



CARICOM Fisheries Unit



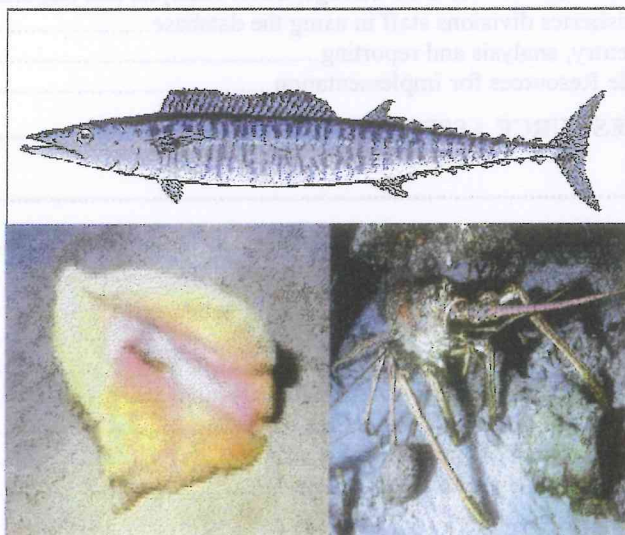
Dominican Republic



European Union

Integrated Caribbean Regional Agriculture and Fisheries Development Programme - Fisheries Component

WORK PROGRAMME FOR THE DOMINICAN REPUBLIC (April 2000 – March 2005)



Prepared By

Fisheries Department of the Dominican Republic and
CARICOM Fisheries Unit, Belize

October 12, 2000

Funded by the Commission of the European Union
Under Lomé IV - Project No. 7: ACP: RPR: 385

TABLE OF CONTENTS

LIST OF ACRONYMS.....	IV
EXECUTIVE SUMMARY	V
BACKGROUND.....	1
About The Work Programme	1
Introduction	1
WBS 300: FISHERIES MANAGEMENT DATA SYSTEMS.....	3
PLANNED ACTIVITIES	4
WBS 311/321: Review the Data Collection and Management Systems.....	4
WBS 312: Enhance Data Collection Plans Covering the Major Fisheries	5
WBS 313: Train Fisheries Divisions Staff in Data Collection	6
WBS 314: Database software for data storage, basic analysis and reporting	6
WBS 315: Train Fisheries Divisions Staff in Using the Database Software for, Data Entry, Analysis and Reporting	7
WBS 316: Provide Resources for Implementation.....	8
WBS 317/326: Preparation of Articles and Technical Reports	8
WBS 318/327: Monitoring and Evaluation	8
WBS 320: LICENSING AND REGISTRATION SYSTEM.....	8
WBS 322: Enhance Licensing and Registration System.....	8
WBS 323: Database Software for Data Storage, Basic Analysis and Reporting.....	9
WBS 324: Train fisheries divisions staff in using the database.....	10
software for, data entry, analysis and reporting.....	10
WBS 325: Provide Resources for Implementation.....	10
WBS 400: FISHERIES RESOURCE ASSESSMENT	11
PLANNED ACTIVITIES	11
WBS 400.1: Review and analysis of historical data.....	11
WBS 400.2 Updating the fisheries activity information.....	12
WBS 400.3: Selectivity Studies.....	13
WBS 430.1: Assessment of Conch Fishery	13
WBS 430.2: Assessment of Lobster Fisheries	15
WBS 410.1: Assessment of the Deep-sea Fish Fishery	16
WBS 410.2: Assessment of Large Pelagic Fish Fishery.....	18
WBS. 410.3: Assessment of Coral Reef Fisheries.....	19
WBS. 410.4: Studies of Spawning Aggregations	20
WBS 400.4: Monitoring	20
WBS 500 FISHERIES RESOURCE MANAGEMENT.....	22
WBS 510: STRENGTHENED NATIONAL FISHERIES MANAGEMENT	22
PLANNED ACTIVITIES	23
WBS 511: National Fisheries Policy, FMP and Advisory/Decision Making Mechanism.....	23
WBS 512.1: Strategic Review and Up-grading the Organizational Structure	25
and Capability of the Fisheries Department	25
WBS 512.2: The Dominican Republic/Haiti/Bahamas/Jamaica bi-national	26
Fisheries Committees	26
WBS 512.3: Mechanism for Conflict Resolution/Management	26
WBS 520: STRENGTHENED REGIONAL FISHERIES MANAGEMENT	27

WBS 530: STRENGTHENED COMMUNITY INVOLVEMENT & PUBLIC EDUCATION	28
PLANNED ACTIVITIES	30
WBS 530.1: Multi-disciplinary Surveys.....	30
WBS 532.0: National Fisheries Workshop.....	30
WBS 535: Regional/Zonal Dialogue Groups	30
WBS 533.1: Community Mobilizing and Institutional Strengthening.....	31
WBS 533.2: Desk Top Printing Training and Information Dissemination Equipment	31
WBS 534.1: First Fisheries Officers (Extension) Training Workshop	32
WBS 534.2: Second Fisheries Field Officers Training Workshop	32
WBS 534.3: First Institutional Strengthening Workshop for Dominican Fishers Organizations	33
WBS 534.4: Second Institutional Strengthening Workshop.....	33
WBS 536: Monitoring	33
WBS 540: LONG TERM TRAINING	34
PLANNED ACTIVITIES	34
Scholarships and Short-term Training	34
WBS 550: SURVEILLANCE AND ENFORCEMENT	34
WBS 560: POST-HARVEST HANDLING PROCESSING AND MARKETING	35
WBS 570: FISHERIES DEVELOPMENT PLANNING.....	35
WBS 570.1: Technological/developmental – Community Based Pilot Project.....	35

APPENDIX I : BUDGET SUMMARY

LIST OF ACRONYMS

ACP	African, Caribbean and the Pacific States (associated to European Union)
DM	Data Manager
BDC	Biological Data Collection
CANARI	Caribbean Natural Resource Institute
CARISEC	CARICOM Secretariat
CFO	Chief Fisheries Officer
CFU	CARICOM Fisheries Unit
CFRAMP	CARICOM Fisheries Resource Assessment and Management Program
CFTDI	Caribbean Fisheries Training and Development Institute
CIDA	Canadian International Development Agency
CRFM	Caribbean Regional Fisheries Mechanism
DRAO	Deputy Regional Authorising Officer
DOF	Department of Fisheries
DSA	Daily Subsistence Allowance
ECU	European Currency Unit
EDF	European Development Fund
FAC	Fisheries Advisory Committee
FAO	Food and Agriculture Organization of the United Nations
FD	Fisheries Department
FISDC	Fisheries Institutional Strengthening and Development Component
FMP	Fisheries Management Plan
FRM	Fisheries Resource Management
GEF	Global Environmental Fund
HACCP	Hazard Analysis and Critical Control Point
IAC	International Agricultural Centre, Wageningen, The Netherlands
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICLARM	International Centre for Living Aquatic Resource Management
ICRAFDP	Integrated Caribbean Regional Agriculture and Fisheries Development Programme (EDF - funded)
IMA	Institute of Marine Affairs
LRS	Licensing and Registration System
MCS	Monitoring, Control and Surveillance
MTI	Maritime Training Institute
NGO	Non-Governmental Organisation
NFW	National Fisheries Workshops
NMFS	National Marine Fisheries Service (U.S.A.)
NRMU	National Resource Management Unit
OVI	Objectively Verifiable Indicators
PPCU	Programme Promotion and Co-ordination Unit
PRC	Program Review Committee
R & T	Research and Training
RAU	Resource Assessment Unit
RDP	Rural Development Project
SCMA	Standing Committee of Ministers of Agriculture
SFO	Senior Fisheries Officer
SVG	St. Vincent and the Grenadines
TA	Technical Assistance
TAP	Technical and Administrative Provisions (annexed to Financing Agreement)
TC	Technical Committee
TCDC	Technical Co-operation between Developing Countries
TIP	Trip Interview Program (Data collection software package)
T & T	Trinidad and Tobago
UNDP	United Nations Development Programme
UWI	The University of the West Indies
WBS	Work Breakdown Structure
WECAFC	Western Central Atlantic Fisheries Commission of the FAO, United Nations
WP	Work Programme (Work Plan/Cost Estimate/Financial Plan)

EXECUTIVE SUMMARY

This 5 – 6 years programme of support to the Fisheries Department of the Dominican Republic is made possible under the Financing Agreement between the Commission of the European Communities and the Member States of CARIFORUM under the ICRAFD programme. It will be implemented in two year Work Plan cycles within agreed areas of focus identified as sub-projects, and monitored annually under an agreed CFU – DoF arrangement.

The programme has been prepared by the Fisheries Department of the Dominican Republic in collaboration with the CARICOM Fisheries Unit (CFU) and is based on information obtained during the recent planning mission to the Dominican Republic by a team of four officers from the CFU, Belize, 19th - 24th June, 2000. The team, which was supported by a local Consultant, Mr. Miguel Silva, gathered information through literature review of existing documents, discussion sessions with fisheries staff, and meetings with policy makers and other stakeholders in the fisheries sector. Some information was also collected from interaction with respondents of the interviews conducted with the multi-disciplinary survey instruments which were administered during the mission.

Based on the resources available under the CARIFORUM Project and the constraints faced by the Fisheries Division, it will not be possible to undertake activities in all areas needed to achieve sustainable development and conservation of the fisheries resources. The Work Plan will therefore seek to address some of the critical issues affecting the fisheries sector by focusing on:

- development of clear and adequate planning and policies framework;
- improving the fisheries database, information management systems and flow of information to stakeholders for planning and management decision making;
- strengthening human and institutional capacities for resource management and conservation;
- empowerment of resource users so that they can assume greater responsibility for sustainable use and management of the fisheries ; and
- improving public awareness of the benefits and importance of the fisheries sector and the need for sustainable resource management.

Fishery management decision-making and planning must be informed by quantitative information on the structure of the sector and the status of the resources. To this end, the Project will seek to address those issues associated with providing fisheries data for assessment and management and as an effective tool for monitoring and regulating catch and fishing effort.

Therefore, with the intention of providing information for management and decision-making on a continuous basis, the Project will assist the Fisheries Division to strengthen its data collection systems to collect data on length, weight, maturity and hard parts for selected species of fish and shell fish in the respective fisheries. The resulting data, along with catch, effort, economic, social and environmental data, should permit qualitative and quantitative evaluation of the impact of the fishery on the population structure, including estimates of fishing mortality, current abundance and status of exploitation, trends in recruitment and projected future abundance, and allowable catch under given management regimes. Biomass dynamic models, length based assessment techniques/models as well as bio-economic models will be utilized in these assessments.

The project will provide technical and financial assistance to the Fisheries Department for the collection of catch, effort, biological, social and economic data for selected species and fisheries within the refined data collection system. Training will be provided to Fisheries Department staff in data collection, management and analysis. Selectivity studies for specific fishing gear such as the gillnet and traps will be conducted. Technical support will be provided for the comprehensive assessment of the conch, lobster, shrimp, shallow shelf reef and pelagic fisheries; and support will be provided for studies on marine reserves. The project will also provide support for the preparation and dissemination of the data and information obtained through the preparation of regular technical reports and articles.

Technical assistance will be provided to the Fisheries Department to strengthen the planning and policy framework and improve the system of governance. Specifically the Project will:

- i) prepare, finalize and support implementation of a comprehensive national fisheries policy;
 - ii) prepare and recommend implementation of a national fisheries management plan;
 - iii) define and establish a mechanism for providing policy advice and enhancement of participatory approaches to decision-making regarding the fisheries sector; and
 - iv) support a review and preparation of recommendations for strengthening of the organisational structure and operational arrangements of the Fisheries Department.
- The project will also seek to strengthen mechanisms for improved technical co-operation in the areas of fisheries between Dominican Republic and Haiti, Bahamas and Jamaica specifically, and among Dominican Republic and other neighbouring countries in Latin America and the Caribbean in general. In addition, support will be provided to improve understanding of the types of conflicts in the fisheries sector and aid the establishment of mechanisms for management and resolution of these conflicts.

The activities designed to strengthen Community Involvement & Education will directly tackle the major knowledge gaps and human relations problems facing the artisanal fisheries sector. These are the absence of a functional extension unit in the Fisheries Department, the absence of any fisher folk organization, the lack of awareness of conservation and management issues among resource users and the absence of effective mechanisms for enforcing management measures, and the weak links between the department and the resource users and other stakeholders.

The absence of active resource user organizations and the lack of operational linkages between resource users and the department will be addressed through a deliberate mobilizing and organizing program to be coordinated by a Fisheries Officer (Community Development Officer), and supported by fisheries field officers who will benefit from training, to build their capacity for field work organizing and mobilizing and group organizing work. They will also provide technical support to the fisher folk organizations that will eventually emerge, and provide the Public Relations input that will cement relations between the department and the resource user groups.

