

Technical Assistance to
Barbados AID Mission
"Development of RFP for Marine Resources
Assessment in the Eastern Caribbean"

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I. BACKGROUND

The eight eastern Caribbean island nations served by the Caribbean Rural Development Office of USAID stretch in a 600 km arc from Barbuda in the north to Grenada in the south. The total population of these islands is 800,000 people, total land mass is 3,700 km², and their economies are based primarily on agriculture and tourism. They are all former British colonies, having achieved independence during the last twenty years.

The traditional fisheries are small in scale and are primarily carried out in nearshore coralline shelf areas by an estimated 10,000 fishermen and 4,000 small boats which employ wire traps, hand lines, beach seines and gill nets to harvest a variety of demersal and coastal pelagic fish species. Production of nearshore demersal species is limited by the available amount of shelf area around the islands (8,000 km²). Some boats are equipped with in-board or out-board engines, but navigational equipment and radios are generally not used. Although some attempts are underway to enhance the production of local wild stocks with artificial reefs and with raft culture, mariculture on these islands is largely non-existent. Total reported production of fish and shellfish from the islands in 1980 was 13,500 metric tons and represented approximately 10% of the total catch of reef and coastal pelagic species (excluding menhaden) in the entire western Central Atlantic Ocean.

For the most part, fish are caught on a daily basis and marketed fresh to local markets. Ice is not generally used. Demand for fish in the islands exceeds supply and over half of the fish consumed is imported. Per capita

consumption of fish on many islands is greater than twice the world average. Considerable demand for high-priced seafood exists in the U.S. and in the region because of the considerable tourist trade. The supply of some pelagic species (e.g., flying fish) is extremely seasonal and leads to quickly saturated markets because of limited processing capabilities, storage space, and freezing capacity.

Despite the fact that primary productivity rates of tropical oceanic environments are low and the shelf area surrounding these islands is limited, there is some expectation that harvest in nearshore habitats can be improved by refining existing small-scale capture technologies; the greatest potential for increasing production from these fisheries may lie in improving handling, processing, and marketing activities. At the same time, a number of underutilized resources have been identified in the Caribbean which could increase the production of island-based small-scale fisheries in the region if new harvest strategies are combined with increased resource utilization efforts. These underutilized resources are coastal and off-shore pelagic species (such as small tuna), sharks, and stocks of deep-water snapper and grouper species which inhabit the edges of island shelves and offshore banks. There is also potential for increased use of artificial reefs to increase the catch of nearshore fish and lobster stocks, raft culture for shellfish and macroalgae, shore-based culture of shrimp and other invertebrates, the use of mid-water fish attracting devices to provide additional shelter for schooling pelagic species, and pelagic long-line and trolling gear.

Although small-scale capture fishery and mariculture enterprises are technologically simple, they are composed of a complex number of inter-related

activities which involve production, processing, marketing, and consumption. At the same time, this entire system of inter-related activities functions within the context of many economic, political, legal, institutional, and sociocultural factors. Failure to account for the integrated nature of small-scale fishery/mariculture systems has led to the failure of many development projects.

II. OBJECTIVES

The objective of this work is to provide a multi-disciplinary assessment of the potential for small-scale fishery/mariculture development in the eastern Caribbean and to recommend appropriate development strategies.

This assessment will identify the full range of constraints and opportunities within production, processing, marketing, and consumption sectors which limit or enhance development of small-scale capture fisheries and mariculture enterprises in the eastern Caribbean. The firm will identify action to alleviate or relieve these constraints, determine which sectors have the greatest potential to respond to increased investment, and recommend development strategies and project activities for the utilization of AID assistance. Development recommendations should be consistent with the wise use of the coastal zone and fishery resources in order to avoid detrimental environmental impacts and resource depletion.

III. SCOPE OF WORK

The contractor will work with government and private sector

representatives to describe elements and activities of the small-scale fishery/mariculture system in the eastern Caribbean. The contractor will rely on personal interviews and observations, secondary data sources available in the region and by country, recent studies and reports by USAID, regional institutions and other donors such as the World Bank, IDB, CIDA, FAO, EDF, UNDP and others as sources of information for this assessment. No formal primary data collection activities are anticipated or required, but individual investigators are expected to conduct field work as necessary to obtain the required information. During collection of information and data, the contractor will be required to investigate past and ongoing small-scale fishery/mariculture projects in the region and to determine reasons for their success or failure in addressing development needs.

To achieve the objectives described in II above, the following specific inter-related tasks will be necessary.

