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International Coastal Resources Management Project

The University of Rhode Island

Funding provided by the Office of Forestry, Environment and Natural Resources, Bureau of Science and Technology, U.S. Agency for International Development

The four major goals of the AID/URI Coastal Resources Management Project (CRMP) are: 1) to apply, as appropriate, existing experience in coastal resources management to developing countries; 2) to assist three developing nations in the design and implementation of integrated coastal resources management programs; 3) to advance the state-of-the-art of coastal resources management in developing countries; and 4) to build URI's capability to assist developing nations with coastal resources management.

The CRMP will work with the cooperating pilot countries to:

- develop procedures for the assessment of the impacts of coastal development proposals
- develop institutional and technical solutions for resource use conflicts
- support research to bette. understand the issues that affect the condition and use of coastal ecosystems
- improve the capabilities of in-country professional staff to plan for and manage coastal development

The countries selected for pilot projects are Ecuador, Sri Lanka and, tentatively, Thailand.

The AID/URI Coastal Resources Management Project is funded by the Office of Forestry, Environment and Natural Resources, Bureau of Science and Technology, U.S. Agency for International Development through a Cooperative Agreement with the International Center for Marine Resource Development, at The University of Rhode Island.

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URI/AID COASTAL RESOURCES MANAGEMENT PROJECT

ECUADOR: THIRD ANNUAL WORK PLAN

1 October, 1987 - 30 September, 1988

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1.0 INTRODUCTION AND OBJECTIVES

The Ecuador Coastal Resources Management Project (CRMP) is governed by a Joint Project Agreement (JPA) between the Government of Ecuador (GOE) and the United States Agency for International Development (USAID). The project is implemented by the Office of the Environment within the Ministry of Energy and Mines (DIGEMA) and The University of Rhode Island (URI) through a Cooperative Agreement with the USAID Bureau of Science and Technology with supplemental funding from the USAID/Ecuador Mission. The project's objective is the creation and implementation of an integrated national program for the management of coastal resources. Specific objectives are:

(a) To assemble and utilize technical information in such a form that supports reasoned decisions regarding environmentally sound development.

(b) To apply research results to management policies and decisions on coastal resources development.

(c) To recognize and utilize institutional and technical solutions to resolve coastal resources use conflicts.

(d) To encourage the creation of an interagency working group with the participation of the private sector (preferably with a legislative mandate) to regularly review coastal development proposals.

(e) To develop the capability of the GOE staff responsible for coastal resources management in order to effectively implement a resources management program.

(f) To define a sustainable mix of activities for Ecuador's coastal areas that is responsive to the needs and desires of the affected society.

It is the URI/AID CRM Project approach in all the pilot countries (Ecuador, Sri Lanka, Thailand) that the following cycle should, if possible, be completed for some elements of the CRM program during the anticipated 4-year life of the project:

Step 1. Problem identification and estimation.

Step 2. Development and selection of management options.

Step 3. Testing (implementation) of selected management options.

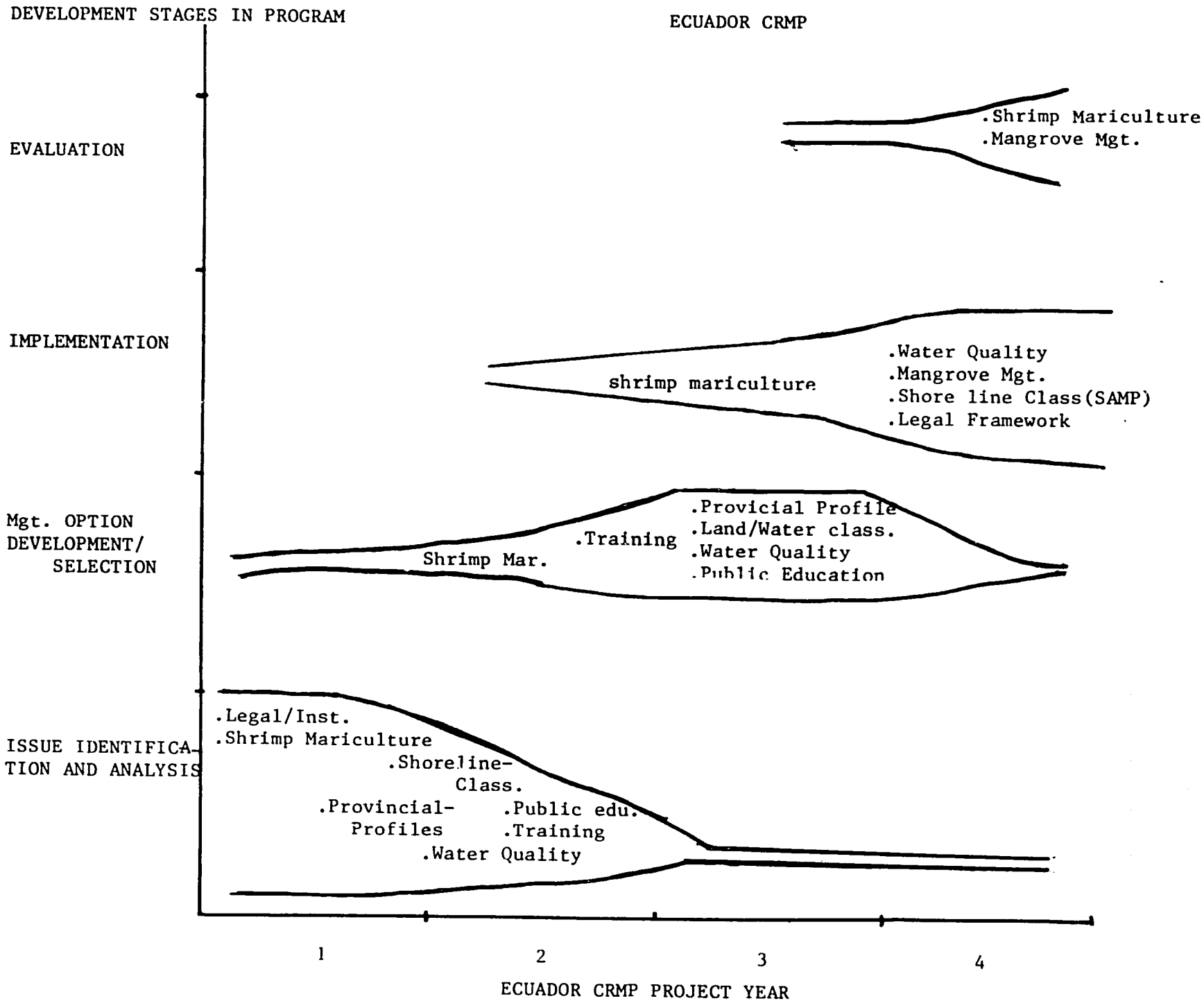
Step 4. Evaluation of results.