The plan will promote greater awareness by planning and promoting a public awareness campaign that will utilize group, print and mass media, supplemented by a radio call-in program, in which all stakeholders will be active participants. This will be supported by a National Dialogue Group of representatives of all major stakeholders that will regularly meet to deliberate on burning issues related to the improvement of the industry and the sustenance of the resources. The matters discussed by this forum will feed into the public awareness campaign. A second Fisheries Officer (Communications/Public Relations) will be recruited to direct and coordinate these activities.

BACKGROUND

About The Work Programme

The Work Programme for The Dominican Republic is a key document under which project activities are planned, implemented, monitored, and assessed. All funds and technical assistance will be provided to The Dominican Republic and spending must be based on an approved work plan. The Work Programme has therefore been prepared with the aim of providing as clearly and concisely as possible a comprehensive description of the project activities, responsibilities, budget, implementation schedule and reporting requirements.

A 5-6 year programme of support will be implemented in two year work plan cycles. This work programme is based on preliminary data garnered during the recent planning mission to The Dominican Republic by a team of four officers from the CFU, Belize, 19th - 24th June, 2000. The team gathered information through literature review of existing documents, discussion sessions with fisheries staff, meetings with policy makers and other informed stakeholders at the landing sites and communities. Some information was also collected from interaction with respondents of the interviews conducted with the multi-disciplinary survey instruments. The latter included:

- A Baseline Survey of seven (7) fishing communities in The Dominican Republic
- A Baseline Survey of the Fisheries Department of The Dominican Republic
- Key Informant Interviews
- Interviews on the status of the Data Collection programs of The Dominican Republic

The Fisheries Department will be responsible for implementing the activities in this Work Programme. Technical assistance and support will be provided by the staff of the CFU, technical experts from the other CARIFORUM Countries (through TCDC arrangements) and consultants where necessary.

Introduction

Fisheries and aquaculture presently make a significant contribution to the economies of CARIFORUM countries. This contribution can be enhanced by a combination of management and development interventions. Within the EDF Funded Integrated Caribbean Regional Agriculture and Fisheries Development Program, there is a component designed to promote the sustainable utilization and management of the fisheries of the CARIFORUM countries. The overall objective of the fisheries program is optimal utilization of marine fishery resource in CARIFORUM countries through optimal sustainable harvesting and optimal post harvest utilization of marine fishery resources. Fishery management would be enhanced by strengthening the capacity of national Fisheries Departments and regional institutions which are responsible for formulation of fishery management policy and implementation. This project is being executed by the CARICOM Fisheries Unit, located in Belize, Central America.

It is recognized that one of the fundamental problems facing the fisheries of the region is the open access, common property nature of the resource system. Accordingly, one of the main challenges faced by countries is the transformation towards a closed access system with clearly defined and equitable rights of access to the resource. Other significant problems include;

- the lack of high level support and clear policy, particularly with respect to resource management and conservation viz fisheries development;
- lack of reliable data and information for planning, decision-making and policy formulation;
- inadequate human resource and weak institutional arrangements for research, planning and decision-making at both governmental and non-governmental levels;
- inadequate resource management regimes and lack of enforcement of regulations;
- limited involvement of resource users and other stakeholders in planning and decision-making; and

- lack of public awareness of fisheries conservation and management issues and consequential lack of support for interventions designed to protect fisheries.

The CARICOM Fisheries Unit through the ICRAFD Programme will support the efforts of the Fisheries Department and seek to address some of these critical issues including: development of a clear and adequate policy framework; improving information management systems and information flow for management decision making; strengthening human and institutional capacities for resource management and conservation; empowerment of resource users and gradual transfer of responsibility for resource management to the users through co-management programs; and improving public awareness of the benefits and importance of fisheries management, thereby increasing public support and involvement in schemes for conservation and sustainable use of the fisheries resources.

It is recognized that this project does not have the resources to solve all the problems affecting the fisheries sector in The Dominican Republic. Stakeholders, including government departments, resource users organizations, NGOs, academic and research organizations in The Dominican Republic and throughout the Region must continue to commit themselves to sustainable fisheries and in this regard provide the human, financial and institutional resources needed to transform the sector into a more sustainable system.

Sustainable fisheries development and management in The Dominican Republic will be enhanced by technical assistance to the Fisheries Department and other national and local organizations associated within the fisheries sector. That will be accomplished through the following activities:

- Strengthening National and Regional Fishery Management Policy and Planning capability;
- Promoting the establishment and formalizing Advisory/Decision-Making mechanisms at the national level;
- Establishing or Enhancing Fisheries data collection and Management Systems;
- Establishing or Enhancing Licensing and Registration Systems for fishermen and fishing vessels;
- Establishing Mechanisms for participation of fishers and fishing industries in Fishery Management;
- Enhancing public awareness of fisheries management issues;
- Enhancing Linkages and cooperation between Government fisheries officials and stakeholders in The Dominican Republic and Haiti, Bahamas and Jamaica;
- Strengthening national Human Resource Capability through Training;
- Assessing the Status and Potential of Critical Resources; and
- Conducting research to generate information for policy formulation.

The main thrust of the program will be undertaken through implementation of the following activities:

- Formulation of Draft National Fishery Management Policy and Plan;
- Strengthening of the catch and effort and biological data collection systems for major fishery resource type;
- Assistance and training in data analysis and interpretation;
- Design and support implementation of systems for Licensing, Registration and Monitoring of Fishermen and Fishing Vessels;
- Design and support implementation of programs to enhance the involvement of fishers in fisheries planning and management;
- Provide support for public education and awareness building programs;
- Long and short-term training for staff of the fisheries departments;
- Research to generate information for planning and policy formulation;
- Establishment of mechanism for closer co-operation between stakeholders in the fisheries sector in The Dominican Republic and Haiti, Bahamas and Jamaica;
- Establishment of mechanism for conflict resolution and conflict management in the fisher sector in The Dominican Republic;
- Provide support for improvement in monitoring, control and surveillance;
- Provide support for improvement in post-harvest handling and marketing of fish; and
- Participate in the RFM.

WBS 300: FISHERIES MANAGEMENT DATA SYSTEMS

Introduction

Fishery management decision making and planning must be informed by quantitative information on the structure of the sector and on the status of resources. During the Planning Mission (June 12-18, 2000) to the Dominican Republic information collected on the fishing industry was obtained from reports, informal discussions, interviews and observations made by the team members. With regards to the current Data Management Systems areas identified for strengthening are:

- i. the PROPECAR Sur Office and other fisheries units/offices involved in data collection
- ii. Computing facilities – lack of computers has severely handicapped the data analysis and reporting capabilities of the PROPECAR Sur Office. Currently data collected is stored in paper format and summary analysis is done manually.
- iii. Inadequate coverage of the landing sites – the current sampling plans need to be reviewed and the uncertainty in the statistical soundness of the plan needs immediate attention. Note, data is mainly collected from the landing sites in the South and the frequency and reliability of data collection in the North is unknown.
- iv. Lack of transportation - affects the frequency and coverage of the landing sites that are currently being sampled.

The Dominican Republic fishing sector operates mainly at an artisanal level and over 50% of the fish consumed locally is imported. Commercially important marine species such as lobster, conch and finfish are over fished. Some of the possible contributing activities are destructive fishing methods, rapid growth in the number of fishermen, boats and fishing gears. Land-based pollution, increase in coastal development and tourist activities is having a negative effect on the marine ecosystem.

The PROPECAR Sur office, currently the most active data collection station, started data collection in landing sites and has been extended to 20 landing sites covering most coastal regions in the south. Most of the fishing in the Dominican Republic takes place on the south coast, where most of the data collection activities take place. Data is collected for stock assessment and fisheries management. Currently, data is collected from each fishing unit at the landing site. A fishing unit in the Dominican Republic is defined as the boat, crew and type of fishing gear. The data elements that should be collected are: the number of fishermen, number of boats, boat size capacity, number and type of gear, gender of the fish and length frequency. However, most of these elements are not collected on a consistent or regular basis. In particular, very little or no data on economic or biological aspects of the fisheries are being collected. The system, at this time does not generate data required to conduct stock assessment or economic assessment of any species using the standard models of tropical fish stock assessment or bioeconomic assessment.

The office currently does not have any computing facilities and all data collected are stored in paper format. The supervisor expressed the need for computers to facilitate data storage and analysis. From discussions with the data collection staff the method of data collection in the North is not reliable. Given the size of the Dominican Republic and the limited resources available it might not be possible to address all the weaknesses in the current system. The best approach would be to first improve and strengthen the current system, and then to add new activities if possible.

The Fisheries Data Management Systems subproject will consist of two components, (i) **Catch, Effort, Biological and Socio-economic Data System (WBS 310)** and (ii) **Licensing and Registration Data System (WBS 320)**. Within each system data collection, data storage, data analysis and reporting will be the main activities, as much as possible these activities will be combined across the systems. The Fisheries Data Management Systems component of the ICRAFD project will provide resources to help the Dominican Republic Fisheries Department to manage the marine resources through the availability of adequate data and information.

Objective of the Work Plan

The primary objective of this sub-project is to improve the data management systems to provide fisheries data for assessment, management, monitoring and regulating fish catch and fishing effort.

PLANNED ACTIVITIES

WBS 311/321: Review the Data Collection and Management Systems

A thorough review of the current status of the data management systems and a detailed needs assessment of the PROPESCAR Sur Office as a potential coordinating center for the data related activities will be done.

The fisheries data collection program currently focuses on the South side of the island with sparse data collection in the North. The PROPESCAR Sur Office, is responsible for monitoring data collection and providing summary reports. Lack of funds, computer and skilled human resource affect the frequency and quantity of data collected and the analysis of the same. Recommendations from the review will allow improvement of the current data management systems.

Purpose

The aim of the review will be to:

- Review the catch, effort, biological, socio-economic and licensing and registration data systems and make recommendation for improvements.
- Review the sampling program (design, data elements, frequency of sampling, minimum number of samples, logistical support including personnel and equipment etc).
- Review the system for recording, storage, verifying, analysis and reporting of the data.
- Review the adequacy of the personnel available to operate the system in terms of skills and numbers available.
- Review the documentation available for the system's operation, maintenance and training of personnel.
- Clearly identify and characterize the strengths and weaknesses of the current data collection system at the different levels (field sampling, data management, analysis and reporting).
- Determine if adequate data exists to assess population parameters (growth, mortality, recruitment, maturity etc.) for the main commercial species and advise on the appropriate data required and most economical and statistically sound method of collection.
- Review the type of economic and socio-economic data and advise on additional data to be collected in order to monitor the performance of the vessels in the different fisheries as well as provide information for management.
- Make recommendations for refining and strengthening the integration of the catch, effort, biological, economic and social data collection programs. Special attention will be given to the collection of fishing effort data to ensure the data collected is species specific and adequately reflects fishing effort.

Approach

- A resource person, with experience in designing and implementing data collection systems (background in fisheries/familiarity with methods used in fisheries data collection systems would be an asset) from CFU, or from within the country or a consultant, will undertake the assignment including preparation of the necessary reports with recommendations for implementation.
- The resource person will work in close collaboration with the Director of Fisheries (DR), Data Manager (CFU), Fisheries Officers and Data Collectors (DR) to conduct the assignment and to facilitate technology transfer to these personnel.
- The resource person will visit the Dominican Republic and conduct a thorough review and analysis of the data collection program in keeping with the above stated objectives. This will include review and analyses of the existing catch, effort, economic, social and licensing and registration data, the data collection forms, the computerised databases and reports. Visits to major landing sites, wharves and processing plants to observe data collection activities and interaction between the fisheries personnel and the fisheries will also be made.

Outputs

The outputs of this activity will be:

- Review and analysis of the data collection and management program for the fisheries, including the data collection forms, the field data collection program, computerised databases and reports in Dominican Republic, with recommendations for refinement.
- Indication as to whether adequate data exist to determine estimation of population parameters for the main commercial species and/or provide advice on the appropriate method of obtaining such data for analysis.

WBS 312: Enhance Data Collection Plans Covering the Major Fisheries

This activity will involve enhancing the current sampling plan to include catch, effort, biological, social, economic and licensing and registration data elements, required for stock assessment and fisheries management, that are currently not being collected.

