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1975-1976 Annual Report

International Center for Marine Resource Development

University of Rhode Island

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ANNUAL 211(d) GRANT REPORT, 1975-1976

I. REVIEW

Date Due: August 31, 1976

Preliminary Report Submitted: July 9, 1976
Final Report Submitted: September 27, 1976

Report Period: August 6, 1975 - June 30, 1976

Grant Title: Institutional Development Grant
AID/csd 2455

Grantee: The University of Rhode Island
International Center for Marine Resource Development
Kingston, Rhode Island 02881

Grant Program Director: Gerald A. Donovan

AID Supporting Technical Office: TAB

Statistical Summary

Period of Grant: May 7, 1969 - June 30, 1977

Amount of Grant: $1,325,000

Expenditures for Report Year: $127,403.61

Accumulated: $1,044,611.34

Anticipated for Next Year: $280,388.66

II. NARRATIVE SUMMARY

During the period August 16, 1975, through June 30, 1976, the University of Rhode Island entered the "utilization" period under the extension of its 211(d) grant and further developed its response capabilities. Workplans were prepared and preliminary research was begun on five specific State-of-the-Art studies on small-scale fisheries and aquaculture. By June 30, field research was underway on three of the five projects. The University responded to several requests made through its International Center for Marine Resource Development (ICMRD), as well as others which were not submitted through ICMRD. Arrangements were made for space in the new wing of the URI Library for the ICMRD Library in order to expand its services and enhance the ICMRD information capacity in anticipation of the demands that will follow completion of the studies. A summer interdisciplinary program in marine resource management was developed for six young Ecuadorian administrators (Fulbright funding). ICMRD provided information requested on the placement of a student from Kuwait in its Department of Marine Fisheries and Technology, and developed a three-year fisheries program for the La Salle Foundation of Natural Sciences in Venezuela. Linkages with Auburn University were strengthened through a two-day visit to the institution by the Director and Assistant Director of ICMRD, and through an agreement to use the services of an Auburn scientist in El Salvador in one of the five studies on a reimbursable basis.

During the six-year development phase of the grant, the University strengthened its faculty involved in fisheries, conducted numerous research projects of significant value to LDCs which have marine resources, programmed fisheries courses for U. S. and foreign students and conducted several seminars. The most important of these seminars was the Seminar-Workshop on Artisan Fisheries and Aquaculture in Central America and Panama, organized and held at San Jose, Costa Rica on January 13-17, 1975. The five specific State-of-the-Art studies now underway are based on the broad recommendations which emerged from the Seminar-Workshop.

The Consortium for the Development of Technology, comprising URI and four other universities, and ICMRD, were administratively and physically consolidated during the reporting period. This completed the relocation and reorganization of ICMRD which began in mid-1975. The day to day operations of both organizations are now under the supervision of the Assistant Director of ICMRD who serves concurrently as Executive Assistant of CODOT, reporting in that capacity to the Coordinator of CODOT. The Coordinator reports to the Dean of the College, who also serves as Director of ICMRD. The policies and operations of the two international organizations are, therefore, coordinated and supervised by a single authority.

III. DETAILED REPORT

A. General Background and Description of the Problem

Simply stated, the problem is the need to double the world's food supply by the year 2000 if famine in some countries is to be prevented. For several developing countries the shortage of food could come within 10 to 15 years. The world's caloric and protein production must be increased by 1985 by approximately 50 per cent above the 1965 production; in a number of areas the required increase will be far greater.

Land resources are decreasing and in spite of higher yields per acre, it is unlikely that agriculture alone can meet the food requirements in the immediate future. Consequently, attention is being given to fish as a readily available marine food resource with a high protein content. The supply can be supplemented by aquaculture--the culture of a wide variety of fish of equally high protein content.

The original five year, $750,000, 211(d) grant was for the purpose of improving URI's competency for the development and utilization of marine resources, especially fisheries, in lesser developed nations. In 1974, a one-year extension and a supplement of $175,000 were authorized to continue the original purpose and to "develop a new approach and focus in the area of artisan fishing and aquaculture" and to "undertake an Artisan Workshop and Seminar in Central America."

Based on this background and the recommendations made by the Seminar-Workshop participants, URI proposed a further extension of the grant to strengthen the new focus of the University's institutional response capability on the economic and sociocultural aspects of small-scale fisheries and aquaculture in the LDCs. Having justified and modified its proposal in accordance with recommendations of an AID Review Team, the grant was extended on September 5, 1975, for two years and increased by $400,000 for the purposes described in the University's proposal. Funds were made available to cover expenses incurred on or after August 5, 1975, the date on which the one-year extension would have expired except for a one-month, no cost extension, which was authorized pending completion of technical requirements within AID.

B. Purpose of the Grant

As indicated above, the purpose of the current extension of the grant is to

> strengthen the new focus of the University's institutional response capability on the economic and sociocultural aspects of small-scale fisheries and aquaculture in the LDCs...

The purpose was to be accomplished in accordance with Agency Review Team recommendations which called for the development of "an appropriate long-range focus for the ICMRD," the development through a State-of-the-Art exercise of "a framework for joint decision-making and collaboration on research and training needs and operational priorities...with emphasis on socioeconomic aspects," and a decision by URI as to "what type of quality response capability it is willing to develop and maintain for AID and other donor use, particularly in terms of its unique multi-disciplinary tradition."

The Team also recommended that "AID must be prepared to specify and describe the type, quantity and quality of a response capability it is willing to help sustain through a 'utilization' grant extension, if necessary."

Through mutual effort, understanding and agreement, AID and URI brought about a "utilization" grant extension, the purpose and objectives of which are now being met.

C. Objectives of the Grant

1. Objectives Restated

The objectives of the grant are summarized below:

a. Extended Knowledge Base

State-of-the-Art studies will be undertaken to achieve this objective, and will cover the entire field of small-scale fisheries. The studies will attempt to inventory and analyze what is known about small-scale fishermen in LDCs, and what should be known. Emphasis will be on impediments to small-scale fisheries development and the formulation of national policies for small-scale fisheries.

The studies on small-scale fisheries and aquaculture will include such problem areas as: (1) the lack of knowledge of available fish stocks; (2) lack of innovation among small-scale fishermen; (3) institutional constraint on fisheries development; (4) underutilization of food technology which results in the loss of available food; and (5) the high cost or unavailability of fishermen's supplies.

The economics of small-scale fisheries and aquaculture will also be the subject of a study and will include analysis of: (1) the lack of knowledge of the demand for fish; (2) marketing systems that impede the development of fisheries; and (3) lack of costs and returns information.

A study of knowledge transfer methodology for small-scale fishermen will be undertaken which will include reasons for the success or failure of such transfers to date, and an effort will be made to develop a methodology that could be used by the LDCs.

b. Response Capability

The above studies will enable the University to respond to requests for technical assistance to LDCs. This will include making faculty members available for advisory assignments, and the development of a roster of other professionals whose services might be available if URI personnel could not respond to requests.

c. Information Capacity

Separate space in a new addition to the URI Library will be set aside for the specialized ICMRD Library, enhancing our capacity to provide information.

d. Education and Training Capability

Source materials emerging from the above studies will be used to prepare short training courses for use overseas. Efforts are being made to restore the Ph.D. program in marine resource economics.

2. Review of Objectives

Of the above objectives, it may be necessary to modify somewhat the scope of Project No. 4, Underutilization of Food Technology Resulting in Losses of Available Food, because the Ghanaian Government has refused to approve the University's request to conduct the field work for the project in Ghana. The field work of two other projects dealing with the transfer of technology was also to be conducted in Ghana, but they have been transferred elsewhere.

As of the end of June, the Food Research Institute of Ghana was attempting to persuade the Government of Ghana to change its position. The FRI was being assisted by a Ghanaian who had earned his Ph.D. at URI in June, 1975, and had been employed as a Research Assistant to do the field work on the "underutilization" project. In the meantime, contact has been made with a food institute in Guatemala (ICAITI) with which the University has had a contractual relationship through its membership in CODOT (Consortium for the Development of Technology) in order to ascertain whether the project could be undertaken there. ICAITI advises that it would cooperate in any way. Inquiries were also initiated as to whether the project could be established in the Ivory Coast, where the fish resource and the nutritional needs are approximately the same as in neighboring Ghana and, consequently, the preliminary research on the project done at URI would be as applicable there as in Ghana. However, it seems that AID would have certain reservations about a project in the Ivory Coast.

With the passage of time, it would appear that the studies on the economics of small-scale fisheries will be somewhat easier to complete in accordance with workplan schedules than some of the others. The reason seems to be that background materials and expert personnel are concentrated in one department of the College of Resource Development, the Dean of which is also the Director of ICMRD. There is excellent coordination under the supervision of the head of the department, and the Principal Investigator is well acquainted with government personnel in Central America who are concerned with fisheries.

This is not to say that the other studies are not on schedule, except for Number 3, but the economic studies show considerably more visible progress than the others.

