CARICOM FISHERIES UNIT
BELIZE

REPORT OF THE MULTIDICIPLINARY SURVEY

OF THE FISHERIES OF SURINAME

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TABLE OF CONTENTS

LIST OF TABLES **PAGES**

1.0 INTRODUCTION

This is the report of a multidisciplinary survey of the fisheries of Suriname. Its findings are mainly meant to set the stage for the planning and implementation of a comprehensive fisheries development and management program in that country. The project under which this survey was carried out is the fisheries component of the European Development Fund (EDF)-financed Integrated Caribbean Regional Agriculture and Fisheries Development (ICRAFD) program under LOME 1V.

Under this program, there is a project designed to promote the sustainable utilization and management of the fisheries of the CARIFORUM countries. The latter is made up of the ACP countries in the Caribbean, which in this case, encompasses the 12 English - speaking CARICOM countries that have been benefiting from the CARICOM Fisheries Resource Assessment and Management Program (CFRAMP) since 1991-2, and four other countries. The former are Antigua & Barbuda, Barbados, Belize, Dominica, Grenada, Guyana, Jamaica, Montserrat, St. Kitts & Nevis, St. Lucia, St. Vincent & the Grenadines and Trinidad & Tobago. The latter comprises the Commonwealth of Bahamas, Haiti, Suriname and the Dominican Republic.

As the project document put it:

> *The project will extend benefits in fisheries surveillance and enforcement, marketing, processing and training to all the CARIFORUM countries, and in addition provide support to enhance national fisheries management capacities in Bahamas, Dominican Republic, Haiti and Suriname, of which it is intended to bring them up to the same level of competence as the 12 countries that have already benefited for a longer period of time from CFRAMP support, partly through Canadian funding.***

The multidisciplinary survey out of which this report was compiled, was planned and implemented by a joint effort of the Fisheries Department of Suriname and a four-member CARICOM Fisheries Unit (CFU) Planning Mission team made up of Mr. Milton Haughton, Scientific Director (Leader), David Brown, Sociologist, Terrence Phillips, Biologist and RAU Leader, and Merline Hemmings, Data Manager/Analyst. The Planning Mission to Suriname took place from 29th May to 5th June 2000.

The findings of this survey will first, serve as a benchmark from which to measure future progress as technical and media intervention by the CFU and the Fisheries Department takes place. Second, for improving on a provisional 5-6 year work plan initially prepared by the Department and the CFU Team, to be implemented in two-year cycles. Third, to serve as the material for the preparation of an agenda for a two-day **National Fisheries Workshop**, to which representatives of all stakeholders will be invited to participate, and

out of which material will be compiled for the initial deliberations of a permanent **National Dialogue Group**, also comprising the major stakeholder groups. From this, the involvement of the fishers' groups, the fishing communities and other stakeholders, in the decision-making processes relating to the conservation and management of the fisheries resources of Suriname, will be continued, further promoted and sustained. A modest process of consultation with stakeholders had begun in June-July, 2000 when a National Workshop in which various stakeholders participated was held to discuss a draft Fisheries Management Plan drafted by P. Charlier. Through the national Dialogue Group, it is expected that this process will become a permanent feature in the fisheries sector. Finally, the findings could serve as basic data for further research by students, professionals and other scholars.

The multi-disciplinary survey involved documentary review, formal and informal interaction, meetings, discussions with decision makers and stakeholders during visits to processing plants, landing sites, fishing communities, and fish markets. The next brief section will further expatiate on the 4 mini-survey instruments administered by a joint effort of the CFU Team and the Fisheries Administration staff of Suriname.

2.0 SOURCES OF DATA and METHODS OF DATA COLLECTION

2.1 Baseline Survey of the Fisheries Department

This instrument was prepared to capture a general overview of the fisheries of Suriname, the structure and functions of the Department and the general operations of the Department in the areas of Fisheries Management, Legislation, Surveillance, Enforcement, Fisheries Research, Fisheries Extension, Information Collection and Management systems, and Post-Harvest Technology. Respondents comprised the Director of Fisheries and two Senior Fisheries Officers. A copy of the instrument used is included in this report as Appendix 1.

