

PROJECT DATA SHEET

L. TRANSACTION CODE

A. Add
C. Change
D. Delete

Amendment Number

2

DOCUMENT CODE

3

1. COUNTRY/ENTITY
Interregional

2. PROJECT NUMBER
931-1050

3. BUREAU/OFFICE S&T/AGR/RNR
Type d. Institution Working With LDCs

4. PROJECT TITLE (maximum 40 characters)
ICLARM - Fisheries Development

5. PROJECT ASSISTANCE COMPLETION DATE (FACD)
MM DD YY
019 | 310 | 815

7. ESTIMATED DATE OF OBLIGATION (Under "B" below, enter L, 2, 3, or 4)
A. Initial FY 719 B. Quarter 2 C. Final FY 815

8. COSTS (3000 OR EQUIVALENT \$) =

A. FUNDING SOURCE ---	FIRST FY			LIFE OF PROJECT		
	B. FY	C. L/C	D. Total	E. FY	F. L/C	G. Total
AID Appropriated Total (Grant)	300	-	300	1,740	-	1,740
Other U.S. 1. Rockefeller 2.	700		700	3,994	-	3,994
Host Country						
Other Donor(s)	251		251	4,828		4,828
TOTALS	1,251		1,251	10,562		10,562

9. SCHEDULE OF AID FUNDING (3000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH CODE	D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
			1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) ARDN	1491	967	1440	-	300	-	1740	-
(2)								
(3)								
(4)								
TOTALS			1440	-	300	-	1740	-

10. SECONDARY TECHNICAL CODES (maximum 8 codes of 3 positions each)

077 | 010 | 029 | 097

876

11. SECONDARY PURPOSE CODE

775

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code BRW | R/AG | ENV | INTR | TECH | TNG | XII
B. Amount 300 | 300 | 300 | 300 | 180 | 180 | 180

13. PROJECT PURPOSE (maximum 480 characters)

To support research in fisheries and aquaculture in the LDCs and to improve the dissemination of technology to small scale fish farmers and fishermen.

14. SCHEDULED EVALUATIONS

Interim MM YY | MM YY | Final MM YY
019 | 810 | 013 | 812

15. SOURCE/ORIGIN OF GOODS AND SERVICES

000 941 Local Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a ___ page PP. Amendment)

To extend the authorized final fiscal year of obligation to FY 1985 and to increase the authorized life-of-project funding totaling \$1,740,000.

17. APPROVED BY

Signature: *Anson B. Bertrand*
Title: Anson B. Bertrand, Director
Office of Agriculture
S&T/AGR

Date Signed MM DD YY
11/17/81

18. DATE DOCUMENT RECEIVED BY AID/W. OR FOR AID/W DOCUMENTS. DATE OF DISTRIBUTION

MM DD YY
| | | | | |

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS
PART II

NAME OF COUNTRY/ENTITY: Worldwide

NAME OF PROJECT: ICLARM - Fisheries Development


NUMBER OF PROJECT: 931-1050

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, the ICLARM - Fisheries Development project which is centrally funded was authorized on February 27, 1979. That authorization is hereby amended as follows:

a. The authorized final year of obligation is extended from FY 1983 to FY 1985.

b. The life-of-project cost is increased from \$1,440,000 to \$1,740,000.

2. The authorization cited above remains in force except as hereby amended.



J.S. Robins
Agency Director for Food and Agriculture
Bureau for Science and Technology

Date 1-19-84

Clearances:

S&T/AGR/RNR, TGill Chyphid date 11-2-84
S&T/AGR, JRoyer SP date 11/5/84
S&T/AGR, ABertrand BA9 date 11/7/84
S&T/PO, GEaton Kmfn date 11/16/84

Drafted by S&T/AGR/RNR:TGill:janet:9/13/84:WANG 2096g

Revised:11/01/84:mt

NOV 13 1984

ACTION MEMORANDUM FOR THE AGENCY DIRECTOR FOR FOOD AND AGRICULTURE, BUREAU FOR SCIENCE AND TECHNOLOGY

FROM: S&T/AGR, Anson R. Bertrand *AR*

SUBJECT: FY 1985 Funding for the International Center for Living Aquatic Resources Management (ICLARM) 931-1050

Problem: Your approval is required to authorize a grant of \$300,000 from FY 1985 A.I.D. funds to the International Center for Living Aquatic Resources Management (ICLARM) for support of its core budget through September 30, 1985.

