



*CARICOM Fisheries Unit*



*The Bahamas*



*European Union*

---

## **Integrated Caribbean Regional Agriculture and Fisheries Development Programme - Fisheries Component**

---

### **TWO YEAR WORK PROGRAMME FOR THE BAHAMAS (April 2000 – March 2002)**

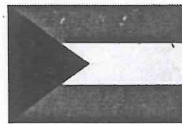


Prepared By  
Fisheries Department of The Bahamas and  
CARICOM Fisheries Unit, Belize  
January 11, 2001

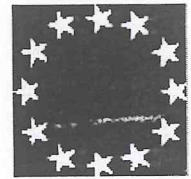
*Funded by the Commission of the European Union  
Under Lomé IV - Project No. 7: ACP: RPR: 385*



*CARICOM Fisheries Unit*



*The Bahamas*



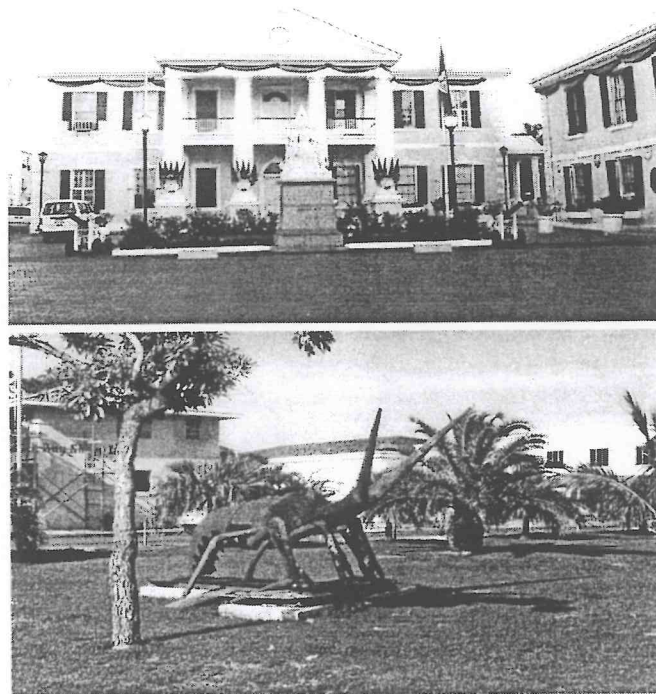
*European Union*

---

## **Integrated Caribbean Regional Agriculture and Fisheries Development Programme - Fisheries Component**

---

### **TWO YEAR WORK PROGRAMME FOR THE BAHAMAS (April 2000 – March 2002)**



Prepared By  
Fisheries Department of The Bahamas and  
CARICOM Fisheries Unit, Belize  
11 January 2001

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

## TABLE OF CONTENTS

<b>LIST OF ACRONYMS.....</b>	<b>3</b>
<b>EXECUTIVE SUMMARY.....</b>	<b>4</b>
<b>WBS 300: FISHERIES DATA AND INFORMATION MANAGEMENT SYSTEMS.....</b>	<b>6</b>
<b>INTRODUCTION.....</b>	<b>6</b>
<b>WBS 310: CATCH, EFFORT, BIOLOGICAL AND SOCIO-ECONOMIC DATA MANAGEMENT SYSTEM.....</b>	<b>7</b>
WBS 311/321: REVIEW THE DATA COLLECTION AND MANAGEMENT SYSTEMS.....	7
WBS 314: DATABASE SOFTWARE FOR DATA STORAGE, BASIC ANALYSIS AND REPORTING...8	8
WBS 316/325: PROVIDE RESOURCES FOR IMPLEMENTATION.....	9
<b>WBS 320: LICENSING AND REGISTRATION DATA MANAGEMENT SYSTEM.....</b>	<b>9</b>
WBS 323: DATABASE SOFTWARE FOR DATA STORAGE, BASIC ANALYSIS AND REPORTING.....	9
<b>WBS 400: FISHERIES ASSESSMENT.....</b>	<b>ERROR! BOOKMARK NOT DEFINED.</b>
<b>WBS 430: LOBSTER AND CONCH ASSESSMENT AND RESEARCH.....</b>	<b>21</b>
WBS 430.1 ASSESSMENT OF CONCH FISHERY.....	21
WBS 430.2 ASSESSMENT OF CRAWFISH FISHERIES.....	22
WBS 410.1 BASELINE SURVEY IN MARINE PROTECTED AREAS.....	23
WBS 400.1 MONITORING.....	24
<b>WBS 500: FISHERIES RESOURCE MANAGEMENT.....</b>	<b>26</b>
<b>WBS 510: STRENGTHENED NATIONAL FISHERIES MANAGEMENT.....</b>	<b>26</b>
WBS 511: NATIONAL FISHERIES POLICY, FMP AND ADVISORY/DECISION MAKING MECHANISM.....	28
WBS 512.1: STRATEGIC REVIEW AND UP-GRADING THE ORGANIZATIONAL STRUCTURE.....	29
AND CAPABILITY OF THE FISHERIES DEPARTMENT.....	29
WBS 512.2: THE BAHAMAS/DOMINICAN REPUBLIC FISHERIES COMMITTEES.....	30
WBS 512.3: MECHANISM FOR CONFLICT RESOLUTION/MANAGEMENT.....	31
<b>WBS 520: STRENGTHENED REGIONAL FISHERIES MANAGEMENT.....</b>	<b>31</b>
<b>WBS 530 COMMUNITY INVOLVEMENT AND EDUCATION.....</b>	<b>33</b>
WBS 530.1: MULTI-DISCIPLINARY SURVEY.....	34
WBS 532.0: NATIONAL FISHERIES WORKSHOP.....	34
WBS 533.1: COMMUNITY MOBILIZING AND INSTITUTIONAL STRENGTHENING.....	34
WBS 533.2: FISHERIES TRAINING PROGRAMS.....	35
WBS 533.3: EDUCATIONAL MATERIALS PRODUCTION.....	35
WBS 534.1: FIRST FISHERIES OFFICERS (EXTENSION) TRAINING WORKSHOP.....	36
WBS 535: INTRA-ISLAND DIALOGUE GROUPS. DIALOGUE GROUPS.....	36
WBS 536: MONITORING.....	36
<b>WBS 540: LONG TERM TRAINING.....</b>	<b>37</b>
SCHOLARSHIPS AND SHORT-TERM TRAINING.....	37

**WBS 550: SURVEILLANCE AND ENFORCEMENT .....37**

**WBS 560: POST-HARVEST HANDLING PROCESSING AND MARKETING.....38**

**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**

The fisheries component of the Integrated Caribbean Regional Agriculture and Fisheries Development Programme (ICRAFD) funded by the European Development Foundation (EDF) was largely designed to plan and implement a 5-6 years fisheries development and management program to benefit four CARIFORUM countries namely, the Bahamas, the Dominican Republic, Suriname and Haiti. Through this project, these four countries are expected to benefit from the implementation of the sub-projects and related activities that constitute the CARICOM Fisheries Resource Assessment and Management Program (CFRAMP) from which twelve CARICOM countries have been benefiting since 1991-2. Additionally, all 16 countries are to benefit from other new sub-project and related activity areas such as Fish Handling, Quality Control, Harvesting, Processing and Marketing. The CARICOM Fisheries Unit (CFU) in Belize is the Executing Agency for the project.

Accordingly, a five-man technical team from the CFU embarked on a Planning Mission to the Bahamas, July 23-30, 2000 and collaborated with the Fisheries Department of the Bahamas in implementing a Multidisciplinary Survey, through administering five survey instruments, namely a Baseline Survey of the Fisheries Department, Key Informants Interviews, Interviews on the Status of Fishermen's Organizations, Interviews on the Status of the Data Collection Programme and a Baseline Survey of Fishing Communities in the Bahamas. These were supplemented with documentary reviews, formal and informal interviews and discussions with stakeholders in the Department of Fisheries, the fishing communities, landing sites, fish markets, processing plants and the relevant ministries. A major seminar with all the main stakeholders was also held.

Out of these, an initial five-year work program was drafted in collaboration with the Fisheries department, and later finalized, approved and signed on by a management team from the CFU and the government of the Bahamas, to be implemented in two-year cycles. This two-year work plan and accompanying budget for implementation, was drawn from the five-year plan to be chiefly implemented by the Fisheries Department of the Bahamas, with technical and financial support from the CFU and some input by the government of the Bahamas, and other relevant institutions in the Bahamas.

The work plan generally covers the areas of data collection and information management, resource assessment studies, management decision-making, policy formulation and management planning, and community involvement in management decision-making and public awareness building and education. Some of the specifics of this two-year plan are presented under the relevant sub-headings below.

### **Fisheries Data and Information Management System**

This activity will upgrade the current data collection system in the areas of catch and effort, biological, socio-economic data collection and licensing and registration of vessels and resource users. It will review the entire system, build on its strengths and find solutions to existing problems, upgrade skills by training personnel in data storage and manipulation. The CFU will provide technical support and provide some of the resources for implementation.

### **Resource Assessment and Research**

This activity area will deal with the broad area of identifying the problems relating to the sustainable utilization of the major species targeted and exploited in the Bahamas, such as Crawfish (Lobsters), Conch, Reef and Slope finfish, and coastal and migratory pelagic species. Assessment studies will be conducted from historical, socio-economic and biological data. A Baseline Survey will be conducted on Marine Protected Areas (MPA) as a management tool, biological sampling will be enhanced and more work will be done on participation in the activities of international control bodies such as ICCAT, and the relatively new area of Sports/ Recreational Fishing will be further developed.

### **Fisheries Resource Management**

This broad activity area is patterned on the CFRAMP model of strengthening national management capability through training, technical assistance and support in management planning, policy formulation and decision making, and pursue the activities in support of regional fisheries management initiatives, leading to the establishment of a Regional Fisheries Mechanism.



The areas of promoting post harvest technologies in processing and marketing, and finding solutions to over-capacity in some fisheries will be pursued. The organizational structure of the department will be revamped to equip it for taking national policy development initiatives, fisheries management planning and the strengthening of the national Fisheries Advisory institution. Measures will also be taken to reduce international tensions among resource users, and promote international co-operation in the management of shared stocks. The Bahamas' participation in the process of establishing the Caribbean Regional Fisheries Mechanism (CFRM) will be continued. The Bahamas will begin benefiting from long-term training of its technical staff under the ICRAFD Scholarships and Research scheme.

The Community Involvement & Public Education sub-project will seek to build upon the impressive strengths of the department in this activity area, and address the weak areas chiefly through the national Fisheries Workshop and the institutionalization of intra-island Fisheries Dialogue Groups, the latter two enhancing the involvement of the resource user organizations in the management decision-making processes and providing cues to policy formulation. Through training and public awareness activities, the capacity of the fisher folk organizations to effectively participate in the management of the fisheries resources will be enhanced, and training programs for fisheries extension officers will lead to building their capabilities in providing support for the stakeholders towards the systematic involvement of co-management regimes in the Commonwealth of the Bahamas.

## WBS 300: FISHERIES DATA AND INFORMATION MANAGEMENT SYSTEMS

### Introduction

During the first cycle of implementation of the 5 years Fisheries Component of the Integrated Caribbean Regional Agricultural and Fisheries Development Programme, the Fisheries Data Management System sub-project will focus on improving the current Data Management System in The Bahamas.

The Fisheries Data Management System will consist of two components, (i) **Catch, Effort, Biological and Socio-economic Data Management System (WBS 310)** and (ii) **Licensing and Registration Data Management System (WBS 320)**. Within each component data collection, storage, analysis and reporting will be main activities. As much as possible, these activities will be combined.

During the Planning Mission (see Five Year Work Programme for The Bahamas for more details) to The Bahamas (July 23-30, 2000) information obtained from Multi-disciplinary Survey instruments, informal discussions and interviews with the Fisheries Department staff highlighted the strengths, weaknesses and some of the problems in the current Data Management System. Some of the current problems and requirements, include:

1. Inadequate coverage of the landing sites due to the distance between the Islands and lack of transportation.
2. The need to obtain data on the sports fishing industry to aid in characterizing this fishery and determine its socio-economic contribution to the national economy.
3. Collection of biological data for additional commercially important species, as biological data is currently collected for only Conch and Nassau Grouper.
4. The Bahamas Fisheries Information System (BFIS) is a DOS-based software, which is outdated and does not adequately address the evolving needs of the fisheries sector. The program should either be upgraded to a Windows version, with a graphical end-user interface, that will run in the Windows environment to increase its functionality and allow easy manipulation and extraction of the data, or it should be replaced.
5. Training for data collectors, as some data collectors and senior fisheries officers felt that lack of proper data collection techniques and insufficient training are issues that need to be addressed.
6. Lack of sufficient data collectors, especially on the Family Islands.

In an effort to address these issues the following activities are being developed:

#### **A. Catch, Effort, Biological and Socio-economic Data Management System (WBS 310)**

1. Review the Data Collection and Management Systems (WBS 311/321)
2. Enhance data collection plans covering the major fisheries (WBS 312)
3. Train fisheries divisions staff in data collection (WBS 313)
4. Develop/upgrade database software for data storage, basic analysis and reporting-TIP (WBS 314)
5. Train Fisheries Divisions Staff in using the database software for, data entry, analysis and reporting - TIP(WBS 315)
6. Provide resources for implementation (WBS 316/325)
7. Prepare Articles and Technical Reports (WBS 310.6/320.6)
8. Monitoring and Evaluation (WBS 310.8/320.7)



## **B. Licensing and Registration Data Management System (WBS 320)**

9. Enhance Licensing and Registration System (WBS 322)
10. Develop/upgrade Database software for data storage, basic analysis and reporting-LRS (WBS 323)
11. Train fisheries divisions staff in using the database software for data entry, analysis and reporting - LRS (WBS 324)

The review of the data collection and management system will be completed during the early part of the first cycle and will provide recommendations that will guide and fine tune the other activities. The development or upgrading of the database software will be completed in the first two years of the project, with the other activities being implemented over the six-year period.