2.2 Key Informant Interviews

The target groups included prominent fishers, fishing community leaders, local and regional political leaders, senior bureaucrats in the relevant ministries, senior fisheries officers and field workers and NGO representatives. The open-ended instrument enquired and probed into the perceptions and opinions of respondents in the areas of fisheries management issues and problems, the levels of community awareness of resource management issues, the existing institutional arrangements for dealing with fisheries management issues, the existing institutional arrangements for facilitating community participation in fisheries decision making, respondents' opinions on how to increase stakeholder participation, and their views on fisheries co-management.

Fifteen of these instruments were administered to traditional leaders (2), fishers, boat owners and captains (3), fisheries administrators (2), retired fisher (1), small scale processors and vendors (3), bureaucrat (1), processing plant manager (1), university lecturer (1), local political representative (1). The instrument used in this mini-survey appears as Appendix 11 in this report.

2.3 Interviews on the Status of the Data Collection Program

The objectives of this mini-survey was to identify the general issues and nature of the problems and conflict areas which might exist, and the strengths and weaknesses of the Human Resource area of the program. It was also to help develop more effective strategies for improving the system through development of awareness and training programs for data collectors and the resource users, and to ensure the co-operation and support of the latter, under the Community Involvement and Public Education sub-project. Ten (10) of these instruments were administered to the Data Manager and nine of the Data Collectors. A copy of the instrument administered is contained in this report as Appendix 111.

2.4.1 Socioeconomic Baseline Survey of Fishing Communities

By having fishers and their communities as the main target groups, this mini-survey becomes the main instrument in the entire survey. Fishers, fisher-boat owners, and fisher-captains, Vendors, Processors
and various combinations of these and other stakeholders, are ultimately, the main intended beneficiary groups of the fisheries development and management project envisaged for Suriname.

The survey instrument used was a modified version of that which was used for the first Community Baseline survey of Thirty Fishing Communities in Twelve CARICOM Countries, planned, coordinated and reported on by Peter Espeut in December, 1994**. A copy of this modified instrument appears at the back of this report as Appendix 1V.

Methods of Data Collection

The Planning Mission was made of a multidisciplinary team, each of whom brought his/her specialty to bear on the research project. The multi-disciplinary approach to the conduct of the survey, allowed for wider coverage of the issues involved, including the biological aspects and the socioeconomic aspects, and the linkages between them. It also allowed for a multi-stakeholder coverage of values, perceptions and knowledge of the various approaches to the examination of the development and management of the fisheries resources of Suriname.

Second, the Triangulation approach, involving the use of multiple data collection methods, such as documentary reviews, informal interaction and discussions, group interviews, participant and non-participant observation, and formal one-on-one interviews, enabled the team to check on the validity and reliability of information by comparing the results from two or more methods. Combining this with the multi-stakeholder approach allowed for testing the consistency and reliability of the information garnered from the direct resource users, other stakeholders, policy makers and traditional leaders under varying conditions.

No claim is being made that the sampling techniques used would scientifically produce an exact representation of the population. In all cases, but particularly for the Community Baseline Survey, the Non-random Quota sampling technique was combined with the Snowball technique in choosing the potential respondents and in administering the instruments on the beaches, in the market places and in the communities. For the Socio-economic Baseline Survey of Fishing Communities, interviewers were trained to operate along these lines, and field tests were done and evaluated, prior to the actual fieldwork. Pains were taken in the choice of districts, localities and target respondents as to obtain sufficient mirroring of the known national characteristics, in terms of number of districts covered, types of landing sites, and coverage of gear and species types. 70% of the respondents were interviewed in the Paramaribo and Commewijne Districts because, “the landings in the estuary of the Suriname-Commewjne rivers account for more than 70% of the total landings” in Suriname (P. Charlier:1993)**. [See Map 1 on the next page]. Table 1 below summarizes the explanations provided above.

