseases namely :

Helminthosporium leaf spot and leaf scald (Rhynochorporium oryzae Hash. & Yok.).

Leaf scald appears to be quite damaging affecting 30% of the rice plant seriously and is present in about 75% of the total rice areas planted at the station.

Recommendations : The following fungicide whichever is available may be used for rice plants not yet badly affected. Benomyl, Thiram, Mancozeb-benomyl, mancozeb, Triphenyltin acetate, captafol, and edifenphos.

Seriously affected plants should be cut and burned.

Banjarmasin Research Institute for Food Crops  
Applied Agricultural Research Project : (BARIF)

**TRIP REPORT**  
**LAPORAN PERJALANAN**

TR-032

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Name <u>Dr. Bernardo P. Gabriel</u>	Department <u>Crop Protection</u>
Nama	Kelompok

Date of Departure <u>26 March, 1984</u>	Return <u>26 March, 1984</u>
Tanggal berangkat	Tanggal kembali

Principal Locations Visited K.P. Tanggul.  
Tempat-tempat yang dikunjungi

Accompanied by Dr. Kevitt D. Brown, Ir. Sutami, MSc, Ir. Nasrullah, Ir. Thamrin  
Pengikut and Ir. Syaiful.

Purpose of trip To observe pest infestations on rice and follow up recommendations  
Maksud perjalanan for fruit trees.

Observations (factors requiring action, new items, etc.)  
Hasil pengamatan (factor-factor yang memerlukan penanganan, hal-hal baru, dll.)

**A. Rice**

In the varietal improvement experiments a considerable portion of the plots were destroyed by rats. Sampling by sweep nets in and around the experimental plots yielded a high population of green leafhoppers (*Nephotettix* spp.) and a few adults of the yellow rice stemborer. Yellow rice stemborer white head damage were also prominent in the plots.

In other rice areas bird, damage to rice panicles was also quite alarming.

Slight incidence of leaf scald was also noticed.

**B. Fruit Crops**

Mango trees were recovering but the rambutan trees were still yellow and there was no noticeable change.

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Trip to Tanggul  
Dr. B.G. Gabriel  
26 March, 1984  
page/2  
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Suggestion and recommendations :

1. A more durable rat fence consisting of galvanized iron and wire nettings should be constructed to protect plants in the different experiments.
2. Protection from bird must be done by hiring or assigning an individual to scare them away.
3. Continue monitoring of insect populations by light trap and sweep nets for any change in activity that may result in serious damage.

1. FIELD ACTIVITIES

Visited the BARIF Experimental Farms established on swampy areas, influenced by direct and indirect tidal flows at Handil Manarap, Belandean, Tatas, Barambai and a varietal screening trial established in a transmigrant settlement at Sungai Buluh, and examined the performance of the on-going experiments with respect to soil amendments (fertilizers) and it was observed that responses to P and N applications are visible, but not for K applications. The surface soil measured by a field pH meter ranged from 4.0 to 5.0, while the flood waters tested by universal indicator paper ranged from 5.0 to 6.0 pH. The low soil pH suggests that we consider cultivating paddy strains tollerant to Al and Fe. The water levels between sites ranged from 25 cm to 125 cm, suggesting that the level of water is also a serious factor worth consideration. In addition, if maximum yearly out-puts are targeted, then two crops of paddy should be cultivated, an early maturing (110 to 120 day) variety in the wet season, and a twice transplanted long duration 7 to 8 months to indigenous variety in the dry season. A quick test of the top soil treated with hydrogen peroxide in the laboratory indicated that the farms at Belandean, Tatas and Barambai will be classed under the group of potential acid sulfate soils. At Tanggul Farm manggo, citrus and rambutan trees have been intercropped on the ridges, adjoining the paddy fields, where water has been impounded. The rambutan trees did show yellowing of the lower or older leaves, indicating a translocation of nutrients to the younger leaves. The soil adjoining the roots were observed to be gleyed. The Farm Manager was recommended to cultivate the soil with a hoe (cangkul) after a sprinkle of lime on the surface. This operation will assist in aeration of roots, and amend Al toxicity.

Considering the complex problems associated with the management of acid sulfate soils, a proposal for the establishment of a benchmark site has been submitted to the Director, BARIF, for his perusal.

A visit to the Farms established on the up-land areas, at Pelaihari and Barabai cultivated with corn, soybean, peanuts, and cowpeas and grown under rainfed conditions were performing well. However, their yields could be improved with the application of a balanced N, P, K and Mg formulation, subject to preplant soil test data, integrated with high yielding cultivars and good crop husbandry. It was observed that the pulses were well nodulated with native rhizobia, which factor is worth serious consideration while recommending N doses for leguminous crops.

## 2. LABORATORY ACTIVITIES

The 'Soils' laboratory at BARIF is equipped to determine pH, Ec, N, P and K. The pH and Ec instruments are battery operated, and are observed to read in error, with a drop in voltage. The sensitive weighing scale too needs a service, as it had remained idle for nearly 9 months. The laboratory has now been remodelled in a small way to ensure the determination of more reliable and duplicable analytical data. We do hope to purchase some equipment, and glassware available ex-stock, in Jakarta or borrowing them thru' the courtesy of the Director, Center for soil research, Bogor.

## 3. CONSULTATIONS

Visited the Agricultural University Wageningen in the Netherlands and discussed cordially with the Soil Scientists and Agronomists -- Dr. Ir. P.M. Driessen, Pons, Sombroek, van Mensvoort, Dosterbaan, Wim Andrisse and others, on their experiences and problems associated with acid sulfate soils, in the Netherlands and in South East Asia. The Agro-Scientists at the University expressed great interest in actively participating with our proposed soil-water-plant systems studies, and sharing an information match. It is quite probable that with time we hope to establish linkages, if agreeable to the Director, BARIF.

#### 4. PROPOSAL.

A proposal on the establishment of a benchmark primary site on a probable Sulfic Tropaeuets, at Unit Tatas, South Kalimantan, (See annex I).

#### 5. ACTIVITIES PLANNED FOR 1984/85

- i. Establishment of a Plant & Soils Laboratory at BARIF.
- ii. Site characterisation of 3 BARIF Farms.
- iii. Twenty-six agro-management experiments have been planned to be installed in the year 1984/85, among which 15 will be installed in the dry season, and 11 to be installed in the wet season.
- iv. Water management studies.
- v. Seminars and On-The-Job training. (See annex II).

#### 6. SUGGESTIONS

In order to optimise transferable information generated from our agromanagement experiments, the sites will have to be characterised by standard analytical methods. In addition, preplant and post harvest soils, plant tissue and water samples will have to be analysed in a routine manner. This necessitates the establishment of a well equipped 'Soils and Plant' laboratory at BARIF. We do understand the delay in the procurement procedures, and the waiver requested from US/AID to have them purchased locally. However, delays are inevitable, considering the bureaucratic procedures. In such instance it is suggested that RMI consider advancing funds for the purchase of Laboratory Equipment in Jakarta available ex-stock, and have them re-imbursed thru' US/AID, at a later date. RMI should also be prepared to advance funds to a maximum of US \$ 2000.00 to BARIF for conducting agromanagement experiments, in the event a delay is envisaged by BARIF, due to GOI administrative lags, provided such a request for funds is covered by a loan receipt from the Project Leader, BARIF. In other words RMI operate a contingencies or special fund to an upper limit of US \$ 5000.00, to accommodate similar requests.