Discussion: A.I.D. provided financial support to ICLARM from August 7, 1979 in annual increments for a total of \$1,440,000. The original A.I.D. grant expired July 31, 1984. The total core support budget for the period of October 1, 1984 through September 30, 1985 is \$1,279,500. As indicated in the attached letter dated October 2, 1984, from the Director General, ICLARM is requesting \$300,000 from A.I.D. or 23 percent of its total budget. The remainder of the core support budget will be financed by the Australian Development Assistance Bureau and other donors.

In March 1982 an evaluation team visited ICLARM to review the quality of the program implemented during the grant period and to provide A.I.D. guidance on project direction and continuation. The evaluation team report recommended continued A.I.D. support to ICLARM based on positive findings in the evaluation. However, at this time S&T/AGR is only recommending a one year grant.

FY 1985 funding of the project will require a Technical Advice of Program Change which is being prepared. The FY 1985 OYB contains \$300,000 that will be reprogrammed for this project.

Recommendation: That you approve the requested one year grant and increase in life-of-project funding by signing the attached Amended Project Authorization.

Attachments: 1. Amended Project Authorization
2. ICLARM proposal for one year core support funding including a Program Description and Budget

Clearances: S&T/AGR/RNR: T. Gill Draft date 11/2/84
S&T/AGR: J. Royer Draft date 11/5/84
S&T/PO: G. Eaton *grm* date 11/16/84

Drafter: TGill:mt:11/01/84:
Revised: 11/09/84: Wang #0401C



mcc p.o. box 1501, makati, metro manila, philippines

Cable : ICLARM MANILA
Telex : ITT 45658 ICLARM PM
Tel. : 818-0466, 818-9283
: 817-5163, 817-5255

02 October 1984

Dr. Anson R. Bertrand
Director
Office of Agriculture
Bureau for Science and Technology
Agency for International Development
Washington, D.C. 20523
U.S.A.

Dear Dr. Bertrand:

The research program of the International Center for Living Aquatic Resources Management (ICLARM) has moved forward in many substantial ways during the last year, and I am pleased to enclose a preliminary Progress Report for the period October 1983 through September 1984.

In addition, our search for additional funding has progressed quite well. A special meeting of donors was held in Manila September 25-27, 1984 which was significant in terms of donor interest, support for ICLARM's eventual inclusion in the CGIAR, and new commitments for support to ICLARM. I am pleased to report we now have substantial funding commitments from the Federal Republic of Germany, Canada (IDRC), Australia (ADAB), the Ford Foundation, and small contributions from the Rockefeller Foundation and the Skaggs Foundation. We anticipate project support in the near future from ODA and from the World Bank, through the Indonesian Government, and we will derive some income from contractual services with the Asian Development Bank, FAO/UNDP, World Bank and the Kuwait Institute for Scientific Research.

In spite of the broad interest in ICLARM as expressed above we still have inadequate funding for 1985 and I am therefore requesting a core support grant from USAID in the amount of \$300,000 for FY 1985. With approval of this grant we will be able to budget the following amounts for ICLARM's research programs for the period October 1984 - September 1985.

Administration	\$ 334,900
Aquaculture	286,200
Traditional Fisheries	205,800
Resource Development and Management	233,300
Program Development	10,000
Program Advisory Committee	20,000
Information Services	189,300
	<u>\$1,279,500</u>

OCT 11 1984

international center for living aquatic resources management

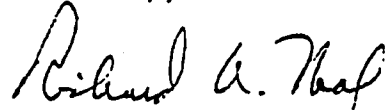
17th floor, metropark plaza, buendia ave. cor. makati, metro manila

4

In support of this request I have attached a Program Description for the period of the proposed grant.

If additional information of any kind is desired please notify me.

Sincerely,



RICHARD A. NEAL
Director General

enclosures: Program Description
Auditors' Report
ICLARM Progress Report

:mrq

Description of ICLARM Research Program
for the period October 1984 - September 1985.