The above objectives and approach serve as reference poi[illegible] selecting work tasks for the Ecuador pilot. The overall CRMP strategy for meeting its objectives during a four-year period is illustrated in Figure 1. Year 1 and Year 2 were designed to emphasize Step 1. Year 3 will include progress toward Step 3 topics.

In contrast to the other two pilot projects being implemented by URI/AID, Coastal Management in Ecuador is at the initial stages of problem definition and policy formulation. There is currently no governmental agency in Ecuador with authority to implement a Coastal Resources Management Program, and there is, as yet, no organized constituency advocating that such an agency or program be created. It is the position of all the project participants that support for coastal management initiatives will require the active participation and support of both the private and public sectors. This participation must be directed initially at the identification of priority CRM issues, the interrelationship among these issues, and formulation of implementable recommendations for action.

By directing 79 percent of the first year non-administrative budget to the formulation of a strategy to promote a sustainable and environmentally viable shrimp mariculture industry in Ecuador, (see Section 2.1 of the Second Year Work Plan), priority issues were identified with the participation of both the public and private sectors. In

FIGURE 1


DEVELOPMENT STAGES IN PROGRAM
ECUADOR CRMP
EVALUATION
.Shrimp Mariculture
.Mangrove Mgt.
IMPLEMENTATION
shrimp mariculture
.Water Quality
.Mangrove Mgt.
.Shore line Class(SAMP)
.Legal Framework
Mgt. OPTION DEVELOPMENT/ SELECTION
Shrimp Mar.
.Training
.Provicial Profile
.Land/Water class.
.Water Quality
.Public Education
ISSUE IDENTIFICATION AND ANALYSIS
.Legal/Inst.
.Shrimp Mariculture
.Shoreline-Class.
.Provincial-Profiles
.Public edu.
.Training
.Water Quality
1
2
3
4
ECUADOR CRMP PROJECT YEAR

Year 2, the emphasis shifted to preparing the coastal province profiles, which included workshops in each province which were attended by a broad range of representatives from coastal resource user groups as well as local and public sector experts. These workshops proved invaluable in more clearly identifying issues and sharpening the focus on salient coastal issues along the entire Ecuadorian coast.

The private sector groups that have been identified thus far as playing a key role in supporting the formulation of coastal policy and in developing the needed constituency are the Shrimp Farmers Association (Camara de Productores de Camaron, or CPC) and the Fundacion Pedro Vincente Maldonado (a Guayaquil-based private volunteer organization dedicated to research and education in support of natural resources management). Working closely with the latter institution is the Polytechnic University of the Coast (ESPOL). The CPC participated actively in the Year One maricuiture issue identification process as well as in the recently completed PL mortality project. The CPC is expected to collaborate as principal partners in the water quality assessment (Task 3.3). All parties believe that support of a strong environmentally sound shrimp mariculture program will help achieve the CRMP's environmental objectives as stated in the JPA, by mobilizing resources from the mariculture private sector to protect their self interests by supporting and actively participating in a program of water quality monitoring and control measures.

The Funcacion Maldonado, whose principals are ESPOL faculty members, carried out the major activity slated for Year 2, the environmental profiles of coastal provinces. The Fundacion Maldonado took a lead role in interacting with public and private sector groups in each province to identify the key issues a national CRM policy should address. ESPOL, represented in both the Water Quality and Mangrove Working Groups as well as the CRM Project Steering Committee, is collaborating in all activities related to training. ESPOL faculty have been designated as counterparts to several expatriate collaborators in the project.

2.0 ELEMENTS OF THE THIRD ANNUAL WORK PLAN

2.1 Highlights of Planned Activities

The Year 3 Work Plan contains a careful mix of coastal planning, problem estimation, and practical implementation activities. The largest single effort is the assessment of water quality problems along the coast, with the focus on potential impacts of water pollution on shrimp mariculture. This work element will provide reliable data to help identify the location and magnitude of water pollution, which can be followed by source identification and consideration of practical control options. The research strategy is aimed at building a sustained monitoring effort using a combination of U.S. and Ecuadorian labs as well as on-site monitoring by shrimp pond and hatchery operators.