The following data elements should be collected if possible:-

- monthly details on the total catch and or landings by species taken by the fishing unit;
- monthly details on the total effort exerted by the fishing unit, e.g. total days at sea, and total number of hooks;
- number of crew per trip per fishing unit;
- reliable estimates of catch and effort for a representative subset of the fleet if it is not possible to sample the whole fleet;
- monthly details on the species taken by fishing unit;
- the number of fish caught per time period by species or the mean mass of fish caught per time period by species;
- estimates of discards or fish not marketed (e.g. kept for home use) giving details of size where possible;
- for each specie or stock, length frequency, hard parts for ageing and maturity data;
- rainfall, temperature, salinity and current patterns will be recorded, to address the effects of environmental factors on stock parameters;
- social and economic data such as
 - i. cost of inputs e.g. capital expenditure-boats, gears, operational costs-fuel, labour etc
 - ii. price or value of catch
 - iii. revenue
 - iv. profit
 - v. subsidies
 - vi. distribution of benefits
 - vii. employment – fishermen, processing, marketing, support sector (e.g. boat building), provision of supplies

- viii. family size
- ix. education level

Purpose

To provide an integrated data collection system which will collect catch, effort, biological, environmental, social and economic data. The analysis of this data will provide information for the major stakeholders and to update the fisheries management plan for the Dominican Republic.

Approach

- The sampling plan will be reviewed under WBS 311/321 and the results used to refine and enhance the data collection program.
- The staff of the Dominican Fisheries Department, with technical support provided by the CFU staff, will be responsible for preparation of the revised and enhanced sampling plan for the major fisheries to facilitate the collection of catch, effort, biological, environmental, social and economic data elements.
- Implementation of the modified sampling plan will be the responsibility of the Fisheries Department with technical assistance and funding by the CFU, regional experts and consultants as required.
- Provide additional human resource and equipment for data collection, data management, analysis and reporting.

WBS 313: Train Fisheries Divisions Staff in Data Collection

Following the modification of the current sampling plan the existing staff involved in data collection and management as well as any newly recruited staff will participate in training workshops on data collection and data management. At these workshops, the participants will be trained in data collection, species identification, quality control and reporting. The areas of focus for the training program will be guided by the review.

Purpose

The purpose of this activity will be to upgrade the skills of existing data collection and data management staff as well as train the new recruits.

Approach

The training will be delivered by resource personnel from CFU and the Fisheries Department (Dominican Republic).

Outputs

Fisheries staff trained in areas of catch, effort, biological, environmental, social and economic data collection.

WBS 314: Database software for data storage, basic analysis and reporting

Currently the department has no software for data (catch, effort, biological and economic) entry, storage, manipulation and analysis, the Fisheries Department staff express the need for a data management software.

Purpose

The purpose of this activity will be to:

- Provide a database software.
- Consider the suitability of Trip Interview Program (TIP). This is the database software being used in the CFRAMP countries for catch, effort and biological data entry, storage, manipulation, basic analysis and reporting.
- Identify and train suitable persons to manage/operate the system.

Approach

- A resource person with data management skills and experience in using database software from within the region or a consultant will undertake the assignment in collaboration with the Fisheries Department. This individual will have a working knowledge of TIP, experience in data storage, manipulation, basic statistical analysis and reporting.

Output

- An implementation plan, with schedules to implement the recommendations for the refinement of the software.
- The availability of database software for data storage, manipulation, basic analysis and reporting.
- Individuals identified and trained to operate the system

WBS 315: Train Fisheries Divisions Staff in Using the Database Software for, Data Entry, Analysis and Reporting

All existing staff involved in data collection and management as well as newly recruited staff will participate in annual training workshops on data entry, analysis and reporting using the database software. At these workshops, the participants will be trained in data entry, manipulation, quality control, basic analysis and reporting.

Purpose

The purpose of this activity will be to upgrade the skills of existing data collection and management staff as well as train the new recruits.

Approach

The training will be delivered by resource personnel from the CFU and the Fisheries Department (Dominican Republic) or by TCDC support involving other CARIFORUM countries.

Outputs

Fisheries staff trained in areas of data entry, manipulation, quality control, basic analysis and reporting.

WBS 316: Provide Resources for Implementation

The Data Collection System will require at least one computer, with adequate resources, and software to support data entry, basic analysis and reporting. To address the issue of lack of transportation motorcycles will be provided. The number of motorcycles required will be guided by the review (WBS311/321). A data entry clerk will be needed to enter data currently in paper format and to provide data entry services for the first three years of the project.

WBS 317/326: Preparation of Articles and Technical Reports

The Fisheries Department, assisted by the CFU multi-disciplinary team, will prepare articles and technical papers to facilitate communication with major stakeholders. These will include:

- Monthly summaries of catch, effort, fish prices, exports and earnings
- Annual statistical reports on the fisheries sectors documenting the performance and trends in the fisheries
- A National Marine Fisheries Atlas for Dominican Republic
- Preparation of scientific articles for publication or presentation at regional /international seminars.

WBS 318/327: Monitoring and Evaluation

The Data Manager will be making two (2) monitoring visits to Dominican Republic per year during the life of the Project to evaluate the progress of the activities associated with the data collection system and to provide assistance and advise during implementation.

WBS 320: LICENSING AND REGISTRATION SYSTEM

WBS 322: Enhance Licensing and Registration System

The current licensing and registration system in Dominican Republic utilizes a manual system with no electronic storage of data. The system as exists does not have the capacity to adequately meet the needs for the effective licensing, registration and monitoring of fishing vessels and fishers involved in the various fisheries.

Purpose

The purpose of this activity is to:

- Review the existing licensing and registration system to make it more effective as a tool in the monitoring and regulation of the fisheries.
- Consider LRS for data entry, storage, manipulation, basic analysis and reporting.
- Identify suitable persons to manage/operate the system.

Approach

- A resource person with data management skills and experience in using database software from the CFU or from within the region or a consultant will undertake the assignment in collaboration with the Fisheries Department. This individual should have a working knowledge of LRS, experience in data storage, manipulation, basic statistical analysis and reporting.
- The resource person will visit Dominican Republic where s/he will conduct a thorough review of the existing Licensing and Registration System. This will include review of the manual/card system of data on fishing vessels. This activity will be merged with WBS 314.

Output

- Review of the existing licensing and registration system with recommendations for its refinement and further computerization.
- An implementation plan, with schedules to implement the recommendations for the refinement of the licensing and registration system.
- The availability of database software for data storage, manipulation, basic analysis and reporting.
- Individuals identified to operate the system.

WBS 323: Database Software for Data Storage, Basic Analysis and Reporting

No computing facility is available for data (licensing and registration) entry, storage, manipulation and analysis, the Fisheries Department staff expressed the need for a data management software to adequately address their licensing and registration needs.

Purpose

This activity will involve:

- Consider LRS for data entry, storage, manipulation, basic analysis and reporting.
- Identify and train suitable persons to manage/operate the system.

Approach

- A resource person working in close collaboration with the, Data Manager (CFU), Fisheries Officers and other personnel (DR) responsible for Licensing and Registration will review the manual system.
- The Data Manger (CFU) will introduce LRS to the Fisheries Department.
- The Fisheries Department will identify suitable persons to manage/operate the system.

Outputs

- Review of the existing manual system for licensing and registration with recommendations for its refinement and computerization.
- An implementation plan, with schedules to implement the recommendations for the refinement of the software.
- The availability of database software for data storage, manipulation, basic analysis and reporting.

- Individuals identified and trained to operate the system

WBS 324: Train fisheries divisions staff in using the database software for, data entry, analysis and reporting

All existing staff involved in data collection and management as well as newly recruited staff will participate in workshops on data entry, analysis and reporting using the database software for the Licensing and Registration System. At these workshops, the participants will be trained in data entry, manipulation, quality control, basic analysis and reporting.

Purpose

The purpose of this activity will be to upgrade the skills of existing data collection and management staff as well as train the new recruits.

Approach

The training will be delivered by resource personnel from CFU, other CARIFORUM countries through TCDC arrangements and/or the Fisheries Department (Dominican Republic).

Outputs

Fisheries staff trained in areas of data entry, manipulation, quality control, basic analysis and reporting using LRS.

WBS 325: Provide Resources for Implementation

The Licensing and Registration System will require at least one computer, with adequate resources, and software to support data entry, basic analysis and reporting.

WBS 400: FISHERIES RESOURCE ASSESSMENT

Developing sustainable fisheries in the region requires comprehensive, coordinated policy and plans based on a good understanding of the fishery resource, the marine environment supporting the resource and on the social and economic conditions of the people and organizations that depend on the resource. Information on these issues is therefore one of the cornerstones for sustainable fisheries development. Not only are scientific and technical knowledge valuable, traditional knowledge accumulated by resource users over generations is also equally valuable for resource management and conservation. Not only are the fisheries systems complex, the research and information needs are also complex and demanding. Information is needed on the oceanographic characteristics of the area; the ecological and biological aspects of the fisheries; and the socio-economic aspects of the fisheries.

Oceanographic studies to understand the physical, chemical and biological features of the region's fisheries and marine ecosystems require expensive research vessels, equipment and highly trained personnel, as well as long time series of data.

Biological and ecological studies on fish stocks also require significant investments in highly trained specialists, research equipment and laboratory facilities as well as the gathering, analysis and interpretation of long-time series of data, including the catch and effort and biological data, in a coherent and consistent manner.

Social and economic studies while less expensive and less demanding than the others also require significant investments in trained personnel, funds, material and infrastructure. Given the socio-economic characteristics of the fisheries resource this type of research is essential for conservation and sustainable development. Socio-economic information on the fisheries is very scarce as traditionally efforts have been directed at gathering biological, ecological and to a lesser extent oceanographic information.

Based on the resources available for Dominican Republic under the CARIFORUM Project and the constraints faced by the Fisheries Division, it would not be possible to undertake activities in all these areas. As such, with the intention of providing information for improved management, the Project is proposing to assist The Dominican Republic in a review of its historical data (catch, effort, biological, social and economic) from the fisheries and undertake analyses, that may be possible, in keeping with the information needs for management; the collection of biological, social and economic data for selected species and fisheries within the refined data collection system; conduct selectivity studies for specific fishing gear; provide technical support for the assessment of the conch, lobster and important species of fin-fish resources

Work on oceanographic factors requires significant investment in personnel and equipment. It is not proposed that the project invest much in this area, although it is recognized that environmental and oceanographic factors have a significant influence on the abundance and distribution of the fish stocks. Nevertheless useful data can be obtained from other agencies in The Dominican Republic and the Caribbean Region which are monitoring environmental factors, such as rainfall, temperature changes and current patterns. The project will encourage closer collaboration among the Fisheries Department and these agencies and institutions in The Dominican Republic and the Region involved in environmental research and monitoring in order to obtain some of the information needed.

PLANNED ACTIVITIES

WBS 400.1: Review and analysis of historical data

Data on the fisheries activities on the Dominican Republic have been collected since 1993. Most of this data has not been properly stored and analyzed and is partly due to problems resulting from inadequate data storage systems and lack of proper training of the technicians and biologist in resource assessment. This data must be first placed in a computerized database and then analyzed using the statistical and fisheries assessment packages available. The data to be analyzed will include data collected during the 1990 census plus other data collected but not analyzed.

Purpose

- To undertake an assessment of the main types of marine fisheries in DR based on the available historical data in order to compare that information with the current situation of the fisheries in DR. This will also ensure that the new activities take into account the historical information including the strengths and weaknesses in the data.

Approach

The Department of Fisheries (DOF) in DR in collaboration with the CFU will be responsible for the implementation of this activity. Staff from PROPECAR-SUR should conduct some of the analysis. Also students from local universities could assist with the entry and storage of data in an electronic format and preliminary analysis of the data. Full assessment of the data for selected species could be done during a local workshop in the Dominican Republic. The results and recommendations should then be presented to the General Department of Fisheries and the Ministry of the Environment and Natural Resources. The students would also be able to use the information for their bachelor degree thesis at the university. The analysis should be conducted in the following ways:

- Types of Fisheries (by area, by gear, boat type, crew number, resource target)
- Total and local biological Yield (for all the landing sites, types of fishing)
- Total and local economic Yield (for all landing sites, types of fishing, species target)
- Socioeconomic aspects of the fisheries for all commercial level where the data has been collected
- Analysis of trends in CPUE for selected species and species groups
- Analysis of the population biology based on length frequency; maturity/spawning data, hard parts data for selected species of commercial importance where data has been collected. This will include estimates of growth, mortality, recruitment, maturity and yield estimates.

Output

- Report(s) of findings
- Identification of available fisheries data and creation of a computerized database
- Estimation of the past level of exploitation of the resources and after comparison with more recent data, and formulation of a proper strategy for management for these resources.

WBS 400. 2 Updating the fisheries activity information

Since 1993 data on volume of landings have been regularly collected by PROPECAR-SUR technicians on the South coast of DR. A comprehensive fisheries census was done in 1990 but most of the data has not yet been analyzed. The data collected should be thoroughly analyzed and a report prepared. This will be done under activity 400.1.

