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UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

REPORT OF THE EVALUATION MISSION OF PROJECT

FISHERIES RESEARCH AND DEVELOPMENT PROJECT, INDONESIA

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ABBREVIATIONS

AAETE	Agency for Agriculture Education, Training, and Extension
AARD	Agency for Agricultural Research and Development
ADB	Asian Development Bank
ASA	American Soybean Association
BAPPENAS	National Development Planning Board
BKPM	Investment Coordinating Board
COP	(Project) Chief of Party
CRIFI	Central Research Institute for Fisheries
DGF	Directorate General of Fisheries
DGHE	Directorate General of Higher Education
FAO	Food and Agriculture Organization of the United Nations
FRDP	(Project) Fisheries Research and Development Project
FPRP	(Project) Fisheries Policy Research and Planning Team
GAPPINDO	Indonesian Association of Fisheries Businessmen
GOI	Government of Indonesia
ICLARM	International Center for Living Aquatic Resource Management
IPB	Agricultural University of Bogor
LIPI	National Science Council
MOA	Ministry of Agriculture
MOE	Ministry of Education and Culture
NFRA	National Fisheries Research Agenda
PM	(Project) Project Manager
RCCF	Research Coordinating Centre for Fisheries
RICA	Research Institute for Coastal Aquaculture
RIFF	Research Institute for Freshwater Fisheries
RIMF	Research Institute for Marine Fisheries
UNHAS	University of Hasanuddin
UNPATTI	University of Pattimura
UNRI	University of Riau
USAID	United States Agency for International Development/Indonesia Mission

1. SUMMARY

BACKGROUND, PURPOSE OF EVALUATION, AND METHODOLOGY

In the 1980s, the Government of Indonesia (GOI), faced with the continuing 2.2% annual growth in population, focussed attention on the unexploited potential of the fisheries sector, in particular traditional marine fisheries and aquaculture which were estimated to be producing only about 20% of their capacity. In addition, increasing demands on world markets indicated exceptional opportunities for earning foreign exchange from the expansion of coastal areas into marine shrimp production, and improved technology. GOI realized to exploit these potentials it was necessary to attract private capital into the sector, and formulated new legal and fiscal incentives. It was also necessary to increase government support services to the sector, particularly to advance the management and technology resource base.

Against this background the Ministry of Agriculture (MOA) and the United States Agency for International Development (USAID) developed a Project Paper with the long-term objective of improving the technological and management resources available to both public organizations and private enterprises in the fisheries sector. In the short-term, it planned for the establishment of a national coordinated fisheries research agenda, upgraded research programs at the MOA and key universities to address priority production constraints, and for improved academic training at selected universities with mandated responsibilities for fisheries training.

The Project Paper was signed in August 1986 with a six-year budget of US$ 3.785 million in loan funds, and US$ 3.320 million in grant funds. GOI would provide the Rupiah (Rp) equivalent of US$ 1,507,000 in cash and US$ 2,700,000 in kind. In 1988, due to a deobligation of USAID funding, with agreement of GOI, the project agreement was changed. Through Amendment No. 1, loan funding was reduced to US$ 200,000 and grant funds to US$ 2,610,000. Counterpart contributions were also reduced to the Rupiah equivalent of US$ 1,025,000.

Further amendments transferred the costs of all graduate training to Project 497-0328, USAID/GOI General Participating Training II, and added US$ 423,340 from In-country Local Support funds for further technical assistance. Under the revised FRDP, greater emphasis was to be given to policy planning, including expanding the role of the private sector, and less emphasis on institutional development. Funds were realigned to focus on the development of a national fisheries development strategy and a national fisheries research agenda, and for the development of technology packages and workshops to assist the private sector in overcoming production and marketing constraints.

The end-of-project evaluation mission, comprising three experts from Indonesia and two from the USA, visited GOI and project offices, field stations, universities, research institutes, private facilities, and farms throughout Indonesia to interview persons associated with FRDP's activities. Data from project files and interviews with 120 persons, of which 23 beneficiaries of education, training, and research grants, and 19 from the private sector,

including small-scale farmers and businessmen, were analyzed to form the basis for the evaluation report.

PURPOSE OF ACTIVITIES EVALUATED

The mission evaluated all project activities to determine their effectiveness in accomplishing FRDP short and long-term objectives, namely:
(a) upgrading staff, facilities, academic training, and research programs of seven universities and research institutions to resolve priority production, marketing, and policy and management problems,
(b) assisting MOA and the Ministry of Education (MOE) to establish a national coordinated fisheries research agenda,
(c) assisting MOA in evaluating the need and mechanisms to improve fisheries policy and planning to ensure optimal utilization and management of Indonesia's aquatic resources, and
(d) improving technologies for production and marketing of commercially important fish products.

FINDINGS AND CONCLUSIONS

The project helped development of national policy agendas through the networking of government fisheries agencies, respective fisheries organizations, and the private sector, and through the publication of proceedings of the annual forums. This process is being regarded as a model by other national sectors.

Long-term education will be lasting, as all 13 fellows have returned or are returning to the country. All are placed in positions where they can apply their new experiences immediately. This will have a multiplier effect within their respective institutions. Short-term training will also be lasting, particularly through the efforts to train trainers and involve NGOs in training and extension. The 22 competitive research grants have produced results which added to the national fisheries information base, and added to the competency of the individual grantees. The initiative to produce 25 mini-technology packages, called Pedoman Teknis, offers a speedy and effective conduit to transfer technology at field level. The process is also a model which may be used by other sectors. The production of a Paket Teknologi (Pa-Tek) has created sustainable industry in intensive culture of freshwater fish in cages of low-volume. The project's activities to link to the private sector have been most valuable at the small-scale farmer level and should provide future impact, particularly through the work with NGOs. The project has been successful in involving women at all levels, and especially in technical transfer. More emphasis on special women's programs is required to sustain these initial efforts.

In summary, the project was in the right place at the right time when Indonesia was rapidly becoming a major fisheries nation, particularly in world aquaculture. It produced valuable outputs currently being used in both the public and private sectors. The project methodology of massive and varied technical assistance organized by a small management core was highly appropriate for the project. It proved to be effective in achieving the short-term objectives,

and for laying the foundation for achieving the long-term goal of a sustainable national fisheries industry.

The prime contractor, Auburn University, was effective in recruiting qualified experts to provide technical assistance to the fisheries sector. This included both marine and inland fisheries, the culture fisheries, and in post-harvest technology and marketing. The contractor exercised great flexibility in new project initiatives and achieving outputs; for example, realignment of research approaches by administering a system of competitive research grants, and the production of Pedoman Teknis to by-pass the slow structured process of producing approved technical packages. The contractor was effective in preparing and placing post-graduate fellows overseas, particularly in view of the highly competitive and diminishing opportunities at all universities in the USA. The International Center for Aquaculture at Auburn University has played a major role in the success of the long-term national investment in education. Moreover the component was highly cost-effective compared with most international education of multilateral assistance projects. The contractor produced almost all its intended outputs.

The Agricultural Agency for Research and Development (AARD), the national counterpart agency for the project, through the Center Research Institute for Fisheries (CRIFI) and its research institutes, was an effective and cooperative collaborator in the project. AARD fulfilled its obligations in the face of legal and administrative constraints, and the fact that certain components of the project were beyond its mandate.

USAID has provided fair and enthusiastic support to the project, although it is the smallest of the agency's current portfolio of assistance projects in Indonesia. It has fulfilled all its financial commitments, notably continuing to add funds to the project from other sources, and through amendments, to compensate for the sudden deobligation of some US$ 4 million from the initial institution-building and research project which was already underway.

RECOMMENDATIONS

The mission identifies an administrative barrier between research and application in the field by farmers caused by the centralized process of preparing, evaluating, and disseminating Pa-Teks. The mission recommends GOI replaces it with a simple system for regional control, using regional research institutes, state regional universities, and provincial extension offices.

The mission commends the approach of FRDP and its Pedoman Teknis to simplify the transfer of technology to the primary producers. The mission recommends that the government continues to use Pedoman Teknis as an extension tool in the fisheries sector.

Noting the success of NGOs in the transfer of technology at the field level, the mission recommends that GOI involves NGOs in the process of technology transfer. The mission also recommends that GOI takes steps to integrate the Directorate of Agriculture Extension within AARD to facilitate closer cooperation between researchers and extension workers.

The mission perceives a general lack of associated socio-economic understanding in the process of extending technical information to the primary producers; therefore the mission

recommends that the Institute of Socio-economic Studies at Bogor receives GOI financial support to create a Fisheries Department.

The mission recommends that AARD and the Directorate General of Fisheries (DGF) adopt a more flexible fishery development strategy which will allow research to respond more to regional rather than central needs, thus widening the options for the primary producers.

The mission recommends that the processes of selection and approval of young candidates for overseas education, and middle-level researchers to attend international conferences or to make study tours, should be localized and simplified so that they are immediately responsive to the timing of opportunities. The mission recommends (i) a new scientific journal for Indonesian fisheries, including aquaculture, paid for through membership in a professional fisheries society, and (ii) national and local trade papers for fishermen and farmers published by the private sector.

The mission recommends that workshops and supporting materials suitable for men and women are prepared to teach the fundamentals of hatchery management and production with the priority for floating hatcheries in the Cirata/Saguling region, and in marine areas where interest in marine fish cultivation is growing.
With regard to the project itself, the mission expresses concern that the Third Conference proposed in June does not have the broad and equitable representation which recognizes the country's regional diversity and different needs. It is recommended that the Conference extends invitations to delegates elected from the regional associations of fishermen and fish-farmers, NGOs within the region active in fisheries development, state regional universities, provincial fisheries offices, associations of professional fisheries scientists, and regional planning boards.

The mission notes that women have been represented in the activities of the FRDP. However, if funds remain at the end of the project the mission recommends that they be used for short-courses for women only, such as training in fish hatchery technology.

LESSONS LEARNED

The donor should strive for consistency and purpose in the administration of bilateral technical assistance through the life of individual projects. Mid-course changes place an unnecessary burden on the contractor and counterpart agency.

The activities expected of technical assistance projects must be within the mandates of the counterpart agency.

Technical assistance projects in support of a diverse sector, such as fisheries, focus on only one or two components and carry them out in depth, rather than undertake many superficial activities in a large number of components.

Local non-government organizations are most effective in communicating technology transfer and extension at the level of the primary producers.

Short-term technical courses should be a minimum of four weeks of effective training, emphasizing practical hands-on training rather than theory, and have follow-up.

Special seminars are not particularly valuable unless part of a formal structured plan, and also offer the students additional follow-up with personal tuition.

2. THE PROJECT PAPER

2.1. Background

Throughout the 1970's the economy of Indonesia grew at a rate of almost 8% per annum. The significant feature of this period of remarkable economic growth was the revenues from oil exports, enabling the Government of Indonesia (GOI) to support a variety of economic development programs with public funds.

The early years of the 1980's saw significant changes. The general world recession, accompanied by a sharp decline in oil prices and market demand, reduced export revenues compelling the GOI to greatly broaden the economic base of the country, but continuing to focus on exports.

At that time, the fisheries sector in Indonesia was contributing about 1.6% to national GDP (gross domestic product), in addition to being a major source of employment for some 3 million persons, or about 5% of the national labor force. Although the productivity of the sector was low (about 1.6% of GDP), the foreign exchange earnings had risen dramatically. This was due to the exploitation of offshore pelagic resources and the spectacular growth in the cultured production of marine shrimps.

Although annual growth in the fisheries sector was not consistent, due mainly to governmental policies restricting trawling in coastal fisheries, GOI recognized the important role of fish and fishery products in the diet of the national population as a whole, contributing over 60% of the animal protein resources in national consumption. The sector accounted for 2.26 million metric tons (t) in 1984, of which 75% was from traditional marine fisheries, 12% from inland fisheries, and 13% from aquaculture.

Faced with the continuing 2.2% annual growth in population, GOI focussed attention on the unexploited potential of the fisheries sector, in particular the traditional marine fisheries and aquaculture which were estimated to be producing only about 20% of their capacity. Furthermore, increasing demands on world markets for seafood indicated exceptional opportunities for earning foreign exchange from the expansion of coastal areas into marine shrimp production, together with improvements in technology.

GOI realized that exploitation of these increased potentials would not be an easy task. Because it was necessary to attract private capital into the sector, GOI formulated new legal and fiscal measures, promoted international joint-ventures, and expanded credit. However, it was also necessary to increase governmental support services to the sector, particularly to advance the management and technology resource base available to both public organizations and private enterprises.

It is against this background that GOI sought bilateral technical assistance from the United States Agency for International Development (USAID) to install viable fisheries research programs at the Ministry of Agriculture (MOA) and key universities which would address significant regional fisheries production and marketing constraints.

2.2. The Project Objectives

The Project Paper developed by MOA and USAID between 1984 and 1985 had the long-term objective of improving the technological and management resources available to both public organizations and private enterprises in the fisheries sector. In the short-term, it planned for the establishment of a national coordinated fisheries research agenda, upgraded research programs at the MOA and key universities to address priority production constraints, and to improve academic training at selected universities with mandated responsibilities in fisheries.

The proposed project, called the Fisheries Research and Development Project (FRDP), had four principal components:
(a) upgrading the staff, facilities, academic training, and research programs of seven universities and research institutions to resolve priority production, marketing, and policy and management problems,
(b) assisting the MOA and the Ministry of Education (MOE) to establish a national coordinated fisheries research agenda,
(c) assisting the MOA in evaluating the need and mechanisms to improve fisheries policy and planning to ensure the optimal utilization and management of Indonesia's aquatic resources, and
(d) improving technologies for the production and marketing of commercially important fish products.

The Project Paper, which was signed in August 1986 had a budget of US$ 7,105,000, of which US$ 3,785,000 was in loan funds, and US$ 3,320,000 in grant funds. The GOI was to provide the Rupiah (Rp) equivalent of US$ 1,507,000 in cash and US$ 2,700,000 in kind to support the project. The duration of the proposed project was for 6 years, ending in September 1992.

Project implementation and coordination responsibilities within the MOA were vested in the Agency for Agricultural Research and Development (AARD), and specifically in one of its seven disciplinary centers, namely the Central Research Institute for Fisheries (CRIFI). A consortium of American universities was formed to manage and provide technical assistance to the project, which included Auburn University, The University of Rhode Island, and the University of Arkansas (Pine Bluff). A number of preparatory activities were launched, including negotiation with the prime contractor, Auburn University, for project organization and management, negotiation for the purchase of vehicles, preparing preliminary design drawings for research pond facilities, and conducting an English course for potential recipients of education fellowships.

In 1988, as research and educational planning and facility design activities were underway, due to a deobligation of USAID funding, with agreement of GOI, the project agreement was changed. Through Project Paper Amendment No. 1 (dated April 1989), the level of loan funding was reduced to only US$ 200,000 and grant funds to US$ 2,610,000. Counterpart contributions from the GOI were also reduced to the Rupiah equivalent of US$ 1,025,000. As this coincided with changes in Indonesia encouraging broader participation of the private sector in economic growth and development, this policy was reflected in the Amendment and proposed program of work.

A 36-month contract with Auburn University for project management and technical assistance was finally signed in July 1988 for the sum of US$ 1,932,000. The balance (to US$ 2,610,000) was designated for equipment (US$ 240,000), training (US$ 50,000), special studies (US$ 220,000), and contingency (US$ 168,000). The loan was designated for training (US$ 193,000) and contingency. The GOI contribution was for training (equivalent to US$ 140,000), special studies (US$ 100,000), administrative and research support (US$ 648,000), and contingency (US$ 137,000).