The third year will also result in a strategy document for Coastal Resources Management in Ecuador building on the findings of the coastal province profiles and legal and institutional analyses completed in Year 2. Major publications scheduled for Year 3 are the overview of Ecuador's coastal region, four coastal province profiles, and a synthesis of the results of the profiling effort. The English and Spanish versions of the Shrimp Mariculture Workshop will also be released, a system for efficient distribution of all project documents will also be in place.

Three work elements will engage the project team in several practical aspects of coastal resources management. An assessment of the Ecuadorian coast from the perspective of shoreline characteristics and processes will be completed along with proposed development guidelines for siting and construction of buildings and activities in the shore zone. The mangrove conversion problem will be quantitatively analyzed in pilot projects under the supervision of the project's mangrove management working group. Finally, ideas and techniques for proper design and siting of priority facilities and infrastructure in the coastal zone will be explored for specific projects in each coastal

province. A special team of experts will be assembled to work with local groups to plan and resolve siting conflicts and problems for needed projects.

The Year 3 Work Plan will develop proposals for coastal resources management at the national level which reflect the common issues encountered in each coastal province. At the same time the project team will be working on the unique circumstances of the four provinces, applying and testing practical techniques and approaches for defining and solving water pollution, mangrove destruction and shore use allocation problems.

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3.0 WORK TASKS

3.1 Project Administration and Coordination

a. Background and Progress

During Year 2, adjustments were made in the structure and functioning of project offices in Guayaquil. Consolidation of project offices, and hiring of a local project director took place in February 1987. Additional details on administrative activities can be found in the Year 2 Progress Assessment.

In addition to the URI/AID project director, Dr. Luis Arriaga, URI/AID was assisted by one secretary, Jessica Elhoul, in the Guayaquil office. DIGEMA-funded project personnel include Jose Vasconez, an engineer, a secretary, and a driver. Alexandro Bodero, a forester specializing in mangroves works for the project in DIGEMA's Quito office.

b. Objectives

(1) To maintain adequate administrative services to the project including secretarial and accounting services, communications, adequate office facilities, and project vehicles.

(2) To produce the required activity and progress reports.

(3) To enhance communication among all project staff and subcontractors.

(4) To enhance communication between the project and the principal governmental and private sector groups with an interest in CRM in Ecuador.

c. Tasks

Task 1: Administration

During Year 3, URI/S&T funds will be used to augment the furnishings on the Project's Office at MAG so that the Office can accommodate technical support activities and improve its information collection. Distribution of project reports, the library and

map collections, meeting facilities and work space for visiting consultants will all be handled in these offices. DIGEMA shall continue to pay for its staff and cover the monthly fees for the offices. Both the URI Project vehicle and DIGEMA vehicle will be maintained and kept available to project personnel for project-related business. Additional computer equipment will be purchased in support of the water quality and profile completion and follow-up work elements. Audio visual equipment will be acquired in order to expand project outreach and communication activities. A project apartment will be rented for used by expatriate consultants, URI staff, and foreign visitors in order to facilitate long term stays and reduce the costs of expatriate participation in the project.

Task 2: Coordination and Communication

Within Project Coordination: The In-Country Director will schedule monthly staff and contractors' meetings. The meetings will have a prearranged agenda which will feature brief progress reports on each activity and an in-depth discussion of specific issues. The purpose of these meetings is to better integrate the results of discrete work plan activities to foster a strong project self identity and provide a forum for discussion of how project objectives can be met.

Interagency Coordination: The In-Country Director will continue to prepare and expand distribution for the quarterly project bulletin. In addition, both the Board and Steering Committee will routinely receive progress reports as well as copies of major project reports and discussion papers. An active education program will be conducted for this committee. In addition, the project will undertake other outreach activities including preparation of a project slide show, brochure, and special briefings for AID/Quito officials, Ecuadorian government officials, and other groups on project objectives, coastal issues and accomplishments. Fundacion Maldonado will assist the in-country project director in obtaining media coverage for CRM issues and projects.

d. Responsibility

This work will be implemented by the In-Country CRMP staff with assistance from Fundacion Maldonado on public relations.

e. Products

(1) Functioning, well integrated URI/DIGEMA administrative services and facilities adequate to meet the needs of the resident staff and cooperating contractors.

(2) Monthly accounting reports, quarterly activity reports, and semi-annual progress reports.

(3) Monthly meeting of major in-country project participants, quarterly bulletins for in-country distribution.

(4) Active program of outreach to public and private sectors.

(5) Organized system for dissemination of project publications.

3.2 Strategy for Coastal Resources Management in Ecuador

a. Background and Progress

During Year 2, the basic legal and institutional research was completed, primarily through the activities of Efrain Perez and Associates. Detailed task accomplishments are described in the Year 2 Progress Assessment.

b. Objectives

(1) To conduct a series of structured discussions within the CRMP that examine the legal and institutional aspects of priority CRM issues.

(2) To prepare recommendations on legal and institutional actions required to implement specific policy recommendations of the CRMP.

c. Tasks

Task 1: Development of a Strategy Paper for Coastal Resources Management in Ecuador

Recommendations by the CRMP to establish new or revised policies to govern the use of Ecuador's coastal resources must be accompanied by the identification of the institutions which could implement these proposals. Taken together, the new initiatives will comprise the institutional framework for coastal resources management and will include both governmental and non-governmental organizations, including the private sector. This task will be carried out through the process of preparing a strategy paper on CRM in Ecuador.

The paper will address the planning, policy making, administration and enforcement elements of a CRM program. This framework should be able to accommodate the use of management techniques such as water and shore use designations, critical habitat protection, water pollution control in targeted areas, and appropriate engineering, construction and operating practices.