A. General

During the period October, 1984 through September, 1984 ICLARM will continue its research activities in support of fisheries development and improved utilization of aquatic resources. The objectives of this research are improved nutrition, incomes and employment opportunities for the poor in tropical developing countries. ICLARM will continue to utilize its special non-governmental, non-profit, independent status to stimulate, catalyze and execute research in critical subject areas that have been neglected by other research organizations. In this respect ICLARM will follow the leadership role of the International Agricultural Research Centers belonging to the CGIAR as it has in the past.

Program areas of emphasis will be: (1) Aquaculture, with emphasis on improvement of the efficiency of systems for production of low-priced fish, genetic stock improvement and waste recycling; (2) Traditional Fisheries, with emphasis on improving the status of small-scale fishermen through social and socioeconomic interventions; and (3) Resource Development and Management, with emphasis on improving methods for stock assessment in complex, multispecies tropical fisheries. Additional information on these programs as well as on the Information Service which provides for delivery of information to key user groups and facilitates communication among research groups is presented below.

B. Aquaculture Program

ICLARM's Aquaculture Program maintains a focus on three research areas chosen for their importance and relevance to warmwater aquaculture development in developing countries: stock improvement of cultured fish, waste-fed aquaculture (including integrated farming) and aquacultural economics of important commodities. In addition, the Program has a highly flexible modus operandi which allows it to address other research, information and training needs for the expansion of warmwater aquaculture production of key finfish and shellfish commodities. Program activities are selected which have road international implications for warmwater aquaculture development, rather than, for example, location-specific development of hatcheries and farms.

With minor exceptions, the Program concentrates on species which can be grown in low-cost systems; for example, tilapias, carps and bivalve molluscs. ICLARM has long taken the view that the scope for growth in production of such commodities in tropical developing countries is vast and merits a large research and development effort to hasten its realization. The combination of high water temperatures, which permit fast growth and the ability of such organisms to feed on bacteria, plankton, vegetation and organic detritus means that cultured finfish and shellfish production can be achieved without high expenditure on fertilizers and formulated feeds.

The Program works mainly through cooperative research projects with developing country institutions, usually with a single institution to address a particular problem for a fixed duration. However, plans are also being made for the establishment of long-term networks, coordinated by ICLARM, to facilitate research cooperation in aquaculture, following the examples set in other ICLARM Programs. Networks are an excellent and cost-effective means of achieving rapid progress in research and for spreading research cooperation and information exchange across the tropics and between developing countries, rather than the North-South linkages for cooperative research assistance which have been the usual pattern in the past.

In addition to such 'hands-on' cooperative research, the Program encompasses a wide range of other activities such as advisory services to government agencies and development banks, publication of commissioned reviews and bibliographies on topics of special interest and relevance to the main Program themes, participation in training courses and organization of workshops and conferences. Throughout all Program activities, a multidisciplinary approach is maintained, so that biological, economic and socioeconomic factors are considered together. In summary, the Program endeavors to address constraints to the expansion of cost-effective warmwater aquaculture through research, working in the developing countries where such expansion can best be undertaken.

ICLARM's genetics/economics project with the Marine Sciences Center of the University of the Philippines (UPMSC) has made substantial progress. Characterization of cultured tilapia stocks in the Philippines has shown that all the so-called Nile tilapia (Oreochromis niloticus) populations examined contain introgressed hybrids with O. mossambicus. In addition to checking the identity of experimental and commercial tilapia stocks from the Philippines, Taiwan and Thailand, ICLARM has imported Taiwanese O. niloticus and O. aureus into the Philippines for use in research and development work by universities and government agencies.

The work of the ICLARM-UPMSC project has been extended beyond laboratory studies and information gathering from cooperator hatcherymen and farmers to actual on-farm culture trials. A comparison is being made of the cage culture performance of Israeli, local Philippine and Taiwanese O. niloticus. The project is linking electrophoretic studies in the laboratory, economic and socioeconomic analyses in the field and on-farm trials - probably a unique combination in aquacultural research in a tropical developing country.

Organic waste-fed aquaculture, including integrated farming is practised throughout Asia and Central Europe. ICLARM's cooperative research project with the Asian Institute of Technology (AIT) Bangkok concentrates on the basis of fish production in waste-fed ponds and has been focused initially on conversion efficiency of algae to fish (Nile tilapia, Oreochromis niloticus). An approach has been developed to quantify oxygen gains and losses in fertilized tank systems during daytime and nighttime and to convert the data to a carbon budget. A computer program is being developed to handle the data.