In September 1988 USAID and MOA agreed to modify the extent of the project again, and also transferred the costs of all graduate training to Project 497-0328, USAID/GOI General Participating Training II. However, the prime contractor still worked cooperatively with the BAPPENAS in the monitoring of the program for postgraduate participants.

An amendment to the contract added some US$ 423,340 from In-country Local Support funds for technical assistance, providing for such things as the annual Forums, publication of technology packages, essential commodity procurement, and in-country overheads. In December 1989 and April 1991, through further amendments to the prime contractor's responsibilities, additional funds of US$ 79,815 and US$ 298,488 were obtained to provide more services and to hold a number of short-term training and outreach courses. These changes added US$ 801,643 to project funding.

Although the overall long-term objective remained essentially the same, the short-term objectives and proposed activities had changed in scope. It is therefore the revised Project Paper, Amendment No. 1, of April, 1989 which is summarized in the following paragraphs, and not the original 1986 Project Paper.

Under the revised FRDP, greater emphasis was to be given to policy planning, including expanding the role of the private sector, and less emphasis on institutional development. Funding resources were therefore realigned to focus on the development of a national fisheries development strategy and a national fisheries research agenda, and for the development of technology packages and workshops to assist the private sector in overcoming production and marketing constraints.

2.2.1 Project components and proposed outputs

The modified FRDP had five principal components, each with respective activities and proposed outputs. These are summarized as follows:

(a) Formulation of fisheries development and research strategies

This component proposed two strategies, namely (i) a national fisheries development strategy to identify the broad needs of the sector for the next 25 years, with five-year benchmarks, and (ii) a national fisheries research agenda to identify and coordinate research activities in support of development. The proposed outputs were a series of information gathering studies to assist GOI in formulating policies, programs, and actions to ensure optimal balance between resources and management. The component was to be initiated through the creation of a special study team (called the Fisheries Policy Research and Planning Team, consisting

of socio-economic and marketing specialists, with the responsibility of establishing a data base for the systematic development of national plans. The team would provide part of 3 man-years to provide long-term continuity, assisted by part of 74 man-months from short-term specialists, and research specialists funded through the project to undertake 10 special studies in support of program development and policy formulation.

(b) Inter-agency communication through forums and annual planning and coordination conferences

The second component proposed inter-agency cooperation between the MOA (through the AARD) and the MOE (through the Directorate General of Higher Education - DGHE) initiated by a forum to evaluate the current status of the fisheries sector, and to identify the 10 special studies required to support the long-term development and research strategies. It was proposed that the forum would convene annually. In conjunction with these meetings, a more comprehensive fisheries sector planning and coordination conference was planned, with private sector participation, with leadership provided by the project under the auspices of the forum. The purpose of these associated conferences was to provide sector-wide participation in the mandates of the project to develop the national fisheries development strategy and the national fisheries research agenda. The conferences would also be focal points for donor participation and possible future financial assistance.

(c) Institutional development

The third component focused on institutional development for the three institutes of CRIFI and three universities which had overall responsibilities for project implementation. A number of education training levels were proposed, specifically 55 man-years of postgraduate education overseas (in association with a preliminary English language training program for 20 individuals), and 64 man-months of local short-term training in selected disciplines designed to fill gaps in current knowledge and shortage of skills. Local training was for scientific staff from research institutes and universities, for governmental extension specialists, and for the private sector. This component was in collaboration with the Agency for Agricultural Education, Training, and Extension (AAETE). The development of women was included in this educational and training element.

In this component the FRDP emphasized also the support of viable research, and coordinated programs of research at the selected institutions of both the MOA and MOE. Between 15-20 special research studies were proposed, which would lead to the production of 'Technology Packages" (see item d, which follows). These activities would be coordinated by part of the 3 man-years of long-term and 74 man-months of technical assistance noted in item (a), above. It was also intended to provide direct technical assistance grants to project institutions for the development of long-term programs of research, equipment (US$ 131,000), and assistance in developing new experimental outdoor facilities.

(d) Technology development

The FRDP proposed in this component the production of 15-20 Technology Packages covering a wide range of subjects, particularly fish production and post-harvest technologies. These 'Paket Teknologi', or 'Pa-Teks', would be developed by the project's seven

participating research centers, and tested through cooperative trials organized by the Directorate General of Fisheries (DGF) with farmers.

(e) Private sector support

Finally, the project proposed support of the private sector through joint and cooperative efforts with national and provincial agencies and institutions. These efforts would include: (a) involvement of the private sector in all planning and coordination conferences, (b) special studies focused on constraints to expansion of private sector investment, (c) central and regional technical seminars and workshops for the dissemination of Pa-Teks, and (d) cooperator trials with farmers and fishermen on their own sites using their resources. In view of the wide range of needs, the project would focus on common problems of large numbers of farmers.

2.2.2. Project organization and management

The project proposed to build on the research and development programs of selected fisheries research institutions in the MOA, and selected fisheries faculties or departments of universities in the MOE. The former would concentrate on applied aspects of production, capture, and marketing, and the latter on academic education and formal research. The technical assistance would address needs for marine, brackish water, and freshwater aquaculture and inland fisheries.

Within the MOA, project support was directed through AARD to CRIFI, and the three institutes under its control, namely the Research Institute for Freshwater Fisheries (RIFF), the Research Institute for Coastal Aquaculture (RICA), and the Research Institute for Marine Fisheries (RIMF). These three institutes, head-quartered at Bogor, Maros, and Jakarta, respectively, each had 3 or 4 sub-stations throughout the country.

Three universities within MOE were selected because of their long association with fisheries and their proximity to facilities of the institutes noted above. These universities were the Agricultural University of Bogor (IPB), the University of Hasanuddin (UNHAS) in Ujung Pandang, and the University of Pattimura (UNPATTI) in Ambon.

(a) Freshwater aquaculture activities therefore involved the RIFF stations in Bogor and Palembang, and the universities of IPB and UNRI, with the purpose of strengthening the linkages between them, increasing their technical capacity, and developing and testing new production technologies. Field research activities would address the constraints limiting production intensification and expansion.

(b) Brackishwater aquaculture linked RICA at Maros with the university of UNHAS, and had the same basic purpose. Activities included a research-training program which would lead to a strong research program at RICA (Maros) to address priority constraints to brackishwater aquaculture and set the stage for an M.Sc. education and research program at UNHAS. Field research activities would address the constraints limiting milkfish and shrimp production, particularly problems of production management, water quality, and handling of post-harvest products. The work would complement the national program in brackishwater

aquaculture development funded by GOI and other multilateral donors, such as the Asian Development Bank (ADB) and the World Bank (WB). For example, the WB would fund construction of the laboratory and pond facilities at Maros. The project would provide short-term technical assistance, training, research studies, and equipment at the laboratory, as well as postgraduate training for the RICA staff.

(c) The development of fisheries in Eastern Indonesia linked the RIMF institute at Ambon with the university of UNPATTI, as well as the provincial offices of DGF at Maluku and Irian Jaya. Activities would address the technology constraints and facilities needed to decrease the costs of processing and marketing products for the domestic market. The project would also develop a data base for fisheries and resource management in the region.

(d) Within this human resource base, the project proposed to improve staff, data, and management capabilities in the MOA to establish national fisheries policies; in particular,
- development of a comprehensive National Fisheries Research Agenda, and policies to address key fisheries production and marketing issues, and
- assistance in strengthening the planning, analysis, implementation, and management capabilities of the MOA in conducting its fisheries research.

Specific activities would include training, short-term technical assistance, and special studies.

These goals would be achieved through linkages between the CRIFI and its institutes, the four cooperating universities, the DGF, and the private sector, coordinated by the project's in-country staff and national counterparts, and additional expertise required.

The management of the FRDP technical assistance was the responsibility of the USAID's prime contractor, Auburn University. The personnel would be led by a resident Chief of Party (COP), who would serve as liaison between the contractor's staff, visiting experts, USAID, and GOI. For 6 man-months, the COP would be assisted in the beginning by a short-term aquaculture facility design specialist, for improvement of facilities at three proposed sites. He would also be assisted by 31 man-months of visiting research specialists, specifically three specialists to work with the Deans of the fisheries faculties or departments at IPB, UNHAS, and UNPATTI; and four research specialists to work with the Directors of the CRIFI institutes at Bogor, Palembang, Maros, and Ambon. The principal tasks of these specialists was to assist their respective institutions to upgrade the planning, implementation, and management of their research and development programs.

In addition there were 36 man-months for non-specific short-term assistance for project evaluations, and an in-country management training course for fisheries administrators and directors. Any balance would be used for special studies. Specific requirements were experts in nutrition, fish production, fish reproduction and physiology, water quality, shellfish production, brackishwater fish production, fish diseases, and general marine aquaculture.

The COP would prepare a Work Plan within two months of arrival, and an Inception Report after six months, including specific programs of work for visiting experts within the next 12 months. The COP would follow these with Semi-Annual Reports, and any Interim Reports as requested by USAID or GOI. These reports would be operational in nature. An Annual Report would provide a detailed assessment of the project in achieving its goals, and

recommendations for the next year's activities. The contract with the prime contractor would end (June 1991) with a Final Report, but subsequently a 'no-cost extension' for 12 months moved this to June 1992. The project would also be subjected to periodic Evaluation.

The GOI would provide the Rupiah equivalent of US$ 1,025,000, consisting of US$ 875,000 in cash and US$ 150,000 in kind. This would provide salaries, per diem, and travel costs of a national Program Manager (PM) and other counterparts to the technical advisers, operational and maintenance costs of project vehicles, in-country travel costs and per diem of short-term trainees, support of special research studies, and in-country commodity procurement.

3. PROJECT OUTPUTS AND LINKAGES

The project outputs, or results, are described in this section under six principal areas of work. These are as follows:

3.1 Policy Agendas

One of the major goals of the amended FRDP was the development of a National Fisheries Development Strategy and a National Fisheries Research Agenda. Three national conferences, called Forums I, II, and III were planned to achieve it.

3.1.1 Fishery Forum I

Forum I was sponsored by AARD and dealt with an overall assessment of progress in fisheries research. In preparation to Forum I, a two-day planning workshop organized by FRDP was held on 27-28 January 1989 in Cipanas, and involved presentations by IPB, CRIFI, RIMF, RICA, and USAID. Following the workshop, a special study entitled, "Towards establishing a national strategy for Indonesian fisheries development" (Bailey and Pollnac, 1989), was commissioned by FRDP. The study identified 12 research initiatives, and 11 studies were initiated in 1989 by national scientists supported by Rp 173 million provided by FRDP (see Table 1, Annex I).

In January 1990, FRDP summarized progress in these initiatives in a report, "Aspects of progress towards developing a national strategy for Indonesian fisheries development" (Pollnac, 1990). On 28 January 1990 further Forum I planning was carried out by CRIFI, RIFF, RIMF, RICA, IPB, UNHAS, UNPATTI, and USAID at a planning meeting in Cisarua. On 30 January 1990 CRIFI and USAID met in Jakarta to finalize plans.

The First Annual Fisheries Conference (Fisheries Forum I) was held on 19-20 July 1990 in Sukabumi, with a listed attendance of 112 persons. Represented were AARD, 18 GOI agencies, 6 associations; the American Soybean Association (ASA), and USAID. The proceedings, entitled, "Prosiding Forum - I Perikanan" (Anon., 1990), was prepared and published by FRDP and distributed in December 1991.

3.1.2 Fishery Forum II

Forum II was jointly sponsored by AARD and DGF for setting national fisheries research priorities. A Forum II planning meeting was held in Sukabumi on 4-5 December 1990 and was attended by representatives from AARD, DGF, USAID, and the Food and Agriculture Organization of the United Nations (FAO). In April 1990 FRDP in, "Status report on the FRDP policy component" (Bailey and Pollnac, 1990), presented a draft outline for the long-term fisheries development strategy. This was followed by a further summary by FRDP of the special studies in, "Review of progress made on policy studies" (Bailey, 1991a). FRDP followed this with a proposal entitled, "Draft agenda for Forum II" (Bailey, 1991b), in February 1991.

The Second National Long-term Fisheries Development Program (Fisheries Forum II) was held on 16-20 June, 1991 in Sukabumi, and was attended by representatives of the agencies of GOI and the private sector. A proceedings of this forum has been prepared by FRDP and is now in press. No copies are yet available.

3.1.3 Fishery Forum III

Planning for Forum III has lagged behind the schedule set by FRDP (Bailey, 1991a). The subject of this forum is an overall fisheries development strategy for Indonesia, in preparation for the next Repelita 5-year Plan, and beyond. The first planning session was held in Jakarta on 22 July 1991 and was attended by representatives from DGF and CRIFI. On 7 August 1991 another meeting was convened by DGF in which an inter-agency steering committee was formed, and a working group designated to develop briefing documents prior to the forum. At the August meeting representatives from DGF, CRIFI, USAID, the Investment Coordinating Board (BKPM), the Association of Fish Merchants (GAPPINDO), and the National Development Planning Board (BAPPENAS) were present.

FORUM III is scheduled for 23-25 June 1992 in Sukabumi. The meeting will now be called a Seminar instead of a Forum, and will focus on a national fisheries development strategy for Indonesia. The tentative agenda for the meeting is given in Table 2, Annex I.

3.2 Education and Training

The project identified staff development as a key component of its institution building strategy. Development took the form of long-term postgraduate education at selected institutions overseas, and short-term training courses in-country.

3.2.1 Education

Thirteen fellowships for postgraduate degrees have been awarded to qualified students from the participating institutions. Recipients were selected on the basis of their national academic qualifications and abilities to pass a course in English language, organized by the project. All postgraduate qualifications (2 Ph.D. and 11 M.S. degrees) were obtained from universities in the USA. The details are provided in Table 3, Annex I.

As of 12 May 1992 five had completed their postgraduate degrees and returned to Indonesia, and eight remained incomplete. The average length of overseas education was 25 man-months for the master's candidates, and 37 man-months for doctoral candidates. Three (23.8%) recipients of postgraduate fellowships were women, who received or will receive qualifications in Fisheries Science, Food Science, and Fisheries Technology.

The estimated cost of the postgraduate scholarship component (as at the end of 1991) was US$ 724,000. An estimate of cost per candidate once all have completed their education is between US$ 2,100-2,500 per training-month.

Six recipients were from the universities, specifically four from IPB and one each from UNHAS and UNPATTI. The others were from the AARD research institutes, specifically four from RIMF (Ambon), and one each from RICA (Maros), RIFF (Bogor), and RIFF (Palembang).

As part of their postgraduate degrees, each student specialized in a particular area of fisheries science and technology. The fields covered in their studies were; economics (3), marketing, post-harvest losses, processing technology, diseases, crustacean physiology, water quality, general aquaculture, fish physiology, freshwater fish production, and marine biology.

3.2.2 Short-term in-country training

FRDP has held many short-term in-country training courses, and others are planned before the end of the project.

As part of the selection process for overseas postgraduate education, an English language course was held for 20 potential recipients of fellowships nominated by the universities and government research institutes. Fourteen passed the test; four were from UNPATTI and IPB, and two from UNHAS, and from the AARD research institutes there were four from RIMF (Ambon), and two each from RICA (Maros), RIFF (Bogor), and RIFF (Palembang). Fifteen qualified by passing the national eligibility test. Thirteen went on the postgraduate courses funded by FRDP (noted in 3.2.1, above), and two others received financial support for postgraduate education in Canada and the United Kingdom, funded by other donors.

The project organized and sponsored almost 100 seminars for professionals and short-term courses between September 1988 and June 1992 which constituted additional manpower training (see Table 4, Annex I). This excludes the events leading up to the three forums noted in Section 3.1, above, as well as the special technical and outreach courses for extension officers and farmers noted in Section 3.5 below.