The options to be considered in the framework should include but are not limited to the following:

a. Adding new responsibilities for CRM to existing organizations without major changes in law.

b. Creating "coordinating mechanisms" to encourage information sharing among public and private groups and to encourage voluntary joint action for solving specific problems.

c. Proposing legal changes to require existing organizations to participate in preparing and enforcing CRM policies and engage in coordinated problem solving efforts.

d. Establishing and funding new administrative units to carry out planning, rule making and enforcement responsibilities.

The strategy paper shall assess the appropriate geographic focus of CRM efforts, comparing local and regional versus nationwide approaches for setting policy and making decisions. Recommendations on the appropriate level for placing responsibility within particular organizations to carry out coastal management functions will be made.

The paper shall also propose options for involving coastal resource user groups and the public in both the policy setting and decision making processes.

Task consultants and CRMP staff will identify key actors and conduct interviews as part of the process for preparing the strategy paper. A discussion draft shall be prepared and reviewed at a meeting structured to foster discussion of institutional options for CRM. The final strategy document will reflect the results of the interviews and workshop which contain a proposed institutional strategy for solving priority CRM problems in Ecuador for wide distribution and discussion.

d. Responsibility

Contractors to be identified and retained by URI.

e. Products

(1) Discussion draft of strategy paper.

(2) Workshop.

(3) Final CRM strategy document.

3.3 Assessment of Water Quality Problems Affecting the Shrimp Industry and Other Users of Coastal Resources

a. Background and Progress

The top priority identified through the shrimp mariculture assessment process for promoting a sustainable mariculture industry in Ecuador is to maintain water quality in estuaries and nearshore hatcheries. According to the CRMP's Shrimp Mariculture Strategy developed during the August 1986 workshop in Guayaquil:

"Good water quality in these areas is critically important not only to the success of the cultivated shrimp industry but also to maintain suitable habitats for juvenile

shrimp. A number of development trends are working in combination to reduce water quality in Ecuador's estuaries and coastal waters. Increasing urban development, further industrial growth and the decline of fresh water discharges by river and greater agricultural production brought by dams are all expected to result in further declines in water quality in the years to come. Poor water quality is already having a negative impact on both the productivity of grow-out ponds and hatcheries. The available, albeit incomplete, data on water quality document the presence of high concentrations of heavy metals and pesticides, the frequent occurrence of toxic red tides and high concentrations of organics that cause low oxygen levels. Hatchery operators and growers report occasional mass mortalities that they attribute to contaminants in their water supply. Some growers are experiencing blooms of microscopic algae in their ponds and reduced growth rates that may also be attributable to the poor quality of the water they pump from estuaries into their ponds."

In addition pollution of coastal waters was a central theme of the participants in the workshops held in each of the four coastal provinces. Strong concerns were raised about the use of river water for agricultural drainage, domestic and industrial discharges, as well as water supply for shrimp larvae hatcheries and municipal water supplies in El Oro. The Estero Salado near Guayaquil receives large volumes of untreated wastewater, posing a human health problem as well as threat to shrimp mariculture and recreational activities. In Esmeraldas concern was raised about the impact of refinery discharges on fisheries productivity. In Manabi discharges from fish processing plants degrade beaches with tourist potential.

Declining water quality is a strong indicator of an overall degradation of coastal resources and it may be expected to have repetitive impacts on a wide range of activities. These include losses in fishery resources and declines in environmental qualities that

affect tourism and local recreational opportunities. Severely degraded water quality may also pose significant threats to human health.

b. Objectives

(1) To identify and assess the significance of specific water quality problems that are currently believed to be impacting the productivity of the shrimp mariculture industry, coastal fisheries and other uses of the coastal zone.

(2) To develop recommendations for how such problems can be resolved through national and local water pollution control efforts.

(3) To assess the in-country capability to conduct the types of analyses required to monitor water quality parameters of concern and to assist such laboratories in performing the needed analyses.

(4) To design an integrated and sustainable program for generating baseline data and monitoring water quality.

Task 1: Design and Implementation of Sampling Program

Step 1. The first step shall be the design of the water quality assessment process. This will require:

a. Review of the existing data; much of this has been assembled by the CRM Project and is available at the Project offices at Guayaquil.

b. Discussion of perceived problems (parameters and locations) with representatives of both mariculture farm and hatchery operators.

c. Discussions of water quality problems as perceived by local scientists and solicitation of their views of the reliability of existing data.

The CRM Working Group on Water Quality will serve as the primary forum for these discussions as well as an important vehicle for identifying contacts with industry and the scientific community. It will assist in formulating the overall water quality assessment approach, and monitor the progress of this task.

Step 2. A sampling program will be designed and implemented that targets the issues that are of priority concern to the shrimp mariculture industry.

The first priority is to make direct measurements of those water quality variables that may be impacting the operations of the shrimp mariculture industry. The problems that have been identified to date suggest the following priorities:

- An assessment of significant concentrations of heavy metals (particularly mercury compounds) and organic chemicals (particularly pesticides) in the vicinity of selected hatcheries and shrimp ponds. Significant contamination problems, if they exist, are likely to be highly localized. The initial assessments will be directed at known "sinks" for these substances: fine-grain sediments, long-lived detrital feeders (e.g., oysters), and predators at the top of the food chain (e.g., fish and fish-eating birds).
- Monitor indicators of poor water quality in shrimp ponds that are most likely to affect the growth and survival of shrimp. The initial focus will be upon oxygen and ammonia levels at "control" and "impacted" sites. Monitoring of selected shrimp ponds will include such variables as nutrient, turbidity, BOD, temperature, and salinity in order to define the ecosystem dynamics. Several shrimp ponds routinely monitor such variables already. The objective here is to develop a standardized, comparable data set that may yield insights into the variability of water quality among farms in different locations and/or resulting from different pond management techniques. In-pond monitoring must be related to concurrent monitoring in the adjoining estuary that provides the source water.

