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REPORT OF: FIRST AID REVIEW OF PROJECT 931-1050
ICLARM - FISHERIES DEVELOPMENT
(INTERNATIONAL CENTER FOR LIVING AQUATIC RESOURCES MANAGEMENT)
September 23-24, 1980

Section 1: Introduction

The initial grant of the Agency for International Development (AID) to the International Center for Living Aquatic Resources Management (ICLARM) contemplated a three year contribution of \$800,000 for the period August 1979 through July 1982. Under PIO/T No. 931-1050/11-3698310 (Attachment No. 1) signed by Kenneth R. Milo on May 22, 1979 a \$300,000 contribution was made available for the first-year of funding. The instructions to the authorized agent under the PIO/T read as follows:

"SER/CM/COD is authorized to negotiate a three-year grant agreement with the International Center for Living Aquatic Resources Management (ICLARM) to provide partial support for the 1979, '80 and '81 Core programs. The amount of this PIO/T is for the 1979 Core program. A.I.D. funding in FY80 of \$200,000 and FY 81 of \$300,000 is projected, pending the availability of funds....."

On December 27, 1979 under PIO/T No. 931-1050-3606279 (Attachment No. 2) an increment of \$200,000 was authorized, "to amend Grant Agreement AID/DSAN-G-0178 to add \$200,000 to cover AID's contribution to the budget from the period August 7, 1980 to July 31, 1981."

Under Attachment II to Grant No. AID/DSAN-G-0178 which deals with the Proposed Budget and Anticipated Sources of Funds for ICLARM, (Attachment No. 3), the following statement appears. "It is understood that the term of this grant and funding therefore may extend beyond July 31, 1981. Such extension shall be contingent upon an AID review at the end of the second year of ICLARM's progress and a determination by AID that an extension with commensurate funding would be appropriate." The statement refers to the final \$300,000 increment to the AID grant to ICLARM, that required to fund the third year which the grant agreement states will continue in effect through August 5, 1982.

With the above requirement in mind the AID review of the ICLARM grant took place in the Philippines during the week of September 22, 1980, with formal sessions held at the Manila offices of ICLARM on September 23 and 24. The review panel consisted of the following four persons:

1. James Storer- Director of the Office of Fisheries Affairs of the Department of State, a member of the Program Advisory Committee of ICLARM.

2. Philip Roedel- formerly of DS/AGR/Fisheries under the NOAA/RSSA, a member of the Program Advisory Committee of ICLARM and Special Advisor to the Director General of ICLARM.

3. Johnie Crance- of the U.S. Fisheries and Wildlife Service of the Department of Interior who is presently under a PASA with USAID/Manila and who represented the USAID.

4. Charles Breitenbach- who as chief, DS/AGR/RNR/Fisheries represented A.I.D./W and directed the review.

The four man team was assisted during the review process by the Director-General of ICLARM, Dr. Ziad Shehadeh and by the Deputy Director General, Dr. Richard Neal, a former member of DS/AGR/Fisheries under the NOAA RSSA with AID. During the first day of the review, the ICLARM project activities were covered. For this purpose the individual staff activity leaders within ICLARM were asked to make individual presentations. During the second day of the review, matters were discussed which related to ICLARM policy and ICLARM use of project funds. For these sessions the meetings were restricted to the four panel members and Drs. Ziad and Neal.

The formal AID review was benefited by the fact that the ICLARM Program Advisory Committee (PAC) had met the previous week, September 15-17, in Manila. As a consequence much of the material which they had discussed was readily available for consideration by the AID review panel on September 23 and September 24. We were provide a draft summary of their recommendations (Attachment No. 4). The timing of the PAC meeting had been a contributory factor in scheduling the dates of the AID review since it effected a considerable cost savings in the travel of Mssrs. Storer and Roedel which, as PAC members, ICLARM had paid.

Because of the dual capacity in which Mssrs. Storer and Roedel served on the AID review panel, that is, as members of the ICLARM Program Advisory Committee as well as panel members of the AID review, the matter of a possible conflict of interest had to be considered. The matter was contemplated in a September 16, memorandum titled, "Objectives and schedule of the first A.I.D. Review of the International Center for Living Aquatic Resources Management (I.C.L.A.R.M.)" (Attachment No. 5) from Mr. Donald Fiester, Director DS/AGR, to the members of the panel. As regards the conditions under which the review would be conducted the memorandum states:

"It is anticipated that the four man review team will be assisted during the review process by the Director-General of ICLARM, Dr. Ziad Shehadeh and the Deputy Director General, Dr. Richard Neal, a former member of DS/AGR/Fisheries under the RSSA with NOAA. They will call on other members of their staff to assist in the review or to provide special presentations as may be desired.

These persons, however, shall have neither voice nor vote in the review process. The four panel members and the two ICLARM representatives named above shall participate equally in assisting to assess the pertinent information in regard to the successess and/or failures of the ICLARM program and its component projects. Only Mssrs. Johnie Crance and Charles Breitenbach, however, shall participate in the final section of the AID review, that titled Conclusions and Recommendations; they having no conflicts of interest in regard to their relationships with ICLARM".

On September 25 Mssrs. Richard Neal, Johnie Crance and Charles Breitenbach visited the Central Luzon State University (CLSU) Freshwater Aquaculture Center at Munoz, Nueva Ecija where ICLARM collaborating with CLSU, has a genetic improvement project on Tilapia broodstock and several projects on applied research in integrated animal-fish farming systems.

On September 26 and 27 Messrs. Richard Neal, Johnie Crance and Charles Breitenbach made a two day field trip to Iloilo. There on September 26 they inspected the South East Asian Fisheries Development Center (SEAFDEC) for brackish water and marine fisheries at Tigbauan. On September 27 they visited the brackish water fisheries stations of the University of the Philippines and, SEAFDEC at Leganes.

On September 29 and 30, before Charles Breitenbach's return to Washington on October 1, 1980, Messrs. Johnnie Crance and Breitenbach met at USAID/Manila. There they finalized the sections of the review dealing with the summary findings and conclusions and recommendations, sections 7 and 8.

The following review is a joint report in sections.

Section 1, the present introduction, was prepared by Charles Breitenbach.

Section 2, which treats the history and background of ICLARM and AID's participation in it, was written by Philip Roedel.

Section 3, a description of the nature of ICLARM was written by James Storer.

Section 4, a review of ICLARM's projects was prepared by Charles Breitenbach with the assistance of Johnie Crance.

Section 5, which deals with the center's core budget for the third of the present three year AID grant, and with project's core budget for years four and five, was prepared by Drs. Ziad Shehadah and Richard Neal.

Section 6, a justification for A.I.D.'s continued support to ICLARM was prepared by Richard Neal. The final sections of the report, those dealing with the summary findings, conclusions and recommendations are a collaborative effort for which Johnnie Crance and Charles Breitenbach are alone responsible.

Section 2: History of ICLARM and the AID Involvement

For a good many years a number of people involved with the international aspects of fisheries affairs have been concerned over the lack of an apparatus that could carry out coordinated long-term research on global problems affecting the rational use of aquatic resources in the developing world.

The Rockefeller Foundation recognized this lack, and in October 1973 convened a meeting in New York at which the concept of an international fisheries research center was articulated. The conference was designed "to provide information on worldwide and regional needs in aquaculture and fisheries development and to assist Rockefeller Foundation officials in organizing a program of support".¹

In the last paper given at the meeting, John A. Pino of the Foundation set forth a proposal for the creation of such a center. He suggested that it focus initially on the Pacific basin with its headquarters in Hawaii and with

¹ Rockefeller Foundation Working Papers. Conference on living aquatic resources management. Perspectives in aquaculture. 1973.

very much the basic operational charter that ICLARM has today. It was patterned after the agricultural centers under the CGIAR.