Two one-day courses on research policy training and instruction for preparing proposals for the Competitive Research Grants were presented in RICA (Ambon) and UNHAS (Ujung Pandang), respectively; each was attended by 20 researchers and staff members. A 3-day technical workshop on soil-water chemistry in aquaculture was held at RIFF (Patra Tani) and RIFF (Palembang) for 20 researchers. A 10-day short-course on research methods for cage culture practices was given in Jakarta to 15 researchers from CRIFI, RICA, RIFF, and RIMF; and a half-day short course on aquaculture principles was given to 4 researchers at RIFF (Palembang).

The seminars given by 30 experts since the end of 1988 have been attended by some 3,500 professionals. This equates to over 800 person-days of instruction.

Each training event has been summarized in a report and filed with FRDP. Some reports are in detail suitable for further comprehensive analysis.

3.2.3 Conferences and study tours

The project supported a few brief study tours. These were usually in support of activities relevant to participating researchers or administrators. Studies tours included the USA for five days, primarily to present a paper on reef habitats to a conference on Continental Shelves; to Singapore for five days to attend a conference on Coastal Zone Management; to Washington D.C. to present a paper on women's participation in FRDP at a conference on Women in Development; and to Japan for one week to present a paper on sea-turtles to the Asian Fisheries Society. There was also a number of in-country study tours for the Project Manager and other associated national leaders. The COP presented a paper to the World Fisheries Congress in Greece, accompanied by the Director of CRIFI and the DGF Director of Production.

3.3 Research and Research Facilities

The project assisted MOA in the preparation of a National Fisheries Research Agenda, noted in Section 3.1, above. As part of the preparatory process, three inter-agency research planning workshops were held at Bogor, on inland fisheries research; at Ambon, on Eastern Indonesian fisheries development; and at Pontianak, on the management of the Kapuas and Musi river systems. Thirty individuals participated in the first two workshops, and 75 at the third. Also in support of developing the background of research in the country, FRDP commissioned 8 reports and proposals, and guidelines for a research proposal review system.

The project began its program to improve research and research management at the Institutes of CRIFI and the participating universities, emphasizing staff training and research planning implementation. Staff training has been described in Section 3.2, above. Having carried out a number of planning workshops in the regions for their respective research institutions, all of which have been reported in detail, FRDP created a new project component for competitive research grants. A total of 22 research grants were approved and funded within a budget of Rp. 166 million (see Table 5, Annex I). Individual grants were between Rp. 2.5 - 11.5 million. All but one of the research grants has been completed with the production of a research report, most of which have now been published and disseminated.

Emanating from these research projects are five major research and development proposals for further funding. Other drafted proposals are for a freshwater monitoring program (the two rivers study), a shrimp health monitoring program, and a fish aggregating device outreach effort). One, on cage fish culture, has received national funding and another, on the utilization of problem soils for aquaculture, has been included in the BAPPENAS Blue Book. These are national proposals which are presented to multilateral and bilateral donors for funding.

FRDP organized almost 100 professional seminars on subjects relevant to fisheries research in Indonesia (see Table 3). Thirty-six dealt with aquaculture, 25 with fisheries development in general, 16 on socio-economic aspects of fisheries development, 9 on marine fisheries, 6 on industrial fishing, including post-harvest technology and marketing, and 4 on fisheries education. The seminars were given by visiting international experts, usually during their assignments on other project activities, many of which themselves contributed to the build-up

of the research information base in the country. Almost 100 technical reports or papers were produced in this way.

The project also assisted three national research centers, at RIFF/Patra Tani, RIFF/Sukamandi, and IPB/Darmaga campus, in the preparation of preliminary design documents for field research facilities, and it also designed a floating field research station.

Because of the deobligation of funds from the original project, FRDP only supported research with the provision of a computer for each of the 7 participating centers. No scientific instrumentation, technical equipment, laboratory supplies, or library resources were provided. However, some personal library collections have been donated to the participating organizations.

In additional to the forging of stronger linkages between the research institutions which were paired for joint-project activities, the visits by international experts strengthened international links with agencies active in the region, such as the International Development and Research Centre and the International Center for Living Aquatic Resources Management. They also encouraged interest in the activities of the Asian Fisheries Society.

3.4 Technology Packages

One of the major tasks of the FRDP was to produce 15-20 Pa-Teks. In the fisheries sector, these Pa-Teks are produced through research under AARD, and evaluated by DGF and possibly then implemented by Dinas Perikanan. The process is formal and lengthy.

FRDP produced only one national Pa-Tek, on cage fish culture. However, it produced 25 mini-technical packages which it called 'Pedoman Teknis'. These were essentially compilations of technical information about aspects of fisheries. Some of these were the result of research and development in the Indonesian research centers, and others were applications of basic aquaculture practices which had been developed and applied world-wide. The purpose of producing the Pedoman Teknis was to accelerate the transfer of information down to the extension service, Dinas Perikanan, and the primary producers.

All 25 Pedoman Teknis were prepared in English, 16 of which have been translated into Indonesian, and the rest are in translation or in press. The full list of the Pedoman Teknis is given in Table 6, Annex I. The first six titles have now been printed and disseminated to about 490 institutions throughout the 27 provinces. The first distribution list (and the number of copies released) includes: AARD Institutes (10), CRIFI Institutes (15), vocational training institutes (8), DGF (3), provincial fisheries offices (27), representative offices of MOA (27), AAETE agencies (27), Agricultural Information Institute offices (25), National Science Council (12), universities (25), Province Governors' offices (27), District Fisheries Offices (more than 120), private fisheries companies (5), and to the participants of the Fisheries Forums and other individuals. FRDP has now received permission and support to produce 2,000 copies of all future issues.

Two additional manuscripts (on cage culture, and water quality management and aeration in shrimp farming) have also been professionally prepared in English, and the former in

Indonesian. These also have been disseminated as above. The latter has not been translated because of its length (82p). Nine other publications have already been drafted in English and are being translated into Indonesian. A computer to assist with desk top publishing has now been purchased by FRDP and is in current use.

3.5 Linkage to the Private Sector

Although one of the major objectives of the project was to assist the development of the country's private fisheries sector, the agencies associated with the project have limited authority and ability to carry out this task. To overcome this constraint, the project adopted the following strategies: first, to develop and test technology; second, to make the technology available for the extension agencies through workshops, seminars, literature, and other means; and third, to assist, if needed, these agencies with the transfer of their information and knowledge to the private sector.

The project proposed to develop 15-20 Pa-Teks. However, as noted in Section 3.4 above, it produced 25 Perdoman Teknis to assist the private sector. It also conducted two seminars in Wonogiri and Lamongan; two workshops in Parepare, Sulawesi, attended by a total of 236 individuals from several government agencies and the private sector; a one-day workshop in Parapat, for 47 individuals, including 33 from the private sector; and a three-day short course on cage fish culture technology and outreach to five members of the local non-government organization (NGO), called Lembaga Studi Pengembangan Wilayah (LSPW), involved in aquaculture development around Lake Toba, Sumatra.

FRDP also carried out a number of other training and outreach courses for the private sector in association with the government agencies. For example, a 2-week short course was given on pre-harvest shrimp quality to 25 participants, 13 from DGF and 12 from the private sector; two 3-day outreach courses on rice paddy-fish cultivation to 120 participants from Dinas Perikanan and five government agencies, and 60 from the private sector; a 3-week outreach course on the principles and practices of cage culture for 20 participants from 8 GOI agencies and the private sector.

The project produced a number of materials related to the needs of the private sector. These included: all materials for one Pa-Tek on cage fish culture, including 'how-to' instructions and a documentary set of slides; the preparation of a 20-page article on how to advance fish production in Indonesia using low volume, high density cage culture technology for publication in the Indonesian Journal of Agricultural Research and Development; publication of a 114-page manual called, "Cage culture - a method of fish production in Indonesia"; publication of a 7-page brochure, "Indonesia's shrimp industry status and development - executive summary report"; and publication of a 17-page bulletin, "Role of women in development and poverty alleviation in the fisheries sector."

Finally, for the last months of the project in 1992, the project has scheduled a short course on seafood quality control (mid-May), and one on Eastern Indonesian fisheries is scheduled for the end of May.

3.6 Project Management

3.6.1 Management of the project

The project paper was authorized in August 1986 and a signed Grant Agreement was made between the Department of Agriculture and the Embassy of the USA in Indonesia in the same month. A number of activities were initiated by the consortium until 1988, when a project paper Amendment (#1) was made, and subsequently signed in April 1989. A three-year contract for the amended project implementation was made with Auburn University on 1 July 1988. This was extended for a further twelve months in July 1991.

The project management unit was accommodated in the offices of CRIFI in Jakarta. The first COP was resident from mid-July 1988 until he retired in February 1991 (31 mm). A new appointment was made but, after five months he was recalled by his University. Thus the position of COP from August, 1991 was filled by a series of short-term non-resident COPs until the end of the project (30 June 1992). In all, five individuals from Auburn University (including the first COP again) occupied the position temporarily for eight terms, which were for periods ranging from 13 days to 86 days. These visits covered the 11 months remaining in the contract, with the exception of one period of 22 days, when there was no COP on site.

Within the management unit there was a permanent national Project Manager and a secretary. Between 1986 to 1992 there have been three project managers, the last of whom served for three years.

The project paper amendment proposed an aquaculture facility design specialist in the unit to complete the preliminary design studies which had been initiated since 1986. Two such individuals provided 6.3 mm of support through five visits between 1988 and 1991, ranging from 28 - 51 days. They completed studies for the renovation and expansion of facilities and ponds at RIFF at Palembang (10 ha), IPB (4 ha), and UNHAS (20 ha), and prepared preliminary designs of a pond complex at the new freshwater fisheries station for RIFF at Sukamandi.

Management of project training activities was by committee. The COP invited administrators of the respective participating agencies to choose topics for the short-term training courses, identify the location, and establish the course criteria. All non-research-related courses were held under the auspices of DGF at either DGF or at CRIFI stations or sub-stations, and all research-related courses under AARD (CRIFI) at the participating universities or their research centers. These lead agencies notified their resources in the provinces to nominate candidates. The committee made the final selection of candidates, and also selected the instructors (frequently consultants) proposed by the COP and project manager. In addition to appropriate staff members of the respective participating institutions, the trainees included members of the private sector, non-government organizations, municipal officers, and staff of other government departments.

Management of planning activities, special studies in support of planning, and the competitive research projects, was also by committee. These inter-agency selection committees were frequently aided by consultants. Between these and project training activities, the COP drew

on the assistance of almost 80 consultant visits, for over 1700 consultant days. These visits varied in length from 2 - 102 days.

As part of the management process, the COP produced an Inception Report in July 1989, and a Mid-Term Report in January 1990. For general information a Newsletter was occasionally prepared and circulated.

3.6.2 Monitoring of the project

The FRDP was monitored financially through quarterly contract file control sheets, and activities and outputs by quarter in 6-monthly reports prepared by the COP.

Project officers from the USAID Mission attended many of FRDP's events, and a Mission Director's Implementation Review of FRDP was carried out in August 1989. An independent four-week Evaluation Mission was conducted in-country in May 1992.

4. FINDINGS

4.1 Effects of the Project

4.1.1 Policy agendas

There was considerable variation in the opinions of administrators, researchers, and fishermen regarding the merit and usefulness of the first two fisheries Forums. In general, those administrators who attended the Forums thought the meetings had been informative and useful. They appreciated the opportunity to hear the exchange of ideas and proposals regarding the national focus on research and policy planning. Other administrators did not appreciate having been invited to attend but only as observers. They believed that all participants should be allowed to participate in the discussion, and to present a short paper if they desired. One administrator who was invited as an observer did not attend because he felt that he did not wish to listen if he could not be heard.

Some administrators, many researchers, and most fishermen had not heard about the two previous Forums, or plans for a third one. When told about the substance and intent of the Forums, some experienced disappointment that they had not been given the opportunity to participate, while others seemed indifferent and suggested that such proceedings were usually dominated by the national agency officials anyway.

The most frequent and strongest concern expressed by most persons interviewed was the need for equitable regional representation at all sector levels at any fisheries forum. The mission was frequently reminded that Indonesia is a vast country with 27 regions covering some 2 million square kilometers of land mass, plus the adjacent exclusive economic marine zone (EEZ); and while fisheries' needs vary greatly between the principal land masses of Sumatra, Java, Kalimantan, Sulawesi, Bali, and Nusa Tenggara Barat, together with the islands of Maluku, and Irian Jaya, fisheries' needs can vary just as greatly between regions within any one of these land masses.

Many persons were critical of the planning process for Forums I and II because they were organized from the "top down", rather than from the "bottom up". Specifically, the concern was that the needs of the more distant and less populous regions would suffer due to pressures from the more populous regions closer to Jakarta. They wanted to see a planning process that started in each region where representatives from the fishing, research, and university levels of the sector could meet to exchange ideas on physical, financial, and policy needs. Ideally, each region would use consensus to develop prioritized lists of needs according to a prearranged reporting system. Each region, then, would elect its representative(s) to not only attend the Annual Fisheries Forum and present the regional needs, but to report back to the region the needs of other regions, and the actions taken, and policies adopted at the Forum.

The mission was encouraged by the contents of the Draft Agenda for Fisheries Forum III. Many (but not all) of the concerns expressed above have been addressed in the Draft. The inclusion of representatives from the various research institutes, universities, and the private

sector, as well as governmental and international organizations should provide a strong cross-section for the working group discussions. However, there does not appear to be the broad representation which would recognize the country's regional diversity and different needs. The organizers should extend invitations to (say) delegates elected from the regional associations of fishermen and fish-farmers, NGO's within the region active in fisheries development, state regional universities, provincial fisheries offices, associations of professional fisheries scientists, and regional planning boards. This would in part offset some of the imbalance of administrators over the private sector, and encourage 'bottom-up' planning, rather than the 'top-down' planning, which is evident.

The four working groups of Integrated Marine Fisheries Resource Development and Management, Integrated Inland Water Fisheries Resource Development and Management, Private Sector, Human Resource Development, and Institution and Technical Development, present a powerful set of topics to help guide formulation of national fisheries policy.

The mission notes that Fisheries Forum III will be conducted in English, with the DGF and CRIFI providing the secretariat and publishing the proceedings. The mission has reviewed the proceedings from Forum I, and was impressed by its detail and completeness. In the personal interviews around the country, the mission met few individuals who had seen or read the document, and were curious about its content. The mission urges that, to alleviate this problem, consideration is given to publishing a condensation of Fisheries Forums I, II, and III in the form of a 'Pa-Tek' for broad distribution to the various regional fishing entities.

4.1.2 Education and training

(a) Education

Only 5 recipients of the 13 postgraduate fellowships were interviewed during the mission. The others had not yet returned to Indonesia, even though some had completed their courses.

The reports of the five recipients about their educational experience were highly favorable. The qualifications received were directly applicable to their working responsibilities. Although one recipient would have preferred postgraduate education in the diseases of marine organisms, he received the applicability of his education of freshwater fish diseases, and another changed from food science and nutrition to resource economics while overseas.

The recipients who had returned had as yet little time to report that their education was being used to the full. However, all indicated that they had been placed in positions where their newfound knowledge would be used, and in some cases been appointed coordinators for research in their institutes. One had been promoted.

The preliminary training in English language had been useful. However, as the 3-7 month training course had been given in 1987, and the students did not leave until 1989 and 1990, they felt that the time interval was too great. The students had to wait from between 15 - 33 months before going overseas. Moreover, the course was not given by the prime

contractor but a small sub-contractor and there was always a delay in obtaining the teaching materials and audio-cassettes.

All the interviewed recipients were young at the time of departure overseas (under 30 years of age), therefore the investment in education for the future educational needs of the country was long-term and properly made. Three women had qualified to be included in the group.