APPENDIX III. D. 1

Banjarmasin Research Institute for Food Crops : (BARIF)  
 Applied Agricultural Research Project

**TRIP REPORT**  
**LAPORAN PERJALANAN**

TR-033

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Name R.G. Manuelpillai Department Soil Science/Agronomy  
 Nama Kelompok

Date of Departure January 21, 1984 Return January 21, 1984  
 Tanggal berangkat Tanggal kembali

Principal Locations Visited K.P. Handil Manarap & K.P. Pleihari  
 Tempat-tempat yang dikunjungi

Accompanied by Ir. Mauliana, Counterpart & Dr. Bernardo P. Gabriel  
 Pengikut

Purpose of trip i. Site orientation  
 Maksud perjalanan ii. To examine and evaluate the progress of the on-going agro-management experiments.

Observations (factors requiring action, new items, etc.)

Hasil pengamatan (factor-factor yang memerlukan penanganan, hal-hal baru, dll.)

At K.P. Handil Manarap : The on-going fertilizer trial established under medium submerged conditions, with paddy cultivar Mahakan (a recent release) are in their panicle emergence stage of flowering, and show response to P and N application, and a slight response to Sulphur applied as Gypsum. The water level is at 25 cm. The field pH of top soil and water are 4.8 and 6.0, respectively. The paddy plants are not showing any toxic symptoms. Rat control is good.

The farmers (neighbourhood) have transplanted with paddy, IR50 (PB 50) and fertilized with P and N and are in their milk stage of grain development, uniform stand and performing well. IR50 appears to be a very promising culture.

At K.P. Pleihari : The maize cultivar screening trial is in progress, and the plants are in their dough stage of ear development, and are performing well. The blanket application of P and N appear to be adequate, however inclusion of K may probably improve their performances. The differences observed between plots appear to be

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## Trip Report

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a treatment effect (cultivar)? The upland paddy screening trial had been direct seeded, and are 2 weeks old. Borer damage is observed, seed treatment with dithate M45, and a sprinkle of furadan may probably have prevented borer damage. Response to K could be expected. Soil erosion is observed, providing deeper drains may have arrested erosion. Crop husbandry has to be improved. The low land paddy screening trials, grown under submergence is standing well. Leaf tips were observed to dry, probably a salt effect. A detailed soil characterisation will probably surface this effect.

10/1



## Appendix III. E. 1

No. : TR-035  
To : AARP-GOI Project<sup>o</sup>  
From : Thomas Gula  
Subject : Trip Report to Gudang Hirang village and Sungai Pinang  
village, Sungai Tabuk area, South Kalimantan.  
Date : 16-20 January, 1984

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### Participants

Greta A. Watson  
Ir. Rosita Galib  
Ir. Eddy Purwanto  
Ir. Yanti Rina  
Ir. Abdul Basit

### Purpose

To collect rat specimens as part of a continuing survey of rodent pests in South Kalimantan; to observe current traditional methods of rat control.

### Summary

#### Gudang Hirang Village

Two separate areas of padi fields which were reported to have active rat damage were baited with 24 snap-traps, 12 traps in each area. A total of three rats were collected, with specimens prepared of two. All appeared to be Rattus argentiventer. Farmers reported that tikus agas, a small rat was not a problem in their fields until October. The area trapped is not tidally influenced, and is planted with both a high-yielding variety, IR-30, and a traditional variety. The HYV was in the heading stage, and visual inspection for cut tillers revealed some heavy rat damage, with many rat burrows observed in adjacent dikes. Farmers reported that rats severely damage the HYV, but don't damage the traditional 10-month variety. To combat rats, many farmers had erected plastic rat fences, about 20-30 cm tall, around entire padi fields. Some tiller cutting was observed inside these rat fences, but other fields appeared to be undamaged.

A study of the efficiency of these plastic rat fences should be conducted, comparing percentage of cut tillers in fenced versus unfenced areas.

When questioned about their use of rodenticides, farmers reported dissatisfaction with Klerat, the anticoagulant distributed to farmers by the government. Farmers apparently are distrustful of Klerat's effectiveness, since it does not kill rats quickly. One farmer was observed applying a chemical to his fields combat rats. This turned out to be a mixture of rice and Temik a potent insecticide. Spoonfuls of poisoned bait were deposited at burrow entrances. Farmers are no longer able to purchase zinc phosphide, so are turning to Temik as an acute poison which can kill quickly and produce visible dead rats. The use and effectiveness of Temmick as a rat control poison in ricefields should be investigated.

#### Sungai Pinang Village.

A total of 24 snap-traps were set for one night in a tidally influenced mixed cropping system that was reported to have numbers of rats. The traps were set along dikes amidst fruit trees and secondary crops such as cassava and taro. Only one rat was collected and prepared, and adult Rattus argentiventer. Visual inspection of the area did not reveal much rat damage. Of interest was the high number of squirrels (tupai) observed in coconut trees. One specimen was brought to me that a farmer had collected in a wire live trap. Squirrels were reported to be a severe pest in coconut trees, damaging large numbers of immature nuts. Farmers set traps in an attempt to reduce their numbers. It is unclear how effective this is, or how severe a pest squirrels are on coconut production.

Appendix III. E. 2

No. : TR-036  
To : AARP-GOI Project  
From : Thomas Gula  
Subject : Trip report to Gudang Hiranng village, Sungai Tabuk area  
Date : 13-14 February 1984

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The purpose of this trip was twofold : 1) to observe and record rat damage to rice near harvest, and 2) to photograph rat damage and the plastic rat fences used by farmers to control rats. Four rice fields in the Gudang Hiranng controlled irrigation area were surveyed for rat damage using the cut-tiller counting, known as the diagonal method, developed by Malaysian workers. All fields were IR-50, about two weeks prior to harvest. Almost all HYVs varieties in this area of Gudang Hiranng were protected by plastic rat fences. 25 rice hills were selected on a diagonal in each field, and all cut, uncut, and ripe tillers recorded. Though per cent damage has not yet been computed, those fields farthest from a line of coconut trees and secondary crops appear to have suffered little rat damage, while those closest to this secondary vegetation appear to have been damaged most.

Flocks of Burung pipit (Lonchura spp.), small finches that attack ripe rice panicles, were very numerous. Farmers throughout the area were observed to minimize bird damage in several ways : 1) children stationed in huts in the rice fields shout at approaching flocks, which usually scares the birds from the immediate area, 2) an elaborate system of rope and string throughout the padi connected to large rock-filled cans placed on poles; children guarding the fields pull on the ropes, causing the rock-filled cans to shake, making noise and scaring away birds, and 3) used audio cassette tape is strung between poles in the field. When this taut tape is vibrated by wind, a buzzing sound is produced which scares birds.

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Thomas Gula  
consultant/RMI

3 March 1984

Rat Control and the Introduction of Deep Water Rice in  
South Kalimantan

The Ricefield Rat, Rattus argentiventer, is a serious pest of rice in both tidal swamplands and upland areas of South Kalimantan. Any attempt at the development of deep water (lebak) areas for rice growing must take into account the potential of serious damage to these newly planted areas. Little is known about the biology of rat populations in these South Kalimantan lebak areas, but conversations with Mr. Mark Bordsen (former consultant, BAPPEDA Banjarmasin) and Dr. Kevitt Brown (consultant, AARP/BARIF) indicate that rats are serious pests. Any attempts at controlling rat populations through chemical or other means require a thorough understanding of their biology and ecology in the lebak.