A new nationwide comprehensive census should also be conducted to obtain new information on the status of the fisheries. The staff of PROPECAR-SUR have considerable experience in data collection and should be given the responsibility for designing and implementing this census with technical support and funding provided by the CFU.

Purpose

- To undertake a comprehensive assessment of the main types of marine fisheries in DR based on a new census. This will provide up to date information on the catch, effort, social and economic situation in the fisheries. The information can be compare with historical data and will help us to better understand the changes and trends in the fisheries sector of the DR.

Approach

Staff of the CFU will collaborate with the fisheries department in DR on the design and implementation of the national fisheries census. TCDC support will be provided if needed.

The staff of PROPESCAR-SUR could take the lead in implementing this activity because they have the necessary training and experience in collection of fisheries data in the DR. Special training should be provided in resources analysis and assessment by the CFU staff or private consultants.¹

Output

- Report(s) on findings.
- From the results of this activity the DF will have available an updated information base for planning and formulation of strategies for sustainable development and management of the specific marine fisheries and species of commercial importance in the DR.

WBS 400.3: Selectivity Studies

In fishery, the type of gear used to fish and the mesh size of traps and nets used determine the length at which the fishing mortality takes place. Gear selectivity needs to be taken into account to estimate the real size composition of the fish in the fishing area. It is an important tool in fisheries management for regulating the minimum mesh sizes for target-selected species. Fishing gears such as traps and nets are indiscriminate in that they catch a wide variety of species. It is clear from studies done in a variety of locations that, if the mesh size is too small then the majority of fishes caught will be juveniles. This results in both growth overfishing and recruitment overfishing. The information provided by this type of study can be used to establish size at first catch and minimal size of mesh for nets and traps used in the fisheries.

Purpose

- To undertake studies of selectivity of mesh size for traps and nets of major use in fisheries, and develop selection ogives for use in stock assessment.
- To undertake selectivity studies (in terms of species caught, length and weigh of the individual) for species catch by Hookah compressor.
- Make recommendations on the most suitable mesh sizes that should be used for traps and nets to permit sustainable exploitation of the fisheries.

Approach

Studies will be designed by the Fisheries Department with the support and assistance of CFU staff. University students could collect and analyze the data and will submit the reports as part of their dissertation requirement.

Output

Report(s) on findings.

Useful information and management recommendations regarding the minimum mesh sizes of nets and traps fisheries need for sustainable management of the resources.

WBS 430.1: Assessment of Conch Fishery

The Queen Conch *Strombus gigas* is the only species of the genus *Strombus* with significant commercial value across the Caribbean Region. In terms of amount of landings and according to statistical data registered at the Fisheries Department (Fisheries Department, 1999), the Queen conch is the single most important fishing resource in the DR. During the past 20 years population growth and the offer of better prices created by the export market, permitted the uncontrolled increase in the volume of catch and the consequence reduction in the number and structure of the queen conch populations in the DR and

¹ It is recognized that the resources available at present might not be adequate to conduct a comprehensive census of the main fisheries. It is hoped that during the life of the project additional resources would be made available to support this activity.

throughout the region. For these reasons this specie was included on Appendix II of CITES in 1992. In the DR one of the main problems confronted by the management of the resources is the inconsistencies among the data reported on the volumes of queen conch caught in international waters and exported to the United States. It is also known that the accuracy of the data collected by some inspectors at the Fisheries Department in DR is not reliable. In the particular case of Parque Jaragua, the increase in the number of fishers and compressors has put more pressure on the conch resource, for that reason Tejeda (1995) recommended at that time, that fishing effort should be frozen at the existing level. Nevertheless, Posada and Mateo (1998) showed that juvenile recruitment was still occurring in many areas. Their results suggest that the resource has not been permanently damaged by over-fishing, and with proper management can be recovered. Even if some initial studies on juvenile distribution and growth of queen conch have been done, more accurate studies are needed at the national level on the status of the queen conch fishery and commercialization as well as fishing data on other mollusk of less importance.

Purpose

- To undertake a comprehensive census of areas, people, gears, fleet involved with the exploitation of the Queen Conch
- To collect landing data for all the major fishing grounds and landing site of the *Strombus gigas* and other conch (*S. costatus*, *S. alatus*) in order to determine the current status of these fisheries.
- To conduct an economic and marketing study on the queen conch products (from fishers selling in landing sites, small vendors, entrepreneurs, cooperatives, processing plants, and export agencies) and on the economic contribution of the queen conch fisheries to the local and national economy.
- To determine population parameters of the queen conch (growth, mortality, recruitment, maturity/spawning)
- Undertake studies of distribution and abundance of queen conch larvae in selected areas
- Undertake census on abundance of juvenile and adults queen conch in selected habitats.
- To determine the positions and dimensions of juvenile conch beds and the linkages between juveniles beds and adult populations and spawning sites.
- Develop a comprehensive management plan for the queen conch fishery based on the scientific information obtained.

Approach

The queen conch study will include five interrelated but discrete components which will be conducted to improve understanding of the state of the queen conch stocks and to formulate recommendations for their management and conservation.

1. The first activity will be a comprehensive census to identify, quantify and document the areas, people involved, gears used, fishing methods, type and number of boats used in the exploitation of the Queen Conch. This will be done by the Department of Fisheries with technical support provided by the CFU.
2. An economic and marketing study on the queen conch products (from fishers selling in landing sites, small vendors, entrepreneurs, cooperatives, processing plants, and export agencies). The purpose of the study is to better understand the marketing situation and the economic contribution of the queen conch fisheries to the local and national economy. The study will make recommendation for improving the contribution of the resource to local stakeholders and local communities. A student from the marketing or economics department of one of the local universities could undertake the study as a thesis.
3. The third component will be a visual census underwater survey to determine the spatial distribution, abundance and population structure of the queen conch. Special note will be taken of the juvenile and adult habitats and abundance as well as potential spawning stocks. This study could be implemented by the Fisheries Department in collaboration with a local NGO.
4. The fourth component will be a biological study to determine i) migration patterns of juveniles and adult by tagging, ii) spawning period and size at maturity and iii) population parameters by collecting and analyzing length and weight frequency data. This could be undertaken by a student leading to a masters degree.

5. The results of the above studies along with the catch and effort information will be integrated and used to formulate a comprehensive plan for sustainable development and management of the queen conch fisheries in the DR.

The Fisheries Department will be responsible for the design and implementation of these studies. The CFU will provide technical assistance and financial support to the Fisheries Department to design and implement the study.

Some components of the study can be done working in close collaboration with NGOs with experience of previous technical work in Parque del Este (MAMMA Foundation) and Parque Nacional Jaragua (Grupo Jaragua, Inc.). Studies of distribution and abundance of queen conch larvae and maturity/reproduction studies can be undertaken by students for a bachelor or master degree. In order to determine the positions and dimensions of juvenile conch beds and the linkages between juveniles beds and adult populations and spawning sites the approach that could be undertake studies on comparative morphology of conch and marking small juveniles for latter recapture as large juveniles or adults.

Output

- Report and findings
- This activity will provide the government of the DR and other stakeholders with a better understanding of the status of the queen conch resource and , the tools and information needed for sustainable co-management of the *Strombus gigas* fisheries in DR.

WBS 430.2: Assessment of Lobster Fisheries

The spiny lobster fishery is one of the most important fishery in the DR. From 1992 to 1999 the spiny lobster represented the third most important fisheries resource in terms of the amount of fish landed, behind *Strombus gigas* (1st) and *Scomberomorus cavalla* (2nd) (Fisheries Department report). Very little information is available on the status of the lobster resource in the DR. The main source of information about the lobster fisheries are the reports prepared by Herrera (1995, 1997) for Parque Nacional Jaragua which deal with lobsters from the southwest part of the DR. Herrera provides some assessments regarding the situation of the resource and proposes methodological recommendations for their further assessment and management. The lobster fisheries in Parque Jaragua and other places of DR have been in practice for more of 40 years. The fisheries are open access and in recent years the number of fishers and fishing boats have been steadily increasing. One interesting point is the fact that in the southwest part of the DR the abundance of juveniles remains constant despite the high exploitation of the resource in this particular area.. Apparently the Southwest platform of the country is a good place for the settlement of post-larvae's derivatives from phylosoma larvae which are abundant in the surrounding oceanic region and due to the numbers of currents and gyres typical of this zone the larval retention is favored (Herrera, 1997). Still, data on the length, weight, maturity/spawning, age of recruitment to the fishery, distribution of juveniles, migration, abundance and recruitment of post-larva should be determined.

Purpose

- To determine the number and location of landing sites for *Panulirus argus* and *P. guttatus* in DR, as well as their fishing grounds, volume of landings, fishing gears, catch and effort.
- To undertake studies of growth, maturity/reproduction and mortality for *P. argus*.
- To establish systems for monitoring puerulus settlement and juvenile recruitment of *P. argus*.
- To undertake tagging studies to determine migration and growth of spiny lobster
- To conduct oceanographic studies of currents in the southwest part of DR
- To undertake studies of the economic and marketing aspects of lobster at local, national and international levels

Approach

The CFU team will support the Fisheries Department on the design and implementation of the studies where priorities are identified. The information of landings and biological information will be collected under the responsibility of the fisheries department staff. A consultant could make specific studies of age and growth, maturity/reproduction and mortality. Migration studies, juvenile recruitment and puerulus monitoring should be undertaken by PROPESCAR-SUR staff or any NGO with interest in the resource. The CFU will provide technical and financial support. The study will include six interrelated but discrete components which will be conducted to improve understanding of the state of the spiny lobster stocks and to formulate recommendations for their management and conservation.

1. The first activity will be a comprehensive census to identify, quantify and document the areas, people involved, gears used, fishing methods, type and number of boats involved in the exploitation of the spiny lobster.
2. The second activity will be an economic and marketing study on the lobster products (from fishers selling in landing sites, small vendors, entrepreneurs, cooperatives, processing plants, and export agencies). The purpose of the study is to better understand the marketing situation and the economic contribution of the lobster fisheries to the local and national economy. The study will make recommendation for improving the contribution of the resource to local stakeholders and local communities. The study will be conducted by a university student of marketing or economics or a private consultant.
3. The third component will be establishment of a post-larval monitoring program to determine the period and intensity of post larval settlement in the south of the DR
4. The fourth component will be a visual census underwater survey in selected areas to determine the spatial distribution, abundance and population structure of the spiny lobster. Special note will be taken of the juvenile and adult habitats and abundance as well as location of potential spawning stocks. This can be undertaken by the Fisheries department in collaboration with local NGO's.
5. The fifth component will be a biological study to determine i) migration patterns of juveniles and adult by tagging, ii) spawning and maturity by collecting size at maturity data over a two year period iii) population parameters by collecting and analyzing length and weight frequency data. This can be conducted by one or two graduate students who will be able to present the final report for their thesis dissertation
6. The sixth component will be oceanographic studies of currents in the southwest part of DR to determine larval abundance and distribution. The oceanographic study in the southwest zone will be conducted with the technical support of the Instituto Cartografico Militar and Instituto de Fisica of University Autonomous of Santo Domingo and could be done as a student project.
7. The results of the above studies along with the catch and effort information will be integrated and used to formulate a comprehensive plan for sustainable development and management of the lobster fisheries in the DR. The plan will include specific recommendations on minimum size and closed season.

Output

This activity will provide the government of the DR and other stakeholders with a better understanding of the status of the spiny lobster resource and, the tools and information needed for sustainable co-management of the *P. argus* fisheries in DR. A comprehensive description of the biological, economic and marketing aspects of the fishery and a management plan based on the most recent information will be prepared.

WBS 410.1: Assessment of the Shrimp Fishery

In the Dominican Republic there is a single shrimp fishery located in Samana Bay. The number of fishers dedicated to the fishery of shrimp (*Penaeus sp.*) make this activity the most important unit of fishery of the

coastal fishery in DR. The "cayuco" is the type of boat employed in the shrimp fishery and its number in Sanchez (where the shrimp fishery takes place) has been estimated in 512. For 1990, around 900 fishermen (Colom et al, 1991) were fishing shrimp in shallow waters of Sanchez and Rio Higuero, the mouth of the Yuna river and in front of Los Haitises in Samana Bay. The fishing gears used to catch the shrimp are gill net (approximately 250 in number) and 350 "atarrayas" (circular net). The shrimp fishery in Samana Bay started in the early 1960's when the train and dock located in Sanchez –the main sources of income- closed their operations. Apparently the shrimp resource is being over exploited, however, the high price per pound of shrimp (RD\$55 = USD\$ 3.44) make this fishery still attractive for a large group of fishermen that continue to catch shrimp for a living (Silva and Aquino, 1993). According with the information gathered from the Fisheries Department, the actual number of fishermen has increased to more than 3,000 fishermen. The total number of boats and the total pressure on the resource have also been increasing. There are also others fisheries of importance in the area which are targeting the crabs including *Cardisoma guanhumi* and *Callinectes* sp. There is a lack of reliable information on the status of the resource, the level of exploitation, the species caught and the contribution of the shrimp fishery to the local and national economies. Studies should be conducted to improved understanding of the state and condition of the fisheries and to facilitate planning and management decision making. The study will seek biological, economic and social information on the fisheries and on the resource system. Studies of the fishing gear used to collect these species and their selectivity will also be conducted.