The participants, who included a representative of AID, gave the idea sufficient support that Rockefeller Foundation held a second meeting in November 1973 involving Hawaiian institutions. This led in December 1973 to the Rockefeller Foundation making a grant of \$250,000 "for the organization and development of a coordinated research, training and action program on living aquatic resources of the Pacific basin".²

Dr. Pino elaborated on his 1973 proposal in an Discussion Document issued in May 1974.³

ICLARM became a reality in January 1975 when it was established as a Rockefeller program with headquarters in Honolulu, under the direction of Philip Helfrich of the University of Hawaii. ICLARM remained in Honolulu for over two years, during which it developed its initial projects and laid the ground work for its long range program.

During this period, ICLARM took steps to broaden its support among donor institutions and agencies including USAID. ICLARM officials held a series of meetings with U.S. representatives from AID and NOAA in the first half of 1976 at which time it became apparent that U.S. support would not be forthcoming unless ICLARM met certain preconditions, and that there was no guarantee of U.S. support even if the preconditions were met. The key preconditions were that ICLARM, broaden its geographic scope; establish its headquarters in a developing nation; emphasize programs that met the requirements of the AID mandate; and reorganize to provide stronger management in dealing with the international donor and fisheries communities. In July 1976 the Rockefeller Foundation convened a meeting in New York at which the progress to date was reviewed by a group that included most of the agencies and institutions that had participated in the original October 1973 meeting. AID and NOAA sent strong representations. The general reaction to the U.S. requirements was positive and led to several significant decisions on the part of the Foundation.

First, the geographic restriction was removed and ICLARM was given a global charter with priority program emphasis in Southeast Asia and the South Pacific.

Second, the headquarters were to be moved to a Southeast Asian nation, and the Philippines was ultimately selected as the host country. The Rockefeller Foundation consulted at length with AID before making this choice, which had AID's approval.

Third, the program of work was to be reoriented to emphasize aquaculture and traditional (artisanal) fisheries.

² ICLARM Report 1977-80.

³ Pino, John A., A proposal for the creation of an international center for living aquatic resources management (ICLARM). Rockefeller Foundation 1974

Fourth, ICLARM would reorganize administratively.

The Foundation thereby met all the preconditions set by the U.S. representatives during the meetings held earlier in the year. In September 1976, ICLARM issued a document⁴ which set forth its revised charter and program. It contains the following pertinent summary paragraphs.

"ICLARM is an autonomous, nonprofit, international center similar in many ways to the international agricultural research centers. It is located in the Philippines; its Board of Trustees will be drawn from the international community. It will employ an interdisciplinary professional staff which will develop linkages with appropriate centers throughout the world.

ICLARM's goal is urgent and ambitious. The pace of fisheries development must be speeded. Its achievement will require time and money. The effort will require the broad participation of experts throughout the world, as well as the financial support of concerned."

The reorganization and shift to the Philippines necessitated a change in top leadership. As Dr. Helfrich, the director, was unable to make the move, the Rockefeller Foundation instituted a search for a replacement, and selected John C. Marr, an internationally known and respected fisheries scientist-administrator, for ICLARMS's first Director General. Again U.S. officials from AID and NOAA played key roles in the search and selection process.

Mr. Marr took over on November 1, 1976, and a newly appointed Board of Trustees held its initial meeting in Manila on November 3. A set of agreed upon Articles of Incorporation were registered with the Government of the Phillipines on January 20, 1977, at which time, ICLARM became an independent institution organized under the laws of the Philippines.

The basic organizational structure set in the Articles of Incorporation remain unchanged today (see Attachment No. 6). An internationally-recruited Board of Trustees of not more than 15 members sets policy; there is an Executive Committee of five that carries out Board policies and decisions. Implementation is the responsibility of the Director General and his deputy. They receive external professional advice through a Program Advisory Committee (PAC) of not more than 20 members recruited internationally and serving in their personal capacities. The programs are carried out by a small permanent professional staff and other scientists who are on limited term appointments.

When ICLARM physically moved to the Philippines in March 1977, the staff consisted of Mr. Marr and Dr. Ziad Shehadeh who had joined ICLARM as associate director in May 1976. In November 1976 prior to the move, as one of his first actions, Mr. Marr invited a group of 17 fisheries experts to serve as the first Program Advisory Committee. There were three U.S. government officials included, two from NOAA and one from AID (the senior fisheries advisor). This group held its first meeting March 7-11, 1977 in Manila.

⁴ Program Development Statement. ICLARM, Quezon City, Philippines, Sept. 1976. 35p.

The PAC, under the chairmanship of a distinguished German fisheries scientist, Dr. Klaus Tiews, gave its stamp of approval on the ICLARM bilaws. It identified a number of priority fisheries problems requiring research and accepted with amendments, the ICLARM program of work. Among the comments of the experts was the observation that a budget of about 1.6 million dollars a year would be required to adequately fund ICLARM's mandate.⁵

The program endorsed by the PAC was later approved by the Trustees, and it remains the focus of the program today.

During the next two years ICLARM grew more slowly than had been anticipated. It was unable fully to implement its program goals or to reach its intended staffing level of about 12 permanent scientific personnel. The reason for this was the lack of significant core funding other than that of the Rockefeller grant. This in no way reflected a lack of effort on ICLARM's part, for the Director General and his liason officer both separately and jointly continued their contacts with key donor governments and institutions.

Both ICLARM and AID had hoped that before long ICLARM could come under the CGIAR umbrella. For a variety of reasons, this has not occurred though it remains a possibility.

ICLARM placed special emphasis on obtaining U.S. support through AID, for it had quickly become apparent that other potential donors were waiting to see what the U.S. was going to do before acting themselves.

AID on its part acted slowly and deliberately, recognizing the long-range implications of even short-term support. The chronology of events within AID was as follows.

Following the PAC meeting of March 1977, the AID Senior Fisheries Advisor, a member of PAC, made the recommendation in his trip report: "That AID provide immediate core support to ICLARM in an amount not to exceed 25% of the core budget.... An AID contribution of \$500,000 for the first two years seems appropriate."

The recommendation was further implemented by the office of Agriculture, which on May 1, 1977 submitted An Action Memorandum to the Assistant Administrator of the Technical Assistance Bureau (Attachment No. 7). This memo which was approved by Curtis Farrar on May 16, 1977 proposed a plan of action that, if carried to a successful conclusion, would provide AID support to ICLARM "in the amount of \$1,500,000 over a five-year period" with an initial 3-year grant of \$800,000.

The plan provided for submission of the proposal to the Agency's Research and Development Committee (R&DC) "for review and consideration. Assuming favorable response we propose to prepare an action memorandum for the administrator's approval requesting authority to enter into discussions with ICLARM and directly with other donors..."

⁵ Program Advisory Committee meeting, Metro Manila; 7-11 March 1977. ICLARM, report no. 1 1977.

The R&DC gave its approval on June 21, 1977. The proposal was sent to the Joint Research Committee (JRC) that same month, but it was not until March 23, 1978 the Board for International Food and Agricultural Development (BIFAD), supported a subsequent JRC recommendation that AID funding be made available to ICLARM. Also that March an Action Memo (Attachement No. 8) was sent to the Deputy Administrator of the Development support Bureau requesting approval for formal discussions leading to long-term support for ICLARM. This was approved on June 9, 1978.