The range of fisheries fields selected by FRDP for project postgraduate education was diverse, and the target universities in the USA fully applicable, and most of the students carried out research projects relevant to Indonesian problems.

The organization for the recipients before departure was not good, although this may have been due more to the lengthy and complicated national process than to the poor management of FRDP. Some students called to Jakarta ready to go had to wait for a month before finally obtaining air tickets and permission to leave, and even then their air tickets were only from Jakarta and not from their home base. Once in-country, problems were few, and only one student reported a problem of not receiving a living allowance for his final three-month extension.

FRDP appears to have had little follow-up with the returnees so far, and is not planning to use them in other events. For example, the student receiving an M.S. degree in food technology and nutrition has not been invited to either teach or translate at the workshop of seafood processing, although the FRDP did pay for her to present a paper on her research at a meeting of national food technology in Jakarta.

(b) Training

Some 13 individuals who had attended short-term technical courses and professional seminars were interviewed. All considered the training to be relevant to their particular needs, and most have had the opportunity to use the new knowledge gained in their current work and area of responsibility.

The courses were well planned at the administrative level, and adequately organized for the recipients. Most trainees received about one-months notice in advance, but there were several exceptions, even to one-day's notice. The instruction had been well prepared, and materials were provided in all courses, but mostly in English. As most of the instructors spoke only English, interpreters were provided.

In general the trainees thought that the courses were too short. In part this was because each course of some 21-24 days had only about 17-20 effective days, some being lost to the inclusion of set national instruction. This reduced time meant that more time had to be given to theory, whereas the trainees were more interested in practical work. Most thought that a minimum of four weeks could have been devoted to each course.

Some trainees thought that the courses were too technical. Those responsible for extension, for example, had little equipment and field apparatus to begin with for, say, water quality and soil testing, and would have liked the course to include low-technology techniques.

The composition of trainees in each course was well controlled, with all research institutes fairly represented. Some courses might have been increased in size or repeated to involve more participants. For example, usually three individuals are responsible for water quality and soil chemistry at the research institutes of CRIFI, but each institute could only nominate one participant. In most cases, the attendee had passed on his experience and photo-copied the course materials for the benefit of his/her colleagues who could not come.

No professional socio-economics courses were organized. This was an omission in view of the fact that extension officers interviewed in the field had little or no idea of the economics and social suitability of the production systems they were expected to be recommending to the farmers. Similarly, there were no special courses for professional women, such as technical training for hatchery operators.

The individuals who attended workshops and professional seminars all acknowledged that the events were far too short. Moreover, almost all reported that they had received only a few days notice about the event from their superiors. Consequently they had no real idea that the courses were organized by FRDP, or that USAID was providing the technical assistance. Frequently there were no hand-outs, and no personal help or guidance.

Certain seminars which provided specific instruction, such as grant proposal writing or research planning, should have been longer, with attendees given the opportunity to write proposals and research plans, and discuss them individually. Some competitive grant proposals reviewed by the mission from attendees were obviously inadequate, and therefore the seminar had produced little benefit.

(c) Conferences and study tours

The mission interviewed two recipients of funds for attending conferences and study tours abroad. In summary, these had merit but the return on the investment was small. Study tours are a highly effective means of training and, as the greater expense of air fare had been committed, more time should have been given to the recipient to make a purposeful study tour. For example, one recipient who travelled to Florida did not visit either URI (as he was a marine fisheries scientist) or Auburn University (the prime contractor).

However, conferences and study tours were not an initial objective of the project, but FRDP was correct in supporting these events.

(d) Linkages

The mission found that, in general, informal linkages at the level of the professional researchers were very good. Because of the financial constraints in forging broader linkages, the researchers linkages were regional in nature, and particularly where institutes were in close proximity, such as those around Bogor, and those in Ambon. There was often contradictory reports about more formal linkages between the research institutions. For example, many university administrators described the use of all qualified professionals in the region to supplement classroom instruction as well as serving on committees for students' theses. This was frequently denied by the researchers outside the universities, and totally denied by capable and qualified individuals in the private sector. Follow-up linkages for

classroom teaching were less evident, and the universities as yet have made little or no use of the newly-returned fellows for lecturing and tutorials.

4.1.3 Research and research facilities

Research planning workshops and information gathering dominated the activities of the FRDP in the first two years. This was necessary in view of the goal of the project to assist in the preparation of a National Fisheries Research Agenda, subsequently held in July 1990. As noted in Section 3.1.1 and 4.1.1, above, the research institutions were well represented at the preparatory meetings and at Forum I, and the mission found the reaction in the field to be highly favorable towards the process and the results achieved so far.

The most valuable activity of the research component concerns the competitive research grants. This activity was not planned by the project. Originally the project intended that three experts should be attached to each of the regional research units (RIFF, Bogor and IPB; RICA, Maros and UNHAS; and RIMF, Ambon and UNPATTI), but the management unit quickly observed that this was not being effective or productive. Consequently FRDP stimulated action by offering relatively small grants (up to Rp 10 million) for research, based on competitive proposals. As part of the process, the COP conducted instructional workshops on proposal preparation and research planning. The 22 funded projects have produced a series of competent research reports, many of which have already been printed in presentable form, and distributed. The research activities were predominantly information gathering and comparative studies, rather than scientific experimentation. However, this is acceptable in view of the constraints of time and the relatively small amount of funding for each project. Two projects have not been completed (one by IPB and one by RIMF) because the final reports have not been received.

Because of the competitive nature of the grants, the distribution among the research institutions was not equal. Seventeen grants were awarded to the CRIFI research institutes, 7 to RIFF, 7 to RICA, and 3 to RIMF, including their sub-stations. Only five were awarded to the universities; 3 to IPB, and 2 to UNPATTI. UNHAS failed to receive any grants, seemingly because it was slow in preparing and submitting proposals, and because individuals applied. The other universities submitted cooperative proposals, often under the auspices of senior members of staff. The research institutes of CRIFI were obviously more responsive to the opportunity, probably because their time is solely devoted to research, and not to teaching classes and instructing students.

One weakness of the competitive grant process developed by FRDP was the lack of feed-back to those whose proposals were rejected. Some rejected proposals seen by the mission were obviously weak, but the researchers had not received any further help in improving their abilities in proposal writing for the future.
Moreover, the proposals had to be written in English. The process was clearly stretched, as the mission found that some researchers had not had any response after a year of waiting, but in some cases the lack of communication had been internal.

The 11 special research information studies in support of the policy agendas were carried out as planned. Many of the these have also been published in final form. Here, the universities

played a greater role, receiving five commissions (three with UNHAS and two with IPB), and one joint commission (UNPATTI with RIMF). The CRIFI institutes received four (one with RICA, two with RIMF, and one with CRIFI), and the one shared. The other project was carried out by FAO.

The Center for Research and Development of Ocean Sciences (PPPO) did not take part in any of the FRDP special studies. The PPPO has large research facilities at Ancol (Jakarta) and Ambon, and much of its work related to commercial fisheries. At Ambon in particular about 30% of its work is applied, rather than basic in nature, and concerns marine aquaculture. Although representatives of PPPO attended the two fisheries Forums, the mission believes that an opportunity was lost to further the linkages between all national research institutions, particularly at the researcher level.

The evaluation mission perceived a number of issues in the national process of research planning and funding. The principal funding agency is BAPPENAS, which appears to be exercising more power over what research is carried out. For example, the PPPO, essentially created to carry out fundamental research, already carries out applied research and is being encouraged to carry out more (possibly up to 50% at Ambon). Furthermore, the majority of research is directed towards 'Commodities' selected by the central administrations in Jakarta, rather than relying on the regional research institutions to respond to the needs of the region.

It was also apparent to the mission that aquaculture received a disproportionate share of research attention and support. Aquaculture development is identified as important in the national policy, but so is marine fisheries, which is receiving little support by comparison. This discrepancy appears to be due to the lack of funding resources. Marine fisheries research, such as the carrying out of resource surveys and gear technology improvement, is very costly, and largely neglected. Research which is being carried out is mostly relatively inexpensive research on post-harvest technology and marketing studies.

The development of research facilities through the preparation of preliminary design drawings by the project has made a valuable contribution to the three centers. The construction of the RIFF center at Sukamandi has been funded by the WB, and the facilities at IPB Darmaga campus will be funded by the Japanese Government.

4.1.4 Technical packages

For the fisheries sector, DGF has the mandate for implementing Pa-Teks through extension, training courses, and policy development. Therefore, to avoid confusing its technical package outputs with the official GOI Pa-Teks, FRDP has called them 'Pedoman Teknis', or bulletins which bridge the gap between research and experience information, and extension. Although drafted in English the FRDP Pedoman Teknis are being translated into Indonesian. The topics were decided by committee to address fisheries development programs. The purpose was to increase the number of fish farmers, improve the incomes of fishermen, increase fish consumption, and increase exports. In developing these publications, FRDP has exceeded expectations.

Most Pedoman Teknis were prepared on topics to promote fish production through aquaculture, especially freshwater aquaculture. Fish-cage production and Tilapia niloticus were the principal topics and species addressed, respectively. Little attention was given to topics dealing with pre- and post-harvest activities. However, there are several problem areas with cage culture which need attention, such as, (i) the availability of seed, particularly of carps, and safe methods to transport fry, and (ii) methods to prevent damage to net cages by parrot-fish and crabs. Such problems as these have made some farmers reluctant to adopt the new technology.

Many farmers also reported that the Pedoman Teknis, although intended for DGF extension personnel, were more theoretical than practical. They realized that the technology was introduced from another country and was not directly applicable to brackish water and marine production, as needed in areas such as South Sulawesi and Ambon. Here, farmers wanted more relevant guides, emphasizing a more practical approach, and in simple language.

Ideally, materials which assist in the transfer of technology to the primary producers should meet certain criteria. Specifically they should - provide means to utilize effectively, efficiently, and safely the available resources; diversify fisheries commodities and products; adapt to changing climates and environments; be capital extensive and provide means to develop all enterprises (such as small, medium, and large-scale fisheries) in utilizing resources; be compatible and not in competition with other production systems, and preferably complementary (such as using rice-paddy production of fingerlings to be used subsequently in cage culture). The technology should be simple, productive, and efficient, and economically and technologically available to all levels of society, including the uneducated and impoverished small operators. Finally, it should be more adaptable than conventional methods to match production to market demands, whether local or export.

To benefit the society the technologies should be transferred directly to the end users. Effective means of technology transfer may be carried out through on-farm research, farming systems research, field day demonstrations, etc. Linkages between research, extension, and users of technology should be well established. Legal aspects of technology development should also be considered in the utilization of resources.

Three additional manuscripts (on cage culture, shrimp industries, and water quality management and aeration in shrimp farming) have also been professionally prepared in English, and the former in Indonesian. These also have been disseminated as above. The latter has not been translated because of its length (82p). Nine other publications have already been drafted in English and are being translated into Indonesian. The FRDP produced four full-color posters of Indonesian aquarium, freshwater, and marine fishes and invertebrates. These posters have received wide distribution and prominent display. A computer to assist with desktop publishing has been purchased by FRDP and is in use.

4.1.5 Private sector development

One major question encountered in the field was how to assist the development of the private sector by the provision of opportunities for the private sector to participate in the various short courses and training organized by the DGF and sponsored financially by FRDP. The

training of the private sector in these courses would help to achieve the training objectives of the project, i.e. to train trainers. The mission considers the private sector in two categories, namely the businessman involved in fisheries business activities, and the farmers who operate small-scale fisheries production activities.

In each of the regions visited, particularly in South Sulawesi and Ambon, the mission interviewed the regional chairmen of GAPPINDO, but found that this important regional association was not aware of the fisheries Forums or the other events of FRDP. The short-courses, and the selection of candidates to attend them, were completely in the hands of DGF. The centralized management of events and selection of participants generated the possibility that only those near the decision-maker will get the opportunity to benefit from events provided by FRDP.

The mission encountered a different situation in the Lake Toba region. There was evidence of a strong linkage between FRDP and farmers living in the area. Working closely with LSPW, FRDP had launched a training program to introduce cage fish culture. The results of this training have been very positive. The first 33 trainees who attended the 1-day workshop went back to their individual villages and began to function as trainers to other villagers. Currently there are more than 235 households around Lake Toba which have adopted the cage fish culture technology, and have developed fishing activities as their principal source of income.

There are several factors which contributed to the Lake Toba success. First, by involving an NGO in the training management, FRDP was able to by-pass the administrative hurdles in the process of selecting participants. Selection criteria became more objective as the NGOs select participants who meet the necessary criteria to become trainees in the individual villages. One criterion, among others, is his or her willingness to help others. LSPW, given the rapid spread of the technology among the villages, has used the criteria effectively in selecting the right persons to attend the training.

Second, LSPW provided a small amount of money to the farmers to build a cage and a raft, and to obtain fry and feed. Sociologically this is important, as it helps each farmer to establish a farm which functions as a demonstration plot for others to see. Providing financial support to farmer/innovators to establish a demonstration is cheaper financially and sociologically more effective than establishing an experimental station. Demonstration pilots operated by farmers provide more opportunity for farmers to get relevant technology, and allows them to evaluate it more critically.

Third, based on the research of the Lake Toba farming system, LSPW knew that women had a significant role in local agriculture production. Therefore, LSPW decided to include women in the aquaculture training programs.

Fourth, the success of LSPW to disseminate cage culture technology among the Lake Toba farmers depended very much on the capability of LSPW staff to establish close and regular contact with their clients. Staff of LSPW were provided with means of transportation, a motor boat and a pick-up truck, which facilitated their contact with the clients. Moreover, they were well trained in cage fish culture so that they could provide reliable information to the farmers.

It is unfortunate that the success of LSPW is diminishing, and farmers find difficulty in trying to get new fry for their cages.

From the mission's findings in Lake Toba it is obvious that here is an urgent need for a short course and training for farmers and hatchery owners to be exposed to better technology for fry transportation. However, looking at the short courses/training which have been conducted by the project, it seems the topics selected tend to cater to DGF's fisheries development priorities rather than the needs of the private sector, in particular the farmers. This explains why farmers in South Sulawesi commented strongly on the training activities conducted by DGF by saying that, "their eyes got sore from continuously looking at the blackboard." They felt that the training was not relevant to their needs, and the information was too theoretical and difficult to follow. South Sulawesi farmers also complained that training had not been followed by provision of credit facilities to allow them to implement the technology.

Government fisheries development oftentimes becomes an impediment for farmers to adopt new technology or for a local fisheries agency to initiate new programs within the region. DGF had decided that the South Sulawesi Fishery Agency must put high priority on the development of shrimp and seaweed. Efforts to develop other "commodities" outside shrimp and seaweed will not receive any support. Thus, when farmers complain that the price of seaweed continues to drop, nobody in the local Fishery Agency dares to take the initiative to provide alternatives for the farmers because they are afraid that their actions might violate the government policy.

The commodity approach in fisheries in South Sulawesi also affected the scientific motivation of the researcher to supply local farmers with new technology. The motivation for a researcher to seek new technology alternatives is basic for meeting farmers' needs, and widening their technological choices. In complex, diverse, and risk-prone fishing activities, the needs of both fish farmers and fishermen often differ from the simplified centrally planned priorities.

Linkages between a research center and clients such as the local Fishery Agency, the private sector, and the farmer is essential for successful development of the regional fisheries sector. Based on the findings of the mission in the field, such linkages generally do not exist. Exceptions seem to occur in South Sulawesi. For example, there is a monthly meeting of the head of the regional Fishery Agency, the head of the Fishery Research Station at Maros, the head of the Fishery Department of the University of Hasanuddin, and the Chairman of the local branch of the Association of Fishery Scientists in Indonesia (ISPIKANI). The purpose of the meeting was to discuss the emerging fishery problems in the region, and try to find solutions to their problems.