Task A - Describe Present Status of Capture Fisheries and Assess
Potential for Increased Production

This task will require a review of available information on existing small-scale fisheries and resource potentials in the eastern Caribbean. This review will include: (1) available resource survey/exploratory fishing information; (2) descriptions of local small-scale fishing operations and habitats; (3) available fishery statistics; (4) assessments of resources which are currently being harvested or could be harvested by small-scale fishermen in the region; (5) a survey of reported incidents of fish poisoning (e.g.

ciguatera) in the region; and (6) a survey of fishery research institutions which serve the region.

The potential for development of the following underutilized resources will be assessed: sharks, deep-water reef species, coastal and off-shore pelagics, and crustaceans and other invertebrates. If possible, this assessment should include an evaluation, on a country-by-country basis, of the degree to which near-shore resources (e.g., demersal reef fish and spiny lobster) are currently being overexploited and the potential for increased production in this habitat. It should also identify the types of appropriate technologies needed to harvest underutilized resources. Consideration should be given to the biological implications for management of any recommended change in harvest or marketing strategy which could lead to increased catches of any given resource.

This task will be primarily performed by a marine fishery biologist/gear specialist who will work in conjunction with other team members to identify economic, socio-cultural and legal/institutional constraints on increased capture fishery productivity.

Task B - Review Present Status of Capture Fishery Market Sector
Activities and Assess Potential for Improved Resource
Utilization Procedures

This task will require a country-by-country survey of existing handling, processing, marketing, and distribution facilities and activities, relying primarily on published information, interviews, and direct observations.

Observations of fish landing and marketing practices will be limited to several selected landing sites in each country. Also required will be an analysis of existing market practices, identification of inefficiencies within the system which impede the utilization of currently exploited resources and determination of what market modifications would be required in order to market increased landings of currently exploited or under-utilized stocks. This market analysis will include a survey of available credit sources, labor, and infrastructural constraints (e.g. roads, ice, communications, boat and gear supplies/repairs, docks, fuel) to current or enlarged market operations. Special consideration should be given to the costs and benefits of relatively simple technological improvements in fish processing, e.g., drying, salting, icing, and smoking of fish. Evaluation of potential markets should include export, tourists, and local populations.

This task will be assigned to a resource economist who will work in conjunction with a fishery biologist/gear specialist, a socio-cultural analyst, and a legal/political specialist. The biologist will identify those species most likely to be landed in greater quantity and provide information on their seasonality. The other two specialists would help identify socio-cultural and legal/institutional constraints on market operation.

Task C - Review Present Status of Mariculture Efforts in the
Caribbean and Assess Potential for Development

This task requires an objective country-by-country study of the potential for mariculture development in the RDO/C region. (By mariculture we mean any manipulation in the habitat and/or life history of a marine organism

which will increase its sustainable yield as a food resource). This task will require a survey of the biological as well as the economic feasibility of any potential project as well as its socio-cultural practicability and political acceptability. This study should include on-site evaluations of the feasibility of adopting existing mariculture techniques which have proved successful in other locations in the Caribbean. Special emphasis will be placed on locally available organisms and simple technologies. These technologies could include such simple manipulations as artificial reefs and rafts. Acceptable objectives for any mariculture project would include: (1) increase the supply of locally available, low-cost marine protein; (2) improve the yield of wild stocks harvested by conventional fishing techniques; (3) generate foreign exchange by producing high-value foods or other marine products for export or for sale to local restaurants.

This task will be performed by a mariculture specialist and a resource economist with assistance from a socio-cultural analyst and a legal/institutional specialist. An additional role may be required of a fishery biologist/gear specialist if mariculture development possibilities include the enhanced production of stocks harvested by conventional methods.

Task D - Identify Socio-Cultural Constraints on Current and
Proposed Production, Marketing, and Consumption
Activities

Previous work has shown that socio-cultural features of marine production-marketing-consumption systems such as crew composition, kinship involvement, attitudes, and beliefs may play important roles in the current

functioning of small-scale fishery systems and may significantly affect the success or failure of proposed changes in these systems. This analysis will require a country-by-country assessment of socio-cultural features of current marine resource production, marketing and utilization practices and identify socio-cultural constraints on current and proposed production, marketing, and consumption patterns. The task will include an assessment of the severity of identified constraints.

The task will require a review of previous studies and experiences in development projects and socio-cultural assessments in tropical small-scale fisheries. Information will also be obtained through personal interviews and observations on a country-by-country basis. This task will require the services of a socio-cultural analyst who will work in conjunction with all other team members.