Preliminary steps required by the memo were taken during the next few months. It was February 1979, however, before DS/AGR agreed on the wording of an action memo (Attachment No. 9) providing a 3-year grant of \$800,000 to ICLARM and it was sent to the Deputy Assistant Administrator. He gave his approval on February 27 and the grant was finally made on 5 August 1979, about 2 1/2 years after AID's Senior fisheries advisor had recommended it.

The summary paragraphs of the action memo (Attachement No. 9) are worth quoting, as they express the view of DS/AGR as to AID's role vis-a-vis ICLARM:

"We believe that with the substantial international funding for ICLARM which is now at hand AID should move ahead expeditiously with its contribution. During the proposed initial three-year period we will continue to monitor the progress of ICLARM programs and encourage them to move ahead to formalize some mechanism to obtain permanent long-term funding.

"At present there is no forum for reaching a commitment decision by donor nations outside of CGIAR. We believe that ICLARM and Rockefeller Foundation should be encouraged to seek entree to the CGIAR family and in our discussions have made it very clear that continued funding after this initial three-year period will be contingent on an evaluation of the quality of the program implemented during the grant period and upon obtaining other substantial international core financial commitments adequate to support a viable program in which the AID contributions will not exceed 25%. If these conditions are not met, AID would not continue its support.

"DS/AGR believes that substantial progress toward formalizing a permanent funding arrangement can be made by the end of three years. Currently, we believe that we could renew the grant for an additional two years through 1984 if that much time is necessary to finalize the long-term arrangements either through the CGIAR or some other consortium arrangement."

The U.S. grant made continuation of ICLARM possible, and funds started soon thereafter to come in from other donors so the future now seems reasonably well assured.

Mr. Marr, the Director General, resigned in April 1979, in part because of USAID's slow action. He was replaced by his Deputy, Dr. Shehadeh, who has carried on in an exemplary fashion.

The first two years of AID support has made it possible to add to the staff, (Attachment #12), which now is approaching the recommended level but still has a few key vacancies. The Program Advisory Committee met for its second meeting in September 1980 just prior to the first AID project review on September 23 and 24, 1980. It commended the Director General for the proper if somewhat difficult course he had pursued trying to ensure a sound financial basis, and it recommended that in its future program ICLARM should continue the strategy the PAC had endorsed in 1977 at its first meeting.

As of the time of the AID review, ICLARM clearly had survived a very difficult period and was making progress in program development and implementation. There is no question but that it fills a real need in the developing world.

There is also no question but that U.S. support through AID is essential to ICLARM's survival.

As has been noted, a key reason for the slowness of AID's response was the Agency's recognition of the fact that even short-term support implied a long-range commitment if ICLARM lived up to its expectations. This fact runs through all the internal documents leading ultimately to the grant, and the action memo of 14 March 1978, (Attachment No. 8), approved by the Deputy Administrator, contains this statement: "Our knowledge... and analysis... lead us to believe that support for its core program is warranted. However, for AID to undertake such support would imply an intention (though not necessarily a commitment) to continue such support for an indefinite period, assuming a satisfactory performance record."

Section 3: The Special Nature of ICLARM

The AID Review Mission felt it was important to consider the basic purposes and nature of ICLARM to see if its activities and programs served these purposes and if it was meeting the AID objectives of benefitting the poor majority in the LDCs. The rationale behind ICLARM's establishment was to provide a mechanism for longer term research on the development and management of aquatic resources. By virtue of its non-governmental status and because it was not to be a "bricks and mortar" institution, it was felt that ICLARM could demonstrate a flexibility in its approach and serve a unique role in selecting important resource subjects and establishing linkages to other operating research organizations. To further enhance its ability to meet research needs of changing and inter-disciplinary manner, ICLARM has intended that its core permanent staff be small but diversified and that additional staff to meet particular needs be recruited on a limited basis.

The Review Mission in examining the present structure and programs of ICLARM felt that these purposes and features had been extremely well served and had demonstrated that ICLARM was meeting needs that could not be met by other organizations and that this unique role was being increasingly recognized by the constituencies that ICLARM serves.

The review by the Mission of the research program of ICLARM clearly demonstrates that the subjects selected for investigation, apart from their basic validity and practicality, have been very much of an interdisciplinary nature, including the extensive utilization of professional economic input into a number of the projects. The staff, in part because of its relatively small size, but more importantly because of its dedication and competence seems to work together very well as a flexible unit. In addition to permanent and fixed term staff, a limited number of young trainees and Ph.D. candidates have been brought into the organization. Apart from the useful training role this provides, it has also been a means of creating linkages with academic institutions in the region.

The matter of linkages is extremely important for ICLARM because it is not a "bricks and mortar" institution and relies on other organizations to provide laboratories and other facilities. Furthermore, the results of ICLARM's research depend upon linkages with governmental, private, or other units that can implement or make use of their findings for large numbers of small fish producers, both farmers and capture fishermen. ICLARM has been able to establish a wide network of linkages with government offices, universities and research organizations. Nine formal agreements have been concluded between ICLARM and other research organizations in Thailand, Malaysia, and the Philippines. It has established observer status with the Southeast Asia Fisheries Development Center (SEAFDEC) and is expecting to have the same status established with FAO. The United Nations University (UNU) is providing part of the funding for an artisanal fisheries project in the Philippines and other projects including training activity with UNU are being discussed.

ICLARM has also had discussions with institutions in both Kenya and Mexico concerning joint investigations on integrated farming and rural development, based on the on-going works of ICLARM with Central Luzon State University in the Philippines. A linkage is also being considered with the Gulf and Caribbean Fisheries Institute (University of Miami) on research dealing with fisheries management and mariculture. Thus, the Review Mission concluded that ICLARM had not only demonstrated a good deal of energy, but that it also was carefully beginning to establish relationships that bring it into a more worldwide orbit.

In reviewing the nature of ICLARM, the AID Mission took note of the recent meeting of the ICLARM Program Advisory Committee. This Committee had met in 1977 and been extremely instrumental in guiding the development of the research program and other activities of the organization. This second meeting with nine people present reviewed in some detail the work accomplished and in progress by ICLARM as well as its future plans. In the report of its meeting, see attached draft document (Attachment No. 10) the Committee gave a resounding vote of confidence to ICLARM and its staff. The Review Mission in considering the PAC report noted with approval that the membership included representation not only of countries in the region but also of countries from which there is either existing or likely financial support. The Federal Republic of Germany and Australia are both represented on PAC and are presently funding some aspect of ICLARM's work. The Netherlands and Sweden are also now represented on PAC and both countries are expected to provide some support. The Mission expressed the hope that participation by present members of the PAC within the region would be increased and that an effort be made to include a member of PAC from Japan.

Section 4: Review of ICLARM Projects

It is the intention in this section, to briefly discuss some of ICLARM's more important projects. Typical activities have been selected under each of ICLARM's major areas of program concern. Until the present, five program areas were recognized; these were (1) Aquaculture (2) Traditional Fisheries (3) Resource Development and Management (4) Marine Affairs and (5) Education and Training. The projects will be discussed under those headings although the Center's Program Advisory Committee resolved at its recent meeting to combine programs (3) and (4) under a single program area titled Fisheries Affairs. A sixth area of ICLARM endeavor, Information Services, will also be reviewed here although ICLARM has considered it as a staff activity.

There follow two lists which summarize the Center's activities for the period 1977-1980. The first list is of activities completed between 1977-80. The second list is of current projects. The entire program of projects is presented in diagrammatic form in Attachment No. 11.