### **Objective of the Work Plan**

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

## **WBS 310: Catch, Effort, Biological and Socio-economic Data Management System**

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

A review of the current data management system will allow existing data to be analyzed, to explore the possibility of improving the sampling plan to cover the major landing sites in a cost effective manner, and to examine the possibility of obtaining more complete and accurate data, particularly on effort data from areas like Spanish Wells, where fishing is done mainly on the commercial level.

The issue of improving the current database software will be examined and the review would look at whether data on sports fishing exist and is adequate for characterizing the fishery and its contribution to the economy. Recommendations from the review will allow improvement of the current data and information management system in The Bahamas.

### **Purpose**

The aim of the review will be to:

- Generate information from which to make recommendation for improvements.
- Determine if adequate data exists for assessing growth and mortality parameters for the main commercial species and advise on the appropriate data required and the most economical and statistically sound method of collection.
- Review the type of economic and social data that exist and advise on additional data to be collected in order to monitor the performance of the different fisheries as well as provide information for management.
- Review the type of data collected in the sports fishing industry and suggest, if necessary, additional data to be collected to effectively monitor and manage the industry.
- Prepare a product pathway from the fishers to the consumers for marine resources.
- 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 by TCDC arrangements 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, the Data Manager, Fisheries Officers and Data Collectors to conduct the assignment and to facilitate technology transfer to these personnel.
- The resource person will visit The Bahamas 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 landing sites, wharves and processing plants to observe data collection activities will be made and interaction between the fisheries personnel and the fishers will also be done.

## **Outputs**

The outputs of this activity will be:

- Review and analysis of the data collection and management program for the fisheries completed. This will include the data collection forms, the field data collection program, computerised databases (BFIS) and reports in The Bahamas, with recommendations for refinement.
- Indication as to whether adequate data exists to determine population growth and mortality parameters for the main commercial species achieved and/or advice provided on the appropriate method of obtaining such data for analysis.

### **WBS 313: Train Fisheries Divisions Staff in Data Collection**

Following the modification of the current sampling plan, all existing staff involved in data collection and management will participate in a workshop on data collection and management. At this workshop, the participants will be trained in data collection, species identification, quality control and reporting.

## **Purpose**

The purpose of this activity will be to upgrade the skills of existing data collection and management staff.

## **Approach**

The training will be delivered by resource personnel from CFU or regional personnel under TCDC arrangements and the Fisheries Department (The Bahamas).

## **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 a software (BFIS) for data (catch, effort, biological and economic) entry, storage and minimal manipulation. Data analysis is currently being done in Microsoft Excel. The Fisheries Department expressed the need for an upgrade of the current Dos-based software to a Windows type system, that is a system with a graphical interface.



## **Purpose**

The purpose of this activity will be to:

- Provide a database software or upgrade BFIS.
- Consider the suitability of TIP for 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 CFU or through TCDC arrangements or a consultant will undertake the assignment in collaboration with the Fisheries Department. This individual should have a working knowledge of TIP, experience in data storage, manipulation, basic statistical analysis and reporting.
- The resource person will visit The Bahamas and conduct a thorough review of The Bahamas Fisheries Information System (BFIS). This activity will be merged with WBS 323.

## **Output**

- Review of BFIS with recommendations for an enhanced data management software.
- 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.
- Fisheries Department staff identified to operate the system

### **WBS 316/325: Provide resources for implementation**

The catch, effort, biological and socio-economic data 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 adequate coverage of landing sites on the Family Islands, transportation allowance will be provided, rather than employing more data collectors. The Licensing and Registration System will require at least one computer, with adequate resources, and software to support data entry, analysis and reporting.

## **WBS 320: LICENSING AND REGISTRATION DATA MANAGEMENT SYSTEM**

### **WBS 323: Database software for data storage, basic analysis and reporting**

Currently the department has a database software (BFIS) for data (licensing and registration of vessels) entry, storage and minimal manipulation. Data analysis is currently being done in Microsoft Excel. The Fisheries Department expressed the desire to have the current Dos-based software upgraded to a Windows version.

## **Purpose**

This activity will:

- Review the current database software.
- Consider LRS for data entry, storage, manipulation, basic analysis and reporting.
- Identify and train Fisheries Department staff to operate and manage the system.

## **Approach**

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

## **Outputs**

- Review of the existing database software 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 400: FISHERIES ASSESSMENT**

### **Introduction**

#### **WBS 410: Pelagic, Reef and Slope Fisheries Assessment**

The lobster (crawfish) fishery is the most developed in the Bahamas, yielding the highest production and estimated value among the species harvested. Notwithstanding, the reef, and slope finfish fisheries also make a notable contribution to overall production, with groupers and snappers ranking among the first four species/ species groups in importance for production, and estimated value. The potential for further growth and development of the reef and deep-water fisheries has been noted (Johnson and Deleveaux, 1998; FAO, 1989; Giudicelli, 1978; González Alberdi, 1975). In recognizing the potential for further development of these fisheries, Johnson and Deleveaux (1998) noted the need for cautious expansion, and recommended that assessments be conducted on both the shallow water resources and deep water slope demersal species. These authors further recommended that an assessment of coral reef resources be conducted and comprehensive mapping of the shallow water marine habitats. Other recommendations included the development and implementation of appropriate management plans and designation of integrated coastal and marine protected areas. González Alberdi (1975) emphasized the requirement of good statistical information systems, covering the collection of catch and effort data, as well as biological data, essential for adequate monitoring growth and to determine appropriate levels of optimum effort. Examination of the Fisheries Department's 'Marine Resource Landing Form', which is a form used on a daily basis, revealed that current data collection covers catch and effort data at the species level for the main species only.

Noting the extensive presence of reefs in the Bahamas, the contribution to production and estimated value of the Nassau Grouper and other similar finfish fisheries, the significant potential for expansion of the reef and slope fisheries, the need to update/refine estimates of potential yield, and to determine the status of the resources for management planning purposes, the following reef and slope fisheries activities are proposed:

1. Review and analysis of historical data on the reef and slope fisheries;
2. Enhancement of fishery and biological sampling for reef and slope species;
3. Assessment of commercially important reef and slope fisheries;
4. Application of data on Nassau Grouper spawning aggregations in further development of current management approaches for this species;
5. Mapping of the different habitats in key reef areas, for estimation of potential yield and to provide reference data for management purposes, including the establishment and management of marine reserves.



At present pelagic species do not comprise a major portion of catches reported by Bahamian fishers. However, the Bahamas is a popular tourist destination, and several sport fishing tournaments are held every year. Sport fishing catches comprise mainly dolphinfish, barracuda, wahoo, bonefish, blue and white marlins and tunas (CFU, 2000; Deleveaux and Higgs, 1995). Furthermore, a significant number of fishing permits (>6,000) is issued annually to foreign fishing vessels for the purpose of sport/ recreational fishing (Deleveaux and Higgs, 1995). These authors also acknowledged that sport fishing makes an important contribution to the Bahamian economy. The detailed catch and effort by these foreign fishing vessels are not recorded and hence are currently unknown. Although there are specific sport fishing regulations, without effective surveillance, these vessels may be collectively harvesting significant quantities of large pelagic species. At present, the Bahamas Fisheries Department obtains information on the total catches and nominal effort of local sport fishing tournaments. NMFS has monitored the international billfish tournaments. Johnson and Deleveaux (1998) also noted the need to conduct assessment of coastal and large pelagic resources.

Noting the extent of sport fishing activities in the Bahamas which could be having a significant impact on large pelagic resources that are highly migratory and hence shared and jointly managed by regional and international organisations such as the International Commission for Conservation of Atlantic Tunas and Tuna-Like Species (ICCAT), the contribution of sport fishing to the economy, the potential for further growth and development, and the benefit of applying more cost effective measures for management of the industry, the following pelagic fisheries activities are proposed:

1. Review and analysis of historical data on the sport fisheries;
2. Enhancement of fishery and biological sampling for reef, slope and pelagic species;
3. Development of sampling program for sport fisheries/ Socio-economic study of the sport fishery;
4. Assessment of commercially important pelagic fisheries;
5. Participation in ICCAT activities.

## **PLANNED ACTIVITIES**

### **WBS 410.1: Review and Analysis of Historical Data on Reef, Slope and Pelagic Fish Species**

In preparation for further development of the infrastructure for monitoring and managing the Bahamas fisheries, it is essential to review and analyse available historical data. This information will provide an updated analysis of the status of the Bahamas fishing industry to facilitate general management decisions, as well as highlight the areas within the data information system in need of improvement.

#### **Purpose**

- To review and analyse fully all the available historical data on the pelagic, reef, and slope fisheries of the Bahamas, for provision of management advice.
- To update estimates of the relative commercial importance of the different pelagic and reef and slope fish species.
- Where possible, to obtain first estimates of fish stock parameters, pertaining to growth and mortality, required for input into stock assessments.
- To identify errors, gaps, and shortcomings of the historical data information system and field sampling program.

#### **Approach**

- A resource person(s), with appropriate skills and experience in statistical and assessment analyses from CFU or from within the country or a consultant will be identified to undertake the assignment.

- The resource person (s) will work closely with the Director of the Bahamas Fisheries Department, the Data Manager, and fisheries officers responsible for data entry and analysis.
- The resource person will undertake a detailed review and analysis of the available historical data on pelagic, reef and slope fisheries, including conducting new stock assessments where possible, or identifying suitable approaches to these stock assessments given available data.
- The resource person will be responsible for preparation of the report(s) of activity items outlined above.

### **Outputs**

- A current evaluation of the status of the Bahamas fishing industry for the selected species, useful for management purposes.
- Updated estimates of the relative importance of individual species and species groups to the Bahamas fishing industry.
- In cases of available data, first estimates of fish stock parameters, pertaining to growth and mortality, required for input into stock assessments.
- Information on the status of stocks not recently assessed, or the identification of suitable approaches to assessment of these stocks, given the available data.
- Identification of errors, gaps, and shortcomings of the historical data information system, and field sampling program, for consideration in future improvements that may be recommended.
- Training of fisheries personnel in statistical analyses of fisheries data.

### **Schedule up to March 2002**

- Identification of resource person to conduct historical data and information systems review by March 2001.
- Study to be completed by August 2001, and report to be prepared by September 2001, as the results will be used to upgrade the current data information system and field sampling programs.
- Training of fisheries personnel in data analysis to be conducted during April-August 2001.

### **WBS 410.2: Enhancement of Fishery and Biological Sampling for Commercially Important Reef, Slope, and Pelagic Species**

The current field data collection program captures catch and effort data at the species level for the main species only: 'crawfish' (assumed reserved for spiny lobster only); 'conch' (assumed reserved for queen conch only); 'Nassau Grouper'; 'green turtle'; 'loggerhead turtle'; 'stone crab claws'. The other species categories noted are general categories. Interviews with field data collectors revealed that the catches of other species were not always recorded at the individual species level. In consequence, the current field sampling program does not provide for continuous capture of detailed fisheries and biological data at the individual species level for most reef, slope and pelagic fish species.

### **Purpose**

- In collaboration with efforts to improve the present data information system, to develop an improved field sampling program.
- In collaboration with efforts to improve the present data information system, to develop improved data collection forms.

- To train fisheries personnel in executing improved field sampling program, including completion of upgraded field data collection forms.

### **Approach**

- A resource person (s), with appropriate skills and experience in finfish fisheries statistical sampling design, including design of the relevant data collection forms, from CFU or from within the country or a consultant, will be identified to undertake the assignment.
- The resource person (s) will work closely with the Director of the Bahamas Fisheries Department, the Data Manager, and fisheries officers responsible for design of the field sampling program for finfish and the collection of these data.
- The resource person (s) will undertake a full review and analysis of the nature and design of the current field sampling program for finfish fisheries.
- The resource person (s) will be responsible for preparing a report on activity items outlined above, and for making specific recommendations for improving the current field sampling program.
- The resource person (s) will work closely with the Director of the Bahamas Fisheries Department, the Data Manager, and other relevant fisheries staff to develop an improved sampling program for finfish fisheries, in accordance with accepted recommendations noted in the report.
- The resource person (s) will be responsible for training the relevant fisheries staff in carrying out the revised field sampling routines and completion of revised data collection forms if necessary.
- The resource person (s) will be responsible for monitoring the implementation of the improved sampling program (s) for the finfish fisheries of the Bahamas, conducting quality control checks, and data analyses during at least the first two years of implementation of the improved sampling program(s).

### **Outputs**

- An improved field sampling program for finfish, that allows the collection of the types of data required for conducting quantitative stock assessments and hence provision of sound management advice.
- Training of fisheries staff in statistical sampling design.
- Training of fisheries staff in collection of fisheries and biological data at the individual species level.

### **Schedule up to March 2002**

- Identification of the resource person to conduct the review and analysis study, by March 2001.
- The review and analysis of the nature and design of the current field sampling program for finfish fisheries are scheduled to be completed and the report and upgrade recommendations to be prepared by September 2001.
- Development of improved sampling program, data collection forms and training will be completed by October 2001.
- Activity implementation is scheduled to commence by November 2001. Field monitoring by CFU staff will commence in January 2002, and be conducted every 3-6 months for a 2-year period.