The sampling programs should make full use of existing data gathering capabilities. It is expected that in-pond monitoring will be implemented

by cooperating shrimp farm managers many of whom may already possess the necessary sampling equipment. The sampling protocols developed by the Sea Grant funded Pond Watchers Program in Rhode island may provide a useful model for this shrimp pond monitoring program.

- Other contaminants of potential concern, such as petroleum hydrocarbons, will be assessed at "control" and "impacted" sites.

Experimental design, logistical arrangements and oversight of the analytical aspects of this water quality activity will be the responsibility of a Spanish speaking scientist contracted by URI with demonstrated qualifications in the technical aspects of this work. Analysis of samples will be conducted in laboratories with demonstrated capabilities in Ecuador, and, where necessary, in the United States. The technical advisor contracted by URI will collaborate closely with the shrimp industry which will (1) provide local transportation and other logistics, and (2) collaborate in the selection of sampling sites, in addition to arranging for monitoring programs at selected shrimp farms. The shrimp industry is also expected to contribute substantial financial resources for the above described analysis.

Once data are available upon which an assessment and prioritization of problems can be based, recommendations will be formulated for steps to correct the problems identified. If pesticide residue is indicated as a problem then recommendations on the use of such chemicals can be made. If mercury is present in significant concentrations, steps should be taken to modify the gold extraction industry that is the major source of such mercury pollution. The Water Quality Working Group (see Task 3 below) will provide the appropriate forum for identifying both the sources of pollutants and the governmental entities most capable of correcting the problem at its source.

Task 2: Assessment of In-Country Diagnostic Capabilities and Strengthening of Selected Laboratories

As the development of Ecuador's coastal region proceeds water quality problems are likely to increase. It is essential that in-country capabilities to assess such problems be strengthened and that mariculturists have confidence in the quality of the data in-country labs provide.

Several well-equipped laboratories have been identified in Guayaquil. Their major problem appears to be a lack of operating funds for expendable supplies, and, in some cases, funds for laboratory technicians. The marine scientist retained for Task 1 will assess the capabilities and needs of these laboratories. The project shall provide modest funding for the necessary supplies and manpower such that an intercalibration exercise and quality control procedure can be conducted.

Products. This step will result in an interim report that identifies the laboratories and personnel that will participate in an intercalibration experiment. The design of this exercise will be detailed and the funds needed for its implementation estimated.

Task 3: Design of an Integrated Baseline Data Generation and Water Quality Monitoring Program

During Year 1 of the CRMP, initial information on water quality parameters in coastal Ecuador was collected and assessed by Dr. Robert Twilley. The data were presented in a synthesis paper for the August 1986 Shrimp Mariculture Workshop. A major focus of the institutional analysis prepared by Efrain Perez and Associates was water quality. The final report by Perez, Prevencion y Control de la Contaminacion de las Aguas Costeras y Estuarinas del Ecuador, was completed in April 1987. DIGEMA staff assigned to the CRMP has continued to compile data on water quality and has surveyed the sampling and monitoring programs of the various GOE agencies.

Early in 1987, the project established a Working Group of Water Quality, composed of representatives of all governmental agencies with responsibilities for

various aspects of water quality in coastal Ecuador. This group will continue to work to coordinate their efforts and to design an integrated baseline data generation and monitoring capability. The Working Group will focus on water quality in, and near, shrimp mariculture activities. The results of Tasks 1 and 2 will be considered by the Working Group and a data collection program will be designed that is focused on the priority problems identified through Task 1 that makes best use of in-country analytical capabilities identified through Task 2.

d. Products

(1) A report presenting the data obtained on priority water quality problems that may be affecting the mariculture industry and an assessment of the significance of the problems identified. Recommendations will be made concerning potential steps to be taken in order to correct or mitigate the problems identified as well as the priority need for further research and monitoring.

(2) An assessment of the in-country capabilities to conduct the analysis identified as most necessary through Task 1 as well as recommendations for strengthening and supporting such laboratories over the long term.

(3) An integrated scheme for developing baseline water quality data and a monitoring program for the coastal waters of Ecuador that integrates the capabilities of the several private sector and governmental agencies involved and focuses upon priority water quality problems.

e. Responsibility

A consultant will be retained by URI to lead the activities described in Tasks 1 and 2. The consultant shall identify laboratories to conduct the analyses required for Task 1. The DIGEMA staff assigned to the project and the In-Country Project Manager will continue to oversee the work of the Water Quality Working Group.

3.4 Evaluation of Coastal Processes in Ecuador Related to Development Trends and Construction Practices

a. Background and Progress

This task was to be supported by Year 2 funds from AID/Ecuador. Since these funds were first received in July 1987, most of the work has been rescheduled for Year 3. However, URI/S&T funds were utilized for preliminary work, including one series of flights and site visits to the coast conducted by Jon Boothroyd and Hector Ayon in February 1987. More detail can be found in the Year 2 Progress Assessment.

b. Objectives

(1) To evaluate the existing data base on coastal processes in Ecuador.