It is our ignorance of even the basic biological and environmental relationships that influence the size of rat populations in lebak that calls for caution in attempting large-scale rice field development and double cropping. Such characteristics of rats as the age of sexual maturity, gestation period (the time from conception to the birth of babies), the number of babies and their

life span have been shown in other studies to be extremely influenced by environmental conditions, especially the amount of food and shelter. Many lebak areas now grow rice in the dry season. For those areas that do, the introduction of double cropping by planting floating rice in the wet season will mean a constant year-long supply of rice plants for hungry rats. Rat populations can be expected to increase in response to this double harvest of rice. A knowledge of how rats move through the area is also important in any control program; in the case of lebak, we need to understand how well rats can move from uncultivated to cultivated areas.

All of these are data on basic biology, which can only be accurately achieved by carrying out small-scale field studies. An area of 20-50 hectares of ricefield would serve as a good first-year pilot study. Within this area, rat control techniques using currently available materials should be tested. With rodenticide treatments, such problems as the number and placement of baits, the type of bait and the timing of baiting need to be investigated. The unpredictability of flooding in these lebak areas will probably make rodenticide treatments necessary soon after planting any deep water rices. We will only be sure of questions such as these, and how they can be used by farmers, through carefully planned experiments.

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APPENDIX IV

QUARTERLY ACTIVITY REPORT FOR THE AARP/RMI SPECIALIST AT THE  
GONDOL SUBSTATION FOR INLAND FISHERIES

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QUARTERLY REPORT  
1 JANUARY TO 31 MARCH 1984  
W.E. VANSTONE  
GONDOL

GENERAL

A. HOUSING

The few errors in construction of our house have been partially corrected and apart from an invasion of coconut rats in the attic and goats in the yard the house and grounds suite our needs perfectly. Total cost to end of March was Rp. 10,505,280,-

A six bedroom mess for staff housing is under construction and two guest houses are planned at the laboratory site. Until the mess is completed most of the staff continues to live in Singaraja and commute occasionally to Gondol.

B. PRESENT PROBLEMS

1. Budget

Mr. Alie Poernomo must have obtained some operational monies in early March as I have not paid for operation and maintenance of the generator or pump since late February. Also a 6 meter diameter fish tank has been purchased and it together with a similar tank installed, a few lengths of PVC pipe was purchased as well as some poultry pellets for use as fish feed. The red jeep belonging to BBAP has been made operational and some office furniture has been purchased.

To date there has been no budget to : install an adequate sea water system to the present fish holding facilities; purchase broodstock fish from the local fishermen (except for Rp. 25,000 in December); or to purchase proper fish feeds, aeration stones, anaesthetics, hormones, etc.

C. FUTURE PROBLEMS

1. Sea water system to new laboratory

I have informed Mr. Tadjuddin and the contractor who is constructing the new complex that I believe the sea water intake and distribution system could be improved by :

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- a). Moving the sea water intake from the west side of the peninsula to the east side and thereby shortening the intake lines across the reefs from about 500 meters to about 50 meters;
- b). Eliminating the planned relatively small header tank and installing a continuous flow system with the distribution system to the tanks linked directly to the pump. If discontinuous flow is required in any one fish tank then the valve to that tank can be closed or opened at will;
- c). Increasing the intake line to at least 15 cm diameter, the main distribution lines to 10 cm, and the lines to each group of 10-1 cm valves to 5 cm. Installing a single 1 cm valve to each tank up to 2 meter in diameter 1 meter deep and 2 or 3 - 1 cm valves on larger tanks;
- d). And by duplicating the intake, pumping and distribution system so that one system will be operating while the duplicate system is filled with fresh water. If the 2 system are alternated on a weekly basis marine growth, which will quickly plug a single system, will be almost eliminated.

## 2. Cage culture

It is probable that we will have to locate sea water cages for culture and rearing and for holding broodstock fishes elsewhere than at Gondol. On the west side of the peninsula the reef which dries at low tide is about 500 meter wide while on the east side it is about 50 meters wide while on the east side it is about 50 meters wide. Cages will have to be located in waters at least 3 meters deep outside the reef. From September through mid March the winds and wave action on the west side was very strong and violent but one suitable location for cages on the east side was very calm. In mid-March the winds shifted and the east side is now becoming quite rough.

## 3. Brackish water culture

It is planned to construct fish ponds about 15 km west of Gondol. The area is semi desert and salt is presently being produced there. Mr. Tadjuddin has informed me that he will be doing brackish water fish

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culture and artemia culture in the ponds.

#### 4. Research project administration

For fiscal 1984/85 three research proposals to be centered at Gondol have been approved. There are :

- 1). Surveying the north coast of Bali for adult milkfish and fry through out the year; 2) Breeding and rearing prawn, artemia culture and plankton culture; and
- 3). Breeding finfishes and rearing the larvae to the fry stage. At present 4 researchers, excluding Mr. Tadjuddin and myself and an absent station head, are at Gondol, Mr. Achmad Sasmita and Mr. Agus Priyono are assigned full time to above project 1). Mr. Tadjuddin, Mr. Adi Asmara Giri, Mr. Tridjoko and Mrs. Titiek Aslianti have been assigned full time to project 2). Mr. Agus Priyono, Mr. Tridjoko and myself have been assigned full time to project 3). above.

Each of the 3 projects are full time year round projects and require one or more full time researchers.

#### D. NON PROBLEMS

Two new large generators arrived in late March to replace the two small generators we have been using. They were installed immediately and are now operating. They will be adequate for our needs in our temporary facilities. Thank you very much.

#### EXPERIMENTAL

Due to lack of leadership and lack of budget for : installation of an adequate water system; purchase of broodstock fishes; purchase of fish feeds, anesthetica, etc. very little experimental work has gone on at Gondol during this past quarter.

## I. FINFISHES

### A. MILKFISH

#### 1. Gondol

Two 6 meter diameter 1 meter deep tanks have been installed. It is planned to make these tanks operational and transfer some adult milkfish from the ponds at Jepara to them.

#### 2. Jepara

The experiment at Jepara is progressing very well. See attached appendices A and B and refer to Dr. Chhorn Lim's section of this quarterly report.

### B. RUNAH

Runah and similar type fishes have not been available during this quarter.

### C. RABBIT FISHES

#### 1. Jepara

Nothing further has been done.

#### 2. Gondol

During January and February we continued to collect rabbit-fishes and stock them in our holding tanks. We are continuing to try and identify the various types. Sadar kuning type 2 spawned in their holding tank but the eggs did not hatch. It is possible the eggs were infertile due to a dietary deficiency as we have been feeding chicken broiler pellets instead of a proper diet.

## II. CRUSTACEANS and III PLANKTON

Due to a lack of leadership, budget and researchers assigned full time to these projects nothing has been done.