3. Review of Critical Assumptions

a. AID will assist the University in contacts with LDCs and international organizations for efficient conduct of present and follow-on approved projects.

b. Joint AID/URI priority determinations will be made to choose the project elements to be pursued in depth within current funding. Others may require supplemental funding. The achievement of grant objectives will be related to current and supplementary funding beyond the first year, and AID's use of URI's response capability.

c. Additional studies, special publications, and non-project assignments will require supplementary funding.

d. AID-approved projects outside the 211(d) grant will require additional funding.

e. Activities terminated or compromised in LDCs as a result of policy or government action will be considered satisfactorily completed if prior project objectives have been met.

f. (Update) Additional funding will be requested to restore some of the reductions that had to be made in order to initiate the five projects within the $400,000 limitation. An additional "response" position is rapidly becoming an urgent requirement. Immediate consideration must be given to transferring the nutrition project from Ghana to Guatemala (ICAITI) at some additional cost.

IV. ACCOMPLISHMENTS

Introductory Statement

Progress on all projects is generally in accord with work-plans as revised in June, 1976, with the exception of the Underutilization of Food Technology Project, the field work of which would have been underway in Ghana by April, 1976, if the Ghanaian Government had granted approval as requested by the US AID Mission, Accra.

Concurrently, the University has responded to several requests for assistance in resolving fisheries problems in LDCs; established a summer marine resources training program for six young Ecuadorian administrators, financed by Fulbright funds; completed plans for providing proper space for the ICMRD Library in the new wing of the URI Library; and completed the reorganization and relocation of ICMRD.

A. Objective/Output #1 - Extended Knowledge Base

1. Small-Scale Fisheries and Aquaculture

a. Lack of Knowledge of Available Fish Stocks

Project No. 1. Assessment of Resource Base for Small-Scale Fisheries

Principal Investigator - Saul B. Saila
Research Associate - David Stevenson

Narrative Description

A concise methodology will be developed which will present first order evaluations of the effects of present and future fishing pressure on tropical fishery resources. The approach will be used as an adjunct to existing data collection efforts (landings data) by national fishery agencies. The basic requirement at the initial stage is the collection of sufficient data to test the analytical approach and the most important priority for the State-of-the-Arts study is a location where large quantities of a number of species are captured by several types of gear. Puntarenas, Costa Rica, meets this requirement.

At the end of two years, a manual will be produced which describes specific solutions to stock assessment problems which can be applied in a variety of situations.

Targets for Reporting Year

The original workplan called for collection of materials during the first few months of the first year and an exploratory trip to Costa Rica. It was estimated that 15 to 18 months would be required in-country to collect data. About three months would be needed in the U. S. for final report preparation.

No specific means of verification were established other than the periodic reports on progress requested by ICMRD.

The basic critical assumption was the cooperation of the Costa Rican Government officials, an assumption which so far has been completely justified.

Accomplishments

Accumulative

This project was established at the beginning of the reporting year and, hence, there are no accumulative accomplishments to report with regard to the project itself.

It should be mentioned, however, that the Research Associate, Dr. Stevenson (just awarded his Ph.D.), gained field experience on a 211(d) funded ICMRD project in Puerto Rico.

Dr. Saila, who is providing a man-month of his time at no cost to the grant, has been involved in several ICMRD projects over the past seven years.

Reporting Year

In addition to planning and researching available information, Dr. Stevenson made a ten-day visit to Costa Rica in May. He met with officials of the Department of Marine Fisheries of the Ministry of Agriculture and they organized a joint program to collect and analyze landing data. He reported that the government officials were most cooperative.

Dr. Stevenson departed for his year-long assignment to Costa Rica on June 20.

Total Expenditures

Accumulative - None
Reporting Year - $9,822.61

b. Lack of Innovation Among Small-Scale Fishermen

Project No. 2A. Sociocultural Correlates of Developmental Change

Principal Investigator - Richard B. Pollnac

Narrative Description

Efforts to develop artisan fisheries usually fail because of the resistance of the individual fisherman to any change in his way of fishing and the sale of his catch. Research indicates that the occupational subculture of fishing has a number of social and psycho-cultural characteristics which distinguish it from other occupational subcultures, resulting in a need for a different approach to the problem of developmental change.

The State-of-the-Art paper for this project will assess current research and a model of man's social and psycho-cultural adaptation to the marine environment will be constructed. The correlates of developmental change will be examined in the light of this model and a method for investigating change among small-scale fishermen will be developed in the form of a field guide.

Targets for Reporting Year

Fall Term, 1975. Prepared and taught new course - Marine Ethnology.

November, 1975 to March, 1976. Research and preparation of eight papers or reports germaine to the project.

June, 1976. State-of-the-Art study near completion.

Means of verification: submission of papers; reports on progress of the State-of-the-Art study.

Accomplishments

Accumulative

This project was established at the beginning of the reporting year and, thus, there are no accumulative accomplishments to report with regard to the project itself.

It should be mentioned, however, that Dr. Pollnac has been and continues to be the recipient of faculty support from 211(d) funds, and has been a participant in several 211(d) funded projects and two conferences. He recently was promoted to the rank of Associate Professor and in the letter advising him of his appointment, URI President Newman stated that Dr. Pollnac's "distinguished contributions to the work of our International Center for Marine Resource Development have contributed greatly to the reputation of both the Center and the University as a whole."

Reporting Year

All the papers scheduled by Dr. Pollnac for the period November, 1975 through March, 1976, will be submitted to AID. During the AID Team's site visit, Dr. Pollnac reported that his State-of-the-Art study would be completed in August.*

Total Expenditures

Accumulative - None
Reporting Year - $11,306.83

*It was.

b. Lack of Innovation Among Small-Scale Fishermen, Continued

Project No. 2B. Lack of Knowledge about Effective Message Design in Communication for Technology Transfer

Principal Investigator - Irving A. Spaulding

Narrative Description

This project supplements and complements Project No. 2A. It could be inserted in Figure 1 of Dr. Pollnac's workplan as "g. Self-identity" under the category "Individual Attributes."

Researchers in the field of person-to-person communication suggest that a critical variable is identity concepts, that is, the conception or image individuals have of themselves, and that their conscious behavior tends to be consistent with that conception. This premise has two germaine implications: one, that more information about identity concepts might be of use in identifying fishermen with high potential for the acceptance of innovation; and two, effective message structure might include identity components which could be related to an innovation that is being introduced into an LDC.

Dr. Spaulding will introduce a system of record keeping among artisan fishermen in Costa Rican villages. This will enable him to examine relationships between fishermen's identity-imagery (concepts) and their performance in innovation decision-making.

Data will be secured when target groups of fishermen are provided with information about the record keeping system and given an opportunity to use it, and again at the end of a period during which trial of the system and its adoption or rejection can be expected to occur. The result should be a process for developing a message regarding an innovation to individuals in such a way that they will identify themselves, their work and needs with the message, and decide to accept and use the innovation because it will be of benefit to them.

Targets for Reporting Year

Goals for this project include the preparation of four sections of the State-of-the-Art paper; delineation and design of research, including arrangements for the collection of data; establishment of linkages; and submission of report.

The only means of verification of progress toward meeting self-imposed targets in a project such as this are the reports by the Principal Investigator, as volunteered or as requested by ICMRD, and the final results.

The critical assumption here is the cooperation of local government officials and the selected fishermen.

Accomplishments

Accumulative

This project was established at the beginning of the reporting year and, thus, there are no accumulated accomplishments to report with regard to the project itself.

However, Dr. Spaulding has been and continues to be the recipient of faculty support from 211(d) funds, and has been a participant in several 211(d) funded projects which relate to the current project.

Reporting Year

Dr. Spaulding states in his workplan of June 1 that target events for the reporting year have been met.

Total Expenditures

Accumulative - None
Reporting Year - $6,638.26

c. Underutilization of Food Technology

Project No. 3. Underutilization of Food Technology Resulting in Losses of Available Food

Principal Investigators - Clinton O. Chichester
Tung-Ching Lee
Research Associate - Matthew Caurie (Ghana)

Narrative Description

This project is concerned primarily with nutrition and is based on the premise that malnutrition problems in the LDCs might be alleviated through adequate consumption of fish since, like meat, it is an excellent source of high quality protein (usually 17 per cent or more) as well as vitamins.

Fishery programs have tended to concentrate on increasing production and to neglect preservation, marketing or storage practices. Technology can be used to control losses in food products and develop those which will better satisfy the food and nutritional requirements of individuals. Food technology must serve as the link between crude aquatic products and consumable food.

Many countries do not utilize trash or "inedible" species. These fish are edible and various food products can be made from them. Utilization of underexploited species will encourage conservation of the resource and reduce fishing pressure on familiar species.

Targets for Reporting Year

Phase I. Literature Survey, Collecting Supplies and Equipment - January, February, March.

Phase II. On-Site Data Collection (in field and laboratory) - April through December, 1976.

Field work for this project was to have been conducted in Ghana, West Africa, and, consequently, the literature survey concentrated on that region.

Means of verification, as with other projects, are ICMRD requests for progress reports, its constant participation in the site problem, and submission of reports.

The critical assumption in this project was that the Government of Ghana would approve conducting field work in that country. This was an erroneous assumption. The efforts of the Ghanaian Research Assistant, Dr. Matthew Caurie, to explain the facts about the project (nutrition--not fisheries) may induce the Government of Ghana to change its position. Since there was also some question regarding AID approval for conducting the project in Ghana even if its government changed its mind, initial contacts were made in Guatemala and the Ivory Coast for establishing the project in either of those two countries.