Completed Projects 1977-80

<u>Program Area</u>	<u>Project Title</u>
(1) <u>Aquaculture</u> :	Conference: The Physiological and Behavioral Manipulation of Food Fish as Production and Management Tools Conference: Integrated Agriculture-Aquaculture Farming Systems
(2) <u>Traditional Fisheries</u> :	Philippine Municipal Fisheries. A Research Review
(4) <u>Marine Affairs</u> :	Fisheries Management and the Law of the Sea in Southeast Asia and the Southwest Pacific

Current Projects

<u>Program Area</u>	<u>Project Title</u>
(1) <u>Aquaculture</u> :	Applied Research on Integrated Animal-Fish Farming : The Genetic Improvement of Tilapia Broodstock in the Philippines : Cooperative Program of Research and Training in Aquaculture and Inland Fisheries : Milkfish Production Economics (Philippines) : Catfish Production Economics (Thailand)
(2) <u>Traditional Fisheries</u> :	Skipjack Tuna and Traditional Fisheries. A Solomon Island Core Study : Malaysian Traditional Fisheries; Options for Development. A Research Review : Small-Scale Fisheries of San Miguel Bay, Philippines. A Multidisciplinary Analysis
(3) <u>Resource Development and Management</u> :	Research on Stock Assessment
(5) <u>Education and Training</u> :	Graduate Study Program in Aquatic Resources : In-Service Training

1. Aquaculture

Aquaculture has no doubt been the most predominant of ICLARM's program areas. As traditional fisheries is reaching or may have reached its maximum production capacity in many parts of the world due to poor management of coastal resources and over-exploitation, the chances of increased fish supplies from pond culture has increasingly developed as an area of promise. ICLARM considers that research on three main species tilapia, milkfish and mullet may many times increase the world supply of cultured fish.

The work on Tilapia at Central Luzon State University well demonstrates what may be done to increase pond fish production by means of improved farming systems and through the genetic manipulation of the fish itself. Up to 1000 tons of tilapia are being harvested per hector a year under small farm conditions. An Integrated Animal Fish Farming Project has demonstrated that when tilapia is reared with swine or poultry, the fecal wastes of the associate animal are effectively utilized to fertilize the bioflora on which the fish feed. The growth rate of the tilapia is hastened and two or three crops of tilapia may be harvested a year. The potential for such animal-fish farming associations with swine, chickens or ducks are enormous in almost all parts of the world.

Also shown to have great advantage in increasing tilapia productions is the use of polyculture. Tilapia tends to have the defect that it starts to breed at a very early age producing large numbers of offsprings. Unless the population is controlled competition for food results, causing the growth of individual fish to be restrained. At Central Luzon State University a number of species of predator fish are being tested in association with tilapia. The result is to keep the population dynamics of the tilapia in balance and to increase the total fish protein yield both as regards the harvest of tilapia and the associate species.

Other significant breakthroughs are being achieved by means of the collaborative research at Central Luzon State University in the field of genetics improvement of tilapia broodstock. The objective of this project is to evaluate existing stocks and determine which varieties show superior feed conversion rates. Experiments are being undertaken on inter-species crosses to determine which of the hybrid races may prove more effective than have the pure breeds. Future studies will include work on inter-species hybrids for the production of unisexual male progeny as well as on other means of genetic manipulation by which to control overpopulation of tilapia under pond production conditions. The availability of high quality mass produced fry has always been a limiting factor in extending the pond culture of tilapia. Possible solutions to this problem are also being studied in association with the Central Luzon State University program.

In the field of Aquaculture ICLARM has also conducted economic studies into the production of milkfish in the Philippines and catfish in Thailand. These studies are intended to determine what the constraints to increased production may be. The results will be published in ICLARM's technical report series. Preliminary results in the milkfish study show that the production of milkfish in the Philippines varies from 1033/kg/ha/yr in Bulacan province to a low of 104/kg/ha/yr in Masbate and that the difference is primarily a matter of feed management. Fertilization with organic manures has far outyielded that when chemical fertilizer is applied.

A major problem has been confronted by ICLARM in its performance in long range pond-culture experiments. The Central Luzon State University facilities are intended to provide answers to matters which the Philippine government program considers as its aquaculture priorities. Being a government facility the resources of the fisheries station must first be responsive to the GOP's aquaculture requirements. This means that ICLARM's projects often suffer from a shortage of labor and other resource availability.

ICLARM intends to explore the possibility of leasing separate facilities for certain projects when they conflict with national objectives and the effectiveness of the ICLARM research is thereby restricted. The ICLARM Program Advisory Committee at its September 1980 meeting recognized the dangers of such a move in encumbering the collaborative status of the Center's activities. As an alternative to unilateral rental of experiment station facilities it recommended that ICLARM continue to investigate the possibilities for increased cooperation with the SEAFDEC Aquaculture Department. It was recommended that cooperation with the private sector might also be considered under conditions which would assure public access to all research results obtained as well as complete autonomy of the research activities conducted on the private facilities.

2. Traditional Fisheries

Representative of ICLARM's research in this programs area is the San Miguel Bay Project. It represents a base line study of the socio-economic conditions under which a traditional Philippine artisinal fishing community is operating. Included in the study is a resource assessment of the San Miguel Bay. Alternatives for improving household incomes are to be investigated as are possible improvements in marketing the catch and alternative post harvest technologies for reducing spoilage. The possibilities of establishing pre-cooperatives as well as government programs in marketing and processing are being looked into. There are four complementary aspects of the project. These are: (1) stock assessment: to assess the status of the fishery resources of the San Miguel Bay. (2) economics of production: to determine catch, effort and incomes of municipal fishermen and costs and returns for the marketing and distribution system. (3) social and demographic characteristics of the fishing communities: to assess the socio-economic development of the six San Miguel Bay municipalities and to analyze social linkages, attitudes and preferences toward fish production processing and marketing. (4) an assessment of occupational and geographic mobility among fishing households: to examine the nature of the flow of human resources between municipal fisheries and other rural sectors so as to assess the potential of reducing the dependence of fishing households on capture fisheries.

Two other studies of similar nature under program area (2) are a Malaysian traditional Fisheries Review and a Solomon Islands study on Skipjack Tuna and Traditional Fisheries.

At its recent meeting ICLARM's Program Advisory Committee recommended that the Center should endeavour to interact with related sociological and environmental aspects of traditional fisheries in other regions. It was recommended that ICLARM continue to intensify its work on the social and economic aspects of traditional fisheries.

3. Resources Development and Management
and
4. Marine Affairs

These are program areas which because of the relative short existence of ICLARM, the Center has not yet emphasized.

In Resource Development and Management, ICLARM has initiated a project on Tropical Stock Assessment. It aims to identify, adapt and collate those methods commonly used in temperate water stock assessment which may also be used in the tropics. Its overall objectives are: (1) to put at the disposal of fishery biologists in the tropics a set of simple reliable methods for use in stock assessment studies (2) to conduct studies on selected representative stocks of the region to demonstrate appropriate methodology and to accelerate the assessment of these stocks, and (3) to train ICLARM interns and other biologists working in the tropics in the field of stock assessment. Although until now it has not been a practice of ICLARM to train interns under its direct hire staff, two local interns from the University of the Philippines have been accepted under this project and are working with the ICLARM project leader at a computer program for analyzing fisheries catch statistics which have been gathered in the Philippines over a period of many years.