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14 - 21 JANUARY

JEPARA TRIP

ITINERARY

- |    |               |   |
|----|---------------|---|
| 14 | 07.00 - 10.00 | Gondol to Denpasar by Jeep. Booked into Yasa Samudra Bungalows  |
| 16 | 08.55 - 09.30 | Denpasar to Surabaya GA 601   |
|    | 15.30 - 16.00 | Surabaya to Semarang GA 305   |
|    | 16.10 - 18.45 | Semarang to Jepara by taxi. Messers Alie Poernomo and Tadjuddin and Dr. Chhorn Lim had arrived about noon and had sample the fish. Booked into the BBAP guest house |
| 17 |               | Discussion with BBAP staff  |
| 18 | 06.15 - 08.15 | Jepara to Semarang  |
|    | 08.50 - 09.40 | Semarang to Surabaya GA 300   |
|    | 10.25 - 11.45 | Surabaya to Denpasar Merpati 340. Booked into Yasa Samudra Bungalows.   |
| 21 | 08.30 - 14.30 | Denpasar to Gondol in RMI Jeep.   |

EXPERIMENTAL

History

Between 15 November and 16 January: 1 fish died in tank A (fed pellets + trash fish) (Table 1); 9 fish died in tank B; 20 fish died in tank C; and 1 died in tank D. Mrs. Anindiastuti and Mr. Pudjiatno had weighed and measured the consulties and had preserved the gonads. They had also kept records of salinities; dissolved oxygen and water temperature in the tanks as well as the amounts of feeds fed each tank (Table 2).

Results

The remaining experimental fish appeared healthy but rather thin. Weight-length data are tabulated in Table 1.

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Instructions

Mrs. Anindiasuti & Mr. Pudjiatno are to transfer 8 more milkfish to tank B and 17 to tank C from the culture pond and to install 5 - 40 W fluorescent light over tank C which receives very little sunlight.

TABLE 1. DATA ON MILKFISH AT JAPARA 26 NOVEMBER 1983 - 16 JANUARY 1984

Date	Code	Sex	Total Weight (g)	Standard Length (cm)	TWx100 (STD.L.)	Fork Length (cm)	Total Length (cm)	Gonad Weight (g)	GWx100 TW	Intestine Length (cm)	Remarks
TANK A FED PELLETS AND TRASH FISH											
13/12/83	A	M	950	52	0.68	-	62	.47	0.49	-	Died, would not eat Sampled-returned to tank Sampled-killed Sampled-killed Sample-returned to tank
16/1/84	A1	-	3380	60	1.56	61.5	74	-	-	-	
	A2	F	2680	54	1.70	56.5	67	3.8	1.42	450	
	A3	F	3000	55	1.80	56.4	70	17	5.67	580	
	A4	-	2200	55	1.32	56.2	65	-	-	-	
TANK B FED PELLETS ONLY											
26/11/83	B1	-	-	-	-	-	-	-	-	-	Died
	B2	-	-	-	-	-	-	-	-	-	Died
23/12/83	B3	M	1450	53	0.97	-	61	.65	0.45	-	No. aeration night of 22/23, died - " - - " - - " - - " - - " -
	B4	M	2400	57	1.30	-	56	2.01	0.84	-	
	B5	M	2000	54.5	1.24	-	54.5	1.76	0.88	-	
	B6	M	2650	57	1.43	-	56	5.35	2.40	-	
	B7	M	3000	58	1.54	-	69	8.32	2.77	-	
	B8	M	2450	55	1.47	-	66	5.47	2.23	-	
	B9	M	2300	57	1.24	-	66	3.42	1.49	-	
16/1/84	B1	-	3200	56.2	1.80	57	70	-	-	-	Sampled-returned to tank - " - Sampled-killed Sampled-returned to tank Sampled-killed
	B2	-	3200	58	1.64	59	70	-	-	-	
	B3	F	3100	57	1.67	58	71	9.8	3.16	525	
	B4	-	2900	55	1.74	56.4	68	-	-	-	
	B5	F	2600	56	1.48	57	66	7.5	2.88	445	

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TABLE 1. (Continued)

Date	Code	Sex	Total Weight (g)	Standard Length (cm)	TWx100	Form Length (cm)	Total Length (cm)	Gonad Weight (g)	GWx1000	Intestine Length (cm)	Remarks
					(STD.L.) <sup>3</sup>				TW		
TANK C FED PELLETS ONLY											
3/1/84	C1	M	2600	56	1.48	-	69	1.75	0.67	-	
4/1/84	C2	F	1750	53	1.18	-	65	4.08	2.33	-	No, electricity no aeration O <sub>2</sub> 11.9 PPM Fish C2-C8 dead at 1400  Fish C9-C20 dead at 1900
	C3	F	2000	53	1.34	-	58	4.50	2.25	-	
	C4	M	3200	57	1.73	-	69	2.10	0.66	-	
	C5	F	2400	55	1.44	-	65	2.80	1.17	-	
	C6	M	2500	55	1.50	-	65	1.00	0.40	-	
	C7	F	2800	50.2	2.21	-	58	46.5	16.61	-	
	C8	M	2600	54	1.65	-	64	1.2	0.46	-	
	C9	F	2300	55	1.38	-	62	9.0	3.91	-	
	C10	M	2600	59	1.27	-	69	1.8	0.69	-	
	C11	M	2400	55	1.44	-	66	2.1	0.88	-	
	C12	F	2750	60	1.27	-	72	13.1	4.76	-	
	C13	F	2250	54	1.43	-	63	13.8	6.13	-	
	C14	M	1600	50	1.28	-	62	2.0	1.25	-	
	C15	M	2100	54	1.33	-	63	1.0	0.48	-	
	C16	F	2300	56	1.31	-	68	6.7	2.91	-	
	C17	F	2450	56	1.40	-	68	9.7	3.96	-	
	C18	M	2300	58	1.18	-	70	2.8	1.22	-	
	C19	M	1950	51	1.47	-	58	3.6	1.85	-	
	C20	M	2500	55	1.50	-	65	2.9	1.16	-	

continued.

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TABLE 1. (continued)

Date	Code	Sex	Total Weight (g)	Standard Length (cm)	$\frac{TW \times 100}{(STD.L)^3}$	Fork Length (cm)	Total Length (cm)	Gonad Weight (g)	$\frac{GW \times 100}{TW}$	Intestine Length (cm)	Remarks
TANK D FED PELLETS ONLY											
? 16/1/84	? D1	- -	- 2050	- 50.4	- 1.60	- 51.2	- 62	- -	- -	- -	Died Sampled-returned to tank
	D2	F	2200	53.2	1.46	54.6	65	11.8	5.36	486	Sampled-killed
	D3	-	2400	55	1.44	56.4	68.6	-	-	-	Sampled-returned to tank
	D4	M	2900	57	1.57	58.4	69.4	9.7	3.34	4.05	Sampled-killed
	D5	-	2000	50	1.60	51	61	-	-	-	Sampled-returned to tank
	D6	F	2100	51.2	1.56	52.4	61	6.5	3.10	360	Sampled-killed
	D7	F	2250	54	1.43	55	66	-	-	390	Sampled-killed

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## OBSERVATION OF MILKFISH BROODSTOCK

TABLE 2.