### **WBS 410.3: Study of the Socio-economic Importance of the Sport Fishery and Development of Sampling Program**

Within the Caribbean region and in the Bahamas, fisheries are important, not only as a source of food and employment for commercial and subsistence fishers, but also for a growing population of tourist and



local recreational fishers. Recreational fishing is defined as fishing conducted for the purpose of pleasure and relaxation rather than for commercial gain or subsistence by the fisherman. Popular sport fishing magazines such as *Marlin*, *Salt Water Sportsman*, and *Sport Fishing*, consistently rate the Bahamas as a prime destination for international anglers for billfishes such as marlins and sailfish, and for several other species of game-fishes. Several international and national fishing tournaments are held each year in the Bahamas. Despite the popularity of sport fishing, there is a lack of data and information on the recreational fishing industry in the Bahamas and in the region more generally. Research is needed to understand fully the scope, economic importance, impact on the resource and management requirements of the recreational fisheries in the region. Recreational marine fisheries and related ventures are believed to be a multi-million dollar industry and provide thousands of jobs. The multiplier effect of these industries also generates millions of dollars in economic activity in the Bahamas.

At present, the Bahamas Fisheries Department obtains information on the total catches and nominal effort of local sport fishing tournaments only. There is no sampling program in place to capture data on the daily fishing activities of non-resident sport/ recreational fishing boats. In consequence, the true significance of the Bahamas sport/ recreational fisheries is likely under-estimated. This information is essential for proper local management of the sport/ recreational fisheries, in tandem with internationally co-ordinated efforts for management of the species concerned. Sport fishers may not land their catches at the same landing sites as the commercial fishermen, and their daily pattern of fishing may not be as predictable as those of commercial fishers. In view of this, it may be advisable to establish a logbook system of data recording and reporting for the resident sport/ recreational fishers. In the case of non-resident sport fishing operations, the logbook format could be modified to produce a data card which could be posted to the Fisheries Department within a given period of time, following cessation of fishing operations in Bahamian waters.

### **Purpose**

- To conduct a socio-economic study to determine the size and nature of the sports/recreational fisheries and their contribution to the Bahamian economy.
- To review the nature and magnitude of resident and non-resident sport/ recreational fishing operations in the Bahamas.
- To review the current sampling program for resident and non-resident sport/ recreational fisheries.
- To develop an appropriate improved sampling program for resident and non-resident sport/ recreational fisheries of the Bahamas including the development and refinement of field data collection and/or logbook forms.
- Develop recommendations for sustainable development and management of the sport/recreational fisheries.

### **Approach**

#### Socio-economic study

- This study would determine the importance of the fishery including the contribution it is making the Bahamian economy.
- This study could be conducted by either a staff of the fisheries department, a staff from the fisheries department who receives a scholarship to do an advanced degree under this project, or a student from another CARIFORUM state, or a local or regional consultant.
- If the study will be undertaken by a student, then the CFU, in collaboration with the Fisheries Department, will make the necessary arrangement with an appropriate university to take the lead role in conducting the study and supervising the student.
- The detailed proposal for the study will be developed by the student in collaboration with the CFU, the student's supervisor at the university and the Fisheries Department.



- The student will undertake the field work with support provided by the Fisheries Department and the CFU

#### Development of Sampling Program for the Sport/Recreational Fisheries

- A resource person(s), with appropriate skills and experience in sport/ recreational fisheries statistical sampling design and surveys, including design of the relevant data collection forms, from CFU or from within the country or a consultant, will be identified to undertake the assignment.
- The resource person (s) will work closely with the Director of the Bahamas Fisheries Department, the Data Manager, and fisheries officers responsible for monitoring resident and non-resident sport/ recreational fishing activities and for the statistical sampling program (s) for these fisheries.
- The resource person (s), with support and assistance from the Bahamas Fisheries Department, will undertake a full review and analysis of the nature and magnitude of resident and non-resident sport/ recreational fishing operations in the Bahamas, as well as the current sampling program.
- The resource person (s) will be responsible for preparing a report on activity items outlined above, which will include specific recommendations for improving the current sampling program(s) for resident and non-resident sport/ recreational fisheries.
- The resource person (s) will work closely with the Director of the Bahamas Fisheries Department, the Data Manager, and other relevant fisheries staff to develop improved sampling program (s) for both resident and non-resident sport/ recreational fisheries, in accordance with accepted recommendations noted in the report.
- The resource person (s) will be responsible for training the relevant fisheries staff in carrying out the revised field sampling routines and completion of revised data collection forms, if necessary.
- The resource person (s), with support and assistance from staff of the Bahamas Fisheries Department, will meet with the resident sport/recreational fishers to explain the need for improved sampling of these fisheries, and where necessary, to train fishers in completing the data forms.
- The resource person (s) will be responsible for monitoring the implementation of the improved sampling program (s) for the sport/ recreational fisheries of the Bahamas, conducting quality control checks and data analyses during at least the first two years of implementation of the improved sampling program (s).

#### **Outputs**

- A report on the nature and magnitude of the sport/ recreational fisheries in the Bahamas. The report will highlight the social and economic contributions of the sub-sector, including the levels of employment and earnings generated.
- Identification of errors, gaps, and shortcomings of the current statistical sampling program (s) for resident and non-resident sport/ recreational fisheries, and specific recommendations for improvements.
- Improved statistical sampling program (s), and revised/updated field data forms for the resident and non-resident sport/ recreational fisheries of the Bahamas.
- Training of fisheries staff in statistical survey, and sampling design.
- A graduate student trained to the masters degree level with expertise in recreational fisheries assessment and management.

## **Schedule up to March 2002**

- Socio-economic study will commence in September 2001, with identification of student/resource person/consultant.
- Socio-economic study proposal will be completed by December 2001.
- Implementation of socio-economic study will be completed by June 2002, and report prepared by August 2002.

### **WBS 411: Participation in ICCAT activities**

The Bahamas is an important tourist destination, with sport fishing being a notable attraction. Bonefish continues to be a popular target species for sport fishers. However, there are certain sections of sea in the Bahamas, such as the 'Tongue of the Ocean', and the 'Northeast Providence Channel', which are world renowned for the abundance of tuna and tuna-like species, and dolphinfish particularly during certain months of the year (Schultz, 1990). Recognising this fact, and noting the high number of fishing permits issued annually to non-resident sport fishing vessels in the Bahamas (Deleveaux and Higgs, 1995), it is important to determine the full impact of both resident and non-resident sport/ recreational fisheries of the Bahamas, as described in WBS Activity 410.3. In addition, many of the species concerned are highly migratory, and are shared with several other countries harvesting these species in the Atlantic Ocean and adjacent seas. In consequence, these species are monitored, assessed and managed through internationally coordinated efforts under the auspices of the International Commission for Conservation of Atlantic Tunas and Tuna-like Species (ICCAT).

It is therefore in the interest of the Bahamas to become a 'Cooperating Party' of ICCAT, and to participate in relevant ICCAT activities, so that the current extent of the large pelagic fisheries in the Bahamas and its contribution to the local economy is internationally recognised and respected. In addition, participation in ICCAT will ensure that monitoring of the local sport/ recreational fisheries for tuna and tuna-like species is coordinated with the efforts of other countries harvesting the same stocks.

#### **Purpose**

- To participate in relevant ICCAT activities (workshops/meetings), which provide information on the status of Atlantic tuna and tuna-like resources and current management regulations.
- To contribute at least basic fisheries data to the ICCAT database and to coordinate local management measures with those imposed by ICCAT.
- To demonstrate cooperation with ICCAT, and so enjoy the benefits of being a Cooperating Party of ICCAT.

#### **Approach**

- This activity can be implemented most easily by incorporating the Bahamian participation in ICCAT into the current regional effort for the same activity carried out by a number of CARICOM countries.
- The current regional effort involves CARICOM representation/participation in the annual ICCAT scientific and Commission meetings, as well as other relevant inter-sessional meetings. The CARICOM representative reports to ICCAT (e.g. statistics, fisheries developments) on behalf of countries, and is responsible for reporting to countries on ICCAT meetings attended and issues of concern.
- Submission of annual large pelagic fisheries statistics to ICCAT, and other pertinent information on the large pelagic fisheries (sport/ recreational) fisheries of the Bahamas. This information can be reported directly to ICCAT, and also be included in the annual CARICOM report to ICCAT.



## **Outputs**

- Annually updated information on the status of Atlantic tuna and tuna-like stocks, including the marlins, and on ICCAT management measures adopted or modified.
- 'Cooperating Party' status in ICCAT and attendant benefits, as it may become necessary.
- Avoidance/minimisation of economic dislocation that could be caused if ICCAT management measures do not recognise/consider the existence of significant large pelagic sport/recreational fisheries in the Bahamas.

## **Schedule up to March 2002**

- This activity will be incorporated into current ICCAT participation activities previously conducted under the CFRAMP project, and which are expected to continue under the CRFM.
- Preparation of a large pelagic fisheries update and national report for submission to ICCAT by August 2001.
- Contribution to and participation in the annual ICCAT SCRS and Commission meetings in October and November 2001.
- Participation in the activities of the CRFM Working Group on Large Pelagic Resources (LAP) which handles issues arising out of ICCAT during the period August 2000-March 2002.

## **WBS 412: Assessment of Commercially Important Pelagic, Reef, and Slope Fisheries**

Not surprisingly, most of the effort to date in stock assessment in the Bahamas has focused on the spiny lobster and the queen conch species. Notwithstanding, the reef, and slope finfish fisheries also make a notable contribution to overall production, with groupers and snappers ranking among the first four species/ species groups in importance for production, and estimated value. The potential for further growth and development of the reef and deep-water fisheries has been noted (Johnson and Deleveaux, 1998; FAO, 1989; Giudicelli, 1978; González Alberdi, 1975). In recognizing the potential for further development of these fisheries, Johnson and Deleveaux (1998) noted the need for cautious expansion, and recommended that assessments be conducted on both the shallow water resources and deep water slope demersal species. The need to conduct assessment of coastal and large pelagic resources was also noted (Johnson and Deleveaux, 1998).

Assessment analyses are essential for determining the health of the fisheries concerned, and for development of appropriate management strategies. Given available data, both traditional methods of assessment, as well as recently developed methods such as bioeconomic analyses and ECOPATH, should be undertaken. The various assessment approaches will allow an examination and understanding of the different perspectives to the same problem, and adoption of more balanced approaches to fisheries management

## **Purpose**

- To train fisheries staff in statistical and assessment analyses.
- To conduct quantitative stock assessments of commercially important species, given available data.
- Participation of fisheries staff in regional fisheries assessment and management meetings.
- Preparation of management advice, based on results of fisheries assessments conducted.

## **Approach**

- It is recommended that this activity be accommodated with a similar effort being carried out at present by a number of CARICOM countries.
- A resource person (s), with appropriate skills and experience in fish stock assessment, from CFU or from within the country or a consultant, will be identified to undertake the assignment.
- The resource person (s) will work closely with the Director of the Bahamas Fisheries Department, the Data Manager, and fisheries officers responsible for data compilation, analyses and assessment.
- The resource person (s) will work with staff of the Fisheries Department to conduct assessments of selected commercially important reef, slope and pelagic fisheries.
- The resource person (s) will work with staff of the Fisheries Department to prepare reports of the completed assessments, which will include management advice for the fisheries concerned.
- Staff of the Fisheries Department will participate in relevant regional pelagic, reef, and slope fisheries assessment and management workshops or working group meetings, to discuss and present the results of their assessments.

## **Outputs**

- Assessment reports providing management advice for fisheries assessed.
- Training of Fisheries Department staff in techniques of stock assessment.
- Further development of regional network of expertise, as well as regional collaboration in the assessment and management of reef, slope and pelagic fisheries.
- Peer-reviews of completed assessments.

## **Schedule up to March 2002**

- Participation of fisheries staff in second Caribbean pelagic and reef fisheries assessment and management workshop, organised by CFU and scheduled for June 2001.
- Preparation of national species datasets for assessments in 2002, to be completed by December 2002
- Training attachment and preparation of assessment report in February 2002.

### **WBS 413: Nassau Grouper Spawning Aggregation Studies**

In striving to achieve sustainable management of a fishery, it is important to ensure that the spawning stock is not fished down to levels at which there is risk of reduced recruitment or recruitment failure. In the case of the Nassau grouper, this species is particularly vulnerable to this type of overfishing, known as recruitment overfishing, owing to the fact that spawning aggregations are targeted heavily by the commercial fishery. Spawning stock biomass per recruit (SSBR) analyses can be used to determine the effects of fishing mortality and age (size) at first capture on spawning biomass. In consequence, an optimal fishing effort/ spawning aggregation size ratio could be usefully applied in managing fishing effort on Nassau grouper spawning aggregations, based on the total optimum fishing mortality that safeguards against recruitment overfishing.

## **Purpose**

- To identify and quantify the number of measurable spawning aggregations in a major fishing area for Nassau grouper.



- To monitor changes in the occurrence and density of spawning aggregations in response to different levels of fishing effort.
- Using a suitable target reference point (say, 30% or 40% of initial spawning biomass obtained from SSBR analyses), to determine an optimal fishing effort/spawning aggregation size ratio for management purposes.

### **Approach**

- A resource person (s), with appropriate skills and experience in acoustic surveys and fish stock assessment, from CFU or from within the country or a consultant, will be identified to undertake the assignment.
- The resource person (s) will work closely with the Director of the Bahamas Fisheries Department, the Data Manager, and fisheries officers responsible for monitoring the Nassau grouper fishery and for conducting field work at sea.
- The resource person (s) will work with staff of the Fisheries Department to prepare a detailed study proposal
- The resource person (s) will work with staff of the Fisheries Department to conduct acoustic surveys of Nassau grouper spawning aggregations over a selected area and time period.
- The resource person (s) will work with staff of the Fisheries Department to record detailed catch and effort data for the spawning aggregations surveyed.
- The resource person (s) will work with staff of the Fisheries Department to analyse the survey data, together with the fisheries catch and effort data, in order to determine the impact of different effort levels on different sizes of spawning aggregations.
- The resource person (s) will work with staff of the Fisheries Department to prepare a report on the activity items outlined above. The report will include recommendations for management of the Nassau grouper spawning aggregations, based on applying the information gathered by the present study to an independently obtained recruitment overfishing reference point at the stock level.