Purpose

- To undertake a comprehensive census of areas, people, gears, fleet involved with the exploitation of the shrimp resource
- To collect catch and effort data for all the major fishing grounds and landing sites of the *Penaeus* spp. and the crabs *Callinectes* sp and *Cardisoma guanhumi* in order to determine the current status of these fisheries.
- To undertake studies of selectivity of mesh size of the main nets used in the shrimp fishery.
- To conduct biological and population studies of the species of *Penaeus* targeted by the fishery in Samana Bay.
- To conduct a socio-economic and marketing study on the shrimp (from fishers selling in landing sites, small vendors, entrepreneurs, cooperatives, processing plants, and export agencies) and on the economic contribution of the shrimp fishery to the local and national economy

Approach

The study will include six interrelated but discrete components which will be conducted to improve understanding of the state of the shrimp stock in Samana Bay and to formulate recommendations for its management and conservation.

1. The first activity will be a comprehensive census to identify, quantify and document the areas, people involved, gears used, fishing methods, type and number of boats used in the exploitation of the shrimp resource in Samana Bay. This will be done by the Department of Fisheries/PROPESCAR-SUR with technical support provided by the CFU.
2. The second activity will be the collection of data on catch and effort of the shrimp fishery and associates fisheries (*Callinectes* sp. and *Cardisoma* sp.) in order to determine the status of these resources.
3. Conduct an study on selectivity of the gill net and "atarraya" used in the fishery. The information provided by this type of study can be used to establish size at first catch and minimal size of mesh for the main gears used in the shrimp fishery.
4. A biological program to obtain data on size frequency distribution and maturity which will be used to estimated, growth, mortality and recruitment for the species of shrimp target by the fishery. At the end of the first year of data collection the data will be analysed and a preliminary report prepared. The study could be carried out by a student as a masters degree program or by a consultant with the support of CFU.
5. A socio-economic and marketing study on the shrimp fishery (from fishers selling in landing sites, small vendors, entrepreneurs, cooperatives, processing plants, and export agencies). The purpose of the study is to better understand the social aspects, the marketing situation and the economic contribution of the shrimp fisheries to the local and national economy. The study will make recommendation for improving the contribution of the resource to local stakeholders and local

communities. A student from the marketing or economics department of one of the local universities could undertake the study as a thesis or the study can be done by a private local consultant.

6. The results of the above studies will be integrated and used to formulate a comprehensive plan for sustainable development and management of the shrimp fisheries in the DR.

The CFU staff will provide technical support to the Fisheries Department staff on the design and implementation of these studies. Information of catch and effort can be taken concomitantly with the data collected in the national census. Staff from PROPECAR-SUR will be able to undertake this assignment. University students will assist with the research on the biological parameters as well as the social, economic and marketing aspects of the fishery, with the advice and supervision of the Fisheries Department and CFU staff. CFU will provide TCDC support if they are needed.

Output

- Reports on the finding and recommendations of the various studies will be prepared.
- This activity will provide the government of the DR and other stakeholders with a better understanding of the status of the shrimp resource and, the tools and information needed for sustainable co-management of the fishery. The activity will also produce recommendations for improving the social and economic conditions of the resource users.

WBS 410.2: Assessment of Large Pelagic Fish Fishery

Large migratory fishes like some species of the family Scombridae have become a very important fishery resource in marine waters of DR. In fact, according to the statistical reports prepared by the Fisheries Department of DR, the King Mackerel *Scomberomorus cavalla* was the second most important fisheries in terms of volume of landings of all marine products from 1992 to 1999 and is also the species in the fisheries with the most important economic value.. Apart from the data on volume of landings no other information is available on catch and effort and biological parameter needed to better understand the status of the stock and possible strategies of management of this resource. In recent years also the use of FADs devices to enhance the aggregation of other migratory fishes (dolphin fish, wahoo, Skipjack tuna, albacore, yellow and blackfin tunas) has become popular among fishers due to the increase in the total weight of the catch. However, the lack of frozen rooms to store the product and problems of marketing make it difficult for the fishers to take advantage of the high production which is possible at the beginning of the fishing season.

Purpose

- To conduct a survey of FADs in DR marine waters determining its numbers, location, species that occur in FADs and success on catching large migrating species
- To determine aspects of the population biology (length, weight, age and growth, maturity/spawning data) as well as information on catch and effort of the King Mackerel and other commercially important large pelagic fishes in Dominican waters.
- To make a diagnosis on the marketing of tuna and tuna like species in DR and international export market including recommendations for the storage of the over production.

Approach

The CFU staff will collaborate with the Fisheries Department in the design and implementation of the above activities. Conduct of the FADs study could be made by the Center of Research in Marine Biology (CIBIMA) of the Autonomous University of Santo Domingo. CIBIMA staff have previous experience in conducting a pilot project introducing FADs in Parque del Este waters. Others NGOs can also participated and support this activity. Students at university level from any university in CARIFORUM countries can conduct specific studies on the population biology of *S. cavalla*. The marketing study of large pelagic fishes will be conducted by one student of marketing at University level or by a private consultant.

Output

The results of these activities will provide the Fisheries Department and the other stakeholders of DR with useful information about number and position of FADs. This information together with data about success of FADs in concentrating large pelagic fishes and improving catch can be use in planning new fisheries strategies taking in mind to decrease the actual pressure over the shallow waters resources and serves like a tool for management of DR large pelagic resources.

WBS. 410.3: Assessment of Coral Reef Fisheries

Demersal fishes exploited in DR are those typically associated with tropical reef and hard bottom environments. These include snappers, groupers, grunts, parrotfishes, triggerfishes, goatfishes and other species. The main gears for exploiting demersal resources are traps, hook-and-line (Appeldoorn and Meyers, 1993) and hookah and free diving. There are very limited data available on the status of the finfish resource in DR. The catch per unit effort data is too sparse and divided over many gears and locations to be used to document statistically any changes in the past several years. Compared to reef associated fisheries elsewhere, these rates are low. Many of the species catch are of low commercial class which is typical of extensively fished areas. Despite this information, it is clear that the fish resource is still present, and therefore recovery should be possible if fishing pressure is reduced. According to Appeldoorn (1998), two kinds of information are particularly needed to address management options: Catch and effort, and length-frequency. Catch and effort data will allow the Fisheries Department to assess what gears are exploiting various parts of the fish community and what their potential impact may be. Length-frequency data give information on population size and age structure, and potentially may be use to calculate rates of grow, mortality and might also provide some indications of recruitment.

Purpose

- To improve understanding of the status of the most common reef fishes targeted by the fisheries.
- To conduct socio-economic study to better understand the economic aspects of the shallow shelf reef fisheries.
- To conduct analysis on catch, effort, and length-frequency data of the most common coral reef fishes target by the shallow water fisheries
- Provide scientific information for use in planning and development of management plan for the shallow-shelf reef fisheries.

Approach

Some data on coral reef fisheries have already been collected by different institutions in different places (PROPESCAR-SUR, GRUPO JARAGUA, MAMMA, CIBIMA). Compilation and analysis of these data will be made by the Fisheries Department with the collaboration of the institutions already mentioned and the support of CFU staff.

With catch and effort and length-frequency data the potential impact on fisheries can be estimated by tracking the variations in the relative abundance of cohorts and/or year classes. This information along with social and economic information will be useful in building strategies of management of these fisheries.

Output

- Report(s) on findings.
- Status of the reef-fisheries including the social and economic conditions of the resource users.
- Recommendation regarding strategies for improving the fisheries.

WBS. 410.4: Studies of Spawning Aggregations

Spawning aggregations of some important species of groupers and snappers have been reported and studies of the Nassau grouper have been done in several places of the Caribbean including Puerto Rico. According to information obtained from the fishers several places have been identified as spawning aggregation sites for *Epinephelus striatus* and other species in Parque del Este. Also, in Parque Nacional Jaragua large aggregations of adults individuals of the White Grunt, *Haemulon plumieri* have been observed but no spawning aggregation in this species have been yet reported in the literature. Scientific studies should be conducted to characterize these sites, determine the importance of these aggregation sites for the reproduction of these species and for use in the developing plans for sustainable management of their fisheries.

Purpose

- To identify and map fish spawning aggregations sites in DR
- To develop recommendations for protection and management of these spawning aggregations
- To undertake preliminary studies on the biology and environmental factors affecting or inducing spawning in these species

Approach

With the support of local fishermen aggregations sites will be identified and recorded using Global Positioning System (GPS) and video cameras. CFU will give support for the acquisition of equipment and will provide technical assistance to the Fisheries Department staff in conducting biological and environmental studies affecting spawning aggregations of fishes in DR.

Output

- Reports and findings
- Useful information that can be used for the sustainable management of different ontogenetic stages of local populations of multi-spawning groupers, snappers and grunts in DR. At the same time, this information can be used in preparing fisheries strategies for protection of these aggregations and sustainable development of these finfishes fisheries.

WBS 400.4: Monitoring

The Biologist will be making two visits per year to Dominican Republic over the life of the program to monitor the progress of the activities associated with resource assessment and research and to provide assistance and advise during implementation of the sub-project activities.

REFERENCES

Appeldoorn, R. and S. Meyers. 1993. Marine fisheries resources of Puerto Rico and Hispaniola. Pags. 100-152. In: Marine fishery resources of the Antilles. FAO Fisheries Technical Paper 326. 234 pp.

Appeldoorn, R. and J. Mateo. 1997. Status of the fisheries resources in Parque Nacional Jaragua, Dominican Republic. Grupo Jaragua, Inc internal report. 9 pp.

Colom, R., Z. Reyes y Y. Gil. 1991. Censo comprensivo de la pesca costera de la República Dominicana. Pags. 3-1. En: Secretaría de Estado de Agricultura. Sub-Secretaría de Recursos Naturales. Proyecto de Promoción de la Pesca Costera Artesanal del Litoral Sur. "Reportes del PROPECAR SUR: contribuciones al conocimiento de las pesquerías en la República Dominicana. Vol.I/PROPECAR-SUR.- Barahona, R. D.: PROPECAR-SUR, 1994, 264 pags.

DEPARTAMENTO DE RECURSOS PESQUEROS. Reporte Estadístico de Pesca para las 5 zonas costeras de Republica Dominicana. 1999.

Grupo Jaragua, Inc./GEF-PNUD/ONAPLAN. 1998. Plan de Manejo Zona Costero Marina Parque Nacional Jaragua. 103 pp.

Herrera, A. y Ricardo Colom. 1995. Análisis de la estructura poblacional de la langosta *Panulirus argus* en datos de las pesquerías de la región de Beata, con recomendaciones sobre el muestreo biológico. Pags. 03-01. En: Secretaría de Estado de Agricultura. Sub-Secretaría de Recursos Naturales. Proyecto de Promoción de la Pesca Costera Artesanal del Litoral Sur. "Reportes del PROPECAR_SUR: contribuciones al conocimiento de las pesquerías en la República Dominicana. Vol.III/PROPECAR-SUR.- Barahona, R. D.: PROPECAR-SUR, 1995.

Herrera, A.; L. Betancourt y F. León. 1997. Las pesquerías de la langosta *Panulirus argus* (Latreille, 1804) en el Parque Nacional Jaragua, República Dominicana: Actualidad y Perspectivas. Informe de investigación. Grupo Jaragua, Inc. 19 pp.

Posada, Juan and I. Mateo. 1998. Distribution and abundance of juveniles of queen conch in Parque Nacional Jaragua waters, Dominican Republic. Caribbean Journal of Sciences.

Silva, M. y C. Aquino. 1993. La Pesquería Marina en la Provincia de Samaná, República Dominicana: Estudio Básico. Centro para la Conservación y Ecodesarrollo de la Bahía de Samaná y su entorno, CEBSE. Santo Domingo. Rep. Dom. 26 pp.

Tejeda, J. C. 1995. La Pesquería del lambí *Strombus gigas* en el Parque Nacional Jaragua. Pags. 04-01. En: Secretaría de Estado de Agricultura. Sub-Secretaría de Recursos Naturales. Proyecto de Promoción de la Pesca Costera Artesanal del Litoral Sur. "Reportes del PROPECAR_SUR: Contribuciones al Conocimiento de las Pesquerías en la República Dominicana. Vol.III/PROPECAR-SUR.- Barahona, R. D.: PROPECAR-SUR, 1995.