(2) To survey the Ecuadorian coast and to identify problems and opportunities posed for coastal development in selected areas.

(3) To characterize important geomorphological and development processes along the coast through maps, photos and an accompanying report.

(4) To work with the provincial profiling team to make initial recommendations to the CRM Program regarding a shoreline classification scheme and shorefront development standards.

c. Tasks

(1) Review the available database at ESPOL and CLIRSEN as well as the reports and atlases assembled by the CRMP staff.

(2) Assess the capabilities of the staff at CLIRSEN and ESPOL to develop and analyze information on coastal processes.

(3) View and graphically document the condition of the entire coast from a small locally rented airplane as well as visits to selected problem areas. Prepare sets of maps which index the collected photos, indicate shoreline types and uses, and note the relationship between shore types and sound siting and construction practices.

(4) Identify coastal areas and/or activities that pose priority issues for the CRM Program and focus upon these areas and/or activities in developing preliminary recommendations for construction standards, setbacks, areas unsuitable for development in addition to areas where specified development activities are appropriate.

(5) Develop recommendations for shorefront construction standards including setback provisions and guidelines for building erosion control facilities, port facilities and other structures that are directly affected by coastal processes.

(6) Present the draft maps and recommendations at a workshop for representatives of groups involved in funding, designing, constructing and regulating construction in shoreline areas.

d. Responsibility

The principal contractor(s) will be retained by URI.

e. Products

A report, with supporting maps and photographs, as appropriate, that addresses the following topics:

(1) Availability of information and expertise in Ecuador on coastal geomorphology related to development strategies, including (a) recommendations for priority development problems and opportunities along the coast as these relate to development strategies, and (b) recommendations for priority training needs.

(2) An assessment of the priority development problems and opportunities along the coast as these relate to geomorphological processes and development trends.

(3) A preliminary version of a shoreline use classification scheme and shoreline development standards.

(4) Recommendations for priorities for further planning, policy development and research.

3.5 Coastal Province Profiles

a. Background and Progress

This work element was the major project activity during Year 2. The major subcontractor, Fundacion Pedro Vincente Maldonado, began work in October 1986, and completed first drafts of four province profiles as well as a regional overview of coastal Ecuador by August 30, 1987. A complete review of progress can be found in the Year 2 Progress Assessment.

b. Objectives

(1) To complete the review and final editing of the four coastal province profiles and regional overview and distribute them.

(2) To conduct follow-up workshops in each coastal province.

(3) To prepare a concise document summarizing the findings and conclusions of the profiles for wide distribution in English and Spanish.

c. Tasks

Task 1: Completion of Coastal Province Profiles

The second draft of the five documents submitted by Fundacion Maldonado at the end of Year 2 will be carefully reviewed for content and editing by CRMP and URI staff. Final comments will be submitted to the subcontractor so that complete camera-ready versions of the documents can be prepared and published by Fundacion Maldonado.

Task 2: Follow-up Workshops

A second workshop will be held in each province to review the final versions of the coastal province profiles. The workshops will be led by the CRMP in-country director and shall focus on the coastal issues identified and the setting of priorities among those issues.

Task 3: Synthesis of the Coastal Province Profiles

A special report will be prepared in English and Spanish which summarizes the results of the coastal province profile work, including key findings, common issues and site-specific concerns of greatest importance to coastal resources management. The publication of the report will follow shortly after the second round of workshops is completed, and will be carried out jointly by CRM project staff and a consultant. The document will be a relatively short, high quality publication emphasizing graphic presentation of information on coastal resources and trends in their use. Preparation of the document will require additional interviews and data gathering to supplement the coastal province profiles.

d. Responsibility

Task 1 will be completed primarily by Fundacion Maldonado with the active involvement of CRM project staff. The lead responsibility for the follow-up workshops will be CRM project staff. The preparation of the synthesis of coastal province resource use and issues will be assigned to a consultant working with CRM project staff.

e. Products

(1) The publication of a regional overview of coastal Ecuador and profiles of coastal resources, their uses and issues in Esmeraldas, Manabi, Guayas and El Oro.

(2) Follow-up workshops in each province.

(3) The publication of a synthesis of the resources and issues in the four coastal provinces.

3.6 Mangrove Management

a. Background and Progress

During its second year, the CRMP formed a Mangrove Working Group that included representatives of government agencies, the private sector, and academic institutions responsible or interested in mangrove management. This working group held

several meetings to discuss development of a cooperative management project. A forester identified by DIGEMA, Alexandro Bodero, led this effort.

The mangrove working group is active and continues to expand its membership. The first training workshop held in Esmeraldas in July 1987 was well attended. A detailed paper on mangrove management was prepared and presented to the First Environmental Congress in February 1987, by Luis Arriaga and Jose Vasconez. The mangrove working group developed proposals for pilot management projects.

b. Objectives

(1) To provide training for project staff and working group members in mangrove ecosystem management.

(2) To conduct pilot programs demonstrating and testing mangrove ecosystem management techniques including multiple use and restricted use approaches.

(3) To establish awareness of world experience in mangrove ecosystems management among institutions, the private sector, and academic centers responsible for the management of mangrove ecosystems in Ecuador.

c. Tasks

Task 1: Training/Demonstration Project Planning

A second mangrove management workshop will be held for Guayas and El Oro provinces, following the approach used in the first session in Esmeraldas. Following the results of the workshop, the Mangrove Working Group will plan a conference on mangrove management for interested groups in Ecuador. A team of international experts in mangrove ecology and management will work with the Mangrove Working Group to design and develop protocols for an ecological cost/benefit analysis of mangrove conversion in Ecuador. The conference will focus on designing the demonstration study and developing a process to incorporate its findings into Ecuador national policy on mangrove ecosystem maintenance.