### **Outputs**

- Direct measurement of fishing operations on selected Nassau grouper spawning aggregations, and the reductions in spawning biomass caused by such effort.
- Given available information from completed assessments on the optimal fishing effort for safeguarding against recruitment overfishing for Nassau grouper stock (s) concerned, recommendations for management of spawning aggregations.
- Training of DOF staff in field research.

### **Schedule up to March 2002**

- The resource person will be identified by July 2001.
- The study proposal will be finalised by October 2001.
- The first set of field surveys will commence by January 2002.

### **WBS 414: Reef Habitat Mapping Study**

Estimates of the biomass or potential productivity of island shelves provide important components of fisheries management plans. Using available satellite imagery data, together with visual dive surveys (groundtruthing), detailed maps of the various types of benthic habitats can be produced for selected major island shelf areas in the Bahamas. These data will be used to develop theoretical estimates of

potential yield, useful for specific fishery management planning purposes. In addition, these data will provide important reference data for general management purposes, including the establishment and management of marine reserves.

### **Purpose**

- To develop maps of the various habitat types in key reef areas.
- To estimate areas of different types of reef habitat, and so develop a preliminary estimate of potential yield of the reef fisheries concerned.
- To provide reference data for guiding management decisions, e.g. determining appropriate boundaries and areas for establishment of marine reserves.
- To provide reference data for monitoring the success of marine reserves, and the impact of development of fisheries activities in other areas.

### **Approach**

- A resource person (s), with appropriate skills and experience in visual dive surveys, processing and interpretation of satellite imagery data, and the application of suitable area-based models of standing stock and secondary productivity from CFU or from within the country or a consultant, will be identified to undertake the assignment.
- The resource person (s) will work closely with the Director of the Bahamas Fisheries Department, the Data Manager, and fisheries officers responsible for the management of reef fisheries.
- The resource person (s), with support and assistance from the Bahamas Fisheries Department, will develop a detailed study proposal.
- The resource person (s), with support and assistance from the Bahamas Fisheries Department, will undertake to obtain, process and interpret the appropriate satellite images, and to identify the different types of marine habitat based on production potential.
- The resource person (s), with support and assistance from the Bahamas Fisheries Department, will undertake to conduct visual dive surveys, in order to verify and rectify the classifications obtained using the remotely sensed images.
- The resource person (s) will supply the classified images as thematic base maps (both hard and digital formats) of marine habitat to a specified depth.
- The resource person (s) will train staff of the Fisheries Department in the interpretation and use of the thematic maps.
- The resource person (s) will be responsible for preparing a report on activity items outlined above, which will include estimates of areas of habitat types and estimates of potential yield.

### **Outputs**

- Classified satellite images and thematic maps of selected major island shelf areas in the Bahamas, useful as reference data for establishment and monitoring of marine reserves.
- Area measurements of the different marine production zones.
- Estimates of potential yield for shelf areas studied.
- Training of Fisheries Department staff in the interpretation of satellite imagery data and the use of thematic maps.



## **Schedule up to March 2002**

- The resource person will be identified by July 2001.
- The study proposal will be finalised by October 2001.
- The study will commence by November 2001, with acquisition and processing of satellite data.
- Report on analysis and interpretation and interpretation of satellite data will be completed by February 2002.

## **WBS 430 LOBSTER AND CONCH ASSESSMENT AND RESEARCH**

### **Introduction**

The basic purpose of fish resource assessment is to provide advice on the optimum exploitation of aquatic living resources. In the Caribbean region, developing sustainable fisheries 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.

As a part of the implementation plan for the fisheries component of the ICRAFD project a planning mission to the Bahamas was conducted in June 2000. Following this mission, a 5-year work plan was developed jointly with the Fisheries Department. This WP will be implemented in cycles of 2 years the first of which started in April 2000 and ends in March 2002, details of the latter are provided in this document.

Based on the resources available for The Bahamas under the resources assessment component of the CARIFORUM Project, it would not be possible to undertake activities in all the areas where weaknesses were identified and strengthening is needed. As such, with the intention of providing information for improved management, the Project is proposing in this first cycle to assist the Fisheries Department in The Bahamas to undertake socio-economic analyses of conch and lobster fisheries; to update the fisheries information of these fisheries by making a review of their historical data, and by conducting comprehensive censuses of people, methods, fleet and gears involved in these fisheries. This component also will support a review and update on the status of the Marine Protected Areas in The Bahamas.

The activities proposed are the following:

### **Planned Activities**

#### **WBS 430.1 Assessment of Conch Fishery**

In The Bahamas, the fishery of conch represents an important supplementary income for fishermen during the Spiny lobster's closed season from April to July when about 60-70% of the total annual conch harvest is made, accounting for approximately 10% of the weight of all fishery products landed in the country. Several studies and reports have been conducted on conch in The Bahamas (Higgs, 1987; Wicklund and Hepp, 1987; CFMC/CFRAMP, 1999) where apparently most of the conch resource is not threatened due to the large area of the platform and small size of the community of fishermen. However, the fact that many important stocks of conch are close to population centers is an important factor to take into account when considering the potential for stock depletion mainly during the close season for lobster. Although some initial studies on stock assessment, including distribution and abundance of the queen conch have been done in selected areas of The Bahamian marine platform, more studies should be conducted to improve understanding of the state and condition of the conch fisheries and to facilitate planning and decision making.

### **Purpose**

- To undertake a comprehensive census of areas, people, gears, fleet involved in the exploitation of the Queen Conch in The Bahamas



- To conduct an economic and marketing study on the queen conch products (from fishers selling at 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.

The queen conch study will include two interrelated but discrete components which will be conducted to improve understanding of the state of the queen conch stocks and to help in formulating 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. The second activity will be an economic and marketing study on the queen conch products (from fishers selling at 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 recommendations for improving the contribution of the resource to the well-being of the local stakeholders and the economy of the local communities. A student from the College of The Bahamas or a regional university could undertake the study as a thesis or the study can be done by a private consultant with the support of CFU.

The CFU staff will provide technical support to the Fisheries Department staff in the design and implementation of these studies. University and/or College students from The Bahamas or another CARIFORUM country will be able to assist with the research on the economic, marketing and social aspects of the fishery, with the advice and supervision of the Fisheries Department and CFU staff. CFU will arrange for TCDC support, if needed.

### Output

- Reports on the finding and recommendations of the various studies will be prepared
- This activity will provide the government of The Bahamas and other stakeholders with a better understanding of the status of the queen conch resource and will produce recommendations for improving the social and economic conditions of the resource users.

### **WBS 430. 2     Assessment of Crawfish Fisheries**

The spiny lobster, *Panulirus argus* (crawfish), is the most important fishery resource in The Bahamas, accounting for more than 80% of the annual catch in weight and with 90.3% by value of the total recorded landings of fishery products in this country. By 1999 the value of the crawfish exported from the Bahamas amounted to B\$ 71,586,006 (Fisheries Department Report, 1999). The Bahamian Spiny lobster fishery is therefore the single most economically important fishery in the Caribbean Region. Several studies had been conducted on the status of the resource but in most cases these were based on sparse empirical data (Thompson, 1980; Smith, G. B. and M. V. Nierop. 1984: FAO, 1991; Department of Fisheries Report, 1997; Ehrhardt et al. In press; Lipcius, ). This two year work plan will focus on compiling and analyzing historical data of the crawfish in order to determine trends in CPUE; and will get updated information on the number of boats, gears and devices (such as casitas), people and landing sites involved in the crawfish fishery. Studies on the social and economic aspects of the crawfish fishery will also be undertaken, as well as marketing studies to facilitate the development of new options for international trade.

### Purpose

- To review and analyze historical data on activities of the crawfish fishery
- To determine the number and location of landing sites of the crawfish *Panulirus argus* in The Bahamas, as well as their fishing grounds, volume of landings, fishing gears, catch and effort.

- To conduct a census on the “casitas” and to monitor the number, location, and selectivity of these devices in catching specific crawfish of specific length. Also the possible impact of the casitas on the sea bottom should be determined
- To undertake studies of economic and marketing aspects of lobster at local, national and international levels

## Approach

The study of the crawfish resource will be implemented by conducting 4 discrete but closely related activities. These activities will help to formulate recommendations for the management and conservation of the resource.

1. The first component will be a detailed review and analysis of historical data of the crawfish fishery in The Bahamas. Data from the past years have been collected from the processing plants. The information obtained could be used to trace past trends in the lobster fishery in The Bahamas and to compare it with the recent information that could help to better understand the dynamics of the resource.
2. The second component will deal with an update of the activities regarding crawfish fishing. This will be a comprehensive census to identify, quantify and document the areas, people involved, gears used, fishing methods, types and number of boats (when possible) involved in the exploitation of the crawfish, together with catch and effort information.
3. The third component will be a study of the use and impact of casitas in the fishery. This component will give us an estimation of the number, location and distribution of the casitas, by working directly with crawfish fishers and locating the casitas using GPS. Also the selectivity of the casitas for specific length of crawfish would be determined. That will facilitate the interpretation of past trends in CPUE. The impacts of the casitas on the sea bottom would be determined by visual survey. Data on current size frequencies of landings could be used to determine any increase in fishing mortality of younger age groups. This study would be conducted by the Fisheries Department supported, by a graduate student.
4. An economic and marketing study of the lobster products (from fishers selling at landing sites, small vendors, entrepreneurs, cooperatives, processing plants, and export agencies) will be made. Economic information and details of processing of catch (kept on ice, no freezing, etc); sale of catch (details of proportions for export, local consumption, origin of the fleet, etc.) Data on the amount of lobster consumed locally at restaurants and hotels and the price per individual crawfish or pound would be determined as well as the price that the general consumer has to pay for crawfish. 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 as well as the sustainable utilization of the resource. University students will conduct studies of marketing and economics of the crawfish fishery or the studies could be done by a private consultant, with the support and supervision of the CFU and the Fisheries Department staff, whichever option is chosen.

## Output

- Reports will be prepared documenting the results and recommendations of each study.
- The results of these activities will provide the government of The Bahamas and other stakeholders with a better understanding of the status of the spiny lobster resource and , provide some of the tools and information needed for sustainable co-management of the *P. argus* fisheries in The Bahamas.

### WBS 410.1 Baseline survey in Marine Protected Areas

It is clear that traditional fisheries management measures, which in most cases are based on single-species population models, are insufficient to achieve the sustainable use of the fisheries resources, especially where biodiversity conservation is an important component of the management plan. It has been demonstrated that Marine Fisheries Reserves are cost-effective tools where others measures of



management have not been successful. Also, most Marine Protected Areas (MPAs) have "no-take" areas which are close to any extractive consumption and have the purpose of protecting the habitat and segments of reef fish populations from over exploitation in specific geographical areas to ensure the conservation of fish and fisheries; to maintain a critical biomass of spawners; to preserve the intra-specific genetic diversity; to maintain age structure of the populations; to provide new recruits and to maintain the balance of the ecosystem (Plan Development Team, 1990; Alcalá & Russ, 1990; Cole et. al.; 1990; Bennett y Attwood, 1991; Roberts & Polunin, 1991; Roberts, 1995). In this first 2-year cycle, the number and status of Marine Protected Areas in The Bahamas, including their success as a management tools will be addressed.

### **Purpose**

- A survey of Marine Protected Areas, their number, location and status will be conducted in Bahamian waters.

### **Approach**

This study will focus, as a first step, on a comprehensive review on the status of the MPAs in The Bahamas, to improve understanding of the state of the Marine Protected Areas in that country and to formulate recommendations for their management and conservation. The approach will be:

1. A literature review. DF staff, CFU staff or a private consultant, would do a literature review on the existing Marine Protected Areas. That review will include numbers and locations of MPAs, past and actual projects implemented. This activity will also review the success of MPAs of The Bahamas in promoting sustainable fisheries and conserving marine biodiversity.

### **Output**

New data and information on the current status of the MPAs in The Bahamas, in the past and current projects conducted in these areas will be produced and summarized. The factors that have made these reserves a successful tool for conservation and management of fisheries resources will be identified. It is expected that this review will produce recommendations for future steps to be taken in the management of these MPAs.

### **WBS 400.1      Monitoring**

The Biologist will make 2 visits per year to The Bahamas over the life of the program to monitor the progress of the activities associated with the resource assessment and research of the WP and to provide assistance and advise during implementation of the projects activities.

### **REFERENCES**

- Alcalá, A. A., and G. R. Russ. 1990. A direct test of the effects of protective management on abundance and yield of tropical marine resources. *J. Cons. Int. Explor. Mar. CIEM*. 46:40-47
- Bennett, B. A., and C. G. Attwood. 1991. Evidence for recovery of a surf-zone fish assemblage following the establishment of a marine reserve on the southern coast of South Africa. *Mar. Ecol. Prog. Ser.* 75:173-181
- CFMC/CFRAMP. 1999. Queen Conch Stock Assessment and Management Workshop. Belize City, Belize, 15-22 March 1999. Bahamas report: pp28-29.
- Department of Fisheries. 1997. Summary Report: An Economic Review of the 1996 Commercial Fishing Industry, 1997. 8 pp
- Ehrhardt, N., V. Deleveaux and C. Higgs. (In press). On the Relative Efficiency of Spiny Lobster Fishing in The Bahamas. 13 pp.

Ehrhardt, N., V. Deleveaux and C. Higgs. (In press). Definition of an optimum minimum size for the spiny lobster, *Panulirus argus*, in the Bahamian fishery. 18 pp.

FAO Fisheries Report No 431 Supplement. 1991. National Reports: The Bahamas Commercial Fisheries Baseline Data, 1986 and 1987. pp. 1-9.

Bahamas, Fisheries Department Report, 1999.