Though findings from such a diverse approach to researching may not precisely represent reality on the ground, they cannot be faulted for at least providing approximate indicators of the reality. This should be sufficient for our purposes, bearing in mind the time factor and the resources at our disposal, and further considering that the findings of this multidisciplinary are to serve as:

- **Benchmarks from which progress arising out of interventions made over the duration of the implementation period would be measured.**
- **Provide additional information for making adjustments to the preliminary work plan and programmes prepared from the initial information garnered.**
- **Provide raw data for identifying issues for the deliberations of the National Fisheries Workshop and eventually, issues for the National Dialogue Group to work on.**
- **Provide indicators to the policy-making establishment of issues of major concern to stakeholders, which might ultimately inform future policy directions.**

FIG. 1

MAP OF SURINAME SHOWING THE MAJOR FISHING DISTRICTS AND SOME OF THE FISHING COMMUNITIES WITHIN THE DISTRICTS BORDERING THE NORTH ATLANTIC OCEAN.

TABLE 1: SAMPLING PROCEDURES

DISTRICTS	SITES OR LOCATIONS	GEAR TYPES	MAIN SPECIES TARGETED	NUMBER OF RESPONDENT
Paramaribo	North Paramaribo	Drifting Gill net	Large Demersals **By catch**- Rays, Sharks Large Pelagics	**36**
Commewijne	Nieuw Amsterdam Pomona Margrita	Chinese Seine *(fuiknet)* Bottom longline Lagoon Gill net *(Kiewnet)*	Small Pelagics Estuarine Shrimp (Sea Bob & Whitebelly shrimp)Large Demersals **By catch**: Rays, sharks Brackish Water Finfish Penaeid Shrimp	**34**
Saramacca	Boskamp	Chinese Seine *(fuiknet/ Jagi-Jag*	Small Demersals **By catch**: Large demersa	**4**
Nickerie	Zeedijk Nieuw Nickerie	Chinese Seine *(fuiknet)* Drifting Gill net	Estuarine Shrimp (Sea Bob & Whitebelly shrimp)LargeDemersals Shrimp By-Catch: Large Pelagics	**26**
TOTAL				**100**

The make up of the respondents is shown in Table 2 below:

TABLE 2: DETAILS OF RESPONDENTS' EMPLOYMENT

EMPLOYMENT STATUS	NUMBER OF RESPONDENTS	PERCENTAGE
Fishers	28	78
Fisher- Boat owners	20	
Fisher- Captains	14	
Fisher-Owner Captains	16	
Vendors	11	22
Vendor-Processors	06	
Processors	05	
TOTAL	**N = 100**	**100 %**

2.4.2 THE DEMOGRAPHIC AND SOCIO-ECONOMIC CHARACTERISTICS OF THE RESPONDENTS

The demographic and socioeconomic characteristics of the sample of interviewees provide the social and economic context within which the operations of the industry can be understood. They provide indicators of the social and economic standing of the resource users and the educational parameters that would indicate their susceptibility to understanding and supporting fisheries management measures.

The Age structure of 73 respondents comprising 65 males (89%) and 8 females (11%) is presented in Table 3:

TABLE 3: AGE STRUCTURE OF RESPONDENTS

AGE GROUPS	NUMBER OF RESPONDENTS	PERCENTAGE
< 20	11	
20-29	16	
30-39	30	**93**
40-49	11	
50-59	3	
60-69	2	**7**
TOTAL	**73**	**100**

The data shows that about 93% of the sampled respondents are under the 50-year age level. This suggests that the age structure is heavily skewed in the direction of youthfulness, with individuals who may lack the experience and discipline to adhere to traditional and modern legal rules and regulations for responsible fishing and conservation practices, although their outlook might also have been ” influenced by their exposure to the traditional situation as well as the Government’s approach to education and enforcement.” In any case, these could contribute to conflict among fishers and ultimately might have negative impact on resource conservation. For such a group, it is critical that awareness and educational programs in responsible fishing and the principles and practices of conservation should be of paramount importance. The sustenance of

the resources of the country might depend on their response to such capacity building programmes.