In Marine Affairs two projects have been completed. The first was a study of Fisheries Management and the Law of the Sea in Southeast Asia and the Southwest Pacific. Its purpose was to compare the changes taking place in Southeast Asia and the Southwest Pacific as a result of extended jurisdiction. The study attempted to identify some of the major problems that are emerging and to suggest some approaches and strategies that might be followed by coastal states in dealing with those problems. The only common element that was found in the two regions was the necessity for improvements in the systems for the management of the marine fishery resource and for the distribution of the resource benefits to the communities depending on it. The study's suggestions for dealing with the problems are not intended to be definitive. Rather they are designed to stimulate further research by the individual governments of the two regions. The second project was a workshop dealing with problems related to the matter of the Law of the Sea in Southeast Asia.

The Program Advisory Committee recommended that program areas (3) and (4) be combined into a single area to be titled Fisheries Affairs. Because of the great importance of marine resource development and management they recommended that as staff restraints permit a senior ICLARM staff appointment be made in this field.

5. Education

Probably because ICLARM is still in its early years, its efforts in the education area have continued to be relatively weak. It was explained that because the technical staff continues to be small in number and because many of the scientists are just getting started at their research, it has not been the Center's policy to encourage a program of student interns. In an institution such as ICLARM which does not maintain its own field station, the

thought is that most long-term education should be implemented at the cooperating institutions where ICLARM is undertaking collaborative activities. It was agreed, however, that a strong education policy should constitute a major effort of the Center as it develops, especially as specialists in the various aspects of traditional fisheries particularly aquaculture and capture fisheries are, in most parts of the world, inadequate to advance significant fisheries incentives.

Under a joint program with the Philippines Council for Agriculture and Resources Research, the Center has provided a small grant (\$5,000) to strengthen support for graduate studies on aquatic resources, particularly those that provide knowledge relevant to the development and management of this research in the Philippines. ICLARM will assist the Philippine Council in screening applicants and will identify suitable topics in aquaculture resources research for their thesis dissertations. The applicants are to be registered in Philippine Universities and supervised by university staffs although the ICLARM scientists will assist in monitoring their progress.

So far only one research intern program has been initiated at ICLARM headquarters. It is the intern program associated with the Tropical Stock Assessment Research Project described earlier. Two students have been seconded to the program by the College of Fisheries of the University of the Philippines. They are receiving training in the methodology of tropical fish population dynamics.

During its recent October 1980 sessions the ICLARM Program Advisory Committee recognized the importance of developing the education program of the Center. It recommended that the possibility be looked into of recruiting a special assistant to assist in strengthening the ICLARM education program area and to organize and plan its workshops.

6. Information Services

Although the ICLARM Information Service is considered a staff function to the Center rather than one of its areas of program emphasis, it has developed as one of the strongest of ICLARM functions. An excellent reference library is being amassed, a publications sub-section is producing several series of publications and numerous studies and reviews as well as conference proceedings have resulted from the conferences, workshops and special studies that ICLARM has already sponsored.

Over 340 journals are received by the library. Books and monograph holdings exceed 2,500 volumes and over 500 reprints have been accumulated to date. Also collected are ephemeral materials such as newspaper clippings on fisheries. The library draws on a series of decentralized input centers throughout the world for the collection of unconventional literature such as graduate student theses and special releases and bulletins produced by governments, international organization and local universities which are often produced in local languages. To facilitate this information in various languages, contacts are being made to carry out translations for in-house use as well as for international distribution. The library's services include circulation and loans, references and information, current-literature-awareness and compilation of bibliographies.

The publication sub-section currently produces several series. A quarterly newsletter carrying articles on ICLARM projects, research and special developments from other fisheries centers in the tropics, news, technical information, reports of meetings and reviews of publications of special interest is distributed to 3,500 institutions. A team of six associate editors, in different countries provide news items and informative articles from their parts of the world. Besides the newsletter the publications sub-section produces six widely circulated series in which there are 36 titles at various stages of production. A list of available publications is appended as attachment No. 13.

To date, conferences and workshops have been held on the "Physiology and Behavioral Manipulation of Food Fish as Production and Management Tools"; "Integrated Agriculture- Aquaculture Farming Systems and Problems of Conflict Management of Fisheries related to the Law of the Sea in Southeast Asia". Summary reports of these conferences have already been printed. Conferences and workshops are soon to be held on the Biology and Culture of Tilapia, Aquaculture Economics, Appropriate Technology for Alternative Energy Sources in Fisheries and on the Theory and Management of Tropical Multispecies Stocks.

The Program Advisory Committee recognizing the importance of the information service as an outreach arm recommended that ICLARM investigate the feasibility of establishing an Asian forum for fisheries scientists to help disseminate pertinent information in the field. It recommended that a plan be investigated for the increased retrieval of unconventional fisheries literature.

Project Summary and Review, 1977-1980

In the three years since the Center's incorporation, it has jointly sponsored three major conference-workshops, with three more firmly scheduled- one in 1980 and two in 1981. Five projects have been set in motion in aquaculture, and four in traditional fisheries. A single, major project, tropical stock assessment research, is underway in the resource development and management program area, and this will expand to embrace management issues in 1981. The marine affairs program has dealt with regional problems relating to the Law of the Sea. Two training projects have begun.

To support these projects, ICLARM has employed to date, in addition to its core staff, (Appendix No. 12) 4 postdoctoral fellows, 1 predoctoral fellow, 2 research fellows, 2 research associates and 35 consultants,

The consultants have been engaged not only to add expertise to projects, but to undertake reviews of important subjects within the program areas, including aspects of fish genetics, reproduction and hatchery techniques, integrated farming, mangrove research, food potential of aquatic weeds, migratory food fish and country case-studies of small-scale fisheries.

In the course of project development and implementation, staff members have attended 31 conferences and workshops and contributed significant papers to 15 of these meetings.

Project development has also involved institutional linkages. ICLARM has entered into negotiations with over 30 country, regional and international institutions. Written agreements have been made with 8 such institutions, while cooperative ventures have also been undertaken with 13 others.

Section 5: Relationship to AID's Purposes

A question that arose during the review is "How is AID achieving its purposes through ICLARM?" Of specific interest are its benefits to the rural poor, either full-time or part-time fishermen and farmers, in terms of increased opportunities for employment resulting in increased income. Of equal interest to AID is improvement in nutrition of the poor resulting from increased availability of animal protein, in this case fish from fishing and fish farming. Reviewers expressed particular interest in the extent to which ICLARM's activities relate to production of lower priced fishery products utilized by the poor.

Many of the research activities supported or strengthened by ICLARM involve improving the efficiency of fish production and therefore will, in the long run, contribute to the economy of production and the availability of lower priced fishery products. Specific examples are research on aquaculture methodology such as Tilapia Broodstock Development, Mass Production of Tilapia Fingerlings, and Integrated Animal-Fish Production projects all of which focus on improving production methodology. Availability of fast growing, efficient breeding stocks will have obvious benefits to small producers and more efficient production of fingerlings will reduce costs of this input to the farmer. The Integrated Animal-Fish Production and proposed detritus research focus on the use of waste products available on small farms and results will minimize use of external inputs, thereby reducing costs. A workshop on alternative energy sources and uses for fishermen, aquaculturists and their communities is being sponsored jointly with the Asian Development Bank. Participants will focus on small producers and means of reducing their dependence on imported petroleum products for boat operation, pumping, fertilization, processing and preservation as well as other community activities.

The artisanal or traditional fisherman is the subject of several research projects designed to improve understanding of the resources he is exploiting, and of the social and economic constraints to improving his income. The San Miguel Bay project has elements involving studies of socioeconomic development of six municipalities, mobility of fishermen, economic efficiency of the fish marketing and distribution system, and studies of the fishery stocks being exploited. This integrated approach is designed to provide an information base upon which planning and policy decisions affecting the small-scale fisherman can be made. Studies of the impact on small-scale fisheries of expanding tuna fisheries have been completed in the Solomon Islands and other review, and studies directly related to improvement of the small-scale fisherman's economic condition have recently been completed.