The seemingly weak linkage between the research station and its clients has generated certain problems, namely the research station cannot exploit the potential financial resources in the private sector by receiving contract research, thus minimizing funding dependency on the government.

Women and their role in the development of the fisheries sector has been one of the objectives of the project. The mission noted that the project has been able to bring this issue

to the attention of policy-makers in AARD as well as DGF. The project, through its Special Studies projects funded research on the role in development and poverty alleviation in the fisheries sector. This will ultimately stimulate other researchers, particularly Indonesian scientists, to conduct similar research.

Also, equal opportunity is provided for men and women to attend training sessions. However, at the field level the mission heard strong criticism concerning the fact that, until the project had reached its phasing-out stage, not a single workshop or training on women in development in the fisheries sector had been offered by the project. There has been great demand for such courses from both the women researchers and extension workers eager to facilitate their work in the field.

4.1.6 Project management

On the whole, project management by Auburn University has been good. Although the Amendment to the original Project Paper proposed a reduction in the Scope of Work, this was not borne out in reality. From a very large project of over US$ 7 million, which focussed on institution building within the fisheries section of AARD, it was reduced to a grant of US$ 2.6 million, plus a component for education and training funded from another source. Although institution building was de-emphasized on paper, it was not in practice, and the activities described in the amended project remained largely institution building for the first three years through linkages between AARD and the research institutes of CRIFI. The Amendment also added prime components of policy making and working with the private sector, both responsibilities of DGF and not AARD. Consequently the FRDP was put in a position between AARD and DGF, and charged with conducting activities which involved them both, or which involved either one.

The situation was helped by two funded Amendments to the contract for conducting special outreach training courses to be organized with DGF and selected private sector organizations, and an improved understanding between the Director Generals of both AARD and DGF. Nonetheless the management unit of FRDP should be complimented on its achievements and diplomatic handling of many components of the project, particularly the three planning Conferences which required close cooperation of both agencies. In many countries it would have been untenable.

Although the national participants in the original Project Paper were reduced to only seven, the activities proposed in the Amendment still included all areas of fisheries production (freshwater, brackish water, and marine), and even post-harvest technology, throughout a country which is a vast archipelago. Consequently the management of FRDP, essentially the COP and PM, was thinly spread, and had to rely on the support of a large number of technical experts to undertake over 100 activities. This counters a national criticism that a large proportion of the project funds were used outside the country.

Good flexibility of FRDP was demonstrated by the initiation of competitive research grants to replace the initial activity of research specialists working closely with the administrators of fisheries departments of selected universities, which proved to be ineffective. The competitive research grants, on the other hand, produced many positive results.

At times the management of FRDP appears to have been lacking in good communication. For example, the mission heard that experts had been sent to agencies with little idea of what they had to do, and that many cooperating organizations had little advanced notice of events, particularly seminars by experts. Good communications diminished the further away from Jakarta. The lack of communication may have been within the cooperating agency, between administrators and actual field participants.

Finally, FRDP appears to have been weak on publicity. The mission was made repeatedly aware that many individuals had little idea about the role of FRDP and USAID in many events and activities in which they had taken part. This is reinforced by the fact that many publications produced under the auspices of the project do not acknowledge either FRDP or USAID. One particularly useful publicity tool used by FRDP was the production of the informative wall charts on Indonesian fishes. These were highly visible in almost every center the mission visited. Although the management unit was expected to produce a Newsletter, this was never carried out regularly or professionally. A quarterly Newsletter would have been the ideal tool for bringing the work of the project before the professionals and the private sector, and for providing a record of past and future events the project was supporting.

4.2 Achievement of Objectives

4.2.1 Short-term objectives

In the short-term, FRDP planned for the establishment of a national coordinated fisheries research agenda, upgraded research programs at the MOA and key universities to address priority production constraints, and to improve academic training at selected universities with mandated responsibilities for fisheries training.

FRDP had four principal components, and the achievements of each are described below.

(a) Upgrading the staff, facilities, academic training, and research programs of seven universities and research institutions to resolve priority production, marketing, and policy and management problems.

The mission finds that FRDP achieved most of these elements, but to varying degrees. Academic training was successfully advanced, thanks to the supplement of funds from outside the project. The cost-effectiveness of overseas education was excellent (about US$ 2,000 per man month), which compares with United Nations estimates for fisheries training of almost US$ 5,000 per man month). Technical training of the staff at the principal fisheries research institutes was also successfully upgraded through a wide variety of short-term courses for many participants. The mission believes that the level of success could have been increased further by closer contact with the many visiting experts who gave the courses. For example, few of the technical sessions of courses were given by nationals who would have gained confidence from this exposure.

Research programs at the participating institutes as a whole were not greatly advanced. Although the competitive research grant element of the project was excellent, the research was mostly information gathering and comparative assessments and not scientific research which might advance the general methodologies of science throughout the institutes. The period of the grants was too brief, and the financial support too limited, to allow this.

Researchers also undertook many special studies commissioned by FRDP. This was a very valuable feature of the project which has led to authored publications. However, FRDP also commissioned many special studies by the technical assistance specialists to develop basic information for the three Forums. This was also valuable for its purpose, but the mission believes that all these studies should have been a team effort of one or two nationals supported by the specialists, and with publications showing the nationals as senior or junior authors. Only a few researchers were fortunate enough to work on these studies, and have their names associated as a co-author.

The amended project did not include the improvement of capital facilities for research (laboratories and experimental ponds). However, FRDP did complete preliminary design drawings for facilities at three research centers which have been (or will be) funded by other multilateral or bilateral donors. Neither did it include the provision of scientific apparatus and laboratory equipment for the participating research institutes. The non-technical equipment, such as vehicles, computers and printers, typewriters, and in some cases a photocopier, have all been provided and well used, but have not upgraded the research resources of the institutes.

(b) Assisting the MOA and the Ministry of Education (MOE) to establish a nationally coordinated fisheries research agenda.

The mission finds that FRDP has greatly assisted MOA and MOE to produce a National Fisheries Research Agenda. There has been a great deal of collective planning, many people have been involved, and a number of significant base-line papers have been prepared. Thus FRDP has provided a vehicle for dialogue which is the foundation of a National Agenda. However, the mission has not been able to evaluate the progress so far as it has not been able to obtain a copy of the proceedings of Forum II, although it notes that there must still be gaps in the mechanism as the National Science Council (LIPI), the agency with the mandate to coordinate research, has so far not been involved.

(c) Assisting the MOA in evaluating the need and mechanisms to improve fisheries policy and planning to ensure the optimal utilization and management of Indonesia's aquatic resources.

The mission finds that FRDP has greatly assisted MOA to ensure optimal utilization and management of the national aquatic resources. Again FRDP has provided the vehicle for dialogue and discussion as the information base for Forum III (to be held in June 1992). The mission commends particularly the structure proposed for the Forum, with regional representation and total participation through working groups. The FRDP will also be an active participant and secretariat of the Forum, and publish the proceedings.

(d) Improving technologies for the production and marketing of commercially important fish products.

The mission finds that FRDP has achieved some success in the improvement of technologies for production and marketing of important species. Accomplishments have been achieved more naturally in culture fisheries, where investment is considerably less, than in capture. Some 25 mini-technical packages, Pedoman Teknis have been produced, and one important Pa-Tek on high-density small-scale cage fish production; many courses have been offered to the private sector, and special studies commissioned. The mission notes, however, that many of the mini technical packages are mostly only suitable for the district extension officers of Dinas Perikanan, and that further work is necessary to prepare material for the farmers. Moreover, many of the proposed technologies have not been analyzed economically or socially for the different regions, and most are for freshwater production whereas the greatest need is in brackish water and marine production.

Although studies have been carried out in support of the marine capture fisheries industry, there has been nothing which would directly increase production, namely research in fishing gear technology and resource surveys. These elements are currently neglected in the country altogether, predominantly due to the high cost.

4.2.2 Long-term objective

The FRDP had the long-term objective of improving the technological and management resources available to both public organizations and private enterprises in the fisheries sector.

The extremely large number of outputs of the project are now being used, all to varying degrees. It is therefore too soon to determine if these effects will produce impacts in the future. The mission believes that the impact will be small, predominantly because these outputs covered all aspects of fisheries in the country, and did not focus on only two or three components which were then attacked in depth. Nonetheless, the long-term benefits of FRDP are unquestionably useful, particularly in better organization for planning both fisheries policy and research, a nucleus of better-educated and trained technical personnel, and a productive system of cage-farming of freshwater fishes by primary producers. In addition there may be impact in the organization and management of the sector by GOI through streamlining a number of internal processes.

4.3 Unanticipated Results

A highly significant and unanticipated result of the project is that other sectors are evaluating and probably going to implement the process which brought together all the fisheries organizations and institutions in the country to discuss policy agendas, namely the preparatory activities which led to the three Fisheries Forums, and the Forums themselves. Thus FRDP may have created a model for effective inter-agency cooperation to develop national policy and to deal with important issues.

Another important and unanticipated result of the project is the effectiveness of an NGO in development, encouraged by good technical information and a modest level of direct financial backing, not credit. However, the latter is obviously most important for subsequent expansion and sustainability. The example provided by the project is the LSPW organization at Lake Toba which, through a program of training trainers and lead farmers, the FRDP successfully launched the production of cage culture in the lake which subsequently involved 235 farmers.

The project produced rewarding results through its system of competitive research grants. These were valuable not only for the end products, but also for the self-confidence of the researchers. In view of the modest investment in this component (about Rp 163 million for 22 projects) the returns were highly cost-effective. However, at this low level of individual grant funding (a maximum of Rp 10 million) such a program would not support scientific studies.

The project did not set out to produce its series of Pedoman Teknis, or small technology packages. However, in view of the protracted process for producing the official Pa-Teks which were originally planned, FRDP changed its target
to meet its own needs and also accelerate the transfer of technology to the primary producers. Some of the information included in the Pedoman Teknis was general in nature, and had been developed and used outside Indonesia. In one or two cases this was not necessarily useful, but the idea of Pedoman Teknis will probably be continued after the project has ended.

Good publicity for FRDP and the technical assistance provided by USAID was obtained very effectively through the unplanned publication of colored wall-charts of commercial and tropical fishes. In general, however, familiarity with the project and its donor throughout the country was poor.

Finally, careful budget management of project enabled a 'no-cost extension' of twelve additional months. This enabled the project to produce more outputs than anticipated, and to focus more attention on assisting policy development (in Forum III) and working more realistically with the private sector than could have been expected at the start.

5. CONCLUSIONS

5.1 The Effectiveness of Technical Assistance

The purpose of the technical assistance provided by USAID to GOI was to upgrade the capacity of Indonesia's public and private sectors to lead and support sustainable fisheries development.

The project has assisted in the development of national policy agendas through the networking of government fisheries agencies, respective fisheries organizations, and the private sector, and through the publication of proceedings of the annual forums. This process is being regarded as a model by other national sectors. The effectiveness in this regard could be improved further by more regional interest-group representation.

A cost-effective investment in long-term education will be lasting, as all fellows have returned or are returning to the country. All are placed in positions where they can apply their new experiences immediately, and this will have a multiplier effect within their respective institutions. Short-term training will also be lasting, particularly through the efforts to train trainers and involve NGOs in the training and extension at the field level.

The work in research has developed a number of strong proposals to multilateral and bilateral donors. The competitive research grants provided by the project have produced results which added to the national fisheries information base, and added to the competency of the individual grantees. However, the effectiveness is modest because of the budget constraints imposed.

The initiative to produce mini-technology packages, called Pedoman Teknis, offers a speedy and effective conduit to transfer technology at the field level. Twenty-five Pedoman Teknis produced by the project offer continuing benefits to both small-scale and commercial farmers. The process is also a model which may be used by other sectors. The production of an approved Pa-Tek has created an active industry in intensive culture of freshwater fish in cages of low-volume.
The project's activities to link to the private sector has been most valuable at the small-scale farmer level and should provide future impact, particularly through its work with NGOs. It has been less effective at the commercial level because of restricted communication

The project has been successful in involving women at all levels, and especially in technical transfer, but more emphasis on special women's programs is required to sustain these initial efforts.

The mission concludes that the project was in the right place at the right time when Indonesia was rapidly becoming a major fisheries nation, particularly in world aquaculture. It has produced valuable results currently in use in both the public and private sectors. Many are direct investments in the future of fisheries themselves, and others are concerned with more effective processes in organization and management. Collectively they anticipate future impact.

5.2 The Effectiveness of Project Methodology

In view of the many demands of a growing national fisheries sector, the methodology adopted by the project was for many short-term technical assistance activities at all levels of the sector, backed by a long-term investment in post-graduate education overseas. The assistance was coordinated by a small management core. This approach was probably the only effective way to achieve the desired project outputs and fulfil the project terms of reference in the three years available, subsequently extended to four.

As the initial emphases of the project were in institution building and research, the project was placed within AARD, an agency responsible for research and human resource development. However, with emphases towards the end on activities in fisheries planning, extension, and farm-level production, the project would have been better placed within DGF, which had such mandates. Assisted by the growing mood of inter-agency cooperation within the country, and by the work of the project leaders, this potential problem did not prove to be detrimental to the project's success.

The technical assistance might have been made more effective by designating national counterparts to each activity, which could have led to co-authored professional publications. Many project activities were undertaken by visiting experts alone. Similarly the short-term training-courses could have involved national experts, and (even though this would have proved to be impractical because of the deferred timing of their education) some courses might have been planned around the new qualifications and experiences of the returning fellowship recipients. Also some visits by overseas experts were too brief to be of real value for all parties, as were a number of overseas conference/study tours funded by the project for national leaders.

The mission concludes that the project methodology of massive and varied technical assistance organized by a small management core was highly appropriate for the project. It proved to be effective in achieving the short-term objectives, and for laying the foundation for achieving the long-term goal of a sustainable national fisheries industry.

5.3 The Effectiveness of Project Management

(a) The prime contractor

The prime contractor, Auburn University, was most effective in recruiting qualified experts to provide technical assistance to the fisheries sector. This included both marine and inland fisheries, the culture fisheries, and in post-harvest technology and marketing. The contractor exercised great flexibility in new project initiatives and achieving outputs; for example, realignment of research approaches by administering a system of competitive research grants, and the production of Pedoman Teknis to by-pass the slow structured process of producing approved technical packages.

It should be noted that working effectively where so many entities are involved has presented some formidable management challenges. The bureaucratic and changing demands from all sides has necessarily consumed considerable energy from the Project. One recent example

that was mentioned involved obtaining travel authority for one of the long-scheduled consultants to come to Indonesia. At least 10 different offices became involved before approval was finally obtained. Although it is not in the scope of our evaluation mandate, it should be clear that more efficient ways need to be found for administration of USAID assistance projects.

The contractor was particularly effective in preparing and placing post-graduate fellows overseas, particularly in view of the highly competitive and diminishing opportunities at all universities in the USA. The International Center for Aquaculture at Auburn University, geared to the special needs of overseas students and supported by USAID for the purpose, has played a major role in the success of the long-term national investment in education complementing the difficult task of managing this component. Moreover, the component was highly cost-effective compared with most international education of multilateral assistance projects.

The contractor produced almost all its intended outputs, with the exception of the fisheries data-base and production of a quarterly newsletter, and in many elements greatly exceeded the target. The data base idea was abandoned because of the DGF was developing a similar data base with ICLARM support. In place of a newsletter, FRDP is compiling a 200-page book of the most relevant special studies to serve as a resource for policy decisions. A special synopsis of the shrimp background studies was also printed by FRDP.

The project was monitored by regular reports and a mid-term Director's Review, and the contractor exercised good budget control, extending the work for a fourth year at no cost, by which time almost all funds will have been spent.