The ICLARM-AIT project team has also joined with the National Inland Fisheries Institute, Bangkok in studying the beneficial effects of sulfide control in intensive culture of airbreathing fishes, notably Clarias batrachus. These are widely cultured in Thailand on waste animal protein in intensive pond systems. The team is studying whether additional iron, added during the culture period, prevents sulfide from increasing in the ponds. Ten weeks into the culture period no mortality has been found in either control or iron-treated ponds. Water quality data collected during the growout period show the exceptional tolerance of Clarias for low (even zero) concentration of dissolved oxygen and extremely high ammonia levels.

In Taiwan, a multidisciplinary project on the development of technology for saltwater tilapia culture is making outstanding progress in the development of methods for improving the salinity tolerance of fry by spawning and early development (in artificial incubators) in controlled salinities. This work was carried out by Dr. C-M. Kuo, based in Taipei, by Dr. W.O. Watanabe at National Sun Yat Sen University, Kaohsiung and at other Taiwanese institutions, coordinated through Dr. Kuo and Dr. J-C. Lee of the Council for Agricultural Planning and Development (CAPD). A substantial Technical Report containing some of the project's major findings has been co-published by ICLARM and CAPD, and publication plans for other research papers are well-advanced.

The final results of several earlier research projects on economic aspects of milkfish were published in 1984. These included a report for FAO (published as ICLARM Technical Reports 15) regarding the dualistic nature of the Philippine milkfish industry and the need for strengthened extension and information systems to support this important industry. This work was also extended to examine current milkfish economics in Taiwan and Indonesia and several papers documenting emerging milkfish marketing constraints throughout Southeast Asia are being published.

The cooperative project between ICLARM and the Brackishwater Fisheries Division, Department of Fisheries (DOF), Ministry of Agriculture and Cooperatives of the Government of Thailand, entitled "Applied Research on Coastal Aquaculture", will complete its second 18-month phase in November 1984. The project involves multidisciplinary studies on the economics and biology of culture and harvesting of Thai commercial bivalve molluscs, principally the green mussel (Perna viridis), the cockle (Anadara granosa), oyster species (Crassostrea spp.) and the short-necked clam (Paphia undulata).

In 1985, the concept of an International Network for Stock Improvement in Warmwater Aquaculture will be further developed. In the Philippines, Dr. R.S.V. Pullin and Ms. J.B. Capili will continue to work on tilapia genetics with the University of the Philippines Marine Sciences Center (UPMSC). The work will encompass electrophoretic studies in the laboratory and culture trials with cooperator farmers in the field. Dr. I.R. Smith, Ms. E. Escover and Mr. O. Salon will continue, through parallel studies with cooperator farmers and hatchery operators, the multidisciplinary economics-genetics studies which have proved so successful in 1984. Dr. L.J. Lester, University of Houston at Clear Lake City, will spend sabbatical leave in the Philippines working through ICLARM at Central Luzon State University on the heritability of growth traits in tilapias.

In its broadest sense, stock improvement also includes the development of tilapias for saltwater culture and this will be continued in 1985 by Dr. Kuo in Taiwan, Dr. Hopkins in Kuwait (under a contract from the Kuwait Institute for Scientific Research) and by other ICLARM researchers. A proposal to hold an international workshop on saltwater tilapia culture will be further pursued. These efforts to increase international cooperation in cultured fish genetics research will involve increasing exchanges of material such as tissue samples for electrophoresis and live fish for broodstock improvement. It is hoped that substantial funding for the proposed International Network will be secured in 1985 with clear indicators as to where stock improvement centers can be established in the tropics.

In waste-fed aquaculture/integrated farming, current research cooperation with the Asian Institute of Technology (AIT), Bangkok will be continued through Dr. Colman. The development of integrated small ruminant-fish farming systems will also be pursued. An international conference on "Detrital Systems for Aquaculture" will be held in August 1985 at the Rockefeller Foundation's Study and Conference Center, Bellagio. Major ICLARM publications in this field will include the proceedings of this conference, a review of the utilization of sewage wastes and waste-water in fish culture and a comprehensive bibliography on integrated agriculture-aquaculture systems.