Task E - Identify Legal/Institutional Constraints on Current
and Proposed Production and Marketing Activities

The purpose of this task is to produce information which will complete the assessment of constraints on capture fishery, mariculture, and marketing development potentials in the region. It is anticipated that most of the information will be collected during on-site visits to RDO/C countries. Specific types of information which are required include: 1) a summary of resource management and territorial sea regulations which might currently limit production by various capture fisheries or could limit the activities of more efficient or mobile vessels; 2) legal constraints to mariculture development such as land use policies and regulations; and 3) environmental

protection regulations which could limit waste disposal at mariculture or processing facilities. This task will also include a review of previous and on-going national and international fishery development projects in the region and a description of the activities of all agencies which promote regional cooperation in fishery management, development and trade, and the ways in which the actions of these agencies might affect prospects for small-scale fishery or mariculture development. As indicated in previous task statements, a legal/institutional analyst will perform this task and will work closely with other team members.

Task F - Recommend Strategies and Project Activities
for Small-Scale Fishery/Mariculture
Development in the Region

This task will require a complete evaluation of all the information generated in Tasks A - E. Development strategy and project activity recommendations will be formulated by the entire assessment team and will address development needs in individual countries and/or on a regional basis, as needed. They will be included as part of the final report (see Appendix A).

IV. PERSONNEL AND TERMS OF WORK

In the performance of the tasks described in the Scope of Work, it is expected that all specialists listed below will function as a team since the multi-disciplinary nature of the assessment will require coordinated information retrieval and analysis. One of the U.S. team members will be designated by the contractor as the team leader; this person will assume

overall responsibility for the coordination of on-site assessment activities and for preparation of the final report. This individual must have previous experience and demonstrated competence in managing a multi-disciplinary field project and in preparing a written report which integrates the combined efforts of different specialists working in different fields. An additional four weeks, not specified in the following individual task descriptions, will be allotted to the team leader for preparation of the final report.

1. Marine Fishery Biologist/Gear Specialist

Qualifications: Fisheries Biologist with Ph.D. and at least five years experience in stock assessment techniques. This person should be familiar with fishing practices used in tropical small-scale fisheries; preference will be given to someone with appropriate work experience in the Caribbean.

Term of Work: Total eight weeks with two weeks initial literature review, four weeks on-site, and two weeks for analysis and preparation of report.

2. Mariculture Specialist

Qualifications: Biologist with M.S. or Ph.D. in appropriate field with minimum of five years experience in mariculture research and development and/or direct experience in a mariculture enterprise, and a demonstrated ability to conduct an objective appraisal of mariculture potential in the region.

Term of Work: Eight weeks total effort with two weeks initial literature review, four weeks on-site, and two weeks report preparation.

3. Resource Economist/Marketing Specialist

Qualifications: Ph.D. Resource Economist specializing in marine fishery economics and marketing with at least five years of experience. Some experience with small-scale fishing operations in under-developed countries is required.

Term of Work: Eight weeks with two weeks for review of published information, four weeks on-site and two weeks for analysis and preparation of report.

4. Socio-Cultural Analyst

Qualifications: Ph.D. Anthropologist/Sociologist with minimum of 5 years experience in small-scale fisheries or other related marine development work.

Term of Work: Total six weeks, one week for initial literature search and interviews in U.S., three weeks on-site, two weeks for preparation of report.

5. Legal/Institutional Specialist

Qualifications: Political Scientist, Lawyer, or Political

Geographer with appropriate advanced degree and at least five years experience in marine/coastal zone legal and political issues.

Term of Work: Six weeks total with one week in U.S., three weeks on-site, and two weeks to summarize findings and prepare a report.

6. Regional Advisor

In addition to the above personnel, the assessment team will include a regional advisor who will be selected by the contractor on the basis of his/her knowledge of regional fishery and mariculture development needs. This advisor will assist in the identification of appropriate counterpart individuals in each country and will work with the project leader to provide guidance in the formulation of development recommendations.

Qualifications: Local resident with at least five years direct experience working in small-scale fishery administration and/or development. This person should have experience working with a broad range of fishery related issues including gear, resources, and marketing and should be familiar with local fishery institutions and current and historical small-scale fishery development efforts in the region.

Term of Work: Available as needed for a maximum period of two weeks.

The following table summarizes term of work specification (in man weeks) for the assessment team according to time spent on-site and in the U.S. for initial review and final report preparation.

<u>Specialist</u>	<u>Literature Review</u>	<u>On-Site</u>	<u>Report</u>	<u>Total</u>
Fishery biologist	2	4	2	8
Resource economist	2	4	2	8
Mariculture specialist	2	4	2	8
Socio-culture analyst	1	3	2	6
Legal/institutional specialist	1	3	2	6
Team Leader*			4	4
Regional Advisor	—	<u>2</u>	—	<u>2</u>
TOTAL	8	20	14	42

* One of the U.S. team members will spend an additional four weeks (i.e., beyond their regular term of work) for final report preparation.