(b) The national counterpart agency

AARD, the national counterpart agency for the project, through CRIFI and its fisheries research institutes, was an effective and cooperative collaborator in the project. AARD fulfilled its obligations in the face of legal and administrative constraints, and the fact that certain components of the project were beyond its mandate. AARD encouraged valuable cooperation between the national fisheries research institutes and the fisheries faculties or departments at their adjacent universities.

The mission was not able to confirm that AARD had fulfilled its commitment of US$ 1,025,000 (Rupiah equivalent), much of which was in kind contributions in staff, facilities, and equipment.

(c) The bilateral donor

USAID, the bilateral donor, has provided fair and enthusiastic support to the project, although it is the smallest of the agency's current portfolio of assistance projects in Indonesia. It has fulfilled all of the amended financial commitments, notably continuing to add funds to the project from other sources, and through amendments, to compensate for the sudden deobligation of some US$ 4 million from the initial institution-building and research project which was already underway.

However, although the short-term objectives of the amended project have been largely met, the mission believes that USAID took a serious if calculated risk in continuing to move ahead on the strength of an Amendment hastily put together at a reduced budget level, and yet in effect expanding the project in response to new USAID policies to work with the private sector and to assist in the formulation of national policies. This vacillation of purpose and objectives was counter-productive to the prime contractor in that it was required to redirect their focus and efforts in mid-course. The attendant changes in program planning and staffing unnecessarily consumed energies in process rather than in program products.

The added components took the project out of the areas of responsibility of the national counterpart agency, and put the project in jeopardy. Furthermore, the amended project did not include a methodology for monitoring the project, or establish standard criteria by which the success and achievements of the project could be measured. Normally, US AID has a reputation among donor agencies and contract recipients for being particular if not over-demanding on these being a key part of any project paper.

The mission concludes it is to the credit of USAID, AARD, and Auburn University that their effectiveness encouraged a great deal of the individual effort given to inter-agency collaboration and cooperation which helped the project transcend the potential problem of its counterpart location within GOI, and produce results which could be immediately used.

5.4 Lessons Learned

A number of lessons were learned from the implementation of the project, among which are the following:

(a) The donor should strive for consistency and purpose in the administration of bilateral technical assistance through the life of individual projects.

The mission believed that the mid-course changes in the original purpose and proposed activities of the project, due to the de-obligation of over half the original budget, placed an unnecessary burden on the contractor and the counterpart agency, and increased rather than decreased their work-load.

(b) The activities expected of technical assistance projects must be within the mandates of the counterpart agency.

The mission recognized the difficulties of the FRDP, charged with assisting in the development of national fisheries policy and working directly with the private sector while placed within an agency only responsible for national fisheries research. They succeeded very well, but thanks in no small part to the good working relationship between the Directors of the two agencies concerned.

(c) Technical assistance projects in support of a diverse sector, such as fisheries, should focus on only one or two components and carry them out in depth, rather than undertake many superficial activities in a large number of components.

The mission noted that the FRDP was responsible to some degree for all components of the fisheries sector (freshwater, brackish water, and marine production, as well as post-harvest technology) and undertook over 100 activities at all levels of the sector, from the primary levels (marketing and production) to all four secondary levels (local infrastructure, national infrastructure, and organization and management). This was extra-ordinarily excessive, particularly for a project management unit of two individuals.

(d) Local non-government organizations are most effective in communicating technology transfer and extension at the level of the primary producers.

The mission commended the approach of FRDP to introduce small-scale intensive cage culture of fish in Lake Toba through LPSW, a local NGO. By training trainers, selected by LPSW for certain skills, the lake region rapidly built up a critical nucleus of over 235 farmers.

(e) Short-term technical courses should be a minimum of four weeks of effective training, emphasize practical hands-on training rather than theory, and have follow-up.

The mission observed a lack of effectiveness of certain short-term courses. This was due to the loss of days in each week, for various reasons, and the emphasis of most courses on theory. Short-term technical courses should always be heavily biased towards practical exercises and hands-on instruction, with the minimum of theory. Moreover, instructors should attempt to use the apparatus and instruments available to the trainees in their own facilities, rather than describe methods of advanced instrumentation. The courses should also provide a mechanism for follow-up, with refresher materials or courses.

(f) Special seminars are not particularly valuable unless part of a formal structured plan, and also offer the students additional follow-up with personal tuition.

The mission noted the low benefit of brief seminars by visiting specialists, who are not particularly familiar with the students, their work, and their resources to carry it out. For example, courses providing planning and guidance require personal tuition to apply the information to each students' particular needs and circumstances.

6. RECOMMENDATIONS

6.1 Recommendations for the Fisheries Sector

(a) With regard to extension, the mission identifies an administrative barrier between research and application in the field by farmers caused by the centralized process of preparing, evaluating, and disseminating Pa-Teks. The mission recommends that GOI replaces it with a simple system for regional control, using regional research institutes, state regional universities, and provincial extension offices, which would have responsibility for producing extension information and conducting training courses in response to local and not central needs.

The mission commends the approach of FRDP and its Pedoman Teknis to simplify the transfer of technology to the primary producers. The mission recommends that the government continues to use the Pedoman Teknis as an extension tool in the fisheries sector, as they can readily be broken down into practical leaflets which can be photocopied and used directly in the field.

Furthermore, noting the success of NGOs in the transfer of technology at the field level, the mission recommends that GOI involves NGOs in the process of technology transfer. The mission also recommends GOI takes steps to integrate the Directorate of Agriculture Extension within AARD to facilitate closer cooperation between researchers and extension workers.

The mission perceives a general lack of associated socio-economic understanding in the process of extending technical information to the primary producers, the mission recommends that the Institute of Socio-economic Studies at Bogor receives GOI financial support to create a Fisheries Department.

(b) With regard to national research, the mission believes that the "Commodity" approach to fisheries development currently practiced by DGF may become a hurdle to fisheries research in the future. The mission recommends that AARD and DGF adopt a more flexible fishery development strategy which will allow research to respond more to regional rather than central needs, thus widening the options for the primary producers.

The mission also identifies administrative barriers in the process of selecting and approving young candidates for overseas education, and middle-level researchers to attend international conferences or to make valuable study tours. Again the mission recommends that the process of selection and approval should be localized and simplified so that it is immediately responsive to the timing of opportunities.

It remains apparent that there is still a need for more printed information available to researchers (and to all levels of the sector). The mission recommends (i) a new scientific journal for Indonesian fisheries, including aquaculture, paid for through membership in a professional fisheries society, and (ii) national and local trade papers for fishermen and farmers be published by the private sector.

(c) With regard to increasing fisheries production, and seeing at first hand the national problem of the shortage of seed for freshwater fisheries, the mission recommends this to be an opportunity for the advancement of women in the sector; in particular, workshops and supporting materials prepared to teach the fundamentals of hatchery management and production with the priority for floating hatcheries in the Cirata/Saguling region, and in marine areas where interest in marine fish cultivation is growing.

6.2 Project-related Recommendations

(a) The mission expresses concern that the Third Conference proposed in June does not have the broad and equitable representation which recognizes the country's regional diversity and different needs. It is recommended that the Conference extends invitations to delegates elected from the regional associations of fishermen and fish-farmers, NGOs within the region active in fisheries development, state regional universities, provincial fisheries offices, associations of professional fisheries scientists, and regional planning boards. This will in part offset some of the imbalance of administrators over the private sector, and encourage 'bottom-up' planning, rather than the 'top-down' planning, which is currently evident.

(b) Although many of the research studies commissioned by FRDP have been published in mimeo form, the mission recommends that FRDP encourages their publication as technical manuscripts in peer-reviewed national and international journals.

(c) The mission notes that women have been represented in the activities of the FRDP. However, the mission recommends that USAID look for opportunities to fund for short-courses for women only, such as training in fish hatchery technology.

ANNEX I. SUPPORTING DATA ON OUTPUTS

TABLES 1 - 6

Table 1. FRDP special studies projects

Table 2. Fisheries Forum III

Table 3. Scholarship recipients nominated by FRDP

Table 4. Seminars presented by FRDP consultants

Table 5. FRDP competitive research projects

Table 6. Status of FRDP Pedoman Teknis

TABLE 1, ANNEX 1

FRDP SPECIAL STUDIES PROJECTS
By FRDP Agencies (Local Support Funds)

Project		Agency	Period		Amount (Rp)		Status[4] (1 Aug 91)
No.	Title		From	To	Committed	Disbursed	
1.	Assessment of Fisheries Cooperatives	UNHAS	Sep	Mar 90	($ 25,000)[1]	0	C
2.	Fisheries Manpower Assessment	IPB	Sep 89	-	21,000,000	21,028,000	C
3.	Relationship ... Shrimp Processors-Producers	UNHAS	Mar	Aug 90	15,180,000	15,213,000	C
4.	Marketing and Credit -- Small-scale Fishermen	UNHAS	Mar	Nov 90	14,600,000	10,972,000	C
5.	Socio-economic Impact of Intensive Shrimp	RICA/Maros	Mar	Jan 91	21,130,000	17,492,000	C
6.	Inter-Insular Trade	RIMF-UNPATTI	May	Dec 90	22,100,000	21,263,050	C
7.	Eval. Cendrawasih Bay Coops	FAO	Jun	Sep 90	2,700,000 (+ $25,000)[2]	2,700,000[3]	C
8.	Enhancing Sul-Sel Shrimp	RIMF	Jun	Mar 91	15,310,000	11,820,000	C
9.	Evaluation of Tuna Resources	RIMF	Aug	Jan 91	36,000,000	33,522,000	C
10.	Nucleus Estates	IPB	Sep	May 91	25,000,000	28,837,000[3]	C
11.	WID	CRIFI	Apr	Jun 91	-	3,212,150	C
			Total, FRDP		173,020,000		
					($ 93,500)		
			Other		92,000,000		
					259,020,000		
					($ 140,000)		

1 Funded under separate USAID-assisted project.
2 Primary funding and direct monitoring by FAO/CBIADP; Project leader is M. Sembiring, USAID-sponsored M.S. candidate at Auburn University from Indonesia Ministry of Cooperative.
3 Includes international airfare and other costs at Auburn.
4 Status code: C = Completed; N = Not completed; S = On sch. lule

TABLE 2, ANNEX 1

DRAFT

FISHERIES FORUM III
SEMINAR
ON
THE ROLE OF FISHERIES IN THE SECOND LONG-TERM DEVELOPMENT PLAN

Informational Guide

Ministry of Agriculture
Directorate General of Fisheries
Agency for Agriculture Research & Development
USAID

Sukabumi, 23 - 25 June 1992

AGENDA OF THE SEMINAR

THE ROLE OF FISHERIES
IN THE SECOND LONG-TERM DEVELOPMENT PLAN

SUKABUMI: 23 - 25 June 1992

Monday, 22 June 1992

Afternoon	
14.00	: Arrival of Participants
	: Check in at Hotel

Tuesday, 23 June 1992

08.00 - 09.00	: Registration
09.00 - 09.15	: Report by the Chairman of the Organizing Committee
09.15 - 09.45	: Keynote Address and Opening of the Seminar by the Minister of Agriculture
09.45 - 10.15	: Coffee break
10.15 - 11.15	: Fisheries Sector Development Review
11.15 - 13.00	: Future Challenges
13.00 - 14.00	: Lunch
14.00 - 14.45	: Discussion (Continue)
14.45 - 16.15	: Inlandwater and Marine Fisheries Resource Development
16.15 - 16.30	: Coffee break
16.30 - 17.30	: Discussion (Continue)
19.00 - 20.00	: Dinner
20.00 - 22.30	: Human Resource Development in Fisheries

Wednesday, 24 June 1992

08.00 - 10.30	: Meeting the Needs of Smallholders
10.30 - 10.45	: Coffee break
10.45 - 13.15	: Private Sector Participation in Fisheries Development
13.15 - 14.15	: Lunch
14.15 - 16.15	: Working Group Session
16.15 - 16.30	: Coffee break
16.30 - 18.00	: Working Group Session (continue)
19.00 - 20.00	: Dinner
20.00 - 22.00	: Working Group Session

Tursday, 25 June 1992

08.00 - 11.00	: Report of Working Groups
11.15 - 11.30	: Coffee break
11.30 - 13.00	: Drafting Committee
13.00 - 14.00	: Lunch
14.00 - 16.00	: Report of the Seminar and Adoption of the Report.
16.00 -	: Closing

PLENARY SESSION

Paper	Speaker	Discussant	Moderator	Technical Secretary
Fisheries Sector Development Review	Director General of Fisheries	-	Director General AARD	
Future Challenges	Kee Chai Chong Saut Hutagalung	Faisal Kasryno Sofyan Ilyas	Alirahman	Grover
Inland water & Marine Fisheries Resource Management	Ismudi Muchsin	Fuad Cholik Purwito M.	Damanhuri (ISPIKANI)	Saila
Human Resource Development for Fisheries	Lutfi Nasution	Suryaman Tardan	Sugiarto (HMSI)	Constantinodes
Meeting the Need of Smallholder Development	Conner Bailey	Effendy P. Untung Wahyono	Rangkuti (Commission IV)	Polnack
The Private Sector Participation in Fisheries Development	R. Soeprapto	Ridwan Dareindra Martono	GAPPINDO (Harun Alrasid)	Bailey

WORKING-GROUP SESSION

Working Group	Chairman	Secretary	Resource person
Integrated Marine Fisheries Resource Development and Management	Dwiponggo	Sudradjat	Purwito, Nurzali M. Suud Elfandi
Integrated Inland Water Fisheries Resource Development and Management.	Sukotjo A.	Atmadja	Untung W, Fuad, Kusno Rahardjo
Private Sector Participation	Martono	Ali Supardan	E. Pasandaran, Alirahman, Harry Supangkat, A. Zakaria, Karim Sudibyo.
Human Resource, Institution and Technological Development.	Muranto	Alwinur	Faisal, Taebunan, Djoko Budianto, Fatuchri, Rukyat.

ANNEX 1.

List of Participants

Ministry of Agriculture

1. Director General of Fisheries
2. Director General of AARD
3. Director, Agriculture Education
4. Head, Bureau of Planning, MOA
5. Head, Bureau of Foreign Cooperation, MOA
6. Secretary, Directorate General of Fisheries
7. Director of Programme
8. Director of Production Development
9. Director of Resource Management
10. Director of Fisheries Enterprise
11. Director of Infrastructure
12. Director of Fisheries Extension
13. Director of Planning, AARD
14. Director of CRIFI
15. Director of Social Economic, AARD
16. Chief, CRIFI - RIMF
17. Chief, CRIFI - RIFF
18. Chief, CRIFI - RICA
19. Dwiponggo, CRIFI - RIMF
20. Director, Academy of Fisheries

BAPPENAS

21. Head, Bureau of Agriculture and Irrigation

Institution Concerned

22. Director of Swamp, Directorate General of Water Resource Dev.
23. Director, Agriculture Marketing Development, NAFED/BPEN
24. Head, Bureau of Planning non-Industry Investment, Foreign Investment Board / BKPM
25. Director of Programme, Directorate General Multivarious Industry
26. Directorate General of Forest Conservation PHPA
27. Director, Resettlement Preparation, Dept. of Transmigration
28. Director, Standardization and Quality Control, Directorate General of Foreign Trade
29. Director, Foreign Investment, Directorate General of Monetary
30. National Institute of Science
31. Ministry of Environment and Population
32. National Land Board
33. Bank of Indonesia
34. State National Bank
35. Chairman, Commission IV Parliament

University
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36. Institute of Agriculture, Bogor
37. University of Gajah Mada, Jogyakarta
38. University of Diponegoro, Semarang
39. University of Hasanuddin, Ujung Pandang
40. University of Riau, Pekanbaru
41. University of Pattimura, Ambon
42. University of Cendrawasih, Jayapura

Private Sector/Association
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43. ISPIKANI (Association of Fisheries Professional)
44. HNSI (Association of Fishermen)
45. GAPPINDO (Federation of Fisheries Enterpreteneur)
46. APPU (Association of Shrimp Hatchery)
47. APCI (Association of Coldstorage)
48. APPI (Association of Tuna Fisheries)
49. HPPI (Association of Fishing Enterprise)

International
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50. World Bank
51. ADB
52. John Grover
53. Conner Bailey
54. Richard Pollnac
55. Saul Saila
56. Wilbur Scarborough
57. Constantinodes
58. Edmundo B. Prantilla (FAO)
59. Kee Chai Chong (FAO)

Discussant/Secretary
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60. Ridwan Dareindra
61. Lutfi Nasution
62. Atmadja Hardjamulia
63. Sofyan Ilyas
64. Alwinur

TABLE 3, ANNEX 1

Scholarship recipients nominated by FRDP from member institutions funded for fisheries study in USA under USAID General Participant Training Program.