Accomplishments

Accumulative

This project was established at the beginning of the reporting year and, thus, there are no accumulated accomplishments to report.

Reporting Year

A considerable quantity of literature was surveyed, selected and reproduced for reference during the field work period in Ghana. Supplies were selected, ordered and shipped to Ghana for laboratory use.

In short, all Phase I targets were met on schedule in preparation for the Phase II on-site activities in April.

The Ghanaian Research Assistant, Dr. Matthew Caurie, returned to Ghana (at no expense to the grant) partly for personal reasons and partly to ascertain the reason for the lack of approval for the project by the Ghanaian Government. He met with AID Mission officials, members of the Food Research Institute (of which he is a member on leave of absence) and with the officials of the Ministry concerned with matters such as this project. He reported that the officials misunderstood the nature of the project, believing it to be primarily related to fisheries, rather than a nutritional project. He later advised that the Ministry was prepared to change its decision and asked that the request be resubmitted.

URI was unable to agree with the proposed resubmission because it was in the form of a joint URI/Food Research Institute undertaking. Dr. Caurie was advised that an explanatory document could be submitted which indicated URI/FRI complete

cooperation, but that the project must remain under URI control. Subsequently, the question of having the Food Research Institute undertake the research on behalf of URI was explored.

Total Expenditures

Accumulative - None
Reporting Year - $10,394.29

d. Knowledge Transfer Methodology

Project No. 4. Knowledge Transfer Methodology for Small-Scale Fisheries

Principal Investigator - John C. Sainsbury
Student Assistant - Mary Hall

Narrative Description

A State-of-the-Art paper will be written which provides an analytical review of existing knowledge and thought with regard to the direction, techniques, procedures and mediums utilized during small-scale fisheries development programs, with specific reference to the transfer of technology. Success factors and important knowledge gaps will be identified, together with prepared research problems requiring attention.

This will be followed by field work to test a specific technique or research a specific problem.

Targets for Reporting Year

Original targets were changed because of lack of approval by the Government of Ghana for conducting project field work in that country.

Dr. Sainsbury's workplan revision of June 1, 1976, lists his schedule of work through June 30 as follows:

Work formally commenced on February 1, 1976, when the Principal Investigator received a 50 per cent time allocation to the project.

Funds for the requested Research Assistant have not been provided and no appointment has been made.

A Student Assistant supported by "Work Study" funds is being appointed for the period June through August, 1976.

The following activities have been completed:

--Initial visit and discussions with FAO Fishery Industry Division personnel connected with Small-Scale Fisheries projects (while on travel connected with another project). Exchange of letters and information is continuing with a more extensive visit planned for early July, 1976.

--Visit and discussion with Fisheries Advisor, British Ministry for Overseas Development.

--Telephone contact and discussions with the International Development Research Centre, Ottawa and Vancouver, principally connected with their Small-Scale Fisheries Project in Ghana.

--Extensive planning in connection with planned trip to Ghana for data collection. This trip was cancelled at the last minute for lack of approval by the Government of Ghana.

--Initial gathering and examination of pertinent literature from various sources, including FAO, IDRC, Intermediate Technology Group.

--Identification of three potential sites for Phase III activities.

Means of verification, as with the other projects, consists of ICMRD requests for progress reports and submissions of the Principal Investigator.

A critical assumption was that the Ghanaian Government would approve the request for permission to conduct the field work for this and two other projects in Ghana. This proved to be an erroneous assumption. In any event, no further consideration has been given to research on this project in Ghana.

Accomplishments

Accumulative

This project was established at the beginning of the reporting year and, thus, there are no accumulative accomplishments to report with regard to the project itself.

It should be mentioned, however, that Dr. Sainsbury has previously been associated with 211(d) grant projects and training of foreign students as head of the Department of Fisheries and Marine Technology.

Reporting Year

Dr. Sainsbury reports that he found there is very little written information concerning the methodology of technological transfer. He has had discussions with FAO officials who indicate that there have been few, if any, attempts to undertake such analyses.

In June, he visited the Azores for the dual purpose of assisting in a prospective AID-sponsored non-211(d) project there, and to ascertain whether the Azores might serve as a site for his planned Phase III testing of Phase I/II surveys and analyses. After leaving the Azores he went to Rome to do library research and for interviews at FAO headquarters. He summarized his accomplishments in a personal report to the AID Site Team during its visit in late July.

Total Expenditures

Accumulative - None
Reporting Year - $7,441.37

e. Economics

Project No. 5. Economics of Small-Scale Fisheries in Lesser Developed Countries

Principal Investigators - Darrell L. Hueth
Harlan C. Lampe
Jon G. Sutinen
Research Associate - David Hughes
Research Assistants - Bruce C. Epler
Jan P. Johnson
Philip N. Logan
Rosemary Yates

Narrative Description

Project No. 5 integrates several program objectives and sub-objectives, including

--Institutional constraints*
--Lack of knowledge of demand of fish
--Marketing systems as an impediment to fisheries development
--Lack of information on costs and returns to small-scale fishermen

The following excerpts from a memorandum prepared by Dr. Jon Sutinen, describes those sub-objectives in detail:

"Institutional Constraints to Artisan Fisheries Development

National fisheries policies and their concommitment government agencies in developing countries are often ill-suited to small-scale fishermen. Furthermore, private enterprises that serve fishermen, such as banks and gear suppliers, are rarely provided the incentives necessary to meet small-scale fishery needs.

Problems for the fishermen arise in a variety of ways, but one of the most serious causes of difficulty has been the proliferation of government agencies, often with conflicting missions, with some interest in fisheries development. In addition to complex administrative structures, laws and regulations are often contradictory, detailed and innumerable. Moreoever, there are private enterprises ill-suited to meeting small-scale fishermen's needs. For example, banking practices virtually preclude lending money directly to small-

*This sub-objective was originally identified as Project No. 3, but has since been incorporated as part of Project No. 5.

scale fishermen. Bankers and importers, as examples, are forced into certain behavior patterns by government regulation and customary practice. These patterns inhibit small-scale fisheries development and confuse the fisherman who is urged to improve but finds obstacles in his way. If appropriate institutional structures do not exist, then fisheries development is hindered. Laws and regulations relating to fisheries in selected LDCs will be collected and examined for their relation to small-scale fisheries.

"Demand for Artisan Fishery Products

Consumer demand is a critical determinant of the success or failure of any fishery development project. Development often involves expanding the production of fish. Expanded production cannot be sustained, however, without consumers being willing to purchase fish products at a price that can support the fishery. To assess, ex ante, the feasibility of a particular project requires a prediction of the prices consumers will pay in the future for greater quantities of fish products. And, to make such a prediction requires knowledge of certain demand characteristics of consumers in LDCs. There exists no systematic demand analyses of fish products in LDCs. For the most part, what have been called demand analyses are merely naive projections of population and per capita consumption. Income projections occasionally have played a role, but rarely have price responses been considered. Several reasons for the rather simplistic approach to these problems can be posited: (i) lack of time, and (ii) lack of skill or methods. Any of these reasons prove valid in various circumstances, but it should be a matter of some concern that so little effort has been made to overcome them.

"Market Systems for Artisan Fishery Products

In recent years a great deal has been written about the marketing of artisan fisheries products. A large part of the writing has been polemic in nature, focusing on the power of the middleman, the failures of pricing systems, and high marketing margins among other matters. A few efforts have been made to evaluate the effectiveness of fish marketing systems, but these have rarely been complete enough to be useful.

Yet attempts are and have been made to 'improve' marketing systems without a clear view of what it is that is being changed for the functions that new systems must assume. Most present programs are based on, at best, a qualitative evaluation of the system.

To effect useful changes in the marketing, distribution and pricing systems requires a careful assessment of: (1) the functions being performed; (2) a clear relationship between these costs and market structure, specific identification of those functions that can be altered or eliminated, and those changes in market structure that can improve its effectiveness. Without adequate information on fishermen's costs and returns, it is virtually impossible to assess the impact of development efforts or the influence of resource management schemes. Information on costs and returns can be analyzed to prescribe beneficial changes in the types of vessels, gear or techniques to be used, and used to develop measures to serve as benchmarks for gauging the relative success of alternative development and management programs.

"The Cost and Availability of Fishermen's Supplies in Artisan Fisheries

The economic development of a fishery implies, among other things, that fishermen become increasingly dependent upon those who sell nets, twine, books, engine parts, ice and other supplies. A successful development effort requires expanding the availability of these supplies in order to avoid serious bottlenecks which can impede the development process.

In addition, there are reasons to believe that in some cases, the cost to fishermen of these supplies are higher than necessary. There can be several reasons for this. One frequently cited case is where the buyer of the fish also supplies the fisherman with his gear and other supplies. Such ties can result in the fisherman having to pay exorbitant prices for his supplies or even finding them not available."

Targets for Reporting Year

Economics:

A State-of-the-Arts study of the economics of small-scale fisheries in LDCs, including

--an assessment of demand analyses for fish products

--a survey of fish marketing systems and an assessment of techniques for evaluating fish marketing systems

--a survey of costs and returns information, and an assessment of methods commonly used for collection and analysis of costs and returns information, and

—an assessment of the causes and extent of high prices and bottlenecks in the markets for fishermen's supplies.