EVALUATION CRITERIA

The following weights will be assigned to the major categories of evaluation criteria below in ranking qualified offerors:

1. Qualifications and Experience of Personnel - 30%

Each specialist must meet minimum qualification requirements described in Scope of Work statements. Resumes and biographic data of every professional staff member to be assigned must include:

- A. Education, including degrees and areas of specification;
- B. Employment history, including specific duties and levels of responsibility;
- C. Research and field experience in marine and development related issues, particularly in the Caribbean and other tropical LDC regions, with specific mention of experiences in integrated, multi-disciplinary, small-scale fishery/mariculture research and/or development work;
- D. Publications and appropriate reports, seminars, etc.

2. Experience of Contractor - 20%

The contractor's experience and successful completion of research and/or development work in small-scale fishery and mariculture activities will constitute 20% of the weighted evaluation. In this regard, the contractor should provide a firm/institution capability statement and a summary of previous relevant activities undertaken by the contractor.

3. Proposer's Understanding of the Statement of Work Required - 50%

30% - Understanding the dimensions of the problem as expressed by an operational strategy (plan of work) which demonstrates the contractor's capability to coordinate information retrieval and analysis and to produce a comprehensive and integrated assessment of small-scale fishery/mariculture development needs in the region. This plan of work will be evaluated in terms of the proposed timetable of individual and group task performance and coordination of efforts.

10% - Completeness of response to the conditions of the RFTP and the overall quality of the proposal.

10% - Innovative suggestions in the proposal which may strengthen the operational strategy and the ability of the proposer to meet the project objectives.

APPENDIX A

SUGGESTED FORMAT FOR FINAL REPORT

The following outline and categories should be used as a guide for preparing the final assessment/report. Items may be added or deleted as necessary, but all major headings must be addressed.

- I. Executive Summary
- II. Review of Harvest and Marketing Sectors By Country
 1. Harvest sector
 - A. Production
 - 1) Species composition
 - 2) Quantity and value of landings (by gear type)
 - 3) Seasonality (by species type)
 - B. Location and extent of habitats and fishery grounds
 - C. Gear and vessels
 - D. Landing sites (location, number of boats, species landed, etc.)
 - E. Fishing communities (size, location)
 - F. Sources of credit, gear, supplies, repairs, etc.
 - G. Producer organizations
 - H. Fisheries research facilities
 - I. Other
 2. Marketing sector (includes handling, processing and distribution)
 - A. Infrastructure (e.g., ice, roads, port facilities, communications, storage, etc.)
 - B. Per capita and total fish consumption
 - C. Imports/exports
 - D. Tourist market
 - E. Location of wholesale and retail markets
 - F. Government policies affecting marketing

- G. Types of seafood products available (local and imported)
 - H. Food preferences
 - I. Fish handling procedures
 - J. Distribution methods
 - K. Processing facilities and procedures
 - L. Socio-cultural profile of harvesting and marketing activities
3. Summary of common elements of harvesting and marketing sectors in the region

III. Mariculture

- 1. Review of existing mariculture efforts (projects, enterprises) in the eastern Caribbean, to include a description of:
 - A. Locations
 - B. Facilities/technology
 - C. Personnel/necessary skills
 - D. Funding on capital invested
 - E. Production
 - F. Markets
 - G. Problems
- 2. Description of existing mariculture technologies in use elsewhere in the Caribbean which could be transferred to the region, to include appropriate elements listed above.
- 3. Inventory of organisms in the region with potential for mariculture, including a review of known life history characteristics.
- 4. Evaluations of potential markets for different mariculture products.
- 5. Survey of habitats with potential for increased production through manipulation (e.g., use of artificial reefs, fish attracting devices).

IV. Constraints to Development

1. Increased production

A. Capture fishery

- 1) Biological (resource base)
- 2) Economic
- 3) Socio-cultural
- 4) Legal/political

B. Mariculture

- 1) Biological
- 2) Economic
- 3) Socio-cultural
- 4) Legal/political

2. Resource utilization

A. Capture fishery

- 1) Economic
- 2) Socio-cultural
- 3) Legal/political

B. Mariculture

- 1) Economic
- 2) Socio-cultural
- 3) Legal/political

3. Summary of development constraints in the region

V. Development Strategy and Recommendations

1. Capture fishery

A. By country

B. Regional

2. Mariculture

A. By country

B. Regional

3. Capture fishery/mariculture linkages

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