No.	Name (Last)	Name (First)	Institution	Sex	Training Objective	Training Institution	Starting Date	Finish Date
1.	Atmomarsono	Muharjadi	RICA	M	MS-Aquaculture	Auburn University	09/13/89	08/31/91
2.	Badawing	Dewi	Univ. Hasanudin	F	MS-Fisheries Sci.	Oregon State University	06/19/90	06/15/92
3.	Bustaman	Sjahrul	RIMF/Ambon	M	MS-Fisheries Sci.	Oregon State University	09/07/89	12/31/91
4.	Hariyadi	Sigid	IPB	M	MS-Aquaculture	Auburn University	03/24/89	06/24/91
5.	Irianto	Bambang	RIMF	M	MS-Agr/Res. Econ.	Univ. of Hawaii	08/07/90	07/30/92
6.	Kristanto	Anang	RIFF/Palembang	M	MS-Fresh. Fish.	Auburn University	06/16/89	07/16/91
7.	Kusumastanto	Tridoyo	IPB	M	Ph.D.-Agr. Econ.	Auburn University	09/18/90	04/30/93
8.	Muluk	Chairul	IPB	M	Ph.D.-Aquaculture	Auburn University	03/24/89	11/30/92
9.	Prihadi	Triheru	RIFF	M	MS-Fisheries	Auburn University	06/16/89	12/31/91
10.	Trilaksani	Wini	IPB	F	MS-Food Science	Univ. of Hawaii	08/07/90	07/30/92
11.	Chasanah	Ekowati	RIMF/Ambon	F	MS-Food Nutrition	Univ. of Rhode Island	08/27/89	12/31/91
12.	Hiariey	Johanis	UNPATTI	M	MS-Agr. Econ.	Auburn University	03/31/90	03/31/92
13.	Purnomo	Agus	RIMF/Ambon	M	MS-Res. Econ.	Univ. of Rhode Island	08/27/89	12/31/91

TABLE 4, ANNEX 1

SEMINARS PRESENTED BY FRDP CONSULTANTS THROUGH 1 AUG 91

No.	Consultant	Date	Time (H:M)	Location	Subject	Audience	
						No.	Representing
				1988			
1.	J. Grover	1 Sep	1:00	IPB	Fishpond benthos research ...	50	IPB, RIFF
2.	L. Lovshin	1 Sep	1:00	IPB	Colossoma culture	50	IPB, RIFF
3.	R. Phelps	Sep	2:00	RIFF/Palembang	N/A	N/A	RIFF
4.	S. Constantinides	5 Nov	2:00	CRIFI	Fisheries development ...	15	CRIFI, RIMF
5.	D. Lightner	Nov	N/A	N/A	N/A	N/A	N/A
6.	D. Lightner	Nov	N/A	N/A	N/A	N/A	N/A
7.	D. Lightner	Nov	N/A	N/A	N/A	N/A	N/A
				1989			
8.	N. Dholakia	6 Jan	2:00	CRIFI	Marketing and development	10	CRIFI
9.	N. Dholakia	10 Jan	2:00	RIMF/Ambon	Marketing and ... development	19	RIMF
10.	S. Constantinides	11 Jan	2:30	RIMF/Ambon	Research activities	25	RIMF
11.	K. Simpson	11 Jan	2:00	RICA/Maros	Artemia quality	35	RICA
12.	K. Simpson	12 Jan	2:00	UNHAS	Artemia quality	40	UNHAS
13.	N. Dholakia	12 Jan	2:00	RICA/Maros	Marketing problems - shrimp	18	RICA
14.	S. Constantinides	13 Jan	2:00	UNPATTI	Research activities	30	UNPATTI

No.	Consultant	Date	Time (H:M)	Location	Subject	Audience	
						No.	Representing
16.	J. Cobb	16 Jan	2:30	UNPATTI	Research and ... experiences Lobster biology	30	UNPATTI
17.	J. Cobb	16 Jan	1:30	RIMF/Ambon	Lobster biology	15	RIMF
18.	K. Simpson	17 Jan	2:00	RICA/Gondol	Artemia quality	25	RICA
19.	N. Dholakia	17 Jan	2:00	RIFF/Bogor	Marketing and innovation	12	RIFF
20.	N. Dholakia	18 Jan	2:00	CRIFI	Marketing and innovation	34	CRIFI, RIMF
21.	K. Simpson	20 Jan	2:00	CRIFI	Blue shrimp problem	25	CRIFI
22.	L. Lovshin	25 Jan	2:30	RIFF/Bogor	Channel catfish culture .. Fish transport	15	RIFF
23.	R. Pollnac	10 Feb	2:00	CRIFI	Conflicts in ... development	50	CRIFI, RIMF, RIFF, UNHAS, USAID
24.	R. Pollnac	17 Feb	1:30	UNHAS	Problems with ... cooperatives	100	Dinas, BAPPEDA
25.	C. Boyd	25 Mar	1:45	RICA/Maros	Water quality in ...	65	RICA, UNHAS, private sector
26.	C. Boyd	6 Apr	2:00	CRIFI	Water and soil management ...	45	CRIFI, DGF
27.	J. Grover	13 May	2:00	UNHAS	Fisheries education ...	20	UNHAS

No.	Consultant	Date	Time (H:M)	Location	Subject	Audience	
						No.	Representing
29.	K. Simpson	24 May	1:45	RICA/Serang	Larvae fish nutrition	50	DGF, RICA, private sector
30.	J. Grover	25 May	2:30	CRIFI	Introduction to ... research	63	CRIFI
31.	K. Simpson	1 Jun	2:00	RICA/Maros	Blue shrimp "disease"	200	DGF, RICA, private sector
32.	D. Jackson	19 Jun	2:00	RIFF/Palembang	Biopolitical aspects of ...	20	RIFF
33.	D. Jackson	3 Jul	2:30	IPB	Orientations for ... Musi and Kapuas ..	40	IPB, RIFF
34.	D. Frankenberg	5 Aug	2:00	CRIFI	Marine science and international development	37	CRIFI, RIMF, USAID
35.	J. Grover	8 Aug	1:30	IPB	Writing research proposals	10	IPB/FF
36.	S. Malvestuto	11 Aug	1:45	RIFF/Bogor	Kapuas and ... assessments ...	30	RIFF, IPB/FF
37.	J. Mevel	2 Sep	2:00	RIFF/Bogor	Aquaculture engineering	40	RIFF, IPB/FF
38.	C. Zemer	4 Sep	1:30	CRIFI	Socioeconomic impacts ...	19	CRIFI, RIMF
39.	C. Bailey	16 Sep	2:00	CRIFI	Social aspects ... development	30	CRIFI, RIMF
40.	J. Mevel	30 Sep	2:00	IPB	The role of ... in aquaculture	47	IPB/FF
41.	R. Phelps	14 Oct	2:00	RIFF/Palembang	Observation ... seed production	25	RIFF, BBAT

No.	Consultant	Date	Time (H:M)	Location	Subject	Audience	
						No.	Representing
43.	S. Constantinides	24 Oct	2:00	UNHAS	Marine food utilization ...	90	RICA, UNHAS
44.	K. Simpson	26 Oct	2:00	UNHAS	Marine pigments	35	UNHAS, RICA
45.	K. Simpson	3 Nov	2:00	RICA/Gondol	Marine pigments	35	RICA
				1990			
46.	N. Dholakia	16 Jan	1:00	RICA/Maros	Marketing challenge - shrimp	35	RICA, UNHAS
47.	J. Gates	16 Jan	1:00	RICA/Maros	Aquaculture economic hypotheses	35	RICA, UNHAS
48.	D. Lightner	17 Jan	2:00	BIOTROP/Bogor	Shrimp diseases, prevent-control	80	BIOTROP, GOI, private sector
49.	J. Gates	30 Jan	0:45	CRIFI	Economic implications - policy	38	CRIFI+
50.	R. Pollnac.	30 Jan	1:00	CRIFI	Sociocultural factors - aquaculture	38	CRIFI+
51.	N. Dholakia	30 Jan	0:45	CRIFI	Marketing challenges - aquaculture	38	CRIFI+
52.	R. Schmittou	6 Feb	3:00	Wonogiri	Principles cage culture	21	Dinas
53.	R. Schmittou	7 Feb	2:30	Lamongan	Principles cage culture	34	Dinas
54.	W. Rogers	7 Mar	3:00	Bogor	Quarantine issues	7	GOI Quarantine
55.	W. Rogers	15 Mar	2:30	RIFF/Bogor	Fish health management	49	GOI depts (17)
56.	R. Schmittou	17 Mar	4:00	LSPW/Parapat	Cage Fish Culture ...	47	Dinas, Priv. Sec.+

No.	Consultant	Date	Time (H:M)	Location	Subject	Audience	
						No.	Representing
58.	S. Saila	23 Mar	2:00	Udayana Univ.	Stock production modules	100	Udayana Univ.
59.	T. Bell	3 May	3:00	CRIFI	Diseases ... processes of shrimp	23	CRIFI, DGF
60.	G. Chamberlain	15 May	2:30	RICA	Shrimp farming technology	32	RICA, IHAS, private sector
61.	G. Chamberlain	16 May	2:00	Priv. sect./Surya	Management in H_2S in ponds	10	Private sector
62.	G. Chamberlain	28 May	2:30	CRIFI	Shrimp farming technology	31	CRIFI, DGF
63.	T. Popma	16 Jun	4:00	RIFF/Palembang	Tilapia seed production	5	RIFF
64.	R. Rosati	22 Jun	2:00	RICA/Bojonegara	Floating research station	40	RICA
65.	T. Popma	23 Jun	3:00	RIFF/Bogor	Tilapia seed production	14	RIFF
66.	R. Schmittou	18 Jul	1:00	Forum I	Indonesian fisheries resources	90	GOI agencies+
67.	R. Pollnac	18 Jul	0:45	Forum I	Status of Policy Resh. & Plan ... FRDP	90	GOI agencies+
68.	C. Boyd	24 Jul	1:00	BBAP/Jepara	Water quality ... tambak	100	GOI & private sect.
69.	D. Akiyama	25 Jul	1:00	BBAP/Jepara	Shrimp nutrition	100	GOI & private sect.
70.	N. Dholakia and S. Constantinides	25 Jul	2:00	CRIFI	Marketing/ Processing issues	50	CRIFI, RIMF, DGF

No.	Consultant	Date	Time (H:M)	Location	Subject	Audience	
						No.	Representing
72.	R. Rosati	8 Aug	2:00	CRIFI	Oxygen & ammonia in aquaculture	26	CRIFI, RIFF, DGF
73.	J. Mevel	10 Sep	1:00	CRIFI	Resh. station design ...	36	CRIFI, RIFF ...
74.	L. Lovshin	10 Sep	1:00	CRIFI	Floating hatchery ...	36	CRIFI, RIFF ...
75.	R. Phelps	6 Nov	2:00	RIFF/Bogor	Tilapia sex reversal	15	RIFF
76.	J. Plumb	15 Nov	3:00	CRIFI	Fish health management	30	CRIFI, RIFF, RICA
77.	R. Phelps	19 Nov	2:00	RIFF/Palembang	Tilapia sex reversal	10	RIFF
78.	R. Phelps	20 Nov	1:00	RIFF/Palembang	Tilapia fry feeding	10	RIFF
79.	J. Grover	N/A	N/A	IPB/Bogor	Research methods	N/A	N/A
				1991			
80.	N. Dholakia	19 Jan	3:00	RICA/Maros	Shrimp marketing	20	RICA
81.	C. Bailey	22 Jan	2:00	RIMF/Slipi	Sociology in fisheries development	25	RIMF
82.	S. Constantinides	31 Jan	2:00	RICA/Maros	Seafood quality issues	40	RICA, UNHAS
83.	S. Malvestuto	12 Mar	2:00	Pontianak	Kapuas River management	75	DGF, CRIFI
84.	R. Pollnac	13 Mar	1:00	Pontianak	Kapuas River management	75	DGF, CRIFI
85.	M. Upton	29 May	2:00	South Sulawesi	WID	35	RICA
86.	M. Upton	14 Jun	2:00	Jakarta	WID	8	USAID
87.	C. Bailey	19 Jun	1:00	Sukabumi	Traditional Fisheries Management	85	Forum II

88.	C. Bailey	20 Jun	2:00	Sukabumi	Legal Issues	85	Forum II
89.	C. Zemer	22 Apr	2:00	Jakarta	Fisheries Law	40	CRIFI, AARD

SEMINAR SUMMARY[1)]

	Individual seminars[2)]	Hours	Number of participants	Participant hours
Total	89	162	3297	6321
Average	1	1.94	39	75.7

1) not including time and audience number for seminar numbers 3,5,6,7 and 79
2) by 27 different consultants

TABLE 5, ANNEX 1

FRDP COMPETITIVE RESEARCH PROJECTS

Project		Agency	Amount disbursed (Rp)
No.	Title		
1.	Production Performance of Lele	RIFF/Depok	6,008,500
2.	Cage Culture of Fishes in Oligotrophic Lake	Cooperator	0
3.	Cage Culture in Ikan Mas and Nila in Mesotrophic Reservoir	RIFF/Jatiluhur	11,619,300
4.	Acidification of Freshwater Swamp Soils	RIFF/Palembang	5,516,000
5.	Cage Culture of Jelawat in Oxbow Lake	RIFF/Palembang	4,142,000
6.	Live Fish Transport (no final report, Rp 2 million obilgated by FRDP to Kusman)	IPB	7,000,000
7.	Sand Goby Hatchery and Nursery	IPB	7,000,000
8.	Mass Production of Rotifers	IPB	9,022,000
9.	Cage Fish Culture in Shrimp Tambak	RICA/Maros	2,435,500
10.	Blue Shrimp Prevention and Control	RICA/Maros	9,000,000
11.	Artemia Culture Using Agricultural Wastes	RICA/Maros	9,000,000
12.	Low-cost Shrimp Feed	RICA/Maros	8,011,000
13.	Factors in Baitfish Mortality	RIMF/Ambon	6,761,000
14.	Utilization of Shark Meat	RIMF/Ambon	6,600,000
15.	Utilization of Sea Cucumber	UNPATTI	9,022,000
16.	Lobster Fishery Resource	UNPATTI	9,011,000
17.	Luminescent Bacteria	RICA-RIFF/Bogor	9,022,000
18.	Ich Control	RIFF/Bogor	9,022,000
19.	Pangasius Feed	RIFF/Palembang	4,500,000
20.	Grouper Feed	RICA/Bojonegara	8,011,000
21.	Handling Tuna	RIMF	4,111,000
22.	Freshwater Swamp	RIFF/Palembang	9,033,000
23.	Semi-intensive shrimp (BBAP/ASA)	RICA	9,064,000
			162,911,300
			($.)