Of the 73 artisanal fishers sampled, only 14 (19.2%) have additional sources of income, besides fishing almost on a daily basis, making it an uphill task to introduce and successfully enforce management measures that might include restriction of access to resources by fishing grounds or seasons, unless alternative sources of livelihood can be created for them. The implication is persistent fishing effort pressure on the resources. The outcome of such a scenario is not always pleasant in conservation and management terms. Tables 4, 5 & 6 depict the educational background and the level of literacy among a sample of 84 respondents:

TABLE 4: EDUCATIONAL ATTAINMENT

EDUCATIONAL LEVELS	NUMBER OF RESPONENTS	PERCENTAGE
Primary/Elementary	51	**60.7**
Secondary/ Technical	30	**35.7**
Tertiary/ University	3	**3.6**
TOTALS	**84**	**100.0**

TABLE 5: GENERAL READING ABILITY

ABILITY LEVELS	NUMBER OF RESPONDENTS	PERCENTAGE
Can Manage	51	**60.7**
Read a Little	19	**22.6**
Can't Manage	14	**16.7**
TOTALS	**84**	**100.0**

TABLE 6: FREQUENCY OF READING NEWSPAPERS

DAYS PER WEEK	NUMBER OF RESPONDENTS	PERCENTAGE
6-7	15	**17.9**
3-5	5	**5.9**
1-2	12	**14.2**
Rarely	15	**17.9**

Never	37	**44.1**
TOTAL	**84**	**100.0**

It is heartening that about 39.3% of respondents have had some secondary and even tertiary education. However, only 11 (13.1%) of respondents have had any vocational or professional training after leaving school, confirming the comments made above following Table 3, regarding the over reliance on fishing as the only means of daily survival, and the related implication of pressure on the resources and further related effects on fisheries conservation and management.

The ability of quite a sizeable percentage of respondents who are able to read (83.3 %) is also encouraging, particularly for the use of motivational and instructional materials such as posters, hand outs, brochures, comics, cartoons and video for communicating with fishers and disseminating information to the public. However, the use of the print media (newspapers) may not have the desired effects (see Table 6) as about 62% of the respondents rarely or never read newspapers. This might be because going to sea almost everyday for the sake of survival might leave little time for the 'luxury' of reading newspapers.

The importance of Radio and Television as very powerful means of communicating with fishers and stakeholders in fishing communities is illustrated in Table 7:

TABLE 7: OWNERSHIP OF TRANSPORT AND COMMUNICATION DEVICES

ITEMS	PERCENTAGE
Colour Television	**83**
Radio at Home	**89**
Radio at the Wharf	**15**
Radio at Sea	**14**
Video Cassette Recorder	**35**
Bicycle	**50**
Motor Cycle	**29**
Motor Car, Van, Truck	**34**

About 83% and 89% of the respondents respectively own television and radio sets at home. The expensive nature of using the TV as a regular means of communicating with fishers and fishing

communities makes it a less useful choice. Occasional use of the television to send crisp, critical messages to fishers and fishing communities could be encouraged. Regular radio programmes for disseminating information on fisheries management principles and legal aspects and informing the general public on issues of importance for resource conservation should be encouraged**.** The most appropriate language to use in communicating with the artisanal fishers of Suriname (Dutch, English or Taki-Taki, should be determined before the radio programmes are planned and executed.**This proposal should be discussed at the National Fisheries Conference and possibly by the National Dialogue Group and strategies formulated to make it possible.**