Higgs, C. 1987. Current Status of Queen Conch (*Strombus gigas*) Stocks and Fisheries Regulations in The Bahamas. Pp. 377. Proceedings of the Thirty-Eight Annual Gulf Caribb. Fish Inst.

Lipcius, P. Recruitment Dynamics and Stock Enhancement of the Caribbean Spiny Lobster. Pp 36-52.

Plan Development Team. NOAA Technical Memorandum.NMFS-SEFC-261. 1990. The potential of Marine Fishery Reserves for Reef Fish Management in the U.S. Southern Atlantic. 29 pp.;

Roberts, C. M. 1995. Rapid build-up of fish biomass in a Caribbean marine reserve. Cons. Biol. 9 (4):815-826

Smith, G. B. and M. V. Nierop. 1984. Distribution, abundance, and potential yield of shallow-water fishery resources of the Little and Great Bahama Banks. FI: DP/BHA/82/002. FAO. 74 pp

Thompson, R. 1980. The Spiny Lobster Industry of The Bahamas. Department of Fisheries. Ministry of Agriculture, Fisheries and Local Government. Nassau, Bahamas. 51 pp.



## **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 evidence to suggest that the major fisheries are being exploited at or near their optimum sustainable levels. 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 for 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.

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**

There are certain important features that distinguish The Bahamas from other CARIFORUM countries and that must be taken into consideration when seeking to address the problems and promote sustainable fisheries development. The per capita GDP in The Bahamas is approximately US\$19,000. The standard of living and the socio-economic conditions of the Bahamians, including the fishers and their families tend to be much better compared to the other countries in the region. Based on the available information, the average fisherman earns approximately \$15,000 per annum. The fisheries, particularly in the northern islands, are highly commercialized activities where economic considerations are significant factors influencing decision making by fishers. There appears to be substantial inequalities in the level of development of the islands in the North and those in the south, both in the general level of economic development and with respect to the fisheries. In the South, it appears that the fisheries are less developed from a commercial stand point but are nonetheless very important to the local economies. The cost of living in The Bahamas is generally higher than in other CARIFORUM States. The maritime space of The Bahamas is in excess of 90,000 sq. miles and is therefore much larger than that of any other CARIFORUM country.

Tourism is the largest and most important sector in the Bahamian economy. The tourism product is based mainly on the extensive coastal and marine ecosystems available in The Bahamas. In this regard the tourist industry and the fishing industry tend to be either in direct or indirect competition for access to the



coastal and marine resources including, beaches, safe harbours, coral reefs, and the shallow coastal waters. In addition there is competition for the limited on-shore space and facilities for storage of equipment, berthing, fuelling and victualling of boats. This has naturally lead to conflicts over the use of these limited resources. Conflict resolution is therefore a major issue affecting the fishery sector.

The national Fisheries Department at this time is not able to adequately carry out its duties related to fisheries management and sustainable development due to limited capacity and limited financial and other 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 modest resources to plan and execute its responsibilities. Over the past 20 years, the work of the Fisheries Department related to data collection, resource assessment and resource management have benefited from financial and technical assistance provided by donor organizations through short to medium-term projects, with contributions from the Government. The government has received significant support from FAO. Several universities and fisheries research institutions from the United States have over the years maintained active marine research and training programs in The Bahamas. Some of these organizations have establish permanent research and training facilities in The Bahamas, e.g., The Caribbean Marine Research Center (CMRC) at Lee Stocking Island. 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 Bahamas.

In The Bahamas, there seems to be a high level of awareness of environmental issues and the need for management and conservation of fisheries and other marine resources. The Government of The Bahamas, in collaboration with NGOs, have implemented bold initiatives to manage, protect and conserve the fisheries and marine biodiversity under their jurisdiction. The concept and practice of responsible fisheries, sustainable use, resource management, conservation and stewardship of the resource are issues that have to be discussed among the authorities, entrepreneurs, fishers, technicians and others with interests in the sector.

For the lobster fishery, overcapacity is a major concern. For the conch and snapper/grouper fisheries, overcapacity could become a major problem in the future if proper management regulations are not implemented. Overcapacity, which can be measured as the number of fishermen, number and size of boats and amount of gear used in a particular area, is perhaps the single most important factor threatening the long-term viability of the fish stocks and the fisheries. More specific policies have to be designed and implemented, in order to ensure sustainable development and management of the fisheries resources. These policies should be oriented towards controlling fishing effort and 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 Bahamas and related to the use of the fisheries and other marine resources, should be developed and implemented. These are necessary to discharge the responsibilities assumed by the government, manage the resource and resolve conflicts over access and use of the resources.

The Fisheries Department has responsibility for sustainable development and management of the fisheries resources. As such, the Department must be equipped, organized and staffed to undertake the complex tasks associated with these responsibilities. At present the Department has a small team of qualified staff and an annual budget of approximately US\$2 million. The Department is therefore not able to fully carry out its responsibilities given the numerous Islands and large expanse of maritime waters under its jurisdiction. There is a need to review the organizational structure and develop a program to strengthen and upgrade the capability of the Department through staff training, provision of equipment, as well as recruitment of new staff.

At the moment, the Government Fisheries Department doesn't have an updated 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. The Plan will draw heavily on the results of the multi-disciplinary survey and the results of past research conducted on the fisheries of The Bahamas.



## 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 Bahamas. Technical assistance will be provided to The Bahamas to:

- i) Prepare, and implement a comprehensive national fisheries policy,
- ii) Define and implement a national fisheries management plan and,
- iii) Support and strengthen the existing National Fisheries Advisory Committee.

#### NOTE:

Preparation of Fisheries Management Plans and strengthening of the National Fishery Advisory Committee will be addressed during the second two-year cycle of the project.

#### Approach

The first step will be the preparation of recommendations for a comprehensive fisheries and aquaculture policy for The Bahamas. After this, a fisheries management plan will be prepared. During the first two year cycle, the CFU will work in cooperation with the Government and other stakeholders to develop and document a draft comprehensive Fishery Policy for The Bahamas. The process of development of the policy will include extensive consultations with stakeholders and review and analysis of existing data and information on the fisheries. A study tour will also be organized to sensitise officials of the government of The Bahamas with successful cases of fisheries and aquaculture development and management in the region.

The fisheries policy document and the fisheries management plan will be based on the most complete description of the fisheries possible with existing information. The Bahamas has already compiled substantial information on the fisheries that will be used as input into the preparation of the fisheries policy and FMP. In addition the results of the multi-disciplinary survey conducted under this project and the dialogue group discussions will be used in the development of the fisheries policy.

The fisheries policy recommendations will be prepared with the participation of the entrepreneurs and fishers representatives. The contents should be publicised, in order that the stakeholders can clearly understand what the Government intends to do. The draft policy document should at least be published in a form that can be distributed to and discussed by the National Dialogue Group and other stakeholders in the industry before it is finalized.

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 recommendations for The National Fishery Policy.

Consultants/Resource Persons will be recruited, logistical arrangements made for their work and recommendations for the Fisheries Policies 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. These consultations will begin with the National Dialogue Group which will be formed to review and discuss the results of the Multi-disciplinary Survey. The results of the Multi-disciplinary survey will provide valuable

information to facilitate the planning and formulation of fisheries sector policies and programs on research, resource development and management, conservation, data collection, human resource development, community involvement and public education, infrastructure development, monitoring control and surveillance, quality control and post-harvest technology, regional cooperation, aquaculture development, and marketing and trade in fish and fishery products.

## **Output**

During the first two year cycle the output expected is the development of a draft policy document for presentation and discussion with the government and other stakeholders in the fisheries sector. The overall output of this activity will be the formulation of fishery development and management policy with stakeholder participation.

### **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 strengthening the organizational and institutional structure of the Fisheries Department, to enable The Bahamas 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 Bahamas with a plan for restructuring and enhancing the capacity of the Fisheries Department in The Bahamas.

## **Approach**

The Fisheries Department has been vested with the responsibility and authority to promote sustainable development and management of the 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, from 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, will be identified and/or 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.

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 (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 to undertake this review and assist with the implementation of the recommendations to upgrade and strengthen the Fisheries Department.

## **Output**

This will be undertaken as one of the first major activities under the project since the upgraded Fisheries Department will facilitate the implementation of the other planned activities.

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

## **WBS 512.2: The Bahamas/Dominican Republic Fisheries Committees**

### **Introduction**

Fishermen and/or fishing boats from the Dominican Republic operate in the waters of The Bahamas. Dozens of fishermen and other fisheries workers from the Dominican Republic are employed as fishermen and workers on Bahaman fishing boats. 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 Bahamas and the Dominican Republic by improved sharing and exchange of information, harmonization of programs for data collection, research and management. A bi-national committee to promote dialogue, greater exchange of information and closer co-operation between The Bahamas and the Dominican Republic will be established.

### **Approach**

The bi-national committee would be made up mainly of technical and senior administrative personnel from the fisheries departments of the countries supported by representatives from the fisheries sector including representatives of fisher's organizations and the fishing processing industry. Through this bi-national committee, the process of effective management of the shared resources can be arranged and issues of mutual interest to the countries dealt with. 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.

The Project will provide support for the Committee for up to 4 years. It is expected that at the end of the project the Governments will continue to support the committee or its successor and to meet regularly to discuss common fisheries issues and plan future programs for sustainable development of their shared fisheries.

### **Output**

During the first two year cycle the Dominican Republic/Bahamas Committee will be established and at least one meeting convened. The main output during the first two years will therefore be the establishment of the Bi-national committee between The Bahamas and the Dominican Republic. The

governments of these countries should begin to work closer with each other to plan and manage their fisheries.

### **WBS 512.3: Mechanism for Conflict Resolution/Management**

Resolution of conflicts within the fisheries sector and between fisheries and other users of the coastal and marine environment has been identified as a priority activity for The Bahamas. The fisheries sector in The Bahamas is made up of a number of distinct groups of stakeholders, including artisanal fishers, industrial fishers, sport fishers, entrepreneurs, processors and exporters, etc. In addition the coastal and marine resources are used by several other interests, including those associated with tourism and maritime transportation. These groups are often in conflict with the fishers. Conflict, both intra-sectoral and inter-sectoral, has been identified as a major issue confronting the fishing industry. Policies and mechanisms are needed to better manage and resolve these conflicts.

#### **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 fisheries of The Bahamas. The scope of the study will include intra-sectoral, inter-sectoral and 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 will be conducted by a student from the Bahamas or another CARIFORUM country pursuing an advanced degree in a fisheries related area. The student would be supervised by a professor from the university at which the student is enrolled with support and co-ordination provided by CFU staff. Recruitment of the student and identification of the training institution that would be responsible for the study will commence during year one. The student should be available and arrangements finalized with the university for the study to commence during year 2 of the project and will run for 2-3 years.

#### **Output**

The main output expected is a report on the conflicts affecting the fisheries with practical recommendations for promoting cooperation and building institutional mechanisms for resolving conflicts affecting the fisheries. A staff from the Fisheries Department of The Bahamas or another Participating State will also gain an advance degree specializing in conflict resolution in fisheries in the Caribbean.

### **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 focal areas of the CFRAMP project at this time. The ICRAFD project will provide support for officials of the Government of The Bahamas to fully participate in this initiative to define and establish the Caribbean Regional Fisheries Mechanism. Funding will be provided to enable representatives of The Bahamas to attend the workshops and regional meetings on the CRFM.



## **Output**

This activity will be completed during the second year of the project. The objectively verifiable indicator that this activity has been completed will be the establishment of the CRFM as an organization serving regional fisheries interests.

## WBS 530 Community Involvement and Education

### Introduction

Between the 23<sup>rd</sup> – 30<sup>th</sup> of July, 2000 a four-member technical team from the CARICOM Fisheries Unit, Belize, went on a fisheries development and planning mission to The Bahamas. The objective was to collaborate with the Fisheries Department of The Bahamas in developing a five-year work plan for the latter mutually agreed upon by the two institutions. The process of information gathering, upon which most of the decisions for formulating the work plans were based took the form of a multi-disciplinary survey comprising the following elements:

- ❑ Baseline Survey of Fishing Communities, administered to 120 respondents
- ❑ Baseline Survey of the Fisheries Department: 2 respondents.
- ❑ Key Informant Interviews: 14 respondents
- ❑ The status of the Data Collection program: 5 respondents.
- ❑ The status of the fisher folk organizations: 3 respondents.

These activities will be deemed completed after the findings have been published.

The government of The Bahamas contributes significantly to the development of the industry, through a series of incentive schemes such as: duty-free concessions on fish gear and equipment, a liberal loans scheme for small-scale fishers, technical assistance and training programs for fishers in fisheries technology.

The Bahamas has already built a foundation in four of the most critical areas of Community Involvement & Public Education that this program will need to solidify and expand. These are:

- 1) A Public Education and training program in the areas of resource conservation, fisheries rules and regulations, and other post-harvest technologies, from which not only fishers, but also other stakeholders and students and teachers in the fishing communities benefit.
- 2) The development of educational materials through the desktop printing technique in support of the public education and awareness building programs.
- 3) An impressive list of active, semi-active and dormant fisher folk organizations:
  - South Andros Co-operative Society- South Andros
  - North Abaco Fishermen's Co-operative – Fox Town
  - Northern Bahamas Fishermen's Association – Grand Bahamas
  - Montague Vendors and Fishermen's Association – New Providence
  - Potter's Cay Vendor's and Fishermen's Association – New Providence
  - Arawak Cay Vendor's and Fishermen's Association – New Providence
  - Coral Harbour Fishermen's Association
  - Spanish Wells Fishermen's Association – Spanish Wells, Eleuthra.
  - Cat Island Co-operative – Cat Island
  - Bahamas Bone Fishing Guides Association
- 4) An efficient staff complement in this area that only needs to be effectively deployed and their capacity strengthened.