TABLE 6, ANNEX 1

STATUS OF FRDP PEDOMAN TEKNIS AS OF MAY 1992

Number	Pedoman Teknis Title	Status	Comments
1	Introduction to *Tilapia nilotica* Fingerling Production Systems	Translated into Indonesian	Printed and Dissaminated
2	Net Enclosures for *Tilapia nilotica* Fingerling Production	Translated into Indonesian	Printed and Dissaminated
3	Introduction to Tilapia Culture	Translated into Indonesian	Believed to be printed
4	Sex Reversal of Tilapia in Earthen Ponds	Translated into Indonesian	Printed and Dissaminated
5	Reproductive Biology of *Tilapia nilotica*	Translated into Indonesian	Printed and Dissaminated
6	Single Pond System for Sustainable Production of *Tilapia nilotica*	Translated into Indonesian	Believed to be printed
7	Introduction to Fish Culture in Ponds	Translated into Indonesian	Believed to be printed
8	Introduction to Fish Pond Fertilization	Translated into Indonesian	Believed to be printed
9	Organic Fertilizer for Fish Ponds	Translated into Indonesian	Believed to be printed
10	Chemical Fertilizers for Fish Ponds	Translated into Indonesian	Believed to be printed
11	Eliminating Unwanted Fish and Harmful Insects from Fish Ponds	Translated into Indonesian	Printed and Dissaminated
12	Feeding your Fish	Translated into Indonesian	Printed and Dissaminated
13	Fish Production in Mini Cages	Translated into Indonesian	Believed to be printed
14	Shrimp Production - Collection and Transport of Wild Fry	Translated into Indonesian	Believed to be printed
15	How to Manage the Environmental Impact of Cage Culture in Lakes and Reserviors	Translated into Indonesian	Believed to be printed
16	Transporting Fish	Being translated as of 1/92	Current status unknown
17	Care and Calibration of Polarographic Dissolved Oxygen Meters used on Aquacultural Farms	Being translated as of 1/92	Current status unknown
18	Rating Soil and Water Information for Aquaculture	Translated into Indonesian	Current status unknown
19	How to Build a 1 Cubic Meter Fish Cage for Fish Fed Floating Feed	FedEx'ed to Alie 12 Feb 92	Being translated
20	Practical Guide for Handling Tuna	FedEx'ed to Alie 26 Feb 92	Being translated
21	Rice-Fish Culture	FedEx'ed to Alie 26 Feb 92	Being translated
22	Aquatic Animal Health Management	Grover to Alie 4 April 92	Being translated
23	Shrimp Production - Site Selection	Grover to Alie 4 April 92	Being translated
24	Shrimp Production - Extensive Culture	Duncan to Alie 16 April 92	To be translated
25	Shrimp Production - Semi-Intensive Culture	FedEx'ed to Alie 22 April 92	To be translated

ANNEX II. REFERENCE DOCUMENTS

1. General Documents

USAID, (1986). Indonesia Fisheries Research and Development Project, Project Paper, 497-0352, Volume I - Main Text.

- Project Grant Agreement between the Republic of Indonesia and the United States of America for Fisheries Research and Development, August, 1986.
- Project Amendment No. 1, April 1989.
- Project Contractor's Amendments No. 1-4, July, 1988.

USAID, (1986). General Participant Training II Project, 497-0328, Amendment No. 8 (December, 1989) and No. 10 (June, 1991).

Chief of Party, (1991). Major accomplishments towards achieving FRDP outputs - Progress through 1 August, 1991.

2. Project Output Documents

November, 1991. Activities report on the short-course on fish seed production.

December, 1991. Report result of transfer technology on breeding and processing of red tilapia.

February, 1992. Activities report on the short-course for the transfer of technology on water quality and pond soil management.

May, 1992. Interim report on the seafood short-course.

AARD, 1986. To know better CRIFI.

Anon, 1990. Prosiding Forum - I Perikanan.

Badan Litbang Pertanian, 1991. Bahan paket technologi perikanan.

Bailey, C., 1991a. Review of progress made on policy studies.

Bailey, C., 1991b. Draft agenda for Forum III.

Bailey, C. and R. Pollnac, 1989. Towards establishing a national strategy for Indonesian fisheries development.

Bailey, C. and R. Pollnac, 1990. Status report on the FRDP policy component.

Bailey, C. and C. Zerner, 1991. Role of traditional fisheries resource management systems for sustainable resource utilization.

Boyd, C.E., 1991. Water quality management and aeration in shrimp farming.

Chamberlain, G.W., 1991. Shrimp farming in Indonesia: Grow-out techniques.

Green, B.W., 1992. Status of FRDP pedoman teknis as of April, 1992.

Grover, J., 1990. Research system report.

Grover, J., 1989a. FRDP benchmark report for IPB/FF.

Grover, J., 1989b. FRDP benchmark report for UNHAS.

Cholik, F., (undated). The Indonesian fisheries research and development project.

Poernomo, A., 1992. Cage culture in Lake Toba.

Pollnac, R., 1990. Aspects of progress towards developing a national strategy for Indonesian fisheries development.

Rosati, R., 1991. Indonesian shrimp industry: status and development.

Saila, S.B. and J. Uktolseja, 1991. Evaluation of the tuna resource potential in Indonesian waters, with emphasis on East Indonesia.

Schmittou, H.R., 1991. Budidaya keramba; suatu metode produki ikan di Indonesia.

Upton, M., 1991. The role of women in small-scale fishery development in Indonesia.

Zerner, C., 1991. Sharing the catch in Mandar: changes in the Indonesian raft fishery (1970-1989).

ANNEX III. PERSONS INTERVIEWED

1. General Personnel

MINISTRY OF AGRICULTURE (MOA)

Agency for Agricultural Research and Development (AARD)

Dr. Soetatwo Hadiwigeno, DG, AARD, Jakarta
Dr. Fuad Cholik, Director, CRIFI, Jakarta
Dr. Sofyan Ilias (rtd.), Ex-Director, CRIFI, Jakarta
Dr. Pasril Wahid, AARD, Bogor
Dr. Fatuchri Sukadi, Director, RIFF, Bogor
Dr. Nurzali Naamin, Director, RIMF, Jakarta
Drs. Chairul, Technologist, RIMF, Ancol
Zainal Arifin, M.Sc. Director, RIFF, Palembang
Ir. Husnah, RIFF, Palembang
Drs. Krismono, Director, RIFF, Jatiluhur
Mrs. Andriani Sri Nastiti, Researcher, RIFF, Jatiluhur
Ningrum Suhenda, Researcher, RIFF, Bogor
Ms. S.N. Aida, RIFF, Palembang
Ir. Ateng Gurnia Jagatraya, Head, IFA, Sukabumi
Ir. Djati Widagdo, Staff member, IFA, Sukabumi
Ir. Tonny Sarwono, Staff member, IFA, Sukabumi
M. Abduh, Administration, IFA, Sukabumi
Ir. T.A.R. Hanafiah, M.S., Head, RIMF, Ambon
Ir. Heri Purnomo, RIMF, Ambon
Ir. Brata Pantjara, Researcher, RICA, Maros
Ir. Nur Amsari, Researcher, RICA, Maros

Directorate General of Fisheries (DGF)

Ir. D.H. Jusuf, Chief, Sub-Directorate, Aquaculture Production, Jakarta
Drs. Alwinur, Director, Information Division, Jakarta
Ir. S. Muranto, Director, Fisheries Extension Division, Jakarta
Dr. Sunarya, Head, National Center for Fish Quality Control, Jakarta

Dinas Perikanan (DP)

Ir. M. Natsir Razak, Pangkep, Sulawesi
Ir. Hasunaddin Atjo, Barru, Sulawesi
Ir. Abdullah Samad, Parepare, Sulawesi
Drs. Sopandi, Cianjur
Effendi, Cirata and Saguling
Ir. Husni Mangga Barani, Head of Fisheries Planning, South Sulawesi

Sri Alam, Maros
Rais, Maros
Ir. Husni, South Sulawesi
Ir. Soekirno, Head, Maluku
Ir. Fachruddin Nur, Chief of Extension, Pangkep
Marwah, Pangkep
Sarnawiyah, Pangkep
Hasanuddin, Pangkep
Marwah Nampo, Pangkep
Ridwan, Pangkep
Achmad Abidin, Pangkep
Mahmud, Pangkep
Ir. Muri Jafri, Extension Specialist, Pangkep

MINISTRY OF EDUCATION AND CULTURE (MOE)

Research and Community Service Development (RCSD)

Dr. Jajah Koswara, Director, Research and Development

Bogor Agricultural University, Faculty of Fisheries (IPB)

Dr. Ismudi Muchsin, Dean
Dr. Ir. Kadarwan Soewardi, Vice-Dean

University of Hasanuddin, Faculty of Animal Husbandry (UNHAS)

Ir. M. Baso Ronda, Vice-Dean
Dr. H.M. Natsir Nessa, Fisheries Department, Staff Member
Dr. Radjuddin, Staff Member
Dr. Ishak Andarias, Staff Member
Ir. H.I. Nengah Sutika, Staff Member
Ir. Alexander Rantetondok, Staff Member
Ir. Syamsu Alam Ali, Staff Member
Ir. H. Achmad Sadarang, Staff Member
Ir. Aspari Rachman, Staff Member
Ir. Najamuddin, Staff Member
Ir. M. Rijal Idrus, Staff Member
Ir. Arifuddin, Staff Member
Ir. Haryati, Staff Member

University of Pattimura, Faculty of Fisheries (UNPATTI)

Ir. J.M. Nanlohy, Dean
Drs. J.J. Wenno, M.Sc., Vice-Dean

NATIONAL SCIENCE COUNCIL (LIPI)

Center for Research and Development of Ocean Sciences (PPPO)

Dr. Kasijan Romimohtarto, Director, Ancol
Dr. Burhanuddin, Staff Member, Ancol
Dr. Harsono, Staff Member, Ancol
Ir. Kurnaen Sumadhiharga, M.Sc., Director, Ambon
Ir. L.F. Wenno, Oceanographer, Ambon

OTHER ORGANIZATIONS

Saudara Sihombing, Site Manager, LSPW, Lake Toba
Veronika J. Brzeski, Biologist, Proyek EMDI
Sanusi, Chairman, GAPPINDO, South Sulawesi

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT (USAID)

Juanita A. Darmono, Office of Program and Project Support
Dr. Edward H. Greeley, Office of Program and Project Support
Wilbur Scarborough, Office of Program and Project Support

FISHERIES RESEARCH AND DEVELOPMENT PROJECT (FRDP)

Dr. John Grover, Chief of Party
Alie Poernomo, Project Manager
Wahyu Widodo, Secretary

FRDP SPECIAL STUDIES EXPERTS

Dr. R. Pollnac, University of Rhode Island, USA
Charles Zerner, Fellow, Woodrow Wilson Center, Washington D.C. USA

2. Beneficiaries

TRAINEES AT SHORT-COURSES, WORKSHOPS, AND SEMINARS

Sofi Hanif, DGF, Sukabumi
Yade Sukmajaya, DGF, Sukabumi
Ms. Ningrum Suhenda, RIFF, Bogor
Ms. Ani Widiyati, RIFF, Bogor
Wahyu Hidayat, RIFF, Bogor
Krismono, RIFF, Jatiluhur
Ir. Husnah, RIFF, Palembang
Ms. S.N. Aida, RIFF, Palembang
Ms. Sri Ismawati, RICA, Maros
Brata Pantjara, RICA, Maros

Akhmad Mustafa, RICA, Maros
A. Sri Alam, Dinas Perikanan, Maros
A.M. Rais, Dinas Perikanan, Maros

FELLOWSHIP RECIPIENTS

Tri Heru Prihadi, M.Sc., RIFF, Bogor
Muharijadi Atmomarsono, M.Sc., RICA, Maros
Ms. Ekowati Chasanah, M.Sc., RIMF, Ambon
Agus Heri Purnomo, M.Sc., RIMF, Ambon
Anang Hari Kristanto, M.Sc., RIFF, Palembang

STUDY TOURS

Dr. Nurzali Naamin, Director, RIMF, Jakarta
Dr. Ir. Ismudi Muchsin, Dean, Faculty of Fisheries, IPB

COMPETITIVE RESEARCH GRANTEES

Dr. Rusdian Lubis, Director, Environmental Study Center, UNHAS (2 grants)
Ir. Arifuddin Tompo, RICA, Maros
Ir. Naftali Kabangga, M.S., Researcher, RICA
Ir. J.M. Nanlohy, Dean, Faculty of Fisheries, UNPATTI
Drs. J.J. Wenno, M.Sc., Vice-Dean, Faculty of Fisheries, UNPATTI
Ir. Husnah, RIFF, Palembang
Zainal Arifin, M.Sc., Director, RIFF, Palembang

THE PRIVATE SECTOR

(a) Farmers

Haji Aziz, Sukabumi
Berlin Gurning, Lake Toba
Sinaga, Balige
Mrs. Sinaga, Balige
Harbo, Lake Toba
Bakarah, Lake Toba
Asril Djunaidi, Tolehu, Ambon
Raismin Kodda, Tolehu, Ambon
Safruddin Lesdahutu, Tolehu, Ambon
Yahya Kodda, Tolehu, Ambon
Bodda, Fisherman, Pare-pare
Mrs. Bodda, Chairman, Village Fishermen's Wives Association

(b) Businessmen

B.H. Poesposoetjipto, Manager, P.T. Mina Kartika Fishing Company, Ambon
Hadi Budoyo, Director, P.T. Mina Kartika Fishing Company, Ambon

H. Sanusi Husen, Head, GAPPINDO, South Sulawesi
Hadi Budoyo, Head, GAPPINDO, Ambon
Abdurachman, Director, P.T. Thamasindo Pratama, Jakarta

ANNEX IV. THE EVALUATION MISSION TEAM AND ITINERARY

1. The Evaluation Mission Team

Howard F. Horton (Team Leader), Oregon State University, Corvallis, USA
Dulmi'ad Iriana, University of Pajajaran, Bandung
Lachmuddin Sya'rani, Diponegoro University, Semarang
Loekman Soetrisno, Gajah Mada University, Jogjakarta
Colin E. Nash, Consultant, Seattle, USA

2. Itinerary

Date	Mission Base/Field Visit	Agencies Visited
May 1	Jakarta	USAID, FRDP (CRIFI)
2	Jakarta	FRDP (CRIFI)
3	Bogor	-
4	Bogor	RIFF, AARD, IPB
5	Bogor/Jatiluhur	Private sector
6	Bogor	Private sector, FRDP
7	Bogor/Palembang	FRDP/DHEC/RIFF
8	Bogor/Sukabumi	DGF/Private sector
9	Bogor/Ujung Pandang	DGF/CORD/Private sector
10	Bogor	-
11	Bogor/Jakarta	DGF/CORD/FRDP (CRIFI)
12	Ujung Pandang	UNHAS
13	Ujung Pandang	UNHAS
14	Ujung Pandang	RICA
15	Ujung Pandang	Private sector
16	Ambon	Private sector
17	Ambon	RIMF/Private sector
18	Ambon	UNPATTI
19	Bogor/Jakarta	-
20	Bogor/Jakarta	-
21	Bogor/Jakarta	CRIFI

Date	Mission Base/Field Visit	Agencies Visited
22	Bogor/Jakarta	US AID/CRIFI
May 23	Bogor	
24	Bogor	
25	Bogor	
26	Bogor	
27	Bogor	Review of Draft/FRDP/USAID
28	Bogor	
29	Bogor	
30	Bogor	Seminar
31	Bogor	End of Mission