Treatment/ Tank	Date taken	Temperatur(°C)		D.O (ppm)		Salinity ( ppm )	Amount of feed(kg)		Remarks
		8.00 Am	2.30 p.m.	8.30 Am	2.30 p.m.		8.00 Am	3.30 p.m.	
A	12-19-83	29	29	4.9	4.6	32	0.8	2.9*	*trash fish
B		29	29	5.2	4.8	33	0.75	0.75	
C		28	28	4.1	4.0	32	0.84	0.84	
D		29	29	5.9	5.9	33	1.9	1.9	
A	12-20-83	29	29	3.8	4.3	32	0.8	2.9	
B		29	29	4.4	4.9	32	0.75	0.75	
C		28	28	4.0	4.8	32	0.84	0.84	
D		29	29	3.9	6.7	32	1.9	1.9	
A	12-21-83	29	29	4.8	4.8	32	1.9	2.9	
B		29	29	4.8	4.6	32	0.75	0.75	
C		28	28	4.2	4.4	32	0.85	0.85	
D		29	29	5.5	5.2	32	1.9	1.9	
A	12-22-82	29	29	5.2	6.0	32	1.9	2.9	
B		29	29	5.0	7.6	32	0.75	0.75	
C		28	28	5.5	3.7	32	0.85	0.85	
D		29	29	5.5	6.8	32	1.9	1.9	
A	12-23-83	29	29	1.26	4.3	32	0.8	2.9	tankC:7 pcs were dead no aeration 0 : 6 0 : 1
B		29	29	1.56	7.7	32	0.58	0.58	
C		28	28	3.2	2.2	32	0.84	0.84	
D		29	29	5.5	5.9	32	0.9	0.9	
A	12-24-83	29	29	5.3	5.3	32	0.8	2.9	
B		29	29	6.1	6.1	32	0.58	0.58	
C		28	28	5.1	5.1	32	0.84	0.84	
D		29	29	5.7	5.7	32			

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continued

	12-25-83	-	-	-	-	-	-	-	Sunday
A	12-26-83	29	29	5.5	6.9	32	0.8	2.9	
B		29	29	5.1	6.1	32	0.58	0.58	
C		28	28	4.1	2.2	32	0.84	0.84	
D		29	29	6.8	7.0	32	0.9	0.9	
A	12-27-83	29	29	4.8	4.7	32	0.8	2.9	
B		29	29	4.2	4.6	32	0.58	0.58	
C		28	28	4.0	3.9	32	0.84	0.84	
D		29	29	5.7	5.9	32	0.9	0.9	
A	12-28-83	29	29	4.7	4.2	32	0.8	2.9	
B		29	29	6.3	4.6	32	0.58	0.58	
C		28	28	4.7	3.7	32	0.84	0.84	
D		29	29	6.1	6.0	32	0.9	0.9	
A	12-29-83	29	29	4.8	4.7	32	0.8	2.9	
B		28	28	5.3	5.3	32	0.58	0.58	
C		27	28	5.0	4.3	32	0.84	0.84	
D		28	28	6.0	6.7	32	0.9	0.9	
A	12-30-83	28	28	4.6	4.6	32	0.8	2.9	
B		29	28	5.3	5.2	32	0.58	0.58	
C		28	28	5.1	5.1	32	0.84	0.84	
D		28	28	6.1	6.7	32	0.9	0.9	
A	12-31-83	29	28	4.6	5.0	30	0.8	2.9	
B		28	28	5.2	5.8	30	0.58	0.58	
C		29	28	5.2	5.2	30	0.84	0.84	
D		28	28	6.1	6.1	30	0.9	0.9	
A	1-1-84								Sunday
A	1-2-84	28	28	4.4	4.9	30	0.8	2.9	
B	1-3-84	28	28	5.5	5.4	30	0.58	0.58	
C		27	28	5.1	2.5	30	0.84	0.84	
D		28	28	5.6	6.2	30	0.9	0.9	

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continued

A	1-4-84	27	27	4.1	3.5	30	0.8	2.9	Fish all dead in tank C
B		27	27	4.6	4.3	30	0.58	0.58	
C		27	27	1.9	-	30	0.84	0.84	
D		27	27	5.4	5.7	30	0.9	0.9	
A	1-5-84	28	27	4.0	3.2	30	0.8	2.9	
B		28	27	5.7	3.1	30	0.58	0.58	
C		-	-	-	-	-	-	-	
D		29	27	5.4	4.7	30	-	-	
A	1-6-84	27	27	3.8	4.1	30	0.8	2.9	
B		27	27	3.7	4.8	30	0.58	0.58	
C		-	-	-	-	-	-	-	
D		28	27	3.8	4.1	30	0.9	0.9	
	1-8-84	-	-	-	-	-	-	-	Sunday
A	1-9-84	27	28	4.9	4.7	30	0.8	2.9	
B		27	28	5.2	5.9	30	0.58	0.58	
C		-	-	-	-	-	-	-	
D		27	28	5.8	6.8	30	0.9	0.9	
A	1-10-84	28	28.5	5.6	4.3	30	0.8	2.9	
B		28	28.5	5.9	5.4	30	0.58	0.58	
C		-	-	-	-	-	-	-	
D		28	28	5.5	6.3	30	0.9	0.9	
A	1-11-84	28	28	5.1	4.4	30	0.8	2.9	
B		28	28	5.7	5.3	30	0.58	0.58	
C		-	-	-	-	-	-	-	
D		28	28	5.9	6.3	30	0.9	0.9	
A	1-12-84	28	28	5.8	4.3	30	0.8	2.9	
B		28	28	6.3	4.9	30	0.58	0.58	
C		-	-	-	-	-	-	-	
D		28	28	6.1	6.8	30	0.9	0.9	

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Continued

A	1-13-84	28	28	4.9	3.6	30	0.8	2.9	
B		28	28	4.7	5.6	30	0.58	0.58	
C		-	-	-	-	-	-	-	
D		28	28	6.1	6.9	30	0.9	0.9	
A	1-14-84	28	28	5.1	5.1	30	0.8	2.9	
B		28	28	5.6	5.5	30	0.58	0.58	
C		-	-	-	-	-	-	-	
D		28	28	6.3	6.4	30	0.9	0.9	

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TRIP REPORT  
JEPARA 12 - 16 MARCH 1984  
W.E. VANSTONE  
GONDOL

ITINERARY

- |    |               |  |
|----|---------------|--|
| 12 | 08.00 - 18.00 | Gondol to Surabaya in RMI Jeep with Mr. Kadek Sri as driver. Booked into Majapahit Hotel   |
| 13 | 08.45 - 15.15 | Surabaya to Jepara. Booked into BBAP guest house<br>Mr. Tadjuddin arrived from Bogor at about 19.00  |
| 14 | 07.30 - 16.30 | Weighed and measured milkfish from the 4 tanks and obtained photographs of siganids. Dr. Chhorn LIM arrived about 11.00. Discussion with BBAP staff. |
|    | 16.30 - 21.00 | Jepara to Tuban accompanied by Mr. Tadjuddin. Booked into hotel  |
| 15 | 06.15 - 08.30 | Tuban to Surabaya where we purchased spare parts etc. for equipment for Gondol.  |
|    | 11.00 - 21.15 | Surabaya to Gondol.  |

EXPERIMENTAL

Observations

The anaesthetic we have been using "Benzocain" and which is also being used on fresh water fishes in Bogor and which is probably being used else where denatures the body slime on our experimental fishes. The denatured slime then sluffs off on to our hands and into the water. We should change our choice of anaesthetic and I suggest we use 2 phenozy ethanol which I, and others, have used in the past with no ill effect on the fish.

Results

The experimental fish appear to be healthy although the fish in tank D are much thinner than those in the other 3 tanks. There have been no deaths since our sampling in January. Weight-length data are tabulated in Table 1.