However, the Directorate of the fisheries administration identifies several areas of weaknesses in the fishing industry that need to be addressed partly through this CARIFORUM project. These include problems and issues created by: Poaching, Tourists' Over fishing, Difficulties in meeting international HACCP and Quality Control standards, Fish Piracy, Bleaching of Reefs, Oil Spills, Violent Fisher Conflicts, Captive Marine Mammals, Conch Poisoning, and Ghost Fishing by Lost traps.

This work plan will build upon the strengths of the department in this area whilst addressing the weaknesses listed above through institutional strengthening and capacity building activities.

### **Objectives**

- ❑ To build upon the strengths of the department in this sub-project area.
- ❑ To develop and implement activities that will address the socio-economic issues facing the fishing industry.
- ❑ To strengthen the capacity of the fisheries staff to support the fishers' organizations in developing co-management capabilities.
- ❑ To strengthen the capacity of the fishers organizations to participate effectively in the co-management of the fisheries resources of The Bahamas.
- ❑ To develop and implement strategies that would improve the existing functional relations between the fisheries administrators and the fisher folk organizations.

### **WBS 530.1: Multi-disciplinary Survey**

This activity will involve the analyzing of data from the five mini-surveys conducted during the Planning Mission to The Bahamas in July, 2000. This activity ends with the publication of the findings of these surveys.

### **WBS 532.0: National Fisheries Workshop**

A two-day national workshop will be convened in The Bahamas to discuss and evaluate the findings of the multidisciplinary survey conducted during the planning mission to The Bahamas. The participants would be representatives of the fisher folk organizations and other stakeholders groups drawn from the various islands that constitute The Bahamas.

The outcome would be a number of policy recommendations for the consideration of the government; a list of issues to be further deliberated upon by regional fisheries dialogue groups around the country, and by a National Fisheries Dialogue Group at a later date. It could also generate some issues to be incorporated into this five-year work plan. The general report will be published and distributed region-wide.

### **WBS 533.1: Community Mobilizing and Institutional Strengthening**

As has been shown above, there is an impressive list of fisher folk organizations that can act as the conduit for mobilizing and organizing fisher folk for training and awareness programs, and be the legitimate representatives for consultative purposes. These organizations are however not as active as should have been the case. This activity is therefore, first and foremost, to invigorate these organizations and make them active participants in activities meant to ensure the sustainable fisheries resources of the country.

Special short-term training workshops will be organized for the benefit of Fisheries Field Officers, in order to build their capacity to coordinate the tasks of rejuvenating these organizations and making them more responsive. The subject areas for these short term training programs include:

- Social, Stakeholder and Power Analysis.
- Processes of Community Integration

- Techniques of Community Canvassing
- Leadership Training
- Planning and Organizing Community Meetings
- Organizing Annual General Meetings
- Managing Finances and Accountability
- Exploring Extra-Income Generating Avenues
- Strengthening Organizations and Empowerment.

The Fisheries Field Officers will be responsible for organizing special training programs for fishers in the areas of group dynamics, mobilization, organization management, fiscal responsibility, book keeping and basic accounting etc. for the existing fisher folk organizations. Assistance could be solicited from the Co-operatives Department in the training of fishers on Cooperative Principles and Management, and Co-operative Law.

### **WBS 533.2: Fisheries Training Programs**

The Department already organizes training programs for fishers, teachers, students and other stakeholders in the fishing communities. The objective of this activity is to provide technical and material assistance to enable the department to consolidate the program and to expand it.

At present the program is planned for only the part of the year when the lobster season is closed, and hence not much is done in this area during the lobster season. It will be expected that rather than the fishers sharing this limited period with other stakeholders, the latter should have their programs scheduled for the season period, so that the fishers have the whole of the off-season for themselves.

Second, the topics covered tend to be biased in the direction of technology transfer and post-harvest technology issues. It is being recommended that issues relating to resource conservation, fisheries biology, biodiversity conservation, and fisheries management and co-management be given more prominence in these programs.

Third, issues which will enable the stakeholders to understand the biological and socio-economic basis for other CFRAMP activities such as data collection, licensing and registration, fisheries management planning, fisheries legislation, and to solicit their support for such activities will be given more attention.

### **WBS 533.3: Educational Materials Production**

The Department has already established itself as capable of producing its own print educational materials in the form of posters, handouts, public notices, brochures, comics, booklets etc. These are being utilized in support of the public awareness and training programs organized by the department, and have become an integral part of the information dissemination process.

The department has the requisite desktop printing equipment and the capability to use them in designing and producing instructional and motivational materials. There will however be the need to supplement these with the following information dissemination equipment:

- 1 Computer (with adequate graphics manipulating and storage capability)
- 5 TV/VCR for video shows in the following islands: New Providence, Abaco, Andros, Grand Bahamas and Eleuthra.

Besides, the department will be supplied with posters on resource conservation prepared by CFRAMP, Belize on the following topics: licensing and registration, scuba diving, fish poisoning, dynamiting, data collection, artificial reefs, lobster closed season, mesh sizes, and over fishing.

Finally, the department will be supplied with copies of at least 15 videos from the collection of the CFU in Belize for training programs and community meetings. The majority of these videos will illustrate aspects of fisheries and organization management in other parts of the Caribbean, from which the fishers of The Bahamas could learn a lesson or two.



Preparations will be made for the production of two videos in The Bahamas on its lobster industry and peculiar features/characteristics of its commercial fishing industry some time in the third and fourth years of this work planning period.

### **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..

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

Additionally, there would be a number of shorter-term seminars, lectures, workshops etc., when the need arises.

### **WBS 535: Intra-island Dialogue Groups. Dialogue Groups**

The peculiar geographical spread of the Commonwealth of The Bahamas makes it economically prudent to decentralize some activities which should have national attention. For this reason, regional fisheries dialogue groups made up of the fishers groups and other stakeholders on the islands of New Providence (Nassau), Grand Bahamas(Freeport), Abaco (Marsh Harbour), Long Island (Deadman's Cay), Eleuthra (Governor's Harbour) and Andros (Staniard Creek) will be the locations of these regional dialogue groups. Further deliberations with the fisheries department could result in the reduction of the number of locations.

The subject matter for deliberating on, will include the matters arising from the National Fisheries Conference; the list of problems and issues identified by the Director of Fisheries as needing urgent attention during the Planning mission; the list of legal prohibitions relating to the various fisheries of The Bahamas, which form part of the rules and regulations governing these fisheries; and any other regional and national matters which the fisher folk organizations and the stakeholder groups deem critical for consideration.

These regional institutional set-ups will remain as the main advisory mechanisms for policy considerations by the government

### **WBS 536: Monitoring**

The Sociologist will be making two monitoring visits per year to The Bahamas 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.

## WBS 540: LONG TERM TRAINING

### Objectives

The aim of this activity is to enhance institutional capability in Bahamas for sustainable fisheries development and management. This will be accomplished by training of staff of the Fisheries Department in Bahamas 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 Bahamas. 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 College of The Bahamas 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	Short-term training courses or attachments	Training Institutions in the Region or in a EU countries,

### 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

### NOTE:

This activity will not be initiated during the first two-year cycle. It will commence during the 2<sup>nd</sup> two year cycle.

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. Bahamas will participate in the study, including the



development of the project proposal. Resources will be provided to support the participation of Bahamas 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. Bahamas will participate in the study, including the regional workshop and development of the project proposal. Financial resources will be provided to support the participation of a representative of The Bahamas in the regional workshop. This activity will be initiated during the first two year cycle.

For the CARICOM Fisheries Unit

Mr. Hugh Saul .....  
Project Director

Mr. Milton Haughton .....  
Scientific Director

For the Government of The Bahamas:

Mr. Ronald Thompson .....  
Permanent Secretary  
Ministry of Commerce, Agriculture and Industry

Mr. Michael Braynen .....  
Director of Fisheries



**APPENDIX I  
BUDGET SUMMARY**

Integrated Caribbean Regional Agriculture and Fisheries Development Programme
---

<b>Activity number:</b>	<b>Activity Title:</b>		
WBS 310	Catch, Effort, Biological and Soci-economic Data Management System		
<b>Scope of work</b>		<b>Year:</b>	
Implement planned activities for 2000-2002		April 2000- March 2002	
<b>Result/Output</b>	A National Catch, effort, Biological and Socio-economic Data Management System established and operational.		
RESOURCE BREAKDOWN			
<b>Description of Components</b>		<b>Total Estimate</b>	
311/321	Review the Data Collection and Management Systems	\$16,060	
313	Train Fisheries Division staff in data collection	\$23,240	
314/324	Database software for data storage, basic analysis and reporting	\$12,050	
316/326	Provide resources for implementation	\$21,500	
330	Multi-disciplinary Survey	\$36,480	



## Integrated Caribbean Regional Agriculture and Fisheries Development Programme

<b>Activity number:</b>	<b>Activity Title:</b>		
WBS 311/321	Review Data Collection and Management Systems		
<b>Scope of work</b>			<b>Year:</b>
Select and engage consultant.  Consultant working in collaboration with the Data Manager will review the current Data Collection and Management System.  Preparation of review report.			April 2000- March 2002
<b>Result/Output</b>	A report documenting the review of the current Data Collection and Management Systems and recommendations for improvement.		
<b>RESOURCE BREAKDOWN</b>			
<b>Description of Components</b>	<b># of Units</b>	<b>Cost/Unit</b>	<b>Total Estimate</b>
<b>Consultant</b>			
Fees	22 days	330 /day	\$7,260
Airfare	1 trip	1,500 /trip	\$1,500
Living expenses	15 days	150 /day	\$2,250
Communication and publication expenses	-	-	\$500
<b>Staff Travel</b>			
Airfare	1 trip	1,500 /trip	\$1,500
Living expenses	7 days	150 /day	\$1,050
<b>Internal Travel</b>	-	-	\$2,000
		<b>TOTAL</b>	<b>\$16,060</b>

**Integrated Caribbean Regional Agriculture and Fisheries Development Programme**

Activity number:	Activity Title:		
WBS 313	Train Fisheries Department staff in data collection		
Scope of work			Year:
<b>Data Collection Training Workshop</b> Production of training material Rental of Conference facility Refreshment/snacks Equipment Rental Staff, travel, living expenses			April 2000- March 2002
Result/Output	Fisheries staff trained in areas of catch, effort, biological, environmental, social and economic data collection.		
RESOURCE BREAKDOWN			
Description of Components	# of Units	Cost/Unit	Total Estimate
Production of Training Material	-	-	\$1,500.00
Rental of Conference facility	2 years	250 /year	\$500
Coffee break/Refreshments	2 years	500 /year	\$1,000
Technical Corporation among Developing Countries (TCDC)			
Fees	2 x 5 days	150 /day	\$1,500
Airfare	2 trips	1,500 /trip	\$3,000
Living expenses	2 x 3 days	150 /day	\$900
Staff Travel			
Airfare	2 trips	1,500 /trip	\$3,000
Living expenses	2 x 3 days	150 /day	\$900
Participants from Family Islands			
Internal travel			
Airfare (return trip for 2 x 7 persons)	14 trips	250 /trip	\$3,500
Accommodation (14 persons for 4 days)	56 days	90 /day	\$5,040
Per diem (6 persons for 8 days)	48 days	50 /day	\$2,400
		TOTAL	\$23,240



<b>Integrated Caribbean Regional Agriculture and Fisheries Development Programme</b>
--

<b>Activity number:</b>	<b>Activity Title:</b>		
WBS 314/324	Database software for data storage, basic analysis and reporting		
<b>Scope of work</b>			<b>Year:</b>
Develop/upgrade database software for both Data Management Systems  Install and configure database software			April 2000- March 2002
<b>Result/Output</b> Availability of database software for both systems.			
<b>RESOURCE BREAKDOWN</b>			
<b>Description of Components</b>	<b># of Units</b>	<b>Cost/Unit</b>	<b>Total Estimate</b>
<b>Consultant</b>			
Fees (details on number of days required not available)	-	-	\$9,000
Airfare	1 trip	1,500 /trip	\$1,500
Living expenses	1 day	150 /day	\$150
Communication and publication expenses	-	-	\$400
<b>Cost of User License</b>			\$1,000
		<b>TOTAL</b>	<b>\$12,050</b>

**Integrated Caribbean Regional Agriculture and Fisheries Development Programme**

<b>Activity number:</b>	<b>Activity Title:</b>		
WBS 316/326	Provide Resources for Implementation		
<b>Scope of work</b>			<b>Year:</b>
Computer Systems  Scientific equipment			April 2000- March 2002
<b>Result/Output</b>	The availability of (1) computing facility for data entry, storage, manipulation and reporting and (2) scientific equipment.		
<b>RESOURCE BREAKDOWN</b>			
<b>Description of Components</b>	<b># of Units</b>	<b>Cost/Unit</b>	<b>Total Estimate</b>
Computers	2 units	3,000 /unit	\$6,000
Computer accessories	-	-	\$1,500
Scientific equipment			\$6,000
Calipers			
Scales			
Measuring board			
Clip boards			
Transportation Allowance	-	-	\$8,000
Inter-island Travel			
To assist data collectors with transportation (specific details not available)			
		<b>TOTAL</b>	<b>\$21,500</b>