Work will also be continued on the major cultured fish commodities, chosen by ICLARM because of their suitability for low-cost aquaculture and their advantages for implementation in tropical developing countries. For the tilapias, in addition to the stock improvement work mentioned above, ICLARM will publish a world review on tilapia as a culture fish commodity and will assist research and development efforts in support of tilapia culture worldwide, including the development of a project in the People's Republic of China. Publication of a detailed carp hatchery/nursery manual by ADB and ICLARM is expected early in 1985. Dr. Kuo will continue to assist with work in Taiwan on the controlled reproduction of important marine and brackishwater finfish species. For the bivalves, the ICLARM-DOF, Thailand-GTZ project on bivalve culture will likely be extended for a further year.

ICLARM's aquaculture economics work in 1985 will be conducted almost exclusively under the auspices of the Fisheries Social Science Research Network. Major activities planned include a workshop on aquaculture economics methodologies and several commodity studies in Thailand, Malaysia and Indonesia.

C. Traditional Fisheries Program

Despite considerable attention in recent years to the resource management and poverty problems of tropical small-scale fisheries, the search continues for generalized approaches with high possibilities of positive impact. The low levels of incomes and standards of living in communities of small-scale fishermen are well documented. Less is known

about the underlying causes of this poverty and even less about the best approaches or combination of approaches that would have high likelihood of successfully managing the fishery resources and raising standards of living in these communities.

ICLARM's Traditional Fisheries Program is designed to accomplish two major objectives:

- (1) To strengthen selected national research institutions through networks and facilitate their long-term commitment to research on traditional small-scale fisheries; and
- (2) To clarify management options for traditional small-scale fisheries, through in-house and commissioned reviews, workshops, improvements in multidisciplinary research methodologies and selected case studies.

In 1983, a Fisheries Social Science Research Network (FSSRN) was launched with an initial geographical focus on Southeast Asia and disciplinary focus on economics. The FSSRN is a long-term professional and institutional development program in Asia which aims to build national research capacity to address important socioeconomic issues in the management and development of the fishery resources of Asian countries. The task is to overcome two serious constraints that have limited social science including economic research related to fisheries resources in the past: (1) the lack of social scientists with training in the applications of their disciplines to fisheries research, and (2) weak institutional support for long-term research on fishery problems.

The Network seeks to achieve its objectives through a combination of formal and informal training, scholarships, research activities, information exchange, seminars, workshops and staff interchange. ICLARM plays a unique and crucial role as facilitator and catalyzer, provider of technical and information services backstopping and network coordination. ICLARM's non-governmental, international status and its own active research program in fisheries social sciences makes it ideally suited for this role of assisting the network institutions develop their national training and research programs.

The member institutions during this initial phase of the network are (1) Faculty of Resource Economics and Agribusiness, Universiti Pertanian Malaysia, (2) Faculty of Economics and Business Administration, Kasetsart University in Thailand, and (3) College of Arts and Sciences, University of the Philippines in the Visayas. The Network has assisted each institution develop training courses in fishery and aquacultural economics, has provided training fellowships to staff members who will take a leading role in the training and research programs in the future, and has made grants for social science research on fisheries and aquaculture.

During 1982-1983 IDRC and ICLARM assisted Universiti Pertanian Malaysia establish a new post-graduate training program in fisheries and aquacultural economics leading to the degree of Master of Science in Resource Economics with a specialization in fisheries and aquaculture. In addition the program offered a one-semester non-degree course with the same subject matter for qualified economists who wished to add fisheries and aquacultural economics to their basic training. These two courses form the backbone of the FSSRN professional training program and five lecturers from Network institutions have been awarded FSSRN Fellowships for the M.Sc. course and four have been similarly supported through the non-degree course.

The FSSRN has helped each university establish special reference collections of academic and topical literature related to social science aspects of fisheries and aquaculture and, in addition, has instituted a Reprint Series of important academic journal articles which are provided free to lecturers and students.

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The Research program carried out during the first phase of the Network (1983-1985) consists of major and minor projects in each affiliated university. A major study of the Malaysian fish marketing system is being undertaken by the FSSRN research team at Universiti Pertanian Malaysia, a major study of the marketing system for shellfish products is being conducted by the Kasetsart University team, and a socioeconomic evaluation of fishery institutions affecting small-scale fishermen in Iloilo Province is the major study of the University of the Philippines team.