TABLE 1. Weight-length and condition factor of milkfish sampled 14 March 1984

Fish No.	Total Weight (g)	Standard Length (cm)	Weightx100	Fork Length (cm)	Total length (cm)
			(STD.L) <sup>3</sup>		
TANK A - FED PELLETS AND TRASH FISH					
1	3920	54.8	2.38	56.4	70.6
2	4470	56.8	2.44	58.6	72.2
3	3800	54.2	2.39	55.0	59.4
4	3090	51.0	2.23	53.0	60.5
TANK B - FED PELLETS ONLY					
5	5640	55.6	3.28	57.4	69.0
6	3090	51.4	2.28	52.0	63.2
7	2960	50.6	2.28	52.0	57.8
8*	3320	55.0	2.00	57.0	59.0
TANK C - FED PELLETS ONLY					
9	3580	55.6	2.08	57.0	60.0
10	3480	55.0	2.09	57.4	71.0
11	2760	53.0	1.85	55.0	67.0
13	3370	51.8	2.42	53.4	65.6
TANK D - FED PELLETS ONLY					
14	2050	51.8	1.47	53.8	68.0
15	2080	51.8	1.50	53.2	66.0
16	1700	48.2	1.52	50.0	59.4
17	1930	48.0	1.75	49.8	61.4
18	2000	48.7	1.73	51.4	62.0
19	3650	56.6	2.01	58.8	70.0

\* Blind in right eye

APPENDIX V

MONTHLY FINANCIAL REPORTS AS OF MARCH 31, 1984

M E M O

To : H. Ahmad Abdullah, AARI Project Leader  
From : Carl R. Fritz, Administrative Specialist  
Subject : DOWNEY FINANCIAL FLEET  
APPLIED AGRICULTURAL RESEARCH PROJECT  
as of January 31, 1984.

Date : March 3, 1984

The following data is submitted as requested :

1. Technical Assistance

1. Fourteen RMI experts were on duty as of January 31, 1984.  
George Manuelpillai arrived January 1, 1984 for assignment  
to BARIF.-

2. Status of Technical Assistance, January 31, 1984

	<u>Contracted</u>	<u>Supplied/ Expended</u>	<u>Committed*</u>	<u>Balance</u>
a. Long term Manros.	630	183	395	235
b. Short term Manros.	24	4.4	4.4	19.6
c. Funding (\$1,000)	6,068	1,621.7	2,854**	3,614

\* To end of existing RMI employee contracts.

\*\* Does not include miscellaneous items e.g. educational  
allowance, visa extension, contingency for inflation,  
etc. for period beyond January 31, 1984.

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MONTHLY FINANCIAL REPORT  
 APPLIED AGRICULTURAL RESEARCH PROJECT  
 as of January 31, 1984

II. Training

1. Progress as of January 31, 1984

	FMI	Outside FMI	Total
<u>Target</u>			
No.	200	7	207
Manmos.	557	6.2	563.2
Funding (\$1,000)	1,849.2	NA	NA
<u>Completed</u>			
No.	64	7	71
Manmos.	118.23	6.2	124.43
Funding(\$1,000)	405.6	NA	NA
<u>Balance Remaining</u>			
No.	136	-	136
Manmos.	438.77	-	438.77
Funding(\$1,000)	1,443.6	-	1,443.6

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III. Construction

1. Funds available in USAID Loan Agreement	:	\$ 7,140,000.00
2. Expended as of January 31, 1984 (Prefinancing Rp. 399,927,000) (\$1=Rp.970)	:	- 412,295.87
		<hr/>
3. Balance to be expended	:	\$ 6,727,704.13

IV. Equipment

1. Funds available in Loan Agreement	:	\$ 6,061,000.00
2. Expended as of January 31, 1984	:	---
		<hr/>
3. Balance to be expended	:	\$ 6,061,000.00

V. Vehicles

1. Funds available in Loan Agreement (including 10% contingency and 30% inflation)	:	\$ 1,423,600.00
2. Expended as of January 31, 1984	:	- 776,591.00
		<hr/>
3. Balance to be expended	:	\$ 848,225.00

Copy : Sadikin Sunintawikarta, DC AARD  
A. Hurdus, USAID/Agric.  
W. Collier  
R. Saunders

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M E M O

To : H. Achmad Abdullah, AARP Project Leader  
*Carl R. Fritz*  
From : Carl R. Fritz, Administrative Specialist  
Subject : MONTHLY FINANCIAL REPORT  
APPLIED AGRICULTURAL RESEARCH PROJECT  
as of February 29, 1984.

The following data is submitted as requested :

I. Technical Assistance

1. Fourteen RMI experts were on duty as of February 29, 1984.  
We were negotiating a contract with Dr. Hobart Frank Peters,  
Large Animal Breeder, who is expected to arrive about April 1.
2. Status of Technical Assistance.

	Contracted	Supplied/ Expended	Committed*	Balance
a. Long term Manmos.	630	197	395	235
b. Short term Manmos.	24	4.4	4.4	19.6
c. Funding (\$1,000)	6,468	1,736	2,854**	3,614

\* To end of existing RMI employee contracts.

\*\* Does not include miscellaneous items e.g. educational allowance, visa extensions, contingency for inflation , etc. for period beyond February , 1984.

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II. Training1. Progress as of February 29, 1984.

	RMI	Outside RMI	T o t a l
<u>Target</u>			
No.	200	7	207
Manmos.	557	6.2	563.2
Funding (\$1,000)	1,849.2	NA	NA
<u>Completed</u>			
No.	64	7	71
Manmos.	122.23	6.2	128.43
Funding (\$1,000)	420.7	NA	NA
<u>Balance Remaining</u>			
No.	136	..	136
Manmos.	437.77	-	437.77
Funding (\$1,000)	1,428.5	-	1,428.5

2. Immediate Plans

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III. Construction

1. Funds available in USAID Loan Agreement	:	\$ 7,140,000.00
2. Expended as of February 29, 1984 (Prefinancing Rp.323,666.170) (\$1=Rp.970)	:	333,676.46
		<hr/>
3. Balance to be expended		\$ 6,806,323.54

IV. Equipment

1. Funds available in Loan Agreement	:	\$ 6,061,000.00
2. Expended as of February 29, 1984	:	---
		<hr/>
3. Balance to be expended	:	\$ 6,061,000.00

V. Vehicles

1. Funds available in Loan Agreement (including 10% contingency and 30% inflation)	:	\$ 1,423,600.00
2. Expended as of February 29, 1984	:	776,591.00
		<hr/>
3. Balance to be expended	:	\$ 848,225.00

Copy : Sadikin Sumintawikarta, DC AARD  
A. Hurdus, USAID/Agric.  
W. Collier  
R. Saunders

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M E M O

To : H. Achmad Abdullah, AARP Project Leader  
From : Carl R. Fritz, Administrative Specialist  
Subject : MONTHLY FINANCIAL REPORT

Date: 19 April 1984

APPLIED AGRICULTURAL RESEARCH PROJECT  
as of March 31, 1984

The following data is submitted as requested with a summary table attached.

I. Technical Assistance

1. Fourteen RMI experts were on duty as of March 31, 1984.

We expected the arrival of Dr. Hobart Frank Peters about April 1, for an 18 month assignment to CRIAS. In addition we had contracted with Mr. Fritz to continue with the Project until September 30, 1985 as Training Specialist.