Develop practical and expeditious techniques for analyzing

--consumer demand in existing and new markets

--the effectiveness of fish marketing systems

--costs and returns information (including the collection of such information), and

--the extent to which fishermen's supplies are overpriced or not available, and for identifying the causes of the high prices and bottlenecks that exist to a serious degree.

Institutional Constraints:

--A State-of-the-Art study of organizational and legal frameworks used by administrators, managers, and fishermen in small-scale fisheries development in LDCs.

--Identification of aspects of existing frameworks which impede development.

The means of verification for this project were primarily the almost daily consultations between the Principal Investigators and ICMRD regarding organizational, personnel, budget and other administrative matters, and the periodic progress reports to the Director.

The critical assumptions were the cooperation of the governments of Costa Rica, El Salvador and Guatemala, where the field work on the projects was to be undertaken, and that available funds would cover the estimated costs of the desired level of field work.

Accomplishments

Accumulative - None. Project established in reporting year. It should be noted, however, that the Principal Investigators have been deeply involved in 211(d) grant research activities during the development phase and both have received faculty support which is continuing under this project.

Reporting Year

Economics of small-scale fisheries:

Demand analysis

--The literature in the area has been reviewed and several sections of the study have been drafted.

--An evaluation of applicability of analytic techniques is to be completed, as is the final report.

Survey of marketing analyses

--The literature has been reviewed and several sections of the study have been drafted.

--A final evaluation of the applicability of techniques, particularly in addressing questions of economics of size, remains to be completed.

Costs and returns

--A preliminary draft is complete which discusses previous methods used around the world to collect costs and earnings data, the problems of these methods, and to a limited extent the use made of these data in fishery development efforts.

--The next draft will seek to review a more complete set of costs and earnings studies, to systematically critique the collection methods previously used and to outline in detail a proposed set of methods for collecting costs and earnings data.

Institutional Constraints:

A very limited literature is readily available in the U. S. on the state of legal and administrative frameworks for fisheries. In consequence, much of this effort has been postponed for in-country collection of data in a year or two.

General

Many significant organizations involved with fisheries development and many peripheral ones have been contacted to ascertain their activity levels in research, their plans, and to acquire available literature.

The literature survey targets have been generally met. The literature relating to fisheries in developing countries has, as was expected, been largely descriptive and nonanalytic. The related domestic literature, while highly analytic, has rarely been directly applied to fisheries problems. The evaluation of the literature and preparation of bibliographic lists remains to be completed.

State-of-the-Art papers are in process of completion and are now in partial draft form.

The preparation for application of research techniques in LDCs is well in advance of earlier plans. This has resulted from the enthusiastic response of governments to our proposals, the support of AID and two preparatory visits to Costa Rica, Guatemala, and El Salvador.

In Costa Rica the government will provide 54 man-months of assistance to the URI projects in data collecting and other help. Supervision of these workers will be provided by six man-months each of a biologist's and an economist's time. The Director of Marine Fisheries, Mr. Milton Lopez, is the counterpart of the P. I. Moreover, the Directorate has made available the use of office space and living quarters in Puntarenas. In-country work on all projects began on June 15, 1976, with a conference of all participants.

Guatemala has appointed an economist as a participant for the demand study. The counterparts of the P. I. will be the co-directors of the FAO/UNDP development projects, one of whom is a Director of Marine Fisheries in Guatemala and the other an FAO employee. Our work on demand in Guatemala is particularly timely since the country plans to expand fish food production by 5,000 tons during the next few years.

Initial work plans have changed for El Salvador to permit better integration of efforts among countries and to adjust to national interests.

El Salvador would have accepted almost any research activity but given its plans, an extension of the costs and returns study to the country seemed most appropriate. Further, there was an opportunity to utilize a U. S. professional who was in-country to initiate and coordinate the work. The expiration of his Auburn contract provided this opportunity to use experienced, interested and skillful help.

Work in El Salvador was initiated with conferences on June 1 and 15 and research began on July 1.

Total Expenditures

Accumulative - None
Reporting Year - $39,488.31

B. Objective/Output #2. Response Capability

Narrative Description

The purpose of the State-of-the-Art studies is to enable the University to expand its knowledge and understanding of small-scale fishermen so that it will be better able to respond to requests for technical assistance to LDCs.

Targets for Reporting Year

The target was the ability to respond to requests for assistance from LDCs--directly or indirectly--in solving their marine resource problems.

Accomplishments

Accumulative

The University has responded to a substantial number of requests for assistance in fisheries problems throughout the life of the grant.

Reporting Year

1. Colombia

During the reporting year the University responded to a request from Colombia to assist in developing a marine affairs capability in cooperation with one or more of its universities. This was the result of a visit late last year by a group of high-ranking officials of several South American countries. Dean Donovan, the Director of ICMRD, will leave for Colombia in September to survey the situation.

2. Iran

The University also responded to a request made through the Royal Iranian Embassy in Washington to provide information on courses and activities which would enable the University to help the Government of Iran to establish a marine affairs program in a new Iranian university. The material was hand-carried to Washington so that an Embassy official could take it with him to Rome where it was to be delivered to a Minister of the Iranian Government. In spite of one or two follow-up inquiries, there has been no response from the Iranians.

3. Chad

A request was received from AID to provide an expert in fish preservation to study a problem of high losses by Lake Chad fishermen. Efforts were made to send Dr. Matthew Caurie, the URI graduate who was in Ghana, since he is a specialist in fish preservation and nutrition, but he did not have the French language capability that was desired. Arrangements were then made to send Dr. John Liston, who is head of the Fisheries Department of the University of Washington and a member of a consortium (CODOT) in which URI is the contracting member. In the meantime, the time schedule for organizing an AID Team to go to Chad was sharply advanced and it was not possible for Dr. Liston to meet the new schedule.

4. Mauritania

An official of the Mauritanian Government inquired whether the University would be interested in and capable of conducting a fish resource study off the coast of Mauritania. The official has been informed that the University is interested and has the capability of making such a study based on prior and current studies of this nature under the direction of Dr. Saul Saila. A procedure was suggested together with an estimate of the cost.

5. Middle East Nation

The Falcon-Alsaqr Trading Company, Inc., of Sparta, New Jersey, asked the University to recommend the names of three consultants who could assist in the development of fisheries in a Middle East country which the company represented. ICMRD advised the company of the University's capabilities in fisheries development and requested more specific information,

which was provided. A "Presentation" on the development of marine fisheries resources was prepared, including a description of an in-depth fisheries resource study done by Dr. Saila in the Persian (Arabian) Gulf. Although the request was made on a "crash" basis and the "Presentation" and accompanying materials were delivered personally to the unnamed Arab country by a vice president of the company, there have been no further developments.

6. Brazil

Dr. Hugo P. Costello of the Brazilian Ministry of Education wrote to ask if the University would be able to assist in researching extensive pollution problems and to study the ecology and fish and shrimp resources of the Los Patos Lagoon at Rio Grande. The University responded affirmatively and offered to send Professor Harlan Lampe to the area in May during his visit to Costa Rica, if the Ministry could provide for his air transportation from there to Brazil. Professor Lampe was to spend a few days there to review the problem and gain some idea of its magnitude. Dr. Costello has not replied to ICMRD's letter to date.

7. Azores

For the past three years the University has been involved in a series of studies and proposals for providing assistance to the Azores without much progress. The situation improved during the reporting year as a result of the changes in the Government of Portugal. A proposal to upgrade commercial fisheries, marketing and education in the Azores became the basis for the new Planning Project Proposal for providing technical assistance to the University of the Azores during the coming year. This new Proposal Project was developed in consultation with AID officials, following a visit by URI faculty to the Azores and to Portugal at the invitation of US AID.

To summarize, the University is receiving an increasing number of requests for assistance from LDCs in resolving fisheries problems. It has responded promptly and positively in each instance, and will continue to do so.

Total Expenditures

It is not possible to estimate the cost of the time and effort given to this objective. It consisted primarily of gathering materials and preparing replies to the requests.

C. Objective/Output #3 - Information Capacity

Narrative Description

A serious problem faced by students and researchers in the marine resource development field is the relative inaccessibility of much of the literature. Most of the publications have a limited distribution and consist of research reports prepared by specialized country agencies, publications of national and international bodies, or papers presented at symposia and conferences.

In an attempt to systematize the organization of such material, a separate research collection was established under the direction of a professional librarian in 1973. Since the literature can rarely be obtained through regular publication outlets, it has been necessary in order to procure materials to search out sources and make individual contacts with the issuing agencies. These contacts often involved the exchange of materials and, thus, collection development is facilitated for the involved parties.

Besides collection problems, organizing the literature is difficult since not only the subject matter, but also the material itself requires special handling. Publications are rarely in the traditional book form and come in all shapes and sizes (including maps and one-page circulars as well as foreign documents and student theses). Paper quality is often poor. Most of the items are more effectively stored in filing cabinets or boxes rather than shelved. By far the most difficult problem is content organization. In an inter-disciplinary area, such as marine resource development, it is necessary to have material on such disparate topics as aquaculture, fish processing and marketing, fishing gear, ocean management and vessel design, not to mention works relating to technology transfer problems, nutritional information and texts of ocean conventions and international organizations. There are few guidelines to the classification and cataloging of information of this diversity and organization has to be geared to use.

There are very few libraries of this type in the United States and this collection has considerable value because of its uniqueness.