Aside from the FSSRN, ICLARM's major Traditional Fisheries Program activity is the Management Options for Tropical Small-Scale Fisheries project. This project is an ongoing activity undertaken by ICLARM staff, often working in collaboration with researchers from other institutions. ICLARM staff involved are Dr. Ian R. Smith and to a lesser extent Dr. Daniel Pauly with assistance from other temporary staff members such as post-doctoral and senior fellows. The work is multidisciplinary and has a strong policy focus. ICLARM particularly encourages the involvement of traditional small-scale fishing communities in the management of those resources which they use. It is expected that the Network will expand considerably during its second phase to include, in addition to the three original members, Diponegoro University in Indonesia, University of the Philippines at Los Baños, the Fishery Economics Section of the Thai Department of Fisheries, the Aquaculture Department of the Southeast Asian Fisheries Development Center in the Philippines, and the Center for Agro Economic Research of the Agency for Agricultural Research and Development in Indonesia. The Network will support the development of training programs in the universities and will expand considerably the scope and size of its research program through institution-based projects and through increasing cooperation in research between FSSRN institutions and

research teams. A workshop on methodologies for economic analysis of aquaculture is scheduled for early 1985. This will be sponsored by Kasetsart University and the FSSRN and will be the first of a series of such workshops to take place in the FSSRN's Phase II.

Further work on the methodologies of multidisciplinary analysis of traditional small-scale fisheries in the tropics is planned. For example, headquarters staff will continue their work on a conceptual level to address issues related to the costs and benefits of alternative management interventions and the trade-offs among competing objectives. The dilemma of efficiency vs. equity and employment in tropical fisheries will receive particular attention. Research to date has barely scratched the surface with respect to alternative institutional arrangements for small-scale fisheries management and the potential for more decentralized community-based management schemes. In-house studies, cooperative research with other institutions, workshops to address these and related issues and major new case studies will be undertaken on a cooperative basis with other national institutions as funding permits.

D. Resource Development and Management Program

The basic objectives of the Resource Development and Management Program are now well established and are directed principally towards the enhancement of the abilities of fisheries scientists working in tropical, mainly developing countries, to undertake stock assessment investigations, to develop methodologies appropriate to their situations and to provide fisheries management advice to the responsible authorities in their countries. An important adjunct to these objectives has been the development of appropriate methods for assessing tropical fisheries. Much emphasis has also been placed on the social and economic aspects of management programs.

Since 1983 the operations of the Program have been grouped around four basic projects: the Tropical Fish Stock Assessment Research Project, the Network of Tropical Fisheries Scientists, the Management-oriented Fisheries Research Project and the International Giant Clam Mariculture Project. Each of these projects, in keeping with the basic Program objectives, has a substantial component of training activities in fish stock assessment techniques, involving collaboration with other international agencies in conducting courses, intensive in-house training of limited numbers of highly motivated scientists from developing countries and the regular publication of Fishbyte, the newsletter of the Network of Tropical Fisheries Scientists. Additionally, a substantial part of the consulting work undertaken by the Program's staff has involved teaching at regional courses and the preparation of materials for such courses.

Initial emphasis in the Resource Development and Management Program was directed towards the development of a relatively inexpensive microcomputer and calculator-based stock assessment techniques and methodologies, with particular emphasis on the use of length-frequency data. Results of this initial thrust have now been published or are in press and are available

in widely distributed texts and computer programs. These activities are all a part of the Tropical Fish Stock Assessment Research Project culminating in the completion of five length-frequency based stock assessment programs for microcomputers, several major works on the "Theory and Management of Tropical Fisheries" and on "Caribbean Coral Reef Fishery Resources" and numerous scientific contributions. More recently, attention has been directed towards questions of natural variation in recruitment in stocks of fish and bivalves and on methods for stabilizing these resources.

The Network of Tropical Fishery Scientists, initiated in April 1982 was firmly established by the start of 1984, with a global membership of 370 in over 63 countries. Members of the Network receive, at no cost, regular issues of Fishbyte and, when requested, free reprints, stock assessment manuals and database searches. Additionally, members have access to advisory services provided by the Program and may also be accorded minimal financial support to work at ICLARM as Visiting Scientists for periods of training.

The Management-oriented Fisheries Research Project consists of stock assessment and management modules which are built around nuclei of members of the Network of Tropical Fisheries Scientists in particular countries or institutions. Each module is provided with training and scientific support and, if required, the use of a microcomputer (which might be donated to the institution at the end of the project). One module, based in the University of the Philippines, has been completed and two, in Peru and Indonesia were operational at the start of the year.