The general question of whether poor consumers can afford to buy fish, either wild or cultured has often been asked. Of the forms of animal protein available in the LDC's, low-priced fish is nearly always among the least expensive. Research with farming of efficient species such as tilapia and planned efforts to improved utilization of so-called trash fish that are presently often discarded help reduce prices of some fish and fish products. Undersized fisheries are sold well below standard market prices and fish sources, pastes and by products provide additional amounts of protein to supplement the diets of even very poor consumers.

To insure optimum employment opportunities associated with new methodologies for fishing or fish farming, labor-intensive rather than capital-intensive approaches are encouraged. In training and extension related activities emphasis is placed in increased utilization of labor.

Information services also are designed to insure benefits to the rural poor. In addition to scientific publications, a newsletter and manuals are prepared with working level information. Local training of counterparts, community members and extension workers is an important component of several projects. Examples are the San Miguel Bay project where community leaders are being educated regarding problems and solutions to the dilemma of the local small-scale fishermen. Studies of the reasons many poor milkfish farmers are reluctant to accept improved techniques will serve as practical training for extension agents and as a basis for seminars on improvement of extension methodology. Special efforts are made to train counterpart personnel who can carry on studies and who will influence governmental policies following completion of ICLARM inputs. Direct transfer of information related to policy matters and pertaining to the rural poor often must be related to policy makers in a quiet and informal fashion for use and/or implementation when opportunities arise. Personal communications of an informational but unofficial nature are carried out with many influential officials.

Other socioeconomic studies are aimed directly at the low income fishermen or fish farmer. A study of successful cooperatives and cooperative-like fishermen's groups is being planned. Economics of milkfish farming, including the very small operators has been examined, and the production economics and marketing of mussels and their relation to the incomes of the small producer will be main topics of a new project in Thailand. Studies of alternative sources of income for small fishermen have been an important aspect of several studies where resources are already being overfished.

Because ICLARM operates entirely through existing institutions, the linkages with other organizations concerned with the rural poor have been numerous and will continue to be a central part of the research effort. As a mode of operation ICLARM has often "seeded" projects with a low level of funding to initiate an activity with a particular focus, and then played a diminishing role as other donors see the success of the approach and are willing to contribute to the activity. In this way funds totaling \$261 000 have been attracted from cooperating agencies for the 1981 calendar year. An interesting example is the San Miguel Bay project to which ICLARM contributed \$17,000, \$11,000 and zero during the first three years while respective contributions of other donors were \$2,500, \$21,500 and \$53,000. Using this "multiplier effect" ICLARM has brought additional funding to bear on the problems of the rural poor in specific target areas determined to be of critical importance by ICLARM scientists.

In summary ICLARM is addressing the food and employment problems of the rural poor and is assisting AID to achieve its goal of assisting the poor majority. Research programs in all the major areas of ICLARM's investigations have the poor fisherman and the poor farmer as their primary focus.

Section 6: Funding History and Budget

Initial funding of ICLARM was a grant of \$456,000 in 1977 from the Rockefeller Foundation. In that year an additional \$11,000 was obtained from miscellaneous other sources. In 1978 Rockefeller funding was increased to \$600,000 and special projects and consulting brought in an additional \$23,000. The initial two-year period of slow growth was a gestation period in terms of ICLARM funding. The typical lag period from initial contact of a donor to funding has been about two years in most cases.

A significant turning point occurred in 1979 with a contribution by USAID and subsequent recognition by several other donors and collaborating institutions. The impetus provided by USAID funding in 1979 paved the way for positive responses by other groups including a willingness to contribute as is reflected in the 1980 funding. Contributions in 1979 of \$700,000 from Rockefeller, \$150,000 from USAID and \$54,000 from others expanded in 1980 to \$750,000 from Rockefeller, \$250,000 from USAID and \$154,000 from other donors as is indicated in the following table.

SUMMARY OF FUNDING 1977 - 1980 (\$000)

	<u>1977</u>	<u>1978</u>	<u>1979</u>	<u>1980</u>
Rockefeller	456	600	700	750
USAID			150	250
Other	<u>11</u>	<u>23</u>	<u>54</u>	<u>154</u>
Total	467	623	904	1,154
Philippine Government				
Tax Breaks	33	71	71	149

The budget for calendar year 1981 and estimated budgets for the years 1982-1984 are presented in detail in the attached tables together with anticipated sources of funding. Figures for the years 1982-1984 represent no commitments on the part of donors and should not be used outside the context of this AID review.

A similar breakdown prorated by periods of August-July corresponding to the AID funding cycle is also presented in the attached tables. Contributions from the Philippine government in terms of tax exemptions are listed separately and have not been included in the totals.

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ICLARM

ESTIMATED BUDGETS (\$U.S.) & ANTICIPATED SOURCES OF FUNDS
(Budget Year = Calendar Year)

I. ESTIMATED BUDGETS

	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
A. Aquaculture	810,000	750,000	650,000	600,00
B. Traditional Fisheries	213,000	280,000	372,000	444,000
C. Resource Development & Management	222,000	270,000	371,000	446,000
D. Education & Training	32,000 ²	98,000	150,000	200,000
E. Information Service	188,000	188,000	210,000	250,000
F. General Administration	325,000	335,000	350,000	400,000
	<u> </u>	<u> </u>	<u> </u>	<u> </u>
TOTALS	<u>1,790,000</u>	<u>1,921,000</u>	<u>2,103,000</u>	<u>2,340,000</u>
G. <u>OTHER:</u> Govt. Philippines (Tax exemption privileges)	120,000	140,000	178,000	200,000

¹ Incorporates Marine Affairs which was a separate program area until 31 December 1980

² Additional expenditure on Education and Training is included under program areas A - C as an integral part of these programs.

II. SOURCES OF FUNDS

	<u>1981</u>	<u>1982</u>	<u>1983</u>	<u>1984</u>
A. U.S.A. (AID) ¹	275,000	320,000	350,000	350,000
B. Rockefeller Foundation	910,000	900,000	900,000	900,000
C. Fed. Rep. of Germany	250,000	250,000	200,000	250,000
D. Govt. Sweden	-	50,000	100,000	150,000
E. Govt. Netherlands	-	50,000	100,000	150,000
F. Govt. Australia	51,000	100,000	100,000	100,000
G. Govt. Philippines	-	-	50,000	100,000
H. Govt. Thailand	63,000	63,000	63,000	-
I. Govt. Canada	25,000 ⁴	-	-	100,000
J. Asian Dev. Bank	70,000	70,000	90,000	90,000
K. Other Cooperating Institutions:	146,000	118,000	150,000	150,000
• NJMSC(USA) ²				
• FAO/UNDP				
• UNU ³				
• etc.				
	<u>1,790,000</u>	<u>1,921,000</u>	<u>2,103,000</u>	<u>2,340,000</u>
L. OTHER: Govt. Philippines (Tax exemption privileges)	120,000	140,000	178,000	200,000

¹ Prorated from Aug. - July fiscal year
² New Jersey Marine Science Consortium (USA)
³ United Nations University
⁴ International Development Research Center (IDRC)

Section 7: Summary Findings

The following observations were noted during the review process. They affirm that at a relatively modest cost ICLARM is achieving the purpose for which the AID grant in support of the core program was provided. As stated in the grant agreement this purpose is, "to conduct and stimulate research on all aspects of fisheries and other living aquatic resources to assist the less developed countries to meet their nutritive, economic and social needs."