Task 2: Pilot Mangrove Management Programs

During the workshop (Task 1), detailed proposals for evaluating the ecological costs and benefits of Ecuador's mangrove ecosystems in specific locations will have been prepared. In this task, the pilot project will be implemented. The Mangrove Working Group has already identified several possible study sites. The legal and institutional implications of the techniques explored in the pilot project will be examined by E. Perez, who is also helping develop the national CRM strategy.

Task 3: Mangrove Monitoring

Aerial and ground techniques for rapidly updating changes to mangroves, building upon the excellent work of CLIRSEN in 1984, will be identified and tested in order to identify areas actively being utilized or damaged, and to select priority zones for enforcement and management techniques, as well as evaluate the success of mangrove protection policies.

d. Responsibility

CRMP personnel will be responsible for the program with the DIGEMA forester acting as a consultant. Foreign consultants will be identified to assist in the training workshop and conference and to develop proposals for applied, analytical research in mangrove ecosystems. Consultants will be selected to develop and implement techniques for mangrove use and change monitoring.

e. Products

(1) Second provincial workshop on mangroves.

(2) Conference on mangrove habitat conversion.

(3) Specific proposals/protocols for pilot project(s).

(4) Functioning pilot projects.

(5) Report on ecological costs/benefits of mangrove conversion.

3.7 Proper Design and Siting of High Priority Development in the Coastal Fringe

a. Background

During the process of preparing profiles of major issues in the four coastal provinces of Ecuador, some common themes emerged which linked pressing needs for economic development along the coast with the question of how to best locate the activities and physical facilities required to support this development. In each province, the development process has been disrupted by a lack of local capacity to develop specific project plans of sufficient quality to present to funding sources. This is compounded by the absence of systematic development programs which can insure that necessary infrastructure such as roads, water supply, and wastewater disposal is ready to support specific new developments. The result has been underutilization of coastal areas and resources on the one hand, and some serious errors in siting activities which have resulted in direct loses of new opportunities for multiple use of coastal areas.

The widely acknowledged need for project planning at the local level presents a unique opportunity for the CRM project to work directly with the private and public sectors to prepare plans and project designs which incorporate sound siting techniques to avoid use conflicts and protect resources.

b. Objectives

(1) To introduce coastal resource management concepts and techniques through assistance in development planning in the coastal area of the four provinces.

(2) To prepare preliminary project designs and siting plans which can be used as the basis for acquiring funding and project implementation

(3) To build the capability for resolving resource use and siting conflicts through intersectoral planning during project development.

c. Tasks

Task 1:Identification of Projects for Site Planning and Analysis

The CRM project staff will gather additional information on priority issues and projects in each province during the review of the coastal province profiles and the follow-up meetings in each coastal province. CRM staff will identify project proposals related to access to transportation and along the coast, water pollution control, artisanal fisheries development, tourism resource development, impacts of urbanization on coastal resources, and use conflicts in coastal resources. Each project should provide an opportunity for engaging local people in a planning process, have the potential to make a direct contribution to economic development and quality of living in a coastal area, as well as solving a resource use or siting conflict or intersectoral decision making problem. A mix of three to five small and large scale projects will be selected from a list of candidate projects for each province.

Task 2: Preparation of Project Reports

An expert team will be formed to work in selected coastal provinces to analyze the proposals. This will include Ecuadorian and expatriate consultants in economics, geology, engineering and ecology. The team will work with local counterparts to prepare a report which includes a justification for the project, specifies facility requirements, recommends proper siting methods, estimates costs and identifies next steps for project funding and implementation, including needed technical studies or conflict resolution.

The reports are intended to strengthen local planning in coastal areas, and will reflect these local priorities and concerns for coastal area development to the government of Ecuador. They will also fill the need by international donor agencies for properly conceived and designed projects. The project team will meet with these funding and donor agencies in advance to learn about their priorities and information needs in advance.

When completed, the collection of reports will provide a source book for specific projects which address priority resource development and problem solving efforts and therefore will be highly attractive for funding. The process of developing the projects will provide the CRM project team, local participants and agencies with experiences in identifying and resolving use and siting conflicts from an intersectoral coastal resources management perspective.

d. Responsibility

CRM project staff and a team of expert consultants to be identified by the URI/AID project.

e. Products

(1) List of candidate project proposals in each province.

(2) Planning activities in each province assisted by expert teams which follow upon the coastal province profile effort.

(3) Project development reports for 3-5 specific proposals in each coastal province for use by local officials, national planning and funding agencies and international donors.

3.8 Training

a. Background

Training is an integral aspect in program development for the Ecuador CRMP. During the project's first two years, the following training activities took place: a two-week CRM Orientation/Study Tour for core CRMP staff; an in-country Environmental Impact Assessment Short Course; participation by core Ecuadorian CRMP staff in the International Conferences on Wetlands and Coastal Management held in Brazil in 1986; participation in Ecuador's Environmental Congress; and participation in the URI/AID Roundtable on "How Should the Problems of Implementation Affect CRM Program Design?" and participation in Coastal Zone '87, an international conference in coastal resources management.