Target for Reporting Year

Because of the continued growth of the collection and its importance as a resource for the entire University community, it was felt that a more central location on the University of Rhode Island campus should be provided. A joint decision was made by the University administration

and the staff of the Center to locate the collection in the new addition to the Main Library building. The Library administration has agreed to modifications in one section of the main floor to provide proper facilities for the material and adequate staff space. This commitment on the part of the University will ensure continued growth and maximum use of the ICMRD Library. In addition, the staff of the Center will benefit because the facilities and basic resource materials of the main library will then be readily accessible to augment the ICMRD collection.

Accomplishments

Accumulative

The Library has grown considerably since 1973 and now contains approximately 3,000 documents, 100 books and 100 microfiches. In addition, at least 80 newsletters and monthly publications dealing with topics in the marine, nutritional and development fields are received on a regular basis. The acquisition budget is low in proportion to the amount of material received because much is available free of charge, on an exchange basis, or acquired by Center staff on overseas assignment. Since the inception of the Library, the policy has been not to duplicate materials that are available in other campus collections.

Use of the collection has been particularly heavy as the Center staff has prepared State-of-the-Art reports on the various aspects of small-scale fisheries. There has also been increased use by undergraduate and graduate students since course offerings and enrollments in the marine fields at the University have expanded. Specific mention should be made of the courses in fisheries and marine technology, resource economics, marine affairs, coastal specializations and aquaculture where use has been particularly high.

Many of the international students at the University are pursuing studies in marine fields and they frequently utilize the Library facilities and the reference services provided by the librarian. Many of the students from developing countries are particularly anxious to acquire materials for their home libraries and request assistance relative to procurement sources.

Reporting Year

The forthcoming transfer of the collection to the main library, and the steady increase in use by the University community have demonstrated the established role of the

ICMRD Library at the University of Rhode Island. The significant number of requests that have been received from outside sources indicates the need for this material and the paucity of collections of this sort. A surprising diversity of organizations have requested material, including a business firm investigating potential for marketing of boats for a West African fishery, graduate students at Brown, the University of Massachusetts and the Woods Hole Oceanographic Institution needing research documents on specific subjects, the local office of the Environmental Protection Agency requiring a foreign document relative to a pollution problem, an obscure international publication required by a state agency, and a picture of an Antarctic krill being sought by the editorial department of the Boston Aquarium.

Because of the steady use, classification and cataloging have lagged, but it is hoped that when the collection is moved, a more concentrated effort may be directed to this end and that a monthly accessions list can be published and distributed within the University and to outside organizations, especially to agencies in developing countries who have requested such information.

Expenditures

Accumulative - $42,878.58
Reporting Year - $12,061.32

D. Objective/Output #4. Education and Training Capability

Narrative Description

As stated in the Proposal, source materials emerging from the State-of-the-Art studies will be used in preparing short training courses to be tested for use overseas.

Even though these materials are not yet available, the University continues to respond to requests for specialized training.

Targets for Reporting Year

To generate information for future use in training courses.

Accomplishments

1. Ecuador

The U. S. Embassy at Quito requested that the University arrange a special summer program for several young Ecuadorian administrators in marine resources to be financed by the Fulbright Commission.

A program was developed and was approved by the Commission. Six Ecuadorians arrived on campus July 9 to begin a four-week program to be conducted by Dr. Francis Cameron, Assistant Professor of Marine Affairs. Administrative matters were handled by ICMRD. The Visitors Program Service of Meridian House International, Washington, D. C., which is under contract to the Department of State, is paying the costs of the program based on a previously approved budget submitted by ICMRD.

2. Kuwait

The UNDP office in Kuwait telegraphed the University's Department of Fisheries and Technology requesting information on the training of students from that country in various fisheries fields. Dr. Sainsbury, head of that department, responded by letter, explaining the requirements for regular courses and pointing out the ability of ICMRD to arrange specialized training in the fisheries fields indicated by the UNDP office in Kuwait. As of the date of this report, the placement of at least one student, financed by FAO, was still under discussion.

3. Venezuela

The La Salle Foundation of Natural Sciences, Margarita Campus, Punta de Piedras, Venezuela, requested the University to assist it by sending a tentative study program for a three-year program in Fisheries and Food Technology. It was indicated that the Foundation is seeking some form of a cooperative arrangement with an American university. A detailed reply was sent on June 2 which provided the requested information as well as URI Bulletins and other informational material. Reference was made to prior program assistance provided for a university in Chile by a URI professor which was of considerable benefit to that university. Reference was also made to the fact that ICMRD can arrange for special training on campus. The Foundation was invited to call on URI for further assistance, but nothing further had developed as of the date of this report.

4. AID

In a letter dated April 23, AID requested information regarding the University's capabilities for receiving AID participant (foreign national) trainees. A detailed reply was sent on May 18, 1976, and it is hoped that the University will receive favorable consideration in the placement of such trainees.

Total Expenditures

There are no identifiable expenditures to report for this category.

V. IMPACT OF GRANT SUPPORTED ACTIVITIES IN ACHIEVING GRANT PURPOSE

During the reporting year, the University of Rhode Island has been able to further strengthen its response capability with regard to the economic and sociocultural aspects of small-scale fisheries because of the experience members of the faculty and staff have gained through the State-of-the-Art studies being conducted at home and abroad. Additionally, valuable linkages have been established and others have been significantly strengthened, especially with the leaders of Central American government agencies responsible for artisan fisheries.

The fact that several young graduate students are collecting data in three Central American countries will enhance their knowledge of the problems faced by the small-scale fishermen of the LDCs. When they return to URI to conclude their studies, they will be valuable resource persons who will be able to assist in responding to requests for assistance in fisheries problems abroad.

The five projects currently underway have also helped URI to sharpen its long-range focus in marine resource development through its ICMRD. These projects did, indeed, provide a useful framework for joint decision-making and collaboration with regard to operational priorities. ICMRD's new leadership and physical relocation, discussed in last year's Annual Report, enhanced its ability to respond to the challenge of the specific projects, in addition to increasing its capacity for education and training in marine fisheries, and to respond to an increasing volume of requests for information and assistance.

In the final analysis, the extent to which the University achieves the purposes of the grant will be fully evident only after completion of the projects and application of their findings and recommendations in actual situations. Nevertheless, progress to date indicates that the grant purposes will be achieved in every respect.

VI. OTHER RESOURCES FOR GRANT-RELATED ACTIVITIES

Negotiations were completed in June for a second two-year contract between the State of Sao Paulo, Brazil, and the University of Rhode Island acting in behalf of the Consortium for the Development of Technology (CODOT) in the amount of $1,142,191. The purpose of the contract is to

provide expert assistance to the Brazilian food industry through its major institute - Instituto de Tecnologia de Alimentos (ITAL), located at Campinas, Sao Paulo. CODOT membership, in addition to URI, includes the University of Washington, the University of California at Davis, the University of Wisconsin, and Michigan State University.

CODOT is also reviewing its contract with the Instituto Centro Americano de Investigacion y Tecnologia Industrial (ICAITI), located at Guatemala City, Guatemala. There is close linkage with AID's ROCAP, also located in that city.

CODOT also has a $5,000 contract with a group of universities in Chile to conduct courses and seminars in food technology.

It is anticipated that a contract will be negotiated in the near future with a food technology group in the Dominican Republic.

As noted earlier, ICMRD reached an agreement with the Fulbright Commission, Ecuador, for providing a four-week summer seminar for the six young Ecuadorian marine administrators. The approved budget totalled $9,135.00.

These CODOT programs relate and contribute to the University's general marine resources program to which, of course, the 211(d) grant is basic.

VII. UTILIZATION OF INSTITUTIONAL RESPONSE CAPABILITIES IN DEVELOPMENT PROGRAMS

A. Requests for Assistance

The requests received by ICMRD for assistance in LDC development programs during the reporting year have been discussed in detail above in Section B. Objective/ Output #2. Response Capability.

In summary, requests for assistance were received from several LDCs (one unidentified) and AID.

Colombia asked for assistance in developing a marine affairs capability and Dr. Gerald A. Donovan, Dean of the College of Resource Development and Director of ICMRD, will go to Colombia in September in response to that request. His travel costs will be funded from the 211(d) grant.

The Royal Iranian Embassy in Washington (at the instigation of Senator Pell of Rhode Island) requested information on courses and activities which would assist in the creation of a marine affairs program in a new Iranian

university. Dr. Thomas L. Meade (aquaculture), Dr. John Sainsbury (marine fisheries and technology), Dr. Richard W. Traxler (Entomology), Prof. Harlan Lampe, Dr. Jon Sutinen, Dr. Darrell Hueth (Resource Economics), and Dr. Saul Saila (oceanography), among others, provided material, advice or reports which were gathered and forwarded to the Iranian Embassy, along with University Bulletins. As of the date of this report, nothing further has been heard from the Embassy - except assurance that the materials were hand-carried to Rome and delivered to the Iranian Minister of Agriculture.

Through the courtesy of the National Fisheries Service, an inquiry from Mauritania regarding a fisheries survey was referred to ICMRD. Direct contact was established between ICMRD and the Mauritania Ministry that had asked assistance. Dr. Saila has responded to the questions raised by the Ministry and has given assurance that URI is capable of conducting the survey (similar to one Dr. Saila conducted in the Persian (Arabian) Gulf.