2. Status of Technical Assistance

	Contracted	Supplied/ Expended	Committed	Balance
a. Longterm Manmos	630	211	431	199
b. Short term Manmos	24	4.4	4.4	19.6
c. Funding	6,468	1,845.3	3,053.2	3,414.8

\* To end of existing RMI employee contracts.

\*\* Does not include miscellaneous items e.g. educational allowance, visa extensions, contingency for inflation, etc. for period beyond March, 1984.

MONTHLY FINANCIAL REPORT  
 APPLIED AGRICULTURAL RESEARCH PROJECT  
 as of March 31, 1984

II. Training

1. Progress as of March 31, 1984

	RMI	Outside RMI	T o t a l
<u>Target</u>			
No.	200	7	207
Manmos.	557	6.2	563.2
Funding (\$1,000)	1,849.2	NA	NA
<u>Completed</u>			
No.	65	7	72
Manmos.	125.43	6.2	131.63
Funding (\$1,000)	430.26	NA	NA
<u>Balance Remaining</u>			
No.	135	-	135
Manmos.	431.57	-	431.57
Funding (\$1,000)	1,418.89	-	1,418.89

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III. Construction

1. Funds available in USAID Loan Agreement	:	\$ 7,140,000.00
2. Expended as of March 31, 1984 (Prefinancing Rp. 343,815,020) (\$1=Rp. 970)	:	\$ 354,018.47
3. Balance to be expended		<u>\$ 6,785,551.53</u>

IV. Equipment

1. Funds available in Loan Agreement	:	\$ 6,061,000.00
2. Expended as of March 31, 1984 (Prefinancing Rp. 4,000,000.00) (\$1=Rp. 970)	:	\$ 4,123.71
3. Balance to be expended	:	<u>\$ 6,056,876.29</u>

V. Vehicles

1. Funds available in Loan Agreement (Including 10% contingency and 30% inflation)	:	\$ 1,423,600,000
2. Expended as of March 31, 1984	:	\$ 776,591.00
3. Balance to be expended	:	<u>\$ 848,225.00</u>

Copy : Sudikin Sumintawikarta, DC MARK  
 A. Hurdus, USAID/Agric.  
 W. Collier  
 R. Saunders

AARP MONTHLY FINANCIAL SUMMARY

as of March 31, 1984

No	ITEM	FUNDS		EXPENDED		BALANCE	
		GRANT	LOAN	GRANT	LOAN	GRANT	LOAN
1	2	3	4	5	6	7	8
1.	TECHNICAL ASSISTANCE	\$6,468,000		\$1,845,232		\$4,622,668	
2.	TRAINING	1,849,157			\$ 430,266		\$1,418,891
3.	CONSTRUCTION		\$7,140,000		354,448		6,785,552
4.	EQUIPMENT		6,061,000		4,124		6,056,876
5.	VEHICLES		1,423,600		776,591		848,225
TOTAL :		\$8,317,157	\$14,624,600	\$1,845,232	\$1,565,429	\$4,622,668	\$15,109,544

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APPENDIX VI

LIST OF AARP/RMI SHORT TERM TRAINING PARTICIPANTS AS OF MARCH 31, 1984

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## APPENDIX VI.

LIST OF AARP/RMI PARTICIPANTS AS OF MARCH 31, 1984

NO.	NAME	EMPLOYING OFFICE	COURSE/OBJECTIVES	INSTITUTION/COUNTRY	DURATION	MAN-MOS
<u>DEPARTURES</u>						
1.	Suparman K.	FPRI/Bogor	Individual Research on lateral strength of fastener.	USDA Forest Products Laboratory, Madison, Wisconsin.	Mar.26 - Sept.25, 1984	0,2
NONE						
<u>CONTINUING IN TRAINING</u>						
2.	P. Sukartana	FPRI/Bogor	Wood Entomologi, Ambrasia Beetles	University of Wisconsin, Madison, USA.	Jan. 3 - Jul. 2, 1984	2.94
3.	E. Suratman	RIAP/Bogor	Theory of Field Machinery	Asian Institute of Technology Bangkok, Thailand.	Jan. 3 - Apr. 7, 1984	2.94
4.	H. Surachman	do	do	do	do	2.94
<u>RETURNEES</u>						
5.	Farid N. Saleh	BARIF/Banjarmasin	Dissemination of Research Results	International Rice Research Institute, the Philippines	Nov. 1 - March 1984	4.00
6.	F. Kasryno	CAER/Bogor	The Structure of Economic Research and Data Processing Management Training Program.	Economic Research Service, USDA, and Dept. of Agricultural Economics, Michigan State University.	Jan 16 - 27, 1984	0.39
7.	C.A. Rasahan	do	do	do	do	0.39
8.	Hermanto	do	do	do	do	0.39
9.	Yanti Rina Darsani	BARIF/Banjarmasin	Techniques and Methodologies of Agric. Economics	International Rice Research Institute, the Philippines	Oct. 13 - Dec. 9, 1983	1,93
10.	Maria T. Anitawati	CAER/Bogor	do	do	do	1,93

NO.	N A M E	EMPLOYING OFFICE	COURSE/OBJECTIVES	INSTITUTION/COUNTRY	DURATION	MAN-MOS
11.	N. Mahrita Willis Abidin	BORIF/Banjarmasin	Integ. Pest Management	do	Aug. 15 - Nov.25, 1983	3,37
12.	Djajeng Sumangat	BORIF/Bogor	Determination & Prevention of Post Harvest Food Losses	Univ. of Idaho, Postharvest Inst. for Perishables, Falls U.S.A.	Sept. 4 - Oct.14, 1983	1,36
13.	Dudung Muhidin	BORIF/Ps. Minggu	do	do	do	1,36
14.	Iis Syamsiah	SURIF/Sukamandi	Water Management	International Rice Research Institute, the Philippines	Aug.10 - Sept.16, 1983	1,23
15.	Nadjib Noor	MORIF/Maros	Training Computer	The Asian Inst. of Technology Reg. FARMAP Trg. Center for Asia & The Pacific, Thailand	Aug. 8 - Aug. 26, 1983	0.63
16.	Hadijah A. Dahlan	do	do	do	do	0.63
17.	Sri Sumastri	RIIF/Bogor	Brackish Water Aquaculture	Taiwan Fisheries Research Keelung, Taiwan	July 9 - Sept. 9, 1983	2
18.	Amin Ismail	RIIF/Jakarta	do	do	do	2
19.	Agus Priyono	RIIF/Bali	do	do	do	2
20.	Supriyono Eko Wardoyo	RIIF/Maros	do	do	do	2
21.	Tadjuddin Dalay	RIIF/Bogor	do	do	do	2
22.	Tridjoko	RIIF/Bali	do	do	do	2
23.	Wa'uyo Subani	RIMF/Jakarta	Library Training	International Center for Living Aquatic Res. Management in Manila, the Philippines	June 6 - July 6, 1983	1
24.	Endang Pratiwi	CRIF/Jakarta	do	do	do	do
25.	Rachkmat	NLAS/Bogor	do	do	do	do
26.	Tuti Sulasmi	NLAS/Bogor	do	do	do	do