WBS 500 FISHERIES RESOURCE MANAGEMENT

Introduction

This component constitutes one of the main expected results of the project, viz. the strengthened national and regional institutional management capacities. It is the key to the rational utilisation of the resources, and is the product of the articulation of biological, social, economic, statistical and environmental knowledge. Although there are gaps in the information available there is clear evidence that the major fisheries are over-fished and economically distressed. Fisheries management therefore needs to be improved, and the type of measures that are needed are also clear even though more research is needed to determine the most optimum measures and strategies of implementation. It should be clearly understood that a thorough multi-disciplinary knowledge is required for effective management, and that this field cannot be claimed by a single discipline. This is reflected in the project's strategy of establishing multidisciplinary survey teams to collect integrated information on the resource users, their numbers, attitudes, strategies, expectations, frustrations, perception of need for management and suggested solutions to problems. The activities have been organized and described under the following headings:

WBS 510	Strengthened National Fisheries Management
WBS 520.	Strengthened Regional Fisheries Management
WBS 530	Support Fishers and Community Involvement/Education
WBS 540	Long-term training
WBS 550	Monitoring, control and surveillance
WBS 560	Post-harvest Handling, Processing and Marketing.
WBS 570	Fisheries Development Planning

The Fisheries Resource Management approach of the project will be similar to the one adopted by CFRAMP, consisting of: strengthening of national fisheries management capability through training, technical assistance and support in the preparation of Basic Fisheries Policy Documents; Fishery Management Plans; establishment of mechanisms for planning and decision making; the establishment and strengthening of a Regional Fisheries Management mechanism, which is expected to continue to provide support for the regional fisheries initiatives.

WBS 510 Strengthened National Fisheries Management

Overview

At the macro-economic level, the Dominican Republic has been pursuing similar policies to other CARICOM countries over the past decade, focused on structural adjustments and economic stabilization. The objectives of these programs included: Controlling inflation by monitoring the fiscal deficit and monetary supply, including the removal of subsidies; liberalizing the national economy; reforming the financial systems; reducing the state's administrative and technical structure and privatising state owned organizations to increase efficiency and reduce the public deficit. These policies are likely to continue in the Dominican Republic and to have significant impact on the fisheries. There are community based NGOs and some functional fisher's organization actively involved in the fisheries sector at this time.

Macro-economic policies to reduce public expenditure, encourage privatisation and facilitate trade are likely to continue and to have a significant impact on the fisheries sector in Dominican Republic. These policies include further privatisation of services and assets and continued reforms within the public service.

The national fisheries at this time is not able to adequately carry out their duties related to fisheries management and sustainable development due to limited capacity and operational resources. At the

same time the demands on the fisheries department appears to be growing as the government accepts and pursues the principles of sustainable use of fishery resources, responsible fisheries, protection of the aquatic environment, and other measures endorsed by the international community in support of sustainable development. The Fisheries Department has very little resources to plan and execute its responsibilities. Over the past 14 years, significant portions of the work related to data collection resource assessment and resource management have been financed by Technical cooperation agencies through short to medium-term projects, with contributions from the Government. The last major project was the German funded project under which PROPECAR SUR, was established. At the end, these projects have contributed to the development of the institutional capability of the Fisheries Department and the information base for development of fisheries sector policies.

In the Dominican Republic, the dominant policy orientation with respect to fisheries is development to improve landings and employment opportunities in the country. This dominant paradigm, has to be discussed with stakeholders along with the new general international tendency, which has been articulated by the former Fisheries Department authority as: **"To establish a sustainable fisheries system, based on the responsible fisheries principles"**. This general policy is understood by the Fisheries Department authority but not made sufficiently clear to the entrepreneurs and other stakeholders. The concept and practice of responsible fisheries, sustainable use, resource management, conservation and stewardship of the resource are issues that have to be discussed between the authorities, entrepreneurs, fishers, technicians and others with interests in the sector.

More specific policies have to be designed and implemented, in order to achieve the general one. These policies should be oriented towards transforming the open access, common property nature of the resource system to a closed access system with clearly defined and equitable rights of access to the resource. Policies, based on the actual state of the different fisheries present in the country, have to be defined and implemented with the participation of all stakeholders.

Finally, policies consistent with international laws, conventions and agreements signed by the DR and related to the use of the marine resources, should be developed and implemented, in order to resolve the actual conflicts with other countries of the region.

The Fisheries Department is under revision as a consequence of the structural changes resulting from the creation of a new Ministry of the Environment and Natural Resources by the new government which assumed office in August 2000. The opportunity exists to review and update the organizational structure of the Fisheries Department, upgrade the staff and equipment, as well as to recruit new staff.

At the moment, the Government Fisheries Department doesn't have a Fisheries Management Plan focused on management and conservation of the fisheries. A plan should therefore be prepared with technical assistance from CFU staff, local, regional or EU consultants or through TCDC collaboration with expertise from another CARIFORUM country.

PLANNED ACTIVITIES

WBS 511: National Fisheries Policy, FMP and Advisory/Decision Making Mechanism

Purpose

The specific goal of this activity is to strengthen the fisheries management and planning capabilities of the fisheries department at the Dominican Republic. Technical assistance will be provided to the Dominican Republic to:

- i) Prepare, and implement a comprehensive national fisheries policy,
- ii) Define and implement a national fisheries management plan and,
- iii) Define and establish a participatory mechanism for providing policy advice and recommendations regarding the fisheries sector.

Approach

The first step is formulation of a fishery policy and a fisheries management plan. With the new government administration in place there is a unique opportunity to work with the policy makers and other stakeholder to elaborate, refine and document the fishery policy of the new government.

The fisheries management plan must be fishery specific and will be based on the most complete description of the fisheries possible with existing information. The Dominican Republic has already compiled information on their fisheries that have to be organised and analysed.

The fishery management plan should also be dynamic, and should be reviewed at least annually. These processes are most effective when there is a formal procedure for acquiring inputs and for review. Therefore, some form of national fishery advisory/decision making body (such as a Fishery Advisory Committee) will be established and made operational. Official reports of the body will be one indication of the extent to which it is functional.

For the Fisheries Department to take action on the plan, it must be prepared with the participation of the entrepreneurs and fishers representatives. It has to be accepted and approved by the undersecretary of coastal-marine resources and the Minister responsible for Environment and Natural Resources.. The contents will be then publicised, in order that the stakeholders can clearly understand what the Government intends to do. The policy and plan should at least be published in a form that can be distributed and discussed by the stakeholders in the industry.

This activity will provide the framework for implementation of the other activities, and will be initiated at the beginning of the project.

The main input in this activity will be technical assistance and funding to the Fisheries Department to define and implement the planned activities. The technical assistance will be from CFU staff, local, regional or EU consultants or through TCDC collaboration with expertise from another CARIFORUM country.

Terms of reference will be developed for provision of technical assistance in preparing and implementing:

1. National Fishery Policy
2. Fisheries Management Plans based on the policies of the Governments and the available information regarding the status of the major fisheries and
3. Options for national advisory/decision making mechanisms.

Consultant/resource person will be recruited, logistical arrangements made for their work and the Fisheries Policies, Fisheries Management Plan and options for national advisory/decision making mechanism prepared.

The process will involve extensive consultations with all stakeholders including government officials, the private sector and the resource users. A series of consultations will be organised at the national level and at community level to discuss the issues and obtain broad base input and support for the exercise.

Output

The overall output will be that fishery management policy is formulated, a fishery management plan is developed with stakeholder participation and insofar as possible within the time frame of the project, implemented and a fishery advisory committee defined and established.

WBS 512.1: Strategic Review and Up-grading the Organizational Structure and Capability of the Fisheries Department

Purpose

The purpose of the work is to assist in defining a suitable organizational and institutional structure for the Fisheries Department to enable the Dominican Republic to discharge its national and international responsibilities regarding sustainable development and management of the fisheries sector in an effective and efficient manner. The specific objective is to provide the Government of the Dominican Republic with a plan for restructuring and enhancing the capacity of the Fisheries Department in the Dominican Republic.

Approach

The Fisheries Department has been vested with the responsibility and authority to promote sustainable development and management of Dominican's marine and freshwater fisheries resources for the benefit of the people and the social and economic development of the country. As such, the Department must be empowered, equipped, organized and staffed to undertake the complex tasks associated with these responsibilities.

An external strategic management assessment of the Fisheries Department will be undertaken during which the key variables that offer opportunities for achieving the overall goal of ensuring sustainable socio-economic benefits from the fisheries sector, and threats that should be avoided, are identified and validated. The external assessment should focus on identifying and evaluating the trends, events and developments locally, regionally and globally, which could have significant implications for the functioning and success of the Fisheries Department. This will include examination of International Conventions and Agreements such as UNCLOS and the UNFAO Code of Conduct for Responsible Fisheries, regional initiatives such as CRFM and WECAFC, and national developments such as the new fisheries.

An internal management assessment of the Fisheries Department will also be conducted to identify its existing internal strengths and weaknesses in the functional areas that are considered necessary for the successful operation of the Department including management and administration (including finance and accounting), fisheries data and information systems, fisheries conservation and management, fisheries development, monitoring and enforcement, trade and quality assurance, training, the provision of extension and other support services to the aquaculture and fisheries sector.

The review should examine and identify the relationship among the various units and functional areas of the Department, including important aspects of the organizational structure that will assist in strengthening the organizational structures. The key success factors and distinctive competencies of the Fisheries Department which have been acquired since its inception and which cannot be easily matched by other organizations should be clearly identified. The review should also examine and document the current mandate, functions and responsibilities of the Fisheries Department and the organizational structure and human resources available to discharge these responsibilities.

Based on the above review a revised organizational structure will be developed for the Fisheries Department to create the organizational and institutional capability necessary to effectively and efficiently discharge the mandate, functions and responsibilities in accordance with the Government policy directives, the evolving needs of the fishing sector, technological advances particularly in information systems, and the new challenges and opportunities presented by the new millennium.

The CFU will provide Technical assistance and funding undertake this review and assist with the implementation of the recommendations to upgrade and strengthen the Fisheries Department.

Output

The output of this activity will be a management review of the organizational structure of the Fisheries Department and a plan for restructuring and enhancing the capacity of the Fisheries Department in the Dominican Republic.

WBS 512.2: The Dominican Republic/Haiti/Bahamas/Jamaica bi-national Fisheries Committees

The Dominican Republic and Haiti share the island of Hispaniola. Fishermen and fishing boats from both countries have traditionally operated in the other's waters in those areas close to the border. The Jamaican conch fishery is conducted mainly by fishermen and fishing boats from the Dominican Republic. Each year up to 100 Dominican fishermen are registered and licensed to operate in the conch fishery in Jamaica. Several fishermen from the Dominican Republic also operate, without proper authorization, in the Bahamas. Sustainable development and management of the fisheries of these countries will be possible only if there is close cooperation between the policy makers, administrators and stakeholders in these countries.

Purpose

The purpose of this activity is to facilitate closer cooperation between the Dominican Republic and Haiti, Bahamas and Jamaica by improved sharing and exchange of information, harmonization of programs for data collection, research and management. Bi-national committees to promote dialogue, greater exchange of information and closer co-operation between the DR and these countries will be established.

Approach

Through bi-national committees made up mainly of technical and senior administrative personnel from the fisheries departments of the countries, and supported by representatives from fisher's organizations and the fishing industry, the process of effective management of the shared resources can be arranged. The Committee will discuss common problems and formulate recommendations for initiatives to improve cooperation and promote sustainable use and management of the fisheries resources. This may lead to the development of more formal bilateral cooperation agreements between the countries. The CFU will support and facilitate the work of the bi-national committee. It is envisaged that the Committee will meet at least once per year. This will facilitate the building of a foundation of a closer regional cooperation in fisheries in keeping with the initiative to establish a Caribbean Regional Fisheries Mechanism and that may include in the future such countries as the Turks and Caicos Islands.

It is expected that at the end of the project the Governments will continue to support these committees and to meet regularly to discuss common fisheries issues and plan future programs for sustainable development of their shared fisheries.

Output

The main outputs will be the establishment of Bi-national committees between the DR and Haiti, Bahamas and Jamaica. The governments of these countries should begin to work closer with each other to plan and manage their fisheries. Promote annual meetings of the Directors of Fisheries to discuss issues of common interests.

WBS 512.3: Mechanism for Conflict Resolution/Management

The fisheries sector in The Dominican Republic is made up of a number of distinct groups of stakeholders, including artisanal fishers, middlemen, entrepreneurs, importers, etc. In addition the coastal and marine resources are used by several other interest which are often in conflict with the fishers. These different groups are often in conflict with each other.

Purpose

The purpose of the study is to identify and characterise the conflicts affecting the fisheries sector and recommend measures for building positive relationships among stakeholders as a means of reducing conflict and promoting co-operation and sustainable management of the fisheries resources.