Integrated Caribbean Regional Agriculture and Fisheries Development Programme			
<b>Activity number:</b>	<b>Activity Title:</b>		
WBS 330	Multi-disciplinary Survey		
<b>Scope of work</b>			<b>Year:</b>
Planning Mission (Administer questionnaires) Analyse data & Prepare Reports Organise workshop for evaluating results Make policy recommendations			April 2000- March 2002
<b>Result/Output</b>			
RESOURCE BREAKDOWN			
Description of Components	# of Units	Cost/Unit	Total Estimate
<b>Planning Mission</b>			
<b>Staff Travel</b>			
Airfare	5 trips	1,500 /trip	\$7,500
Living expenses (5 persons for 7 days)	35 days	150 /day	\$5,250
<b>Local Expenses (Community Baseline Survey)</b>			
Supervisor of Community baseline instrument			\$5,880
Interviewers fees (4 for 10 days)			\$5,600
In-country cost			\$3,110
Communication and Publications			\$1,500
Data Entry-Bahamas Questionnaires			\$200
<b>National Fisheries Workshop</b>			
<b>Staff Travel - Bahamas</b>			
Airfare	3 trips	1,500 /trip	\$4,500
Living expenses (4 persons for 5 days)	12 days	150 /day	\$1,800
<b>Local Expenses (Participants)</b>			
Participants from outside Nassau (6 persons)			
Inter-island Airfare	6 trips	150 /trip	\$900
Internal travel (6 persons)	6 trips	50 /trip	\$300
Acommodation (6 persons for 2 days)	12 days	70 /day	\$840
Per Diem (6 persons for 2 days)	12 days	50 /day	\$600
<b>National Fisheries workshop activities</b>			
Educational materials production			\$360
Rental of conference facilities			\$500
Lunch (for 20 persons for 2 days)	40	20	\$1,400
Refreshment/coffee break (for 20 persons for 2 days)	40	15	\$800
<b>TOTAL</b>			<b>\$36,480</b>

**CARICOM FISHERIES RESOURCE ASSESSMENT AND  
MANAGEMENT PROGRAM**

Activity number:	Activity Title:			
WBS 410	Pelagic, Reef and Slope Fisheries Assessment			
Scope of work			Year: 2000-2002	
Result/Output				
RESOURCE BREAKDOWN				
Description of Components		# of Unit	Cost/Unit	Total Estimate
WBS 410.1	Review and Analysis of Historical Data on Reef, species Slope and Pelagic Fish Species			7,000.00
WBS410.2	Enhancement of Fishery and Biological Sampling for Commercially Important Reef, Slope, and Pelagic Species			4,000.00
WBS410.3	Study of the Socio-economic Importance of the Sport Fisheryand Development of Sampling Program			
WBS 411	Participation in ICCAT activities			6,000.00
WBS 412	Assessment of Commercially Important Pelagic, Reef, and Slope Fisheries			
WBS 413	Nassau Grouper Spawning Aggregation Studies			4,000.00
WBS 414	Reef Habitat Mapping Study			6,500.00
				14,050.00
				5,000.00
			TOTAL	\$46,550



# CARICOM FISHERIES RESOURCE ASSESSMENT AND MANAGEMENT PROGRAM

Activity number:

WBS 410.1

Activity Title:

## Review and Analysis of Historical Data on Reef, Slope and Pelagic Fish Species

### Scope of work

Year:

2000-2002

Result/Output
---------------

## RESOURCE BREAKDOWN

### Description of Components

# of Units

Cost/Unit
-----------

Total  
Estimate

CFU staff time costs or external consultancy:  
Fees (data review, analysis, report)

10 days

4,500.00

Field operations:

Return airfare to the Bahamas

Hotel and per diem costs

1 fare

1,200.00

5 days

1,000.00

## Reporting and Communication

300

TOTAL

\$7,000

**CARICOM FISHERIES RESOURCE ASSESSMENT AND  
MANAGEMENT PROGRAM**

Activity number:

WbS 410.2

Activity Title:

## Enhancement of Fishery and Biological Sampling for Commercially Important Reef, Slope, and Pelagic Species

### Scope of work

Year:

2000-2002

Result/Output
---------------

## RESOURCE BREAKDOWN

### Description of Components

# of Units

Cost/Unit
-----------

Total  
Estimate

CFU staff time costs or external consultancy:  
Fees (review systems designs, develop proposal, develop data collection forms)

3 days

1,200.00

Field operations:

Return airfare to the Bahamas

Hotel and per diem costs

Training (not using external consultant)

1 fare

5 days

days

1,200.00

1,000.00

500

## Reporting and Communication

100 |

TOTAL

\$4,000
---------



# CARICOM FISHERIES RESOURCE ASSESSMENT AND MANAGEMENT PROGRAM

<i>Activity number:</i>	<i>Activity Title:</i>	
WBS 410.3	Study of the Socio-economic Importance of the Sport Fishery and Development of Sampling Program	
<i>Scope of work</i>		<i>Year:</i> 2000-2002

Result/Output	
---------------	--

## RESOURCE BREAKDOWN

<i>Description of Components</i>	<i># of Units</i>	<i>Cost/Unit</i>	<i>Total Estimate</i>
CFU staff time costs or local student scholarship: registration fees, including develop proposal, develop interview forms	20 days		3,000.00
Field operations: Hotel, per diem costs In-country travel	20 days		2,000.00 800
Reporting, photocopying and communication			200
		TOTAL	\$6,000

**CARICOM FISHERIES RESOURCE ASSESSMENT AND  
MANAGEMENT PROGRAM**

Activity number:	Activity Title:		
WBS 411	Participation in ICCAT activities		
Scope of work			
Year: 2000-2002			
Result/Output			
RESOURCE BREAKDOWN			
Description of Components	# of Units	Cost/Unit	Total Estimate
Participation in 2001 annual ICCAT Commission meeting: LPWG discussions/ meeting preparations	30 days		400
Meeting attendance:			
Return airfare	1 fare		1,500.00
Hotel and per diem costs	9 days		2,000
Reporting, photocopying and communication			100
		TOTAL	\$4,000

# CARICOM FISHERIES RESOURCE ASSESSMENT AND MANAGEMENT PROGRAM

Activity number:	Activity Title:	
------------------	-----------------	--

## Assessments of Commercially Important Pelagic, Reef, and Slope Fisheries

Scope of work	Year:
	2000 2001

**Year:**  
**2000-2002**

Result/Output	
---------------	--

RESOURCE BREAKDOWN	
--------------------	--

Description of Components	# of Units	Cost/Unit	Total
---------------------------	------------	-----------	-------

# of Units	Cost/Unit	Total
------------	-----------	-------

Cost/Unit	Total
-----------	-------

**Total  
Estimate**

Participation in 2001 meetings of LPWG and RSWG :			
---	--	--	--

2,000.00

1,500.00

Training attachment :			
-----------------------	--	--	--

1,000.00

1,500.00

Reporting, photocopying and communication				500
---	--	--	--	-----

TOTAL	\$6,50
-------	--------

\$6,500
---------



**CARICOM FISHERIES RESOURCE ASSESSMENT AND  
MANAGEMENT PROGRAM**

Activity number:	Activity Title:		
WBS413	Nassau Grouper Spawning Aggregation Studies		
Scope of work		Year 2000-2002	
Result/Output			
RESOURCE BREAKDOWN			
Description of Components	# of Units	Cost/Unit	Total Estimate
CFU staff time costs or external consultancy :			
Fees (proposal development)	3 days		1,350.00
Fees (field study)	10 days		4,500.00
Return airfare	1 fare		1,000.00
Hotel and per diem costs	10 days		1,500.00
Field operations:			
Crew compensations/wages	2		1,200.00
Fuel	10 days		2,000.00
Equipment (acoustic survey equipment, computer software)			2,000.00
Reporting, photocopying and communication			500
		TOTAL	\$14,050

**CARICOM FISHERIES RESOURCE ASSESSMENT AND  
MANAGEMENT PROGRAM**

Activity number:	Activity Title:
------------------	-----------------

WBS 414	Reef Habitat Mapping Study	
---------	----------------------------	--

Scope of work	Year:
---------------	-------

*Year:*  
2000 -2002

Result/Output	
---------------	--

## RESOURCE BREAKDOWN

Description of Components	# of Units	Cost/Unit	Total
---------------------------	------------	-----------	-------

# of Units	Cost/Unit	Total
------------	-----------	-------

Cost/Unit	Total
-----------	-------

Total  
Estimate

CFU staff time costs or external consultancy :			
--	--	--	--

Fees (proposal development)	3 days		1,350.00
-----------------------------	--------	--	----------

Fees (satellite data acquisition, processing, and analysis)	8 days	2,250.00
---	--------	----------

Operational costs:				
--------------------	--	--	--	--

Acquisition of satellite data and charts				50
--	--	--	--	----

Acquisition of mapping software, and related hardware				70
---	--	--	--	----

2		
---	--	--

Reporting, photocopying and communication	10 days		20
---	---------	--	----

TOTAL	\$5,000
-------	---------

\$5,00

# CARICOM FISHERIES RESOURCE ASSESSMENT AND MANAGEMENT PROGRAM

<i>Activity num</i>	<i>Activity Title:</i>
430.1	Assesment of Conch Fishery

<i>Scope of work</i>	<i>Year:</i>
A comprehensive census of the people, gear, fleet involved with the exploitation of the Queen Conch in The Bahamas will be conducted together with an economic and marketing study of the Queen Conch products	April 2000 to Mar-02

*Result/Output* Status of the Conch fishery and its economic/marketing perspectives in The Bahamas

## RESOURCE BREAKDOWN

<i>Description of Components</i>	<i># of Units</i>	<i>Cost/Unit</i>	<i>Total Estimate</i>
<b>430.1.1 Undertake a census</b>			
In-country transportation			
Airfare (round trip) to 5 islands	2 x 5	\$150	\$1,500
In-island transportation	2 x30	\$50	\$3,000
Subsistence and accommodation	2 x30	\$60	\$3,600
Copies of forms for data collection			\$150
Development of a report			\$250
<b>430.1.2 Socio-economic and marketing study</b>			
Student transportation			
Aifare to 5 islands	1p x5	\$150	\$750
Internal transportation	1p x30	\$25	\$750
Subsistence and accommodation	1p x30	\$60	\$1,800
Forms for data collection			\$100
Development of a report			\$250
		<b>TOTAL</b>	<b>\$12,150</b>



Integrated Caribbean Regional Agriculture and Fisheries Development Programme				
Activity num:	Activity Title:			
430.2	Assessment of Crawfish fisheries			
Scope of work:			Year:	
Analyse the data available on the crawfish fishery in The Bahamas in order to determine past trends in this fishery			April 2000 to Mar-02	
A census of areas, people, gears, devices, fleet involved in the exploitation of lobster resource in The Bahamas will be conducted				
To conduct a socio-economic and marketing study of the lobster fishery in The Bahamas				
Result/Output:	Useful data and information on the status of the crawfish fishery gathered			
RESOURCE BREAKDOWN				
Description of Components:		# of Units	Cost/Unit	Total Estimate
430.2.1	Review historical data			\$2,000.00
430.2.2	Undertake a census*			\$3,000
	Airfare (round trip) to 5 islands			
	In-island transportation			
	Subsistence and accommodation			
	Forms for data collection/report			
430.2.3	Survey of casitas**			
	Airfare to 5 island	2p 5trips	\$150	\$1,500
	In-islands transportation			
	land and sea***	2p x30	\$100	\$6,000
	Underwater survey			\$3,000
430.2.4	Socio-economic/marketing study			
	Student transportation			
	Aifare to 5 islands	1p x5	\$150	\$750
	Internal transportation	1p x30	\$25	\$750
	Subsistence and accommodation	1p x30	\$60	\$1,800
	Forms for data collection			\$100
	Development of a report			\$250
			TOTAL	\$19,150

**Note:** \* This activity will be implemented with 430.1.1 and the cost will be shared by both subprojects

\*\* Part of data will be obtained during the general census of lobster fishery

Preliminary:

\*\*\* The boat owned by the FD could be used for this study, in which case funds for travel would be used to support the operational cost of the boat.

## Integrated Caribbean Regional Agriculture and Fisheries Development Programme

**Activity num:** 430.3  
**Activity Title:** Baseline Survey of Marine Reserves

**Scope of work:**  
 A survey of Marine Protected Areas will be conducted in The Bahamas based on a review of the existing documentation and on-going projects

**Year:**  
 April 200 to Mar-02

**Result/Output:** Production of a report on the status of MPAs in The Bahamas

### RESOURCE BREAKDOWN

Description of Components		# of Units	Cost/Unit	Total Estimate
430.3.1	Literature review, development and administration of questionnaires and production of report			\$2,000
			<b>TOTAL</b>	<b>\$2,000</b>

**Integrated Caribbean Regional Agriculture and Fisheries Development Programme**

Activity num	Activity Title:
400.1	Monitoring and Evaluation

Scope of work	Year:
Monitoring the implementation of the activities under WBS 400	April 2000 to
Evaluation of progress on the various studies under WBS 400	Mar-02

Input	Result/Output
1	1
2	4
3	9
4	16
5	25
6	36
7	49
8	64
9	81
10	100
11	121
12	144
13	169
14	196
15	225
16	256
17	289
18	324
19	361
20	400
21	441
22	484
23	529
24	576
25	625
26	676
27	729
28	784
29	841
30	900
31	961
32	1024
33	1089
34	1156
35	1225
36	1296
37	1369
38	1444
39	1521
40	1600
41	1681
42	1764
43	1849
44	1936
45	2025
46	2116
47	2209
48	2304
49	2401
50	2500
51	2601
52	2704
53	2809
54	2916
55	3025
56	3136
57	3249
58	3364
59	3481
60	3600
61	3721
62	3844
63	3969
64	4096
65	4225
66	4356
67	4489
68	4624
69	4761
70	4900
71	5041
72	5184
73	5329
74	5476
75	5625
76	5776
77	5929
78	6084
79	6241
80	6400
81	6561
82	6724
83	6889
84	7056
85	7225
86	7396
87	7569
88	7744
89	7921
90	8100
91	8281
92	8464
93	8649
94	8836
95	9025
96	9216
97	9409
98	9604
99	9801
100	10000

### RESOURCE BREAKDOWN

Description of Components		# of Units	Cost/Unit	Total Estimate
400.1.1	Travel by the Biologist			
	Airfare	1 trip	\$1,500	\$1,500
	Per Diem	6 days	\$150	\$900
			<b>TOTAL</b>	<b>\$2,400</b>