1. Although it will not be an ICLARM policy to specifically conduct a program which benefits the poorest of the poor as this is not possible while the demand for fish products outweighs the supply, ICLARM is working on those fisheries problems which can have priority benefits for the large majority of the developing world's population. This is being accomplished by stressing small farm culture systems with relatively low priced fish. Tilapia, milkfish and mullet are being dealt with in contrast to high valued species such as shrimp, prawns or eels. Examples of the types of projects which have been implemented are: the genetic improvement of tilapia broodstock, increased production of fish seed to expand the supply, pond culture systems which can increase the small producer's income with low energy inputs such as polyculture in fish production, improved systems for simultaneous rice and fish production and integrated animal-fish farming systems. Other examples are studies of the socio-economic conditions in fish farming and artisanal fisheries communities which will lead to a clearer understanding of the bottlenecks that constrain the communities' development and an expansion of their fishing industries.

2. During its first two years of implementation with AID core support, ICLARM has established itself as a competent fisheries center with projects which promise to provide significant development assistance, particularly in Southeast Asia and the Southwest Pacific, in increased fish production and utilization. Primary emphasis is being placed on aquaculture and traditional fisheries.

3. ICLARM has assisted in crystalizing a number of breakthroughs in fish production. These include a series of farming methods which increase the potential of small farm incomes by association of tilapia in farming systems where pond fish are utilized to convert poultry and swine wastes into valuable low production cost fish protein. Through its workshops and the publication of its review series ICLARM is helping to make known the latest developments in the production of tilapia, milkfish and mullet.

4. With a small staff and a modest budget ICLARM is serving to demonstrate a new international center concept which by implementing programs with other fisheries institutions, rather than on a center-controlled research station, promises to achieve research and development at considerably less cost than can such established centers as IRRI, CYMMIT and CENTA.

5. In initial agreements the program is proving successful in the development of projects where with small amounts of its seed money and comparatively large inputs from other donors and collaborating institutions, considerable multiplier effect is being achieved.

6. Its unique character as an autonomous, non-government, non-profit, international scientific research institution allows ICLARM to avoid much of the political pressures which are found to impede the progress of developmental assistance at government to government and host country institutions. Though there are problems in conducting research on the facilities of collaborating research station since the allocation of scarce resources such as land, water and personnel must first serve the host stations intrinsic program needs, the economies of such an operational mode appear far to outweigh the disadvantages.

Section 8: Conclusions and Recommendations

a. Conclusions

On meeting to conclude what significant findings had been made as a result of the biannual AID review of the ICLARM program and the AID contribution to the core budget of that program, certain observations appeared noteworthy to Messrs. Crance and Breitenbach. It is their intention to list those observations which they believe pertinent to the review. Although the observations are loosely grouped according to their order of importance below, no attempt has been made to prioritize them in the different groupings listed.

1. The status of the ICLARM concept.

Although ICLARM must be given high grades for having acquired an enthusiastic, bright young staff of fisheries technicians, during the first two years since the AID contribution took effect, it is still too early to determine whether the concept of an international research center without its own research station facilities can prove effective. Certain problems are already being evidenced.

At Central Luzon State University where much of the farming systems research with tilapia is being collaboratively carried out, a question has already developed regarding how much of the University's fisheries station can be made available for ICLARM sponsored long-range research. CLSU has a commitment first to service the fisheries needs of the Philippines. Because CLSU's resources are limited ICLARM is already considering the possibility of constructing and/or leasing separate facilities for some of its long-range projects.

Certain potential ICLARM donors have expressed a reluctance to support the core budget because of the lack of its own research station. They would rather provide their contributions in the form of grants for special projects. This has been used as an argument on the part of the Canadian International Development Research Council (IDRC) to give its backing to SEAFDEC while withholding support to ICLARM.

2. The breadth of the ICLARM program.

The possibility that the Center's areas of program activity were overly expanded was considered a matter of special concern. These program areas presently consist of Aquaculture, Traditional Fisheries, Fisheries Affairs, Training and Education, and Information Services. The thought was raised that with its small budget ICLARM might possibly benefit from reducing its range of program coverage at least during its first years. We approve of the fact that a majority of ICLARM's present projects are in the program area of Aquaculture and that the staff assignments are heavily weighted in that program area.

It is agreed that work on Traditional Fisheries is, like Aquaculture, a vital part of LDC rural development. We believe that such projects as the Philippine Municipal Fisheries Review and the San Miguel Bay study of an artisanal fisheries community in the Philippines are of priority importance. The socio-economic conditions which exist in such communities and the fisheries resources available to them should be evaluated before any community development programs are undertaken.

We endorse the decision on the part of ICLARM's project advisory committee to combine what were previously two areas of program activity, namely Resources Development and Management and Marine Affairs, into a single area of activity titled Fisheries Affairs. In fact we question whether ICLARM should even deal with a political issue of such breadth as Marine Affairs and the Law of the Sea problems the issue implies. Such issues we consider might better be left under the jurisdiction of the FAO, the Indo-Pacific Fisheries Commission and/or the Association of Southeast Asian Nations. Other Fisheries Affairs projects such as Tropical Stock Assessment we considered might perhaps be included under the Traditional Fisheries program area.

3. The ICLARM Education Policy.

It was noted that within the ICLARM organizational chart, "Education and Training" is assigned the category of a program area along with "Aquaculture" and "Traditional Fisheries." A whole separate function is assigned to "Information Services" (Attachment #6) as a staff activity in the Director-General's Office along with "Administrative Services." Although such a division of outreach effort would seem appropriate in a large established research institution it appeared to us that under the present conditions they might equally well be combined in the project area titled "Education and Training."

It was felt that until now ICLARM has failed to establish an adequate education policy. As AID considers education of local personnel to be a priority spin-off of its assistance, we consider that the Center would do well to develop an education strategy.

We understand why ICLARM may wish to limit the number of interns it accepts for study programs under its direct-hire technicians since the demands on the small number of senior technicians already are taxing. Nevertheless we would point out that there are instances in which the assistance of an intern can both advance the work of the technician and prove a beneficial experience to the intern.

We question ICLARM financial support to the Philippine Council for Agriculture and Resources Research (DCARR). First it is difficult to understand what there is to be gained by ICLARM with its small contribution of \$5,000. It appears there should be other more appropriate sources of funding available to the Council. We further understand that in several instances there have been available sources of funds to the council which went unutilized.

It might be well for ICLARM to consider an education strategy whereby in its collaborative activities with other agencies in-service training would constitute a significant component.

We consider that training can have a major multiplier effect on the future acceptance of new technology and information as it is developed at ICLARM. For that reason we believe that it is in ICLARM's interest to decide whether it might better provide funds for degree training or seed money to students for the solutions of special problems which they might use as their thesis subjects.

4. Information Services.

We questioned whether ICLARM should be unilaterally involved in most workshops and conferences or if when a sponsor it might not be better to pass much of the credit off to such co-sponsors as the FAO, the ADB and other participating host country institutions. The issue revolves on the matter of to whom the major credit should be assigned. There may be certain recriminations when various experts from a number of countries have participated in developing a state-of-the-art summation of available information and yet the publication of the proceedings is made unilaterally in ICLARM's name.

We note that so far ICLARM publications have been directed to technicians at the professional level and we are of the opinion that this is the clientele for whom ICLARM should be making technical information available. Nevertheless if small fisheries are to be the beneficiaries of the improved technology released by ICLARM it must be decided by what method this information is to be given the wide dissemination it will require to be accepted. A valid component of the Information Services Program should be to study how its information may best be made available to fish farmers and traditional artisanal fishermen.