Approach

The project will assist by conducting a socio-economic study to identify and characterise the major types of conflicts affecting The Dominican Republic, including trans-boundary conflicts, which are having a negative impact on efforts to use and manage the fisheries resources in a sustainable manner. The study will also evaluate the ways in which conflict can be managed or resolved. The work should consider both intra-sectoral conflicts and inter-sectoral conflicts e.g between fisheries and other users of the coastal zone, such as the tourism sector. It should develop a better understanding of the impact of factors of change on the fisheries systems, and in particular how such changes can lead to conflict by affecting traditional operations and existing institutional arrangements. In addition, the study should examine the possibilities for predicting conflict, and how this facility might be used to manage conflict and its impacts. The study should identify and recommend policy measures and practical modalities for building positive formal and informal relationships among stakeholders as a means of reducing conflict and promoting co-operation and sustainable management of the fisheries resources. This Study could be conducted by a student from the CARIFORUM Region pursuing an advanced degree in a fisheries related area and could be supervised by the university in collaboration with CFU Staff.

Output

The main output expected is a report on the conflicts affecting the fisheries with practical recommendations for promoting cooperation and resolving conflicts affecting the fisheries.

WBS 520: STRENGTHENED REGIONAL FISHERIES MANAGEMENT

The CARIFORUM Countries have been working to define and establish a Caribbean Regional Fisheries Mechanism (CRFM) to facilitate management of shared stocks and promote cooperation among Caribbean States. Development of the CRFM is one of the main areas of focus of the CFRAMP project and is recognized as such by ICRAFD. The ICRAFD project will provide support for officials of the Government of the Dominican Republic to fully participate in this initiative to define and establish the Caribbean Regional Fisheries Mechanism. Funding will be provided to enable representatives of the Dominican Republic to attend the workshops and regional meetings on the CRFM.

WBS 530: STRENGTHENED COMMUNITY INVOLVEMENT & PUBLIC EDUCATION

Introduction

From June 12 – June 18, 2000, a four member technical team from the CARICOM Fisheries Unit, Belize, was in the Dominican Republic on a Planning Mission. The main objective of the Mission was to examine all aspects of the fisheries programs run by the Department of Fisheries and to formulate a new work program based on the information garnered. For that purpose data was collected through review of existing literature, formal and informal discussions with officials and stakeholders, and the administering of a number of surveys under the general rubric, "Multidisciplinary Survey."

The survey consisted of 5 instruments. These were as follows:

- Baseline Survey of Fishing Communities- administered to 100 respondents in 7 communities.
- Baseline Survey of the Fisheries Department of the Dominican Republic – 2 respondents.
- Key Informant Interviews: 23 respondents
- The status of the data Collection programs of the Dominican Republic: 8 respondents
- The status of the Fishermen's Organizations in the Dominican Republic: 3 respondents

These will exist in this work plan as activities being implemented until the reports are prepared and published. The findings of these surveys might lead to modifications to this plan. They might also act as benchmarks on which the effects of our intervention for the next five to six years will be evaluated periodically.

The preliminary information garnered from documentary sources and official field activities carried out during the Planning Mission in the Dominican Republic, point to the PROPECAR-SUR as the institutional gateway to developing a viable Community Involvement and Public Education program in the Dominican Republic. The PROPECAR-SUR was created by a German-Dominican Republic governments' initiative that initiated and implemented a fisheries development and management project. While German funds were available, the organization did some solid work for the fisheries of the Dominican Republic. The end of the project, and hence the end of external funding has greatly affected the operations of the organization, even though a viable organizational structure and human resource core still exists.

This work plan proposes to tap into these resources to kick off the Community Involvement & Public Education sub-project in the Dominican Republic. The PROPECAR-SUR exists as a semi-independent arm of the Fisheries Department, with its head office in Barahona, in the South-West of the country. It has a staff complement of 25, with a Director who reports to the Director of Fisheries in Santo Domingo. It has an administrative head office in Barahona and a Sub-office in Bani.

Among other things, it has a team of Biologists, Data Collectors, and Extension Officers (with at least first degrees and an average of 7-8 years field experience) operating out of 4 sub-stations namely:

Sub-stations

- Barahona
- (Peravia) Bani
- Azua
- Pedernales

Field Staff

- 4 Data Collectors, 4 Extension Officers
- 2 Data Collector-cum-Extension Officers
- 2 Data Collector-cum-Extension Officers
- 1 Data Collector-cum-Extension Officer

The Extension staff benefited from in-service training programs whilst the German project was in operation. If the CFU and the fisheries administration decide to utilize their skills they would need to be

re-trained specifically with a slant for resource conservation and management and organization formation, maintenance and strengthening. Other Fisheries Officers and Data Collectors will also benefit.

Second, there is an acute shortage of equipment for Extension work. If the CFU and the fisheries administration decide to strengthen their capabilities in this area, new equipment for Desk Top Printing and Information Dissemination will have to be procured, and all Officers trained in their use.

Third, we are proposing that in order for the four Fisheries Field Officers to be effective in their work and to achieve easier coverage of the five geographical costal zones, namely the North Coast, the North East Coast, the East Coast, the South Coast and the South West Coastal, they need to be provided with individual motor cycles.

Among other things, these Field Officers (Extension) will be responsible for:

- Reviving, stabilizing and strengthening the fisher folk organizations in the five coastal zones, partly through training and information sharing programs.
- Organizing public awareness programs targeting the fishing communities and other stakeholders.
- Providing technical assistance to facilitate the operations of the regional dialogue groups, thereby preparing the grounds for a future national fisheries advisory committee.
- Providing mobilizing and technical support for the Marine Protected Area (MPA) - communities and management institutions.
- Providing mobilizing and field assistance for the conduct of fisheries socio-economic research.
- Promoting the concept of community-based resource co-management (CBRCM) among fishers and other stakeholders.

There are at present 4 known major fishers organizations, namely:

Names	Locations
1. Cooperativa Grupo Manati Barahona	Barahona
2. Cooperativa Carlos Marte	Bani – Azua -- Palmar del Ocoa
3. Grupo de Pescadores Salinas Puerto Hormoso	Puerto Salinas
4. Asociacion de Pascadores de Halillo	San Cristobal

Additionally, there are a number of dormant groups in the Samana- Sanchez- Miches region in the East, the Monte Cristi- Puerto Plata area in the North West, and the San Pedro de Marcoris- San Rafael del Yuma zone in the South East. A "Revival- Consolidation Process" will be appropriate for rejuvenating these dormant institutions.

There is therefore, a strong institutional base to launch a "Revival- Consolidation- Capacity Building Drive" by way of:

- Community Organizing and Institutional Strengthening Activities,
- Educational/ Training Programs for Capacity Building for Resource User Groups,
- Public Awareness Building activities on current and proposed policy, legislative and resource management measures, and,
- The formation of regional fisheries dialogue groups to prepare the grounds for the formulation of national fisheries policies and the instituting of a national fisheries advisory committee.

Objectives

1. To strengthen and build upon the existing foundations of community involvement and education programs.
2. To expand on the initial strengthened models to other communities and groups in the country.
3. To improve the general awareness of the stakeholders of the critical issues affecting the fishing industry and the resource development-management process
4. To develop and implement strategies that would improve existing functional relations between the fisheries administration (government) and the fisher folk groups.
5. To build the capacities of the fisheries administrators to carry out the responsibility of providing the technical and moral support to the resource user groups to participate in the decision making process and the management of the fisheries resources.

PLANNED ACTIVITIES

WBS 530.1: Multi-disciplinary Surveys

This activity will involve the analyzing of data from the five surveys conducted during the Planning Mission to the Dominican Republic in June 2000. This activity ends with the publication of the findings of these surveys.

WBS 532.0: National Fisheries Workshop

The findings of the multi-disciplinary surveys administered during the planning mission to the Dominican Republic will be the subject matter for a two-day seminar-workshop. The main material will be a summarized version of the main reports, which will highlight the main issues engendered by the survey, which need further discussion.

Participants will be drawn from fishers groups and stakeholders such as policy-making bureaucrats, fish processors and marketers, small- scale vendors, representatives of fisher folk organizations, surveillance and enforcement agencies, NGOs in the areas of environmental and fisheries concerns, and representatives of fisheries from the five regional coastal zones.

It is expected that the deliberations of the working groups, will produce recommendations that will become:

Advisory issues for consideration of policy makers.

Material to further inform the 5-year work plan for the fisheries department

Material for further consideration by the Regional/Zonal Fisheries Dialogue Groups.

WBS 535: Regional/Zonal Dialogue Groups

A very significant outcome of the national fisheries workshop (532.0 above) will be a number of recommendations that will be made by the working groups at the workshop. To this will be added issues of fisheries legislation and policy (both existing and forthcoming), issue pertinent to resource conservation and management, and regional/zonal needs and concerns of the fishers groups and communities from the 5 coastal zones of the country. The division of the country into these zones (North, North East, East, and South and South -West) is based on geographical location, types of fishing vessels used, methods of exploiting fish, and the degree of concentration of fishers (R. Colom. et. al, 1994).

It will be one of the chief responsibilities of the Fisheries Field (Extension) Officers to follow up the preliminary arrangements for the formation of these zonal institutional arrangements, with members drawn from the stakeholder- and community groups in these regions. A healthy indicator will be to have at least three viable, working and influential regional dialogue groups by the end of the five-year period. Throughout this period, the Extension Officers will provide effective mobilizing, advertising, public relations and technical support to these organizations. A deliberate attempt will be made to gradually relinquish certain functional responsibilities to the members of these bodies.

These regional institutions will remain essentially, advisory bodies with the potential of influencing policy and legislative matters in the fishing industry, but they will also contribute to defining and supervising the application of local policies and regulations and the resolution of conflicts between stakeholders. At a more mature stage these may constitute the building blocks of a National Fisheries Advisory Committee.

WBS 533.1: Community Mobilizing and Institutional Strengthening

As shown above, the institutional basis of viable fisher folk organizations has been laid. The major initial task will be to mount a relentless "Revival, Stabilizing and Strengthening" program, which will culminate in the reinvigorating of the moribund organizations, and supplying the motivational inputs which will see the emergence of strong and self-reliant organizations. It should also ensure that the institutional strengthening drive leads to the emergence of effective leadership material to produce self-reliant organizations, with the capable of advocacy and resource co-management. This will be the main test of the capability of the Fisheries Field (Extension) Officers, backed by the fisheries administration.

The activities needing to be planned and implemented should include:

Public Education and Awareness Building activities, involving mass and print media, and information dissemination relevant to the conservation and management of the coastal resources and organizational management, data collection, licensing and registration rationale etc.

Community Training and Education programs (seminars, work shops, video shows, lectures, visits etc.)

Networking and Advocacy.

Participatory Research.

Policy Discussion and Advisory Forums.

Community Mobilizing and Consultation Processes.

Organizational Management (leadership, financial and administrative capability building)

Exploration and Actualization of Alternative Livelihood Programs

Promoting the concept and institutionalizing, of Community-Based Coastal Resource Co-management projects.

WBS 533.2: Desk Top Printing Training and Information Dissemination Equipment

The production of instructional and motivational materials in support of educational and public awareness building is a critical and money-saving strategy. Building the core staff's capability to design and produce print materials for all aspects of the fishing industry, will enhance the institutional strengthening and capability building processes. One of the Extension Officers at the branch office of the PROPECAR-SUR at Bani (Mr. Leonardo Gomez) has the capability of training his counterparts in the use of the desk top printing equipment and the designing and production of posters, fact sheets, leaflets, booklets, graphics, cartoons, brochures, newsletters etc. It is proposed that the skills of this officer be used for this purpose.

The equipment to be procured for the use of the Fisheries Field Officers and the Biologists in the department should include the following:

- 1 Computer (with adequate graphics manipulating and storage capability)
- 1 Colour Ink Jet Printer
- 1 Scanner
- 1 TV/VCR
- Overhead Projector & Large Screen
- 1 Portable Stand-by Generator
- 1 Public Address System

WBS 534.1: First Fisheries Officers (Extension) Training Workshop

The task of providing technical support to the fishers groups and communities to develop their institutions to become involved in the planning and decision making process lies with the fisheries officers who interact with the resource users on a daily basis. Their capacity to perform these tasks needs to be built and strengthened. For this purpose, all fisheries officers who, by the nature of their jobs need to interact constantly with fishers and other stakeholders at the landing sites and in the fishing communities, need to benefit from training programs. This training will be available to all Extension Officers, Data Collectors and other fisheries officers who interact on and off with the stakeholders, and selected High School teachers in the fishing communities.

The first of these two-week training workshops will be held in the latter part of PY 2000-2001 and the second in PY 2002-2003. Additionally, there would be a number of shorter-term seminars, lectures, workshops etc., when the need arises.