The Brazilian Ministry of Education requested assistance with regard to pollution problems, and the ecology of fish and shrimp resources at the Los Patros Lagoon at Rio Grande. The Ministry was informed that Prof. Harlan Lampe would be available to explore the problem in May if the Ministry could cover his air travel and other expenses from Costa Rica. No reply has been received from the Ministry.

An intermediary, the Falcon-Alsaqr Trading Company, Inc., of Sparta, New Jersey, requested assistance in the development of a fisheries in an unidentified mid-Eastern country (thought to be Kuwait). A "Presentation" was prepared on a crash basis, but to date there has been no word from the country in question.

AID requested that the University send an expert in fish preservation to Chad to study the high losses being experienced by Lake Chad fishermen. Dr. Matthew Caurie, then in Ghana, would have gone immediately except for a French language requirement. Arrangements were made to send Dr. Jon Liston, head of the Fisheries Department at the University of Washington. However, after arrangements were completed, the time of the AID Team's departure for Chad was advanced by several weeks and Dr. Liston could not meet the new schedule.

A formal Project Proposal which will provide technical assistance to the University of the Azores has been prepared by URI personnel in response to a request from AID. This program is designed to upgrade the commercial fisheries and includes improvements in fishing gear and techniques, studies on marketing of fish products, and training courses for fisheries personnel.

B. Other

1. Number of LDC Graduate Students and Countries of Origin

a. 105 LDC graduate students were enrolled at URI during the reporting year.

b. Countries of origin:

Brazil
China, Rep. of (Taiwan)
Chile
Cyprus
Ecuador
Ghana
Guatemala
Hong Kong
India
Indonesia
Iran
Korea
Malaysia
Nigeria
Portugal
Saudi Arabia
Sudan
Thailand
Trinidad
Turkey
Uganda
Vietnam

2. Number of Visitors

There were 17 foreign visitors hosted by ICMRD, all of whom were involved in on-campus consultations. There is little doubt that other foreign visitors came to URI and held consultations with other colleges. There is no central visitors' registry where such information is compiled.

3. Known Use of Research, Teaching Materials, Methodologies

Grant supported research, teaching materials and training, as well as methodologies, are being brought to bear in the five small-scale fisheries projects authorized by the grant extension. This is evident in the data collections and surveys being conducted in Central America where methodologies are of paramount importance and where prior contacts (linkages) paved the way for total cooperation of the host governments. Members of the fisheries agencies of those governments are well informed regarding URI fisheries and oceanographic research, training and degree programs.

Dr. Pollnac, who has received and still receives grant support, completed his research in Panama following the Costa Rica Seminar-Workshop, and this work resulted in a number of papers which have been published and/or submitted to AID such as, "Artisanal Fishermen's Attitudes Toward the Occupation of Fishing in the Republic of Panama," and "Correlates of Fishermen's Cooperative Membership in the Republic of Panama," among others.

Dr. Matthew Caurie, a grant-supported student, has returned to Ghana where his research on preservation and improved nutritional value of fish will be used in the Food Research Institute (and will be utilized in the Nutrition Project mentioned earlier, if the Government of Ghana gives approval for doing the field work on the project in that country).

4. Significant Roles in Development Played by Graduates of the University

Mention was made above concerning the role of Dr. Matthew Caurie in Ghana where his application of western technology to traditional hot smoke curing of fish is expected to improve the quality of fish consumed in that country.

Lars Vidaeus is expected to be awarded his Ph.D. in September and has already been selected to conduct a marine resources survey in Sierra Leone on behalf of AID immediately thereafter.

A representative listing of URI graduates and their post-graduate roles was given in the 1974-1975 Annual Report.

5. Personnel Involved in Non-211(d) Grant Development Programs

In addition to the personnel involved directly in the 211(d) grant projects, personnel of the University are involved in a wide-variety of development programs, not necessarily related to the 211(d) grant and not within the purview of ICMRD. While many of these programs are of primary benefit to the U. S., there may be spin-offs which will eventually also benefit the LDCs. A few representative examples are listed herewith:

a. Robert E. Taber
National Marine Fisheries Service
"Feasibility Demonstration of Bottom Pair-Trawling for Herring and Other Finfish"
3 years - $13,675

b. Saul B. Saila
National Marine Fisheries Service
"Stock Identification of Bluefin Tuna (Thunnus Thynnus) via Critical Growth Analysis"
1 year - $19,877

c. Jeffrey L. Howe
National Marine Fisheries Service
"Multi-Purpose Processing Plants"
18 months - $76,000

d. Jeffrey L. Howe
National Marine Fisheries Services
"Silo Fish Farming Feasibility"
6 months - $16,500

e. John Sainsbury
National Marine Fisheries Service
"Offshore Operations Technology"
4 years - $977,000

f. K. L. Simpson
Environmental Protection Agency
"Nutritional Requirements of Marine Larval and Juvenile Fish"
1 year - $25,000

g. Saul B. Saila
Department of Interior
"Technical Proposal for Development of Prediction Techniques Impacts of Water Withdrawal on Fishery Resources"
2 years - $235,334

h. Howard E. Winn
Marine Mammal Commission
"The Humpback Whale--Populations, Energetics"
3 years - $66,282

i. J. Stanley Cobb
National Science Foundation
"Workshop on Lobster Physiology and Ecology"
9 months

j. L. R. LeBlanc and F. H. Middleton
U. S. Coast Guard
"Instrumentation of Field Test for Evaluation of Pollution Response Equipment for Floating Hazardous Chemicals"
3 years - $29,439

k. Chris W. Brown
U. S. Coast Guard
"Operational Laboratory for Identification of Oil Spills"
5 years - $516,850

l. Chris W. Brown
Office of Naval Research
"The Identification and Analysis of Hazardous Chemicals by Roman Spectroscopy"
3 years - $189,130

m. Scott W. Nixon
Environmental Protection Agency
"The Problems of Ocean Dumping--Stability and Resiliency in Experimental Ecosystems Exposed to Constant and Time Varying Stresses"
12 months - $56,743

n. Saul B. Saila
Army Corps of Engineers
"An Assessment of the Potential Impact of Dredged Material Disposal in the Open Ocean"
9 months - $60,891

o. John K. Gamble
Office of Naval Research
"Prospects for a New Law of the Sea Treaty"
1 year - $14,000

p. Dana R. Kester
Office of Naval Research
"Acquisition of a Laboratory Computer System for Marine Studies"
15 months - $67,030

q. R. Weisberg
National Science Foundation
"Observation of Equatorially Trapped Waves in the Gulf of Guinea"
3 years - $211,987

r. Robert A. Duce
National Science Foundation
"Anomalously Enriched Elements in the Marine Atmosphere: Sources, Distribution, and Fluxes"
17 months - $274,813

s. John A. Knauss
Environmental Protection Agency
"A Facility for the Experimental Analysis of Coastal Marine Ecosystems"
2 years - $999,500

t. David L. Evans
National Science Foundation
"Ocean Mining Processes"
1 year - $92,200

u. Kenneth L. Simpson
National Science Foundation
"Aspects of Nutrition and Carotenoid Transformation in Aquatic Animals"
3 years - $10,100

C. Linkages

During the reporting year the University strengthened its numerous linkages established during prior years of the grant and established several new linkages. Domestically, these include the following:

Auburn University
Michigan State University
University of Wisconsin
University of California, Davis
University of Washington
University of Vermont
National Science Foundation
NOAA - National Marine Fisheries Service, Department of Commerce
(See also above section)

International:

Escuela Superior Politechnica del Guayaquil, Ecuador
(involving training of two of its professors at URI Department of Fisheries and Marine Technology last year)

Fisheries Department, Government of Fiji
Mr. Robert Stone, Chief Fisheries Officer
(formerly a student at URI Department of Fisheries and Marine Technology)

Universidad Catolica de Valparaiso and CEPLA of Universidad de Chile. (With the guidance of Professor Harlan Lampe, Luis Adriasola, Ph.D. candidate in the Department of Resource Economics at URI, produced a series of papers in the preparation of a report on the development of the fishing industry in Chile.)

Instituto de Internacional Estudios de la Universidad de Chile. (Professor Lampe and Luis Adriasola are writing a paper to be presented to the conference on "Making Ocean Policy," to be held at that institution.)

A survey was conducted by Professor Lampe of the research, educational and government departments in various Asian countries to evaluate manpower requirements in the social sciences for fisheries development. These included the follcwing countries:

**	*	Indonesia	**	*	Thailand
**		India	**	*	Malaysia
**	*	Bangladesh	**	*	Philippines
**		Nepal	**	*	Singapore

** Government represented at the seminar
* Universities represented at the seminar

Also, Professor Lampe convened a seminar in Singapore on the same subject for university and government officials, sponsored by the Agricultural Development Council, Inc.

During the year, the University has cooperated with the East-West Center and the International Center for Living Aquatic Resources Management (ICLARM) in developing a workshop to be convened in September to develop social science research projects relating to artisan fisheries in various countries in Southeast Asia.

D. Plans for Utilization of Institutional Response

The University of Rhode Island, through its International Center for Marine Resource Development, is actively seeking participation in the implementation of Title XII, "Famine Prevention and Freedom from Hunger," of the International Development and Food Assistance Act of 1975.