The International Giant Clam Mariculture Project was launched in January 1983. The Indo-Pacific stocks of clams are being decimated by the combined effects of systematic illegal pulse fishing by certain nations combined with heavy demand for giant clams in most of the island countries of the Indo-Pacific region. The recognition that giant clams exhibit relatively rapid growth rates, are theoretically capable of extremely high yields per unit area and are the only "self-feeding" potential farm animal known to humankind were the principal incentives for initiating the project.

The project aims at rehabilitation of giant clam fisheries through a program of support for research on hatchery and nursery techniques and the studies of the economic feasibility of reef restocking, extensive or intensive mariculture systems. James Cook University of North Queensland, Australia, was invited to participate in the project and undertake the major biological research activities with ICLARM concentrating on stock assessment techniques, the development of a pilot-scale hatchery at a suitable equatorial Indo-Pacific location, socioeconomic problems and processing, product development and marketing studies. The project design calls for the participation of numerous Indo-Pacific institutions in many aspects of research.

The Network of Tropical Fishery Scientists is expected to greatly increase its membership during the course of the year (in September it had a total of 370 members in 63 countries). The Fishbyte newsletter is

already much expanded over what was originally envisaged, largely as a result of the enthusiasm of the membership and the abundance of information available for publication. The availability of free reprints selected for their immediate relevance has been the most popular of the facilities offered to members, highlighting the extent to which most tropical fisheries scientists have inadequate access to recent scientific literature. Seven members, sponsored from a variety of sources, visited ICLARM in 1984 for periods ranging from a few days to three months.

During 1984 the Indonesian module of the Management-oriented Fishery Research Project drew to a close and a new module was initiated in Zambia. The Indonesian module produced growth and mortality estimates for 80 stocks of fishes and invertebrates and the availability of a microcomputer resulted in a substantial increase in activity and interest in stock assessment work. The basic results of the work were written up by module participants during the latter part of the year and the final report will be published in 1985. The Peruvian module continued to work on the analysis of a very large (1953-1982) time series of length-frequency and catch of anchoveta, and of bird abundance data and funding is assured for an expansion of this work in 1985.

A major scientific conference on "The Theory and Application of Length-Based Stock Assessment Methods" will be held from 10-15 February 1985 at the Instituto di Tecnologia della Pesca e del Pescato, in Mazara del Vallo, Sicily, Italy, with cosponsorship from the Kuwait Institute of Scientific Research and FAO. The conference will investigate in detail the various length-based models proposed to date for the management of fisheries - notably the ELEFAN programs - propose improvements where need be, and consider the implications of such methodologies for sampling and research program. The proceedings of this conference, an ICLARM-KISR copublication, will be published in the ICLARM Conference Proceedings series.

The Network of Tropical Fisheries Scientists will be expanded and funding will be sought to place the publication of Fishbyte on a sounder footing, provide funds to enable members to make research visits to ICLARM and to expand the facilities available to members. The newsletter, Fishbyte, will be issued on a quarterly basis.

The activities of the Management-oriented Fisheries Research Project will focus upon the further development of the Peruvian and Zambian modules. Dr. Pauly will spend two months in Peru to finalize the data acquisition for this module, and prepare, with his Peruvian colleagues the first draft of papers based on the data analyzed so far. Dr. Munro will make at least one visit to Zambia to review the progress of that module. If funding permits, several small modules will be added to the project in response to expected requests from the Universiti Pertanian Malaysia and from a South Pacific island nation. Additional, external support will continue to be sought for development of an African Fish Stock Assessment Research and Extension Unit, to be situated somewhere in East-Central Africa (preferably Zambia for logistical reasons).

The International Giant Clam Mariculture Project will be expanded and will include an expansion of the Townsville-based research activities in collaboration with James Cook University, submission of proposals to a variety of funding agencies and seeking funding for increased participation by various Indo-Pacific institutions. The principal focus will be upon the proposed pilot-scale hatchery and the organization of the program of work of the collaborating institutions.

E. Information Service

The Information Service has continued to pursue its duties to ICLARM staff through library activities and publications; its role as distributor of important research results, and it has also begun a more active public relations campaign that has borne considerable fruit over the last twelve months.