5. The ICLARM Directorate.

We are concerned that the allocation of how core budget funds are to be utilized is now entirely at the disposition of the Director-General. It is our belief that this responsibility should not be unilateral and feel it should be shared with the executive committee of the Board of Trustees. AID/W should provide its guidelines as to how its contributions may legally be utilized.

At the present time the Director-General makes all appointments to the technical advisory committee. We are apprehensive that such central control could have the effect of a packed jury if an unpopular decision were at some future date desired by the Directorate.

b. Primary Recommendations

1. We strongly recommend that AID make available to the core budget of ICLARM its final \$300,000 increment to its \$800,000 three year grant. This recommendation has been made after a careful review of the ICLARM activity since the first AID contribution was provided in August 1979. Messrs. Crance and Breitenbach have arrived at this recommendation on the basis of the impressive strides which ICLARM has achieved in establishing itself as a respected International Center among the nations of Southern Asia and the Southwest Pacific. We make said recommendation recognizing that the responsibility for that decision as per Mr. Piester's Memorandum of September 16, 1980 (Attachment #2) is exclusively theirs and not a joint responsibility of the entire review committee.

2. We feel that it is premature to make a decision at this time as to whether the AID support of ICLARM as an International Center should be continued after the present three year grant terminates in August 1982, although our inclination as of September 30, 1980 would be to do so. We consider that a final decision in that regard should be relegated to the first quarter of FY 1982, at which time the decision can be made based on how ICLARM and its programs continue to develop and be accepted in its primary area of influence as well as in other parts of the world.

3. There follows a series of secondary recommendations which we believe to be pertinent to the continued successful development of ICLARM. We recommend that either the matter of how they have been implemented or an explanation of why they have not been implemented be weighed when the decision is made whether AID will provide its continued financial support to the International Center for Living Aquatic Resources Management after July of 1982.

c. Secondary Recommendations.

1. During the third and last year of the present AID grant, ICLARM should develop explicit commitments for long-range support of its core expenses with its individual host country donors, with private foundations and with possible private enterprises which will guarantee to all free access to any results from the activities their funds may finance.

2. In order to justify long-term continued support to ICLARM on the basis which AID provides core support to the CGIAR sponsored group of International Agricultural Research Centers, ICLARM should continue its efforts to obtain membership in the CGIAR, or at least an indication that its membership will be considered by a specified future date. ICLARM should keep AID advised as to its progress in these efforts.

3. Firm new commitments should be sought from additional donors not now contributing to the ICLARM program. A wider corps of participating countries should be sought, particularly Japan, because of its available funds for international fisheries development and Taiwan, because of its vast wealth of experience in the field of aquaculture.

4. A network of relationships should be defined with fisheries related agencies both in the Southeast Asian and Southwest Pacific regions as well as with such agencies and institutions throughout the world. Special consideration should be directed to how the network will relate ICLARM to other international agencies involved in fisheries development, particularly the FAO and SEAFDEC.

5. As regards the involvement of existing and potential new donors in the management and administration of ICLARM we recommend that a Japanese fisheries technician be appointed to the Technical Advisory Committee. The good counsel of the Japanese might well be sought in bringing about a closer relationship between SEAFDEC and ICLARM. We feel that this might apply equally in regard to Taiwan relative to Taiwan's providing of counsel.

6. Canada also has a representative on the technical advisory committee, but because some Canadian scientists have accused the Rockefeller Foundation and AID of establishing ICLARM as a predominantly US dominated Center relationships have not been good. Every effort needs to be made to demonstrate that the allegation is unfounded.

7. We support the recommendations of ICLARM's Technical Advisory Committee to continue to pursue a closer relationship with SEAFDEC in order that any existing sense of mistrust may be dispelled between that entity and ICLARM.

8. Inquiries should be instigated in Mainland China to determine the possibility of interested fisheries development institutions there also becoming a part of the international fisheries network system.

9. ICLARM could well take greater interest in a program of mutual cooperation between it and the US university competency in international fisheries development which exists at the Auburn University International Center for Aquaculture and the University of Rhode Island International Center for Marine Resource Development. There may be a good possibility for a strong collaborative research program in aquaculture between ICLARM and the AID Pond Dynamics CRSP. ICLARM should pursue that possibility.

10. Within the Philippines we believe a major effort needs to be made on the part of ICLARM to encourage a national movement for better planning and coordination between the different fisheries development agencies, both foreign and domestic, in order to insure that duplications in their programs do not take place. This is recommended so that scarce resources are well employed. The coordinated effort should include such foreign institutions as ICLARM, SEAFDEC, the FAO and the UNDP as well as USAID. Other possible foreign financed programs which should be included are the UNDP special South China Seas program and their Brackish Water Fisheries Training Program, the World Bank and Asian Development Bank funded fisheries programs. As regards Philippine institutions the coordination should include the Bureau of Fisheries and Aquatic Resources of the Ministry of Natural Resources, the Philippine Council for Agricultural Research, Central Luzon State University and the University of the Philippines.

11. We recommend that the possibility of decentralizing the authority of ICLARM's Directorate be considered for we are apprehensive that under the present conditions the director-general is subject to special interest influences. We are apprehensive that this is being used to justify the belief that ICLARM is dominated by the desires of its major contributors who are US in origin.

12. Finally although we agree with ICLARM that it was expedient to place major emphasis first on establishing its programs in Southeast Asia and the Southwest Pacific, we believe the time is rapidly approaching when the Center must extend its work to other parts of the world. An effort needs now to be made to increasingly include Latin America, Africa and the Near East in the ICLARM program of activities.

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ESTIMATED BUDGETS (\$U.S.) & ANTICIPATED SOURCES OF FUNDS

I. ESTIMATED BUDGETS

	<u>Aug. '81- July '82</u>	<u>Aug. '82- July '83</u>	<u>Aug. '83- July '84</u>
A. Aquaculture	775,000	692,000	620,000
B. Traditional Fisheries	252,000	334,000	434,000
¹ C. Resource Development & Management	250,000	339,000	435,000
D. Education & Training	70,000	138,000	179,000
E. Information Service	188,000	205,000	236,000
F. General Administration	331,000	344,000	379,000
	<u>1,866,000</u>	<u>2,052,000</u>	<u>2,283,000</u>

Incorporates Marine Affairs which was a separate program area until
31 December 1980

II. SOURCES OF FUNDS

	<u>Aug. '81- July '82</u>	<u>Aug. '82- July '83</u>	<u>Aug. '83- July '84</u>
A. U.S.A. (USAID)	300,000	350,000	350,000
B. Rockefeller Foundation	900,000	900,000	900,000
C. Fed. Rep. of Germany	250,000	211,000	229,000
D. Govt. Sweden	27,000	88,000	129,000
E. Govt. Netherlands	21,000	88,000	129,000
F. Govt. Australia	80,000	100,000	100,000
G. Govt. Philippines	-	29,000	80,000
H. Govt. Thailand	63,000	63,000	26,000
I. Govt. Canada	25,000 ³	-	100,000
J. Asian Dev. Bank	70,000	82,000	90,000
K. Other Cooperating Institutions:	130,000	141,000	150,000
• NJMSC(USA) ¹			
• FAO/UNDP			
• UNU ²			
• etc.			
	<hr/>	<hr/>	<hr/>
TOTALS:	<u>1,866,000</u>	<u>2,052,000</u>	<u>2,283,000</u>

L. OTHER: Govt. Philippines (Tax exemption privileges)	132,000	162,000	191,000
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¹ New Jersey Marine Science Consortium (USA)

² United Nations University

³ International Development Research Center (IDRC)