The first training workshop will include the following subject areas:

- Extension Principles and Methods
- Co-operative Principles and Methods
- Leadership Training
- Group Dynamics
- Public Relations & Social Interaction
- Community Organizing
- Communication Techniques
- The Rationale for Data Collection and Licensing & Registration.
- Elements of Resource Conservation and Management
- Work Planning Techniques

WBS 534.2: Second Fisheries Field Officers Training Workshop

This workshop is scheduled for PY 2002-2003. It will concentrate primarily on addressing the weaknesses and problems encountered in the field by the participants of the first workshop. Additionally, it will take on board, issues relating to Fisheries Management Planning and Plans and the role of fishers in the process, the Fisheries Advisory Committee and the role of fishers and Post Harvest technologies for fishers and fisheries co-management.

The specific topics to be covered in this second workshop will include:

- Elements of Fisheries Management
- Introduction of Co-Management
- Structures of Co-Management
- Extension Principles
- Video Production & Use
- Extension Methods 1
- Extension Methods 11
- Extension Methods 111
- Extension Methods 1V

WBS 534.3: First Institutional Strengthening Workshop for Dominican Fishers Organizations

Institutional Strengthening is a core objective of the Community Involvement & Education sub-project. As part of the package of strategies geared towards the realization of this goal, a number of Dominican Republic active fishers and members of fisher folk organizations will be invited to participate in this first institutional strengthening workshop. Preference will be given to the leadership and potential leaders of these organizations. Participants will be guests of the CFU Belize and the fisheries department of the Dominican Republic.

The overall objective will be to strengthen the fisheries resource user organizations in the country. The specific objectives are:

To promote dialogue and exchange of information among fisher folk organizations in the country.
To encourage resource user organizations to learn from each others' strategies, operations and problems.
To lay the foundation for the development of a network of operations among the fisher folk organizations in the country.

The subject areas to be covered at this workshop will include:

Co-operative Formation and management
Harvesting Techniques
Processing Techniques
Marketing Techniques
Resource Conservation and Management
Data Collection and Resource Assessment

Classroom activities will be complemented with out-door activities such as visits to MPAs, Co-management sites, and video shows.

WBS 534.4: Second Institutional Strengthening Workshop

The second workshop will follow the same pattern as the first but will involve new candidates drawn from the same formal groups and any new ones that might have emerged since the first workshop. The subject matter will weigh heavily in the direction of resource co-management.

WBS 536: Monitoring

The Sociologist will be making monitoring visits to the Dominican Republic over the life of the sub-project to assess progress of activities being implemented, and to provide technical assistance to the fisheries department and to organize short-term training programs. Information will also be gathered on issues to be included in subjects for the second Fisheries Field Officers Training Workshop.

REFERENCE

R. Colom. et. al, 1994. Comprehensive Coastal Fisheries Census, Report del PROPESCAR-SUR, Vol. 1., 1994, pp.03-11

WBS 540: LONG TERM TRAINING

Objectives

The aim of this activity is to enhance institutional capability in Dominican Republic for sustainable fisheries development and management. This will be accomplished by training of staff of the Fisheries Department in Dominican Republic through long term scholarships, short courses and short term attachments.

Planned Activities

Scholarships and Short-term Training

The development of the necessary skills for fishery assessment and management in Fisheries Divisions of participating countries is the cornerstone of a long-term approach to improved fisheries management. New concepts and methods for data analysis and resource assessment are continually being developed. The Fisheries Department staff will be best able to carry out the resource assessments and resource management activities if they are familiar with these concepts and competent in the newest methods. There is a need within the Fisheries Department for expertise in data collection, data management, resource assessment and resource management. Advanced degree training is therefore needed in data collection and management, resource assessment and resource management. At least two scholarship years of advanced level (Masters degree) training in fisheries will be provided to the fisheries staff in Dominican Republic. Scholarships are tenable at universities in the CARIFORUM states or EU member countries. Candidates receiving scholarship support are expected to conduct research in priority areas that are of direct relevance to sustainable development and management of the fisheries in their countries. Several of these study topics have been described under WBS400 and WBS 500. In addition support will be provided for existing staff of the Fisheries Department to upgrade their skills and or conduct research projects at a local university in Dominican Republic in areas directly relevant to the sustainable development of the fisheries sector. Full or part sponsorship will be provided to successful candidates.

NAME	PROGRAM	INSTITUTION
Fisheries Dept. staff	M.Sc degree in Fisheries Assessment and management	University in the CARIFORUM Region or a EU Country)
Fisheries Dept. staff	BScDegree in Fisheries related discipline	University of Dominican Republic and other regional university
Fisheries Dept. Staff	Short-term training courses or attachments	Regional or in EU countries, training courses

Output

The expected outputs are enhanced capability within the Fisheries Department for sustainable fisheries development and management through trained Fisheries Officers, Fisheries Assistants and Field Officers.

WBS 550: Surveillance and Enforcement

Surveillance and enforcement need to be improved in the CARIFORUM region to successfully manage the fisheries. The purpose of this activity is to promote regional co-ordination of surveillance and policing of marine fisheries resource. To better understand the problems and needs of the countries regarding surveillance and enforcement and develop a co-ordinated regional approach, a consultant will be engaged to study the issues and develop proposals to resolve the problems. This is a regional initiative which will benefit all the CARIFORUM Countries. Dominican Republic will participate in the study, including the development of the project proposal. Resources will be provided to support the participation of Dominican Republic in the regional workshop.

WBS 560: POST-HARVEST HANDLING PROCESSING AND MARKETING

In order to optimise the returns from the fish captured significant improvement is needed in post-harvest handling, processing and marketing of fish in the CARIFORUM region. To better understand the problems and needs of CARIFORUM countries regarding post-harvest handling, processing and quality control these needs will be studied by a consultant and a report prepared. The report will define a strategy and a project proposal for enhancing regional institutional capability to meet these requirements. Possible areas for examination would be quality control, upgrading legislation, strengthening of inspectorate, marketing intelligence and value added processing. The Consultant's report will be discussed by the CARIFORUM Countries at a regional workshop. The Consultant will revise the report and project proposal in light of the discussion and conclusions of the workshop. The proposal will then be submitted to a donor for funding.

This is a regional initiative which will benefit all the CARIFORUM Countries. Dominican Republic will participate in the study, including the development of the project proposal. Resources will be provided to support the participation of Dominican Republic in the regional workshop.

WBS 570. FISHERIES DEVELOPMENT PLANNING

WBS 570.1: Technological/developmental – Community Based Pilot Project

The fishermen along the south coast reported that they frequently encounter problems marketing pelagic fishes during the fishing season due to lack of cold storage facilities and transportation to take the fish to the metropolitan areas. If cold storage and suitable transportation were available the fishermen believe that they could catch much more fish than they currently do. The project could conduct a study to determine the feasibility of establishment of cold storage facilities on the beaches and the marketing arrangements required to alleviate the problems encountered by the fishermen. The study should include preparation of a proposal which could be presented to the Government or donor agencies seeking funding for development of the necessary infrastructure. This proposal could be developed by a local consultant.

The above program of work has been agreed upon this 29th day of September 2000, by the Fisheries Department of The Dominican Republic and the CARICOM Fisheries Unit headquartered in Belize, in witness whereof the Parties hereby affix their signatures as follows:

For the CARICOM Fisheries Unit:

Mr. Hugh Saul
Project Director

Mr. Milton Haughton
Scientific Director

For the Government of the Dominican Republic:

Dr. Frank Moya Pons
Secretario de Estado de Medioambiente y Recursos Naturales

Lic. Cecilio Diaz Carela
Subsecretario de Estado de Recursos Costero/Marinos

WBS #	ACTIVITY	BUDGET
WBS300	FISHERIES DATA AND INFORMATION SYSTEM	
310.1/320.	Review and Refinement of the data collection system	7,000.00
310.2	Enhance data Collection plans to cover the major fisheries	45,000.00
310.3	Train Fisheries divisions staff in data collection	3,000.00
310.4	Database software for data storage, basic analysis and reporting	4,000.00
310.5/320.	Train DOF staff in data entry, analysis and reporting (TIP & LRS)	3,000.00
310.6/320.	Provides Resources for Implementation(Computer and data collection equipment)	6,000.00
310.7/320.	Preparation & dissemination of articles and technical reports	3,000.00
320.2	Enhance Licensing and Registration System	5,000.00
320.3	Database software for data storage, basic analysis and reporting (Licensing & Registration)	5,000.00
310.8/320.	Monitoring and provision of technical assistance	5,000.00
	SUB-TOTAL	86,000.00

400	FISHERIES RESOURCE ASSESSMENT	US\$
400.1	Review and analysis of historical data	6,000.00
400.2	Updating the information on Fisheries Activities	15,000.00
400.3	Selectivity Studies	15,000.00
430.1	Assessment of Conch Fishery	45,000.00
430.2	Assessment of the lobster fishery	45,000.00
410.1	Assessment of Deep-sea fish-fishery	12,000.00
410.2	Assessment of large Pelagic Fishery	10,000.00
410.3	Assessment of coral reef fishery	15,000.00
410.4	Studies of Spawning Aggregations	5,000.00
400.4	Monitoring	7,000.00
	SUB-TOTAL	175,000.00

WBS 500	FISHERIES MANAGEMENT	US\$
511.1	Preparation of comprehensive national Fisheries and Aquaculture Policy	8000.00
511.2	Preparation/finalization of FMP	5000.00
511.3	Support Implementation of FMP	10000.00
511.4	Preparation of Plan for FAC	5000.00
511.5	Establishment/Operation of FAC	5000.00
512.1	Strategic Review and upgrading organizational structure of the Fisheries Department	8000.00
512.2	Bi-national Fish. Committees (DR/Haiti; DR/Bahamas; DR/Jamaica)	15000.00
512.3	Development of Mechanism for Conflict Resolution (Study plus implementation)	10000.00
	CFU staff Monitoring and provision of technical assistance	5000.00
	Sub-total	71000.00

WBS520	Regional Fisheries Management	US\$
520.1	Participation in the Development of the CRFM	5000.00
520.2	Regional Cooperation: Participation of fisheries staff in regional/international fisheries management fora (including CFRAMP WBS500 Terminal	4000.00
	SUB-TOTAL	9000.00

WBS530	COMMUNITY INVOLVEMENT AND PUBLIC AWARENESS	
532/330	National Dialogue group	11000.00
533.1	Community Mobilization & Organization Formation	20000.00
533.2	Desk Top Printing and Information Dissemination Equipment	14000.00
534	Fisheries Field Officers Workshop	12000.00
535	National Dialogue Group	10500.00
536	Activities Monitoring & Evaluation	7000.00
	SUB-TOTAL	74500.00

WBS 540	HUMAN RESOURCE DEVELOPMENT (TRAINING)	
540.1	Long-term training and scholarships	40000.00
540.2	Short-term training and attachments	12000.00
	SUB-TOTAL	52000.00

WBS 550	SURVEILLANCE AND ENFORCEMENT	
	Development of a regional approach to MCS. This is a regional activity in which the Dominican Republic would participate	3500.00
		3500.00

WBS 560	POST-HARVEST HANDLING PROCESSING AND MARKETING	
	Development of a regional strategy and proposal for improved post-	3500.00
		3500.00

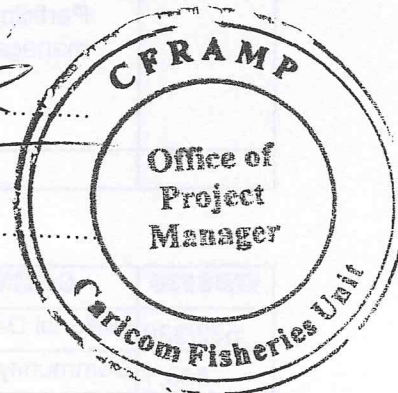
WBS 570	FISHERIES DEVELOPMENT PLANNING	
570.1	Community based study to develop proposal for storage and marketing of fish in the southern areas.	3500.00
	SUB-TOTAL	3500.00
	Sub-total	\$478,000.00
	Contingency	\$40,000.00
	TOTAL	\$518,000.00

The above program of work has been agreed upon this 29th day of September 2000, by the Fisheries Department of The Dominican Republic and the CARICOM Fisheries Unit headquartered in Belize, in witness whereof the Parties hereby affix their signatures as follows:

For the CARICOM Fisheries Unit:

Mr. Hugh Saul
Project Director

Mr. Milton Haughton
Scientific Director



For the Government of the Dominican Republic:

Dr, Frank Moya Pons
Secretario de Estado de Medioambiente y Recursos Naturales

Lic. Cecilio Diaz Carela
Subsecretario de Estado de Recursos Costero/Marinos