A total of 14 items in ICLARM's technical series was produced during 1984 as well as 10 pamphlets and brochures. The major production was "Fish stock assessment in tropical waters: a manual for use with programmable calculators". It represents ICLARM's first offering of "software"-preprogrammed calculator program cards which are offered as an "optional extra" to this manual. Computer software may be offered with future publications.

A second national distributor of ICLARM publications, Pioneer Publishers and Distributors in Bombay was appointed in 1984 for India; the other is International Scholarly Book Services (ISBS), Oregon, for the U.S.A., appointed 1983. ISBS sold 409 copies of ICLARM publications from August 1983 to July 1984.

From sales, library exchange and free issue, the total number of books in ICLARM's five technical series distributed since the first publication early in 1980 is 41,066 as of August 1984. Distribution of quarterly ICLARM Newsletters from the first issue in July 1978 now totals around 90,000 copies.

Late in 1983, ICLARM appointed a journalist, Mr. Rudy Fernandez, to prepare press releases about the Center's activities. This was an area to which little time had previously been given. Some 20 releases have been made to the regional DepthNews service. The releases are also sent to various, up to 40, fisheries-related publications around the world. The acceptance rate of these releases has been outstanding and articles based on them have appeared in magazines, journals and newsletters in the Philippines, Australia, Southeast Asia, various countries in Europe and the U.S.A. Some have been aired on an internationally broadcasted program of the British Broadcasting Corporation. Some have also been published in secondary outlets, magazines and newspapers reporting or summarizing previously published articles.

A growing number of ICLARM publications are receiving reviews in the primary literature in American, European and international journals. Apart from endorsing the quality of the contents of the publications,

reviews have proven to be prime means of publicizing them. Other fisheries related journals and magazines regularly note the availability and source of ICLARM publications sent to them.

This year ICLARM books have been displayed in India at the New Delhi World Book Fair; the 16th Singapore Festival of Books; for the second time at the Frankfurt Book Fair, on the Philippine stand as well as that of the International Agricultural Research Centers; and various displays in Manila and Cebu in the Philippines.

Several reports by Dr. Daniel Pauly for FAC have been translated into French and Spanish over the past 18 months. A milestone occurred recently with the news that ICLARM's already best-selling book "The biology and culture of tilapias" has been translated into Chinese for distribution in the People's Republic of China. A second ICLARM report on "Applied genetics of tilapias" has been translated into Chinese and is awaiting publication.

The library's holdings of books and monographs increased by 27.5% in the past 12 months; the number of serial titles received increased from 390 to 555 (483 of which are received in exchange or free); and the reprint collection increased from 2,330 titles in 1983 to 2,600 at the end of August 1984. Some 660 visitors used the library in the eight months from January to August 1984. On an annual basis this indicates a 68% increase over external library usage in 1983. By comparison, there were about 150 external users in 1981.

The Selective Information Service, a project sponsored in part by the International Development Research Centre (IDRC) of Canada, became operational in 1984. This service consolidates ICLARM's external information activities, allowing in-depth replies to requests for information on projects within ICLARM's areas of expertise. In common with most institutions, ICLARM staff are hard pressed to find time to respond to enquiries as fully as they would wish. The new project provides staff and time to handle enquiries more efficiently. It also provides avenues of assistance for other institutions wanting advice to improve their own information handling ability.

The enthusiasm of fisheries scientists of the Asian region for a regular forum and fisheries society has resulted in the formation of the Asian Fisheries Society. ICLARM is continuing its catalytic role in this Society through assistance with publicity, publication of pamphlets and providing a temporary secretariat. Major activities of the Asian Fisheries Society include the Asian Fisheries Forum, the first of which will be held in Manila in May 1986, and a regional fisheries journal.

All these Information Service activities will be continued during FY 1985.

ICLARM BUDGET (In US \$)
For Period October 1 1984 to September 30, 1985

	<u>T O T A L</u>	<u>U S A I D Contribution</u>
Administration	334,900	82,402
Aquaculture	286,200	64,207
Traditional Fisheries	205,800	29,202
Resource Development and Management	233,300	62,336
Program Development	10,000	-
Program Advisory Committee	20,000	-
Information Services	189,300	61,853
	<u>1,279,500</u>	<u>300,000</u>