NO.	N A M E	EMPLOYING OFFICE	COURSE/OBJECTIVES	INSTITUTION/COUNTRY	DURATION	MAN-MOS
27.	Novenny A. Wahyudi	RIIF/Bogor	Aquaculture Trg. Program	Auburn Univ. Alabama, USA	March 18 - July 15, 1983	4
28.	Punwito Martosubroto	RIMF/Jakarta	R&D Management Consultancy Training	Denver Res. Inst. Denver	May 23 - July 1, 1983	1.3
29.	Ati Sri Duriat	LERIH/Lembang	Elisa Techniques	American Type Culture Center in Rockville Maryland, USA.	Feb. 20 - June 9, 1983	3,6
30.	Nani Sumarni	LERIH/Lembang	Interdisciplinary Research in Plant Breeding	Asian Vegetable Res. & Dev.	Nov. 7 - May 7, 1983	6
31.	Etti Purwati	do	do	do	do	do
32.	Yoyo Sulyo	do	do	do	do	do
33.	R. E. Suriaatmadja	do	do	do	do	do
34.	Kosasi Kadir	FRRI/Bogor	Woodworking & Drying & Research Project Planning & Evaluation.	Forest Products R&D Inst. Los Banos, the Philippines	March 7 - April 7, 1983	1
35.	Mas Ismunadji	BORIF/Bogor	Spec. Trg. in Upland Crops Physiology	Asian Vegetable Res. & Dev. Center, Taiwan.	Nov. 11 - Dec. 1, 1983	0.7
36.	Mochamad Sirdan	CAPP/Jakarta	Project Preparation & Evaluation in Ag. and Rural Development	Statistical, Economic and Social Research & Training Center for Islamic Countries Turkey.	Oct. 18 - Nov. 12, 1982	0.9
37.	Syafril Lamsayun	CARP/Jakarta	Procurement Training	TransCentury Corp, USA.	Oct. 15 - Nov. 14, 1982	1
38.	Abdussamad Syahrani	BARIF/Banjarmasin	Procurement Training	TransCentury, USA.	Oct. 15 - Nov. 14, 1982	1
39.	A. L. Laponanqi	MORIF/Maros	do	do	do	1
40.	Warsito Hutomo	CAQ/Jakarta	Agric. Proj. Planning & Analysis, Section II	USDA, Washington, DC, USA.	Sept. 7 - Nov. 11, 1982	2,2
41.	Mohamad Mansur	CRIC/Bogor	do	do	do	do

NO.	N A M E	EMPLOYING OFFICE	COURSE/OBJECTIVES	INSTITUTION/COUNTRY	DURATION	MAN-MOS
42.	Hafni Zahara Syukri	CARP/Jakarta	do	do	do	do
43.	Wahyadi Sosrowardoyo	CRIFI/Jakarta	Applic. and Diffusion of Agric. Res. Results to the Community Level.	Iowa State Univ. USA.	Aug. 25 - Oct. 1, 1982	1,3
44.	Sofyan Ilyas	RIFT/Jakarta	Determination & Post Prevention of Postharvest Food Losses.	Cornell University, USA	Sept. 6 - Oct. 13, 1982	1,3
45.	Achmad Hidayat	CAQ/Jakarta	Plant Quarantine	USDA, Washington, DC, USA.	July 19 - Sept. 17, 1982	2,3
46.	Dewa M. Tanteraa	BORIF/Bogor	Integrated Pest. Mgmt.	Purdue University, USA.	June 9 - July 23, 1982	1,5
47.	Sudiarto	CRIIC/Bogor	Agric. Research Method	Kansas State Univ. USA	May 31 - July 23, 1982	1,8
48.	Lalu Sukarno	BORIF/Bogor	do	do	do	do
49.	Siti Sufiani	MORIF/Maros	do	do	do	do
50.	M. Saleh Pandang	MORIF/Maros	do	do	do	do
51.	Wafiah Akib	MORIF/Maros	do	do	do	do
52.	Tambak Manurung	CRIAS/Bogor	Agric. Research Method	Kansas State Univ. USA	May 31 - July 23, 1982	1,8
53.	Didi Suardi	CRIFIC/Bogor	do	do	do	do
54.	Yono C. Rahardjo	CRIAS/Bogor	do	do	do	do
55.	Budhojo Sukotjo	Prof. & Proj. Form Unit/Jkt.	Agric. Research Mgmt.	Washington, DC and Hawaii, USA.	June 6 - 12, 1982 June 18 - 21, 1982	0,4
56.	Tambunan S.M. Manungkol	BORIF/Bogor	Estab. Data Bases & Analist. Syst. for Econ. Decision Making in Agric.	University of New Mexico, USA.	June 6 - Aug. 13, 1982	2,3
57.	Rachmat Kartapradja	LRIF/Lembang	Veg. Crop. Prod. & Market	Rutgers University, USA	July 12 - Aug. 20, 1982	1,3
58.	Artaty Wijono	CRIFI/Jakarta	Ag. Comm. & Med. Strategy	Iowa State University, USA	July 12 - Aug. 20, 1982	1,3

NO.	N A M E	EMPLOYING OFFICE	COURSE/OBJECTIVES	INSTITUTION/COUNTRY	DURATION	MAN-MOS
59.	Abisano	TARII/Tg. Karang	do	do	do	do
60.	Adi Widjono	CRIFC/Bogor	do	do	do	do
61.	T. H. Mangunsong	Reg. Ag. Quarant/ Bogor	do	do	do	do
62.	Fathan Muhadjir	BORIF/Bogor	Wheat & Maize Phys.	CIMMYT, Mexico City, Mexico.	July 20 - Aug. 25, 1982	1
63.	Nurlaila Hasbullah	BORIF/Banjarmasin	Rice Production	IRRI, the Philippines	July 1 - Aug. 27, 1982	1,9
64.	Nurul Aida	BORIF/Banjarmasin	do	do	do	do
65.	Achmad Dimiyati	BORIF/Bogor	Tech. & Econ. Aspects of Soybean Production	University Illinois, USA	May 10 - Aug. 6, 1982	2,9
TOTAL MANMONTHS OF TRAINING UNDER PMI CONTRACT						125#43

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NO.	N A M E	EMPLOYING OFFICE	COURSE/OBJECTIVES	INSTITUTION/COUNTRY	DURATION	MAN-MOS
<u>TRAINING OUTSIDE RMI CONTRACT</u>						
66.	Achmad Samita	RIIF/Bogor	Study Milkfish Cultiv. Method.	SEAFDEC/Philippines Inst. of Marine Biology & Gulf Coastal Fish. Center/USA SEARCA/the Philippines	July 5 - Aug. 15, 1981	1.4
67.	Haniah	do	do	do	do	1.4
68.	Suningat	NIAS/Bogor	Regional Micrographic	SEARCA/the Philippines	Jan. 10 - 23, 1982	0.5
69.	Sumardi Dahlan	do	do	do	do	0.5
70.	Azis Arifin	LERIF/Lembang	The Decimal Long of Cip. Comparative Study for TUBER Crops Research Comparative for Wheat Research	Pery CIAR/Columbia CIMMYT/Meico	Feb. 22 - 26, 1982 Feb. 29 - March 1, 1982 March 3 - 4, 1982	0.3
71.	Surahmat Kusumo	CRIFC/Bogor	do	do	do	0.3
72.	Sundaru	BORIF/Bogor	Management Agric. Organ.	USDA/USA	May 17 - July 9, 1982	1.8
TOTAL MANMONTHS TRAINING OUTSIDE RMI CONTRACT						6.2
GRAND TOTAL						<u>131.63</u>

600