During 1986 and into early 1987, a CRMP Training Issue Team was convened by URI to develop an overall strategy for training for the URI/AID CRM Project. This team reviewed both international and domestic training programs, the skills required by CRM managers, and available CRM training materials. The team developed an approach to teaching CRM and an outline for a six-week short course on "The Design and Implementation of Effective CRM Programs."

b. Objectives

1. To develop and implement a project training plan on CRM Program Design and Implementation and selected CRM issues.
2. To enhance Ecuador's capability to provide CRM training and education opportunities.

c. Tasks

Task 1. Develop and Implement a Training Plan

In collaboration with the URI Training Coordinator, a training plan for the Ecuador CRM program will be developed. The training plan will draw from the approach and materials prepared by the URI training issues team and the documents prepared through the Ecuador CRM project including the provincial profiles and synthesis, the diagnostic background papers on shrimp mariculture in Ecuador, and the institutional/legal analysis paper for CRM in Ecuador. The training plan will include the following elements:

1. Courses, Seminars, Workshops. Recommendations for the content, participants, faculty and schedule for:
   a. training sessions for mid and upper level Ecuadorian officials and NGO representatives on the design and implementation of effective CRM programs.
   b. sessions on CRM issues and management approaches for educators and technical level officials to introduce CRM project reports and encourage research and training activities in universities and schools.

c. workshops on local coastal issues, policies and problems of implementation and enforcement for port captains, field personnel of agencies and officials who will likely be involved in future efforts to develop and enforce coastal resource use controls.

2. Resource People. A review of individuals and institutions who can provide elements of training in CRM.

3. Plan for Developing Required Training Materials

4. Budget. Estimated costs for proposed training plan, including budgets for each proposed training activity.

d. Responsibility

Fundacion Pedro San Vincente Maldonado will be contracted to undertake this work. They will work in close cooperation with the URI Training Coordinator.

e. Products

1. CRMP-Ecuador Training Plan

2. Course curriculum and materials for courses, workshops and seminars described in the plan.

2. Final reports and evaluations on all courses, seminars and workshops.

3.9 Publication of the Proceedings of the Shrimp Mariculture Workshop

a. Background and Progress

During Year 1, the major activity for the CRM Project was to make an assessment of the shrimp mariculture industry. Eleven experts were retained to produce "synthesis papers" on a wide range of topics affecting the present condition and future prospects of the industry. These papers were the bases for a four-day workshop held in Guayaquil, August 4-7, 1986. The workshop was attended by representatives of the industry, involved governmental agencies, academic, and non-governmental organizations. The sessions were devoted primarily to facilitated discussions that focused upon the accuracy of the data presented, priorities for action and priorities for research. The public policy

issues raised by the problems and opportunities posed by the mariculture industry were discussed in depth.

This assessment process resulted in two products: corrected, edited versions of the background papers that will be released as a book, and a brief synthesis of findings and recommendations for an integrated management strategy produced by the CRM project staff. Both are in Spanish and English.

b. Objectives

To complete publication of the workshop proceedings in Spanish and English.

c. Tasks

(1) To prepare final layout for the edited English versions of the workshop papers, and to obtain Spanish translations and layout for the Spanish version.

(2) To identify printers for the English and Spanish volumes and submit camera-ready copy.

(3) To print and distribute English and Spanish volumes.

d. Responsibility

URI/AID staff in Rhode Island and Guayaquil, Ecuador.

e. Products

Publication and distribution of printed volumes of the shrimp workshop papers in Spanish and English.

Ecuador Project Schedule
October 1, 1987 to September 30, 1988

Work Plan Element	O	N	D	J	F	M	A	M	J	J	A	S
3.1 ADMINISTRATION												
Slide Show		X										
Brochure	X											
DIRECTORIO												
Field Trip						X						
3.2 CRM STRATEGY												
Initial interviews	X											
Discussion paper on options		X										
Roundtable					X							
Strategy paper (final report)						X						
Report on mangroves						X						
Report on shoreline classification								X				
Report on water quality management											X	
3.3 ASSESSMENT OF WATER QUALITY												
Design of pollutants assessment				X								
Conduct assessment					X	X	X					
Report on assessment results								X				
Assess lab capabilities and needs				X	X							
Interim report 2					X							
Intercalibration experiment								X		X		
Monitoring program design				X								
Monitoring program implementation				X	X	X	X	X	X	X	X	X
Final report on assessment											X	
Paper on pollution control options												X

	O	N	D	J	F	M	A	M	J	J	A	S
3.4 COASTAL PROCESSES												
Second field trip				X								
Base map preparation						X						
Draft recommendations						X						
Workshop								X				
Final recommendations										X		
3.5 COASTAL PROFILES												
Printing and distribution			X									
Second workshops												
Guayas		X										
El Oro				X								
Esmeraldas					X							
Manabi						X						
Synthesis: regional perspective		X										
Synthesis legal chapter		X										
Synthesis: coastal province issues				X								
Final synthesis document						X						
Printing							X					
3.6 MANGROVE MANAGEMENT												
Initial workshop #2	X											
Expert consultants visit and tour												
Demo project final design				X								
International workshop												
Monitoring contractor retained												
Monitoring report												

	O	N	D	J	F	M	A	M	J	J	A	S
3.7 PROPER DESIGN OF PRIORITY PROJECTS												
Selection of areas and issues							X					
Field analysis										X		
Report												X
3.8 TRAINING												
Training plan						X						
Short course												
Workshop for educators/technicians												
Workshops for local officials												
3.9 SHRIMP WORKSHOP PROCEEDINGS												
English final drafts	X											
Spanish final drafts		X										
Layout and graphics		X										
Spanish translations				X								
Printing												
English			X									
Spanish						X						