As both a land-grant and a sea-grant institution, with long and extensive experience in agriculture and marine fisheries, and as a recipient of a 211(d) grant for the past seven years, the University believes it should be able to make a significant contribution to the efforts of the United States Government toward increasing the world's food production.

Participation in this international effort would be a logical sequence on completion of the five State-of-the-Art studies now being prepared by the University under its current 211(d) grant extension which expires June 30, 1977. These studies should provide information on what is known about small-scale fisheries in the LDCs, and should suggest many ways in which this major body of food producers could increase substantially their production. It would be a waste of money and effort if the results of these studies were not tested.

Accordingly, the University plans to seek a significant role under Title XII in order to put its studies to the test in the context of the national famine prevention effort.

However, regardless of the outcome of its attempts to become fully involved in Title XII, the University will continue in the future, as it has in the past, to make its knowledge and experience available to the LDCs in solving their marine resources problems.

VIII. NEXT YEAR'S PLAN OF WORK AND ANTICIPATED EXPENDITURES

Objective/Output #1 - Extended Knowledge Base

Project No. 1. Assessment of Resource Base for Small-Scale Fisheries

Year Two

1. Continuation and completion of field work. This aspect of the project will require a year in order to insure adequate background data. Initial procedures may be modified in order to adapt the model and its objectives to available information.

2. Return to Rhode Island for the completion of data analysis and the preparation of a final report. This report will be in the form of a manual which will explicitly detail methods which can be applied to resources which are harvested with similar gear in any tropical artisan fishery. Recommended modification should permit the application of the same or similar methods to resources harvested by gear not used in Costa Rica. The report will be coordinated with economic, technological and sociological sub-projects.

Targets - Year Two

1. Site visit by Dr. Saila (Costa Rica).

2. Dr. Stevenson to return from a 10-month assignment in Costa Rica to complete report/manual.

Expected Cost: $32,442

Project No. 2A. Sociocultural Correlates of Developmental Change

Year Two

1. The findings of the State-of-the-Art paper will be applied to a problem in developmental change.

   The model presented as a part of the State-of-the-Art paper will be tested in an area of the world where small-scale fisheries development projects are planned or in process. The field guide which forms part of the State-of-the-Art paper will be used in this research. Problem focus will be related to other University of Rhode Island projects being conducted in the same geographical region. Data collected will, thus, provide important baseline information for both assessing the potential and real social impact of the projects.

Targets

1. September 1 - December 4, 1976
   Field work in Costa Rica.

2. December 5 - May 30, 1977
   Data analysis.

3. May 30, 1977
   Completion of final report on Costa Rica research.

Expected Costs: $16,541

Project No. 2B. Lack of Knowledge About Effective Message Design in Communication for Technology Transfer

Year Two

1. Visit Costa Rica (Puntarenas) about mid-September to consult regarding data collection.

2. Prepare for data analysis and report writing.

3. Analyze data (some to be provided by Dr. Pollnac during period September - December).

4. Write report.

Targets

1. September, 1976: Trip to Puntarenas, C. R., and vicinity for collection of data.

2. September 30, 1976: Complete collection of initial data.

3. October 1, 1976: Begin analysis of initial phase data.

4. December 1, 1976: Complete analysis of initial phase data.

5. December 15, 1976: Complete collection of second phase data.

6. January 2, 1977: Begin analysis of second phase data.

7. March 30, 1977: Complete first outline of final report.

8. May 1, 1977: Complete final stages of data analysis.

9. June 1, 1977: Complete first draft of final report.

10. June 30, 1977: Complete final draft of final report.

Project No. 3. Underutilization of Food Technology Resulting in Losses of Available Food

Year Two

If the plans for conducting field research on this project in Ghana are realized, some of the first year work (on-site data collection originally scheduled for May through June) will be moved forward to the second year. The same observation applies in case the project is transferred to Guatemala.

The second phase of these investigations will be focused on traditional processing methods in use in the test or survey areas. For example, in West African countries fish is processed to avoid losses of unsold fish, i.e., for preservation rather than for the value of the fish. Investigations will aim at both objectives. The importance which processing or preservation plays in the fishing industry in developing countries in general may be exemplified by a Ghanaian experience where in 1971 only 25 per cent of the fish caught were marketed as landed; the remaining 75 per cent were processed before reaching the consumer (da Costa, 1973). Various methods of fish preservation in the survey areas will, therefore, be recorded and their relative importance assessed. The important preservation methods will then be carefully studied to find out which stages are technically or nutritionally unsound and, therefore, need modification. This may require a modification of both equipment and methodology. Recent studies on fish smoking in this direction in our laboratory indicate that such modifications are possible (Caurie, 1975). Care will be taken in this study also to ensure that any modification to traditional equipment and methods will be inexpensive and simple as it is otherwise known that such modifications run a high risk of rejection.

Targets (subject to above)

1. July - December, 1976
   On site data collection (in field and in laboratory).

2. October - December, 1976
   Analysis of data.

3. January - April, 1977
   Preparation of reports.

4. March - June, 1977
   Laboratory investigations.

Expected Costs: $28,894

Project No. 4. Knowledge Transfer Methodology for Small-Scale Fisheries

Year Two

Because of cancellation of plans to conduct project field work in Ghana, it is now proposed to combine Phase I and II of the original workplan in year two, as follows:

Combined Phase I and Phase II

1. Establishment of Data Base.

   a. Listings of programs involving transfer of technology and their analysis to determine success factors based on:

      --Transfer attempted
      --Step level above exisiting technology
      --Transfer medium used
      --Training of recipients
      --Continuance of transfer following withdrawal of medium
      --Factors leading to success or failure

   b. Linkages between transfer methodology in peasant agriculture and aquaculture with the fisheries.

   c. Survey of present forward thinking regarding technology transfer in small-scale fisheries. Identification of knowledge gaps and areas requiring research and/or program activity.

   d. Preparation of "State-of-the-Art" document.

2. Planning for program action and field work to address one or more specific gaps or development features identified during the work of 1. above.

Activities will be undertaken concurrently, field work planning and test site selection being made as the result of conclusions based on information obtained in the establishment of the data base with appropriate up-dating.

In general, activities are expected to follow those of the original workplan; however, the apparent lack of literature will lead to more emphasis being placed on input from experienced workers in the field.

Field work will concentrate on obtaining site profiles leading to selection of location(s) for Phase III activities.

Staff to be Involved

Combined Phase I/Phase II:

John C. Sainsbury - 50 per cent of the time
Student Assistant (work study) - approximately three months

Targets

Combined Phase I/Phase II (ending April, 1977)

Activities of these phases will now be carried out concurrently within the period ending April, 1977.

1. Approximately one week at FAO headquarters, Rome: literature survey and interviews with selected personnel (July 2-8, 1976).

2. Two weeks Azores Islands: site profile (June 19 - July 2, 1976).

3. Two/three trips Washington, D. C.: Literature survey and interviews with selected personnel from development banks (first trip planned week of June 7, 1976).

4. One visit (2-3 days) Auburn University: Probably during the fall of 1976.

5. One/two day visit for literature survey and discussions with selected personnel at the International Development Research Centre at Ottawa.

6. Listing and analysis of programs involving technology transfer with small-scale fisheries. To be completed by October/November, 1976.

7. Linkage of technology transfer methodology in other small-scale enterprises with fisheries: completed by October/November, 1976.

8. Ten days Costa Rica/Guatemala (also probably Ecuador): November, 1976.

Phase III (May 1977 - ?)

Field work during this phase planned to address specific knowledge or programming gaps as identified during Phase I/ Phase II. This will be arranged to complement activities by other agencies in site selected so far as possible (e.g. FAO plans in Azores, IDB plans in Ecuador or project in Costa Rica/Guatemala).

While the active program will be keyed to needs of the specific locations, the problem and approach will, so far as practicable, be made general in application.

In the first instance, work on this phase should extend up to two years with extension into specific problems and/or sites if justified by results.

Additional staffing for in-country activities will be required, in addition to budget allocations for equipment, supplies, personnel support and general operating expenses. These activities will commence during the present grant period in anticipation of extended budget allocations being available beyond the existing expiry date.

Expected Costs: $12,499 (does not include potential costs of Phase III)

Project No. 5. Economics of Small-Scale Fisheries and Institutional Constraints

Year Two (Economics)

1. Application of selected research techniques in selected LDCs, chosen from the following:

   a. Demand assessment techniques, tested in a selected central city (e.g., Guatemala City) and outlying areas

   b. Market evaluation techniques, tested in a selected LDC (e.g., El Salvador)

   c. Implement in a selected fishery (e.g., Costa Rica) a system for collecting costs and returns information (this phase of the research will be linked with and conducted jointly with the research on resource assessment)

   d. Test in a selected LDC the techniques for evaluating fishermen's supplies markets (to coordinate with b, above, in El Salvador)

2. Refinement of the developed research techniques based on the application experience in LDCs.

3. Prepare reports prescribing appropriate research techniques for economic analysis of small-scale fisheries in LDCs.

Targets

1. Application and testing of appropriate research techniques in selected LDC (begin August, 1976, and continue to May, 1977).

2. Refinements of techniques, based on LDC experience (to be completed by June 1, 1977).

3. Prepare a report explaining and evaluating the research techniques, with suggestions for their application in other LDCs (by August 30, 1977).