**Integrated Caribbean Regional Agriculture and Fisheries Development Programme**

**Activity number:**  
WBS 400

**Activity Title:**  
Resource Assessment and Research, Two Year Work Plan for The Bahamas

**Scope of work**

The implementation of the activities under WBS 400

**Year:**  
April 200 to  
Mar-02

**Result/Output**

**RESOURCE BREAKDOWN**

<i>Description of Components</i>		<i># of Units</i>	<i>Cost/Unit</i>	<i>Total Estimate</i>
WBS 430.1	Assessment of Conch Fishery			\$12,150
WBS 430.2	Assessment of Crawfish Fishery			\$19,150
WBS 430.3	Baseline Survey of Marine Reserves			\$2,000
WBS 400.1	Monitoring and evaluation			\$2,400
			<b>TOTAL</b>	<b>\$35,700</b>

Integrated Caribbean Regional Agriculture and Fisheries Development Programme				
<b>Activity number:</b> WBS 500		<b>Activity Title:</b> Fisheries Resource Management		
<b>Scope of work</b>  The strengthening of national and regional institutional management capacities for sustainable development and conservation of the fisheries resources. It is the key to rational utilization of the resource and is the product of the articulation of biological, social, economic, statistical and environmental knowledge, integrated with inputs from local resource users and stakeholders.				<b>Year:</b> 2000-2002
<b>Result/Output</b>		Strengthened national fisheries management administration in the Bahamas		
RESOURCE BREAKDOWN				
<b>Description of Components</b>		<b># of Units</b>	<b>Cost/Unit</b>	<b>Total</b>
				<b>Estimate</b>
WBS 510	National Fisheries Management			\$31,800
WBS 520.	Regional Fisheries Management			\$4,700
WBS 530	Comm. Involvement/Education			\$46,350
WBS 540	Training-longterm/shortterm			\$38,000
WBS 550	Monitoring, control &surveillance			\$0
WBS 560	Post-harvest Process/marketing.			\$3,500
			<b>TOTAL</b>	\$124,350

# Integrated Caribbean Regional Agriculture and Fisheries Development Programme

<b>Activity number:</b> 510	<b>Activity Title:</b> Strengthened National Fisheries Management
--------------------------------	--

<b>Scope of work</b>	<b>Year:</b> 2000-2002
----------------------	---------------------------

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

i) Prepare recommendations for a comprehensive national fisheries policy,

**Result/Output:** Fisheries policy, FMP and FAC documented and established

## RESOURCE BREAKDOWN

Description of Components		# of Units	Cost/Unit	Total Estimate
511.1	Consultancy - Preparation of national Fish. & Aqua. Policy			
	Fees	18 days	350	\$6,300
	Misc exp.-comm, printing etc			\$700
	Study tour to Belize			
	Airfare	2 trips	\$700	\$1,400
	Perdiem	10 days	\$200	\$2,000
	Local expenses		\$1,000	\$1,000
511.2	Preparation/finalization of FMP			\$0
511.3	Support Implementation of FMP			\$0
511.4	Preparation of Plan for FAC			\$0
511.5	Establishment/Operation of FAC			\$0
			<b>TOTAL</b>	<b>\$11,400</b>



## Integrated Caribbean Regional Agriculture and Fisheries Development Programme

<b>Activity num</b> 510	<b>Activity Title:</b> Strengthened National Fisheries Management
----------------------------	--

<b>Scope of work</b>	<b>Year:</b> 2000-2002
----------------------	---------------------------

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

- i) Prepare recommendations for a comprehensive national fisheries policy,
- ii) Define and implement a national fisheries management plan and,
- iii) Strengthen the National Fishery Advisory Committee (FAC).

**Result/Output:** Fisheries policy, FMP and FAC documented and established

### RESOURCE BREAKDOWN

RESOURCE BREAKDOWN				
Description of Components		# of Units	Cost/Unit	Total Estimate
512.1	Strategic Review & upgrading Fish. Dept.-Consultancy/TCDC	20 days	\$350	\$7,000
	Fees			\$1,000
	Expense-comm, printing etc			
512.2	Bi-national Fish. Committee - DR/Bahamas			\$4,000
512.3	Study of Mechanism for Conflict Resolution-student research cost			\$6,000
513	CFU staff Monitoring and provision of technical assistance	1 pers 6 days	\$1,200 \$200	
	Airfare,			\$1,200
	perdiem			\$1,200
			TOTAL	\$20,400

## Integrated Caribbean Regional Agriculture and Fisheries Development Programme

**Activity num:** **Activity Title:**

520

Strengthened Regional Fisheries Management

**Scope of work:**

Support will be provided to enable Officials of the Government of the Bahamas to participate in the initiative to Define and establish a caribbean regional fisheries mechanism to facilitate the management of shared fish stocks and closer cooperation among caribbean countries in fisheries matters

**Year:**

2000-2002

**Result/Output:** Regional fisheries management mechanism established and operational

### RESOURCE BREAKDOWN

Description of Components		# of Units	Cost/Unit	Total Estimate
520.1	Participation in the Development of the CRFM			
	Airfare,	2 pers	\$700.00	\$1,400.00
	perdiem for workshop	8 days	\$200.00	\$1,600.00
520.2	Regional Cooperation:			
	Participation of fisheries staff in regional/international fisheries management fora (airfare and perdiem)			
	Airfare,	1 pers	\$700.00	\$700.00
	perdiem for workshop	5 days	\$200.00	\$1,000.00
			<b>TOTAL</b>	<b>\$4,700</b>

**Integrated Caribbean Regional Agriculture and Fisheries Development Programme**

Activity number:	Activity Title:		
WBS 530	Community Involvement & Education:- Bahamas, 2000-2002		
Scope of work		Year:	
Plan Activities for 2000-2002 for the Bahamas		April 2000- March 2002	
Cost Activities for the Bahamas for 2000-2002			
Result/Output			
Institutional Strengthening and Capacity Building for stakeholders improved			
RESOURCE BREAKDOWN			
Description of Components		Total Estimate	
533.1 Community Mobilizing and Organization Formation		\$8,950	
533.2 Fisheries Training Programmes		\$7,800.00	
533.3 Educational Materials Production		\$8,000	
534.0 First Fisheries Field Officers (Extension) Training Workshop		\$10,180	
535.0 Intra-island Dialogue Groups		\$7,220	
536.0 Monitoring & Evaluation		\$4,200.00	



**Integrated Caribbean Regional Agriculture and Fisheries Development Programme**

Activity number:	Activity Title:		
533.1	Community Mobilizing and Organization Formation		
Scope of work			Year:
Identify Officers for co-ordinating this activity  Organize Training Program for all Field Officers  Provide Resources for field work			April 2000- March 2002
Result/Output			
Fishers' Organizations Strengthened for the task of sustainable management			
RESOURCE BREAKDOWN			
Description of Components	# of Units	Cost/Unit	Total Estimate
Staff Travel	1 trip	1,500	\$1,500.00
Living Expenses	7 Days	150	\$1,050.00
Field Work Allowance (18 months)	2 officers	100 /mth	\$3,600.00
Educational Materials Production	2 "	500 year	\$1,000
Transportation Expenses (18 months)	2 "	50 mth	\$1,800
			\$8,950

<b>Integrated Caribbean Regional Agriculture and Fisheries Development Programme</b>
--

<b>Activity number:</b>	<b>Activity Title:</b>		
533.2	Fisheries Training Programmes		
<b>Scope of work</b>			<b>Year:</b>
Develop course outline  Identify 2 officers for taking coordinating responsibility  Organise training programme  Develop working scheme for field officers			April 2000- March 2002    to implement
<b>Result/Output</b>	Capacity of Stakeholders for management decision making improved		
RESOURCE BREAKDOWN			
<b>Description of Components</b>	<b># of Units</b>	<b>Cost/Unit</b>	<b>Total Estimate</b>
Preparation of Educational Materials	2 years	1000 yr.	\$2,000.00
Inter-island transportation costs	2 years	2,000 yr.	\$4,000
Field Allowances	2 officers	450 yr.	\$1,800
		<b>TOTAL</b>	<b>\$7,800</b>

**Integrated Caribbean Regional Agriculture and Fisheries Development Programme**

Activity number:	Activity Title:		
533.3	Educational Materials Production		
Scope of work			Year:
Identify Equipment to be procured  Request quotations and put in orders  Engage Resource Persons to take responsibility of coordinating activity  Conduct Training			April 2000- March 2002
Result/Output			
Capacity of Field Officers to produce and utilize materials enhanced			
RESOURCE BREAKDOWN			
Description of Components	# of Units	Cost/Unit	Total Estimate
Computers	2	2,000	\$4,000
TV/VCR	5	700	\$3,500
Updating posters, copying videos	1	1	\$500
		TOTAL	\$8,000



# Integrated Caribbean Regional Agriculture and Fisheries Development Programme

<b>Activity number:</b>			
534	Fisheries Field Officers Training Workshop- The Bahamas		
<b>Scope of work</b>			<b>Year:</b>
Develop Course Outline, Prepare Notes and Time Table			April 2000- March 2002
Make arrangements for Workshop site, accommodation etc.			
Engage two Resource Persons			
Invite 10-12 Participants			
Conduct 10-day workshop			
<b>Result/Output</b>			
Capabilities of Field Workers improved considerably			
<b>RESOURCE BREAKDOWN</b>			
<b>Description of Components</b>	<b># of Units</b>	<b>Cost/Unit</b>	<b>Total Estimate</b>
Staff Travel	1 Trip	1500	\$1,500.00
Living Expenses	12 days	150 day	\$1,800
TCDC Support Staff	24 days	50 day	\$1,200
Lunch	120 dyas	15 day	\$1,800
Participants from outside Nassau (4)			
Internal Travel	4	20	\$160
Per Diem	40 days	30 day	\$1,200.00
Accommodation	36 days	70 day	\$2,520
		<b>TOTAL</b>	<b>\$10,180</b>

**Integrated Caribbean Regional Agriculture and Fisheries Development Programme**

<b>Activity number:</b>	<b>Activity Title:</b>		
535	Intra-island Dialogue Groups		
<b>Scope of work</b>			<b>Year:</b>
Form nucleus of island-based groups Organize one-day follow-up meeting with representatives Demonstrate procedural processes Develop broad agenda for follow up quarterly meetings Arrange for publication of outcomes Plan for other follow up activities			April 2000- March 2002
<b>Result/Output</b>			
Stakeholders intimately involved in decision making			
<b>RESOURCE BREAKDOWN</b>			
<b>Description of Components</b>	<b># of Units</b>	<b>Cost/Unit</b>	<b>Total Estimate</b>
Accommodation for 4 from outside NASSAU	4	70	\$280.00
Per Diem for 4 from outside Nassau	2 days	30	\$240
Cost of two-way transportation for 4	8	200	\$1,600
Cost of 4 quarterly meetings	4	1000	\$4,000
Publication og Reports			\$1,100
		<b>TOTAL</b>	<b>\$7,220</b>

**Integrated Caribbean Regional Agriculture and Fisheries Development Programme**

<b>Activity number:</b>	<b>Activity Title:</b>		
536	Activities Monitoring & Evaluation - The Bahamas		
<b>Scope of work</b>			<b>Year:</b>
Communicate constantly with the Fisheries Department on progress and problems  Identify areas where direct assistance is needed  Arrange for trip to provide assistance on the spot  Conduct short seminars when needed			April 2000- March 2002
<b>Result/Output</b>			
Performance of field workers closely monitored and enhanced			
<b>RESOURCE BREAKDOWN</b>			
<b>Description of Components</b>	<b># of Units</b>	<b>Cost/Unit</b>	<b>Total Estimate</b>
Travel by Sociologist- Air Fare	2 trips	1500	\$3,000.00
Living Expenses	8 days	150	\$1,200
		<b>TOTAL</b>	<b>\$4,200</b>



## Integrated Caribbean Regional Agriculture and Fisheries Development Programme

**Activity num** **Activity Title:**

540

Long term and short-term training and attachments

**Scope of work:**

Provision of long-term scholarship and short-term training to staff of the Fisheries Dept of The Bahamas. Long-term training for masters level degree training at universities in the CARIFORUM Region or a EU country. Training will be in fisheries or related area. Short term scholarships will also be awarded to students from universities in the region who are working on research projects under this work program

**Year:**

2000-2002

**Result/Output:** Candidates trained in fisheries

### RESOURCE BREAKDOWN

Description of Components		# of Units	Cost/Unit	Total Estimate
540.1	Long term scholarship	2	15000	\$30,000.00
540.2	Short -term scholarships and attachments	4	\$2,000	\$8,000
			<b>TOTAL</b>	<b>\$38,000</b>

# CARICOM FISHERIES RESOURCE ASSESSMENT AND MANAGEMENT PROGRAM

<b>Activity number:</b>	<b>Activity Title:</b>
560	Post-harvest, handling, processing and marketing

<b>Scope of work:</b>	<b>Year:</b>
Development of a regional strategy to enhance post-harvest handling, processing, quality control and marketing of fish and fishery product in the region. This component will participation in a regional workshop to consider and finalize a proposal prepared by a consultant.	2000-2002

<b>Result/Output:</b>	Regional strategy and project proposal to enhance post-harvest handling, processing, quality control and marketing of fish and fishery product in the Caribbean
-----------------------	---

## RESOURCE BREAKDOWN

Description of Components		# of Units	Cost/Unit	Total
				Estimate
560.1	Participation in the Regional Workshop			
	Airfare,	2 pers	\$700.00	\$1,400.00
	perdiem for workshop	8 days	\$200.00	\$1,600.00
	Report preparation and communication			\$500
			<b>TOTAL</b>	<b>\$3,500</b>