Beyond the Second Year

Further application and refinement of the techniques in other LDCs at the request of USAID and/or interested LDCs (with, of course, additional funding).

Year Two (Institutional)

1. Design alternative organizational and legal frameworks.

2. Review these alternative frameworks with administrators, managers, and fishermen in a selected LDC (e.g., Costa Rica).

3. Prepare final report recommending alternative frameworks, and how they may have to be adapted to fit the peculiar situations of a variety of LDCs.

Targets

1. Interviews of fishermen (by October 1, 1976).

2. Analyze the collected data (by January 1, 1977).

3. Design alternative organizational and legal frameworks (by April 1, 1977).

4. Review alternative frameworks with administrators, managers, and fishermen (by June 1, 1977).

5. Prepare final report (by August 30, 1977).

Beyond the Second Year

Further analysis of organizational and legal frameworks in other LDCs at the request of USAID and/or interested LDCs (with, of course, additional funding).

Expected Costs: $96,031

IX. INVOLVEMENT OF MINORITY PERSONNEL AND WOMEN

This University has attracted a significant number of minority group personnel and women as students, faculty and staff. This is partly the result of the University's wide variety of courses which attract students from all groups, and also due to widespread advertising of staff and faculty openings.

The following positions are held by minority personnel and women under the 211(d) grant or grant-related activities:

1. Principal Investigator, Project No. 3 - American Oriental
2. Administrative Assistant - Woman, American Indian
3. Research Librarian - Woman
4. Research Assistant, Project No. 5 - Woman
5. Student Assistant, Project No. 4 - Woman
6. Fiscal Clerk - Woman

The International Center will continue its specialized efforts to attract minority personnel. Such efforts are facilitated by the opportunities afforded by the nature of its work and its funding, including particularly the 211(d) grant. This grant, and hopefully its continuation in one form or another after June 30, 1977, provides employment opportunities for minority personnel and women both in the U. S. and abroad and the nature of the program attracts people who wish to participate in efforts to improve economic and social conditions among the LDCs.

Table I

Distribution of 211(d) Grant Funds and Contributions From Other Sources of Funding*

Reporting Period August 6, 1975 - June 30, 1976

Grant Objectives/Outputs	211(d) Expenditures				Non-211(d) Funding Amount*
	Review Period 8/6/75 - 6/30/76	Cumulative Total	Projected Next Year	Projected to end of Grant	
Objective/Output #1: Extended Knowledge Base					
Project #1	$ 9,822.61	$ 9,822.61	$ 32,442.39	$ 32,442.39	$100,000 - a conservative estimate of the contributions in personal services, space and equipment being made by the Governments of Costa Rica, El Salvador and Guatemala in field research on these projects
2A	11,306.83	11,306.83	16,541.17	16,541.17	
2B	6,638.26	6,638.26	7,430.74	7,430.74	
3	10,394.29	10,394.29	28,894.71	28,894.71	
4	7,441.37	7,441.37	12,499.63	12,499.63	
5	39,488.31	39,488.31	96,031.69	96,031.69	
Subtotal	85,091.67	$ 85,091.67	$193,840.33	$193,840.33	
Objective/Output #2: Response Capability	-	-	-		
Objective/Output #3: Information Capacity	12,061.32	12,061.32	16,288.68	16,288.68	
Objective/Output #4: Education & Training Capab.	-	-	-		$9,135 (Fulbright Comm.)
Director's Office	30,250.62	30,250.62	70,259.65	70,259.65	$79,000 Salaries & O/H
Totals	$127,403.61	$127,403.61	$280,388.66	$280,388.66	*$188,135

*Estimates

Table II - A

211(d) Expenditure Report

Actual and Projected Summary

Under Institutional Grant #AID/csd 2455

Reporting Period August 6, 1975 to June 30, 1976

	Expenditures* to Date		Projected Expenditures* Y E A R			Total
	Reporting Period	Cumulative Total	1	2	3	
Personnel	$ 94,886.07	$ 683,712.61	$105,963.39			$ 789,676.00
Graduate Students	5,393.83	158,226.32	37,597.68			195,824.00
Travel	17,079.82	103,933.36	58,566.64			162,500.00
Other	10,043.89	98,739.05	78,260.95			177,000.00
Grand Total	$127,403.61	$1,044,611.34	$280,388.66			$1,325,000.00

*Expenditures to be reported on accrued basis

Table II - B

211(d) Expenditure Report

Reporting Year Detail

Under Institutional Grant #AID/csd 2455

Reporting Period August 6, 1975 to June 30, 1976

I. A. Salaries: Names of faculty, percentage of time charged against the grant and the amount

Pollnac, Richard B.	80%	$10,194.76
Spaulding, Irving A.	40%	6,118.15
Sainsbury, John C.	30%	5,009.29
Lampe, Harlan C.	50%	9,196.74
Hueth, Darrell	14%	2,420.23
Sutinen, Jon G.	75%	11,673.97
Stevenson, David	100%	5,850.00
Caurie, Matthew	100%	6,350.00
		$56,813.14

B. Other: Percentage of time and the amount for each category

Management

Estes, Thomas S.	100%	$14,910.21

Library

Alexander, Jacqueline	100%	$10,250.58

Clerical

Gammerino, Jaclyn	33%	$ 1,116.88
Kornegay, Cheryl B.	100%	310.38
Colbert, Emeline T.	100%	4,049.40
		$ 5,476.66

Other Non-Professional

None

C. Fringe Benefits: As applicable for the above

(Includes fringe benefit charges on salaries for Student Support)	$ 7,829.40

Table II - B, continued

II. Student Support: Name of student, country of origin, amount of support per student

Name	Country of Origin	Amount
Hall, Mary	USA	$ 77.70
Epler, Bruce	USA	619.32
Johnson, Jan P.	USA	600.66
Logan, Philip N.	USA	600.66
Yates, Rosemary	USA	619.32
Scheid, Allan	USA	366.25
Adriasola, Luis A.	Chile	2,116.00*
		$4,999.91

*Includes tuition and fees

III. A. Consultants: Total number and total amount

None

B. Guest lecturers, visitors, etc.: Total number and total amount

None (17 visitors at no cost to grant)

IV. Travel: Total number of trips and total amount

A.	Domestic	14	$ 1,569.59
B.	Foreign	15	15,510.23

V. Equipment: Number and description of items the individual cost of which is $2,500 or over

None

VI. Library Acquisitions: Total amount $ 742.29

VII. Publications: Number and total amount

4	$ 1,240.20

VIII. Other (such as telephone, postage, computer): Total amount

Miscellaneous	$ 2,965.43
Communications	645.19
Supplies	4,450.78

Table III - A

Requests for Assistance Received During Reporting Period August 6, 1975 to June 30, 1976

A. Requests Attended

	Description of Request for Assistance	Whom did you Assist?	Who Requested Assistance	Who Funded Assistance	Size of Effort		Results of Assistance
					Dollars	Man Days	
1.	Survey of Colombian marine resources	Colombian Science Institute	Colombian Science Institute (COLCIENCIAS)	ICMRD			Dean Donovan will visit Colombia in August/ September for initial survey to determine level of assistance required
2.	Information on courses for marine affairs programs	Iran	Royal Iranian Embassy, Washington, D. C.	-	-	-	Still awaiting response
3.	Fish resource study	Mauritania	Ministry of Fisheries, Mauritania	-	-	-	Still awaiting response
4.	Development of fisheries on behalf of unidentified Mid-East country	?	Falcon-Alsaqr Trading Co.	-	-	-	Still awaiting response
5.	Pollution problems and ecology of fish and shrimp resources	Brazil	Ministry of Education, Brazil	-	-	-	Still awaiting response
6.	Summer program in marine affairs - one month	Ecuador	Fulbright Commission through U. S. Embassy, Quito	Fulbright Commission, Ecuador	$9,135	45	Group of six Ecuadorian administrators completed four-week special program in marine affairs on campus
7.	Fisheries training for students from Kuwait	Kuwait	UNDP/FAO Kuwait	-	-	-	Expect students next year

Table III - A, continued

Requests for Assistance Received During Reporting Period August 6, 1975 to June 30, 1976

Requests Attended

Description of Request for Assistance	Whom did you Assist?	Who Requested Assistance	Who Funded Assistance	Size of Effort		Results of Assistance
				Dollars	Man Days	
Provide three-year study program in fisheries and food technology	La Salle Fdn. of Natural Sci. Margarita Cam. Punta de Piedros Venezuela	La Salle Fdn. of Natural Sci. Margarita Cam. Punta de Piedros Venezuela	-	-	1/2	Still awaiting response
Technical assistance program to improve commercial fisheries	Azores	USAID Office (1976)	AID	-	-	Project proposal prepared and submitted

Table III - B

Requests for Assistance Received During Reporting Period August 6, 1975 to June 30, 1976

Requests Not Fulfilled

Description of Request for Assistance	Whom did you Assist?	Who Requested Assistance	Who Funded Assistance	Size of Effort		Why Not Met?
				Dollars	Man Days	
Survey of high losses of fish catch, Lake Chad	-	AID	-	-	-	AID advanced date for Team departure and Dr. Liston (University of Washington) could not be available for the earlier date

Annex I

Publications

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