It is important to notice that whilst an impressive number of fishers possess radios at home, only very few carry the radio with them to sea. The implication of this in terms of the safety of fishers is apparent. The establishment of radio communication connections between the fishers' organizations and the fisheries staff on land, and the fishers out there at sea must be taken seriously. That way, possible impending dangers can be nipped in the bud. **We propose that this tendency of fishers not carrying radios at sea, should be discussed at the National Fisheries Conference and also by the National Dialogue Group and strategies formulated to make this possible and perhaps binding.**

Finally, notice must also be taken of the encouraging number of fishers and stakeholders who own their own means of transportation, as a partial indicator of improving standards of living.

2.4.3 FISHING TECHNOLOGY AND PRACTICES

Types of Boats

The majority of the fishing boats or Koraaj (Canoes) as locally known are varieties of the type named apparently after fishing boats used in Guyana. It is interesting to note that a great number of the fishing crew and some boat owners are Guyanese operating legally in Suriname, although some Guyanese do some illegal poaching in Surinamese waters, as do some from French Guiana.

TABLE 8: TYPES OF BOATS

TYPES OF BOATS	NO. OF RESPONSES	PERCENTAGE
Decked Guyana Boats	34	**47.22**
Open Guyana Boats	24	**33.33**
Snapper Flat Boats, Canoe	14	**19.44**
TOTALS	**72**	**100.0**

The elongated shape of the boats used makes the size of the boats look unusual for artisanal vessels especially since the crew sizes mirror closely what pertains in other artisanal fishing areas in the CARICOM region. About 75% have crew sizes of 1-4, whilst the rest have crew sizes of 5-7. Table 9 below summarizes the lengths of the boats in question.

TABLE 9: LENGTH OF FISHING BOATS

CATEGORIES (FT.)	NUMBER	PERCENTAGE
15 –20	16	**22.2**
21-25	7	**9.7**
26-30	13	**18.1**
31-35	23	**31.9**
36-40	3	**4.2**
> 40	10	**13.9**
TOTALS	**72**	**100.0**

The powering of fishing boats, indicates the technological basis of the operations of the artisanal fisheries. The data follows the trend in the CARICOM countries, with a move away from vessels depending on the elements and physical prowess for motion and direction to boats that are powered mainly by outboard and also inboard engines as illustrated in Table 9 below.

TABLE 10: HOW FISHING BOATS ARE POWERED

SOURCE OF POWER	NUMBER	PERCENTAGE
Oars only	2	**2.8**
In Board Engine Only	16	**22.2**
Outboard Engine Only	49	**68.1**
Outboard Engine + Sails	5	**6.9**
TOTALS	72	**100.0**

Types of Gear

There are varieties of gear types each geared towards the targeting of particular fish or types of shrimp as already shown in Table 1 above. The main types reported by the sample of respondents are presented in Table 11, shows the preponderance of the use of nets for fishing operations.

TABLE 11: GEAR TYPES

NAMES	NUMBER REPORTED	PERCENTAGE
Fuiknet (Chinese Seine)	28	**38.9**
Drifting Gill Net	27	**37.5**
Njaware (Pin Seine)	6	**8.3**
Kieuwnet (Lagoon Gillnet)	8	**11.1**
Bottom Longline	3	**4.2**
TOTALS	**72**	**100.0**

The Chinese Seine and Drifting Gill Net are clearly the most popular gears. The use of fish pots or fish traps that is common in other CARICOM countries does not seem to be suitable for the fisheries in Suriname. The use of nets is very common, and "could have been influenced by the environment in which the artisanal fishers operate (demersals, muddy/sandy conditions)". According to Terrence Phillips, the "selection of gear may have been influenced by those from adjoining areas with similar conditions eg. Guyana. It would seem as though most of the technology and practices might have been influenced by the "immigrant nature" of the artisanal fisheries in Suriname, particularly the in-migration of Guyanese fishers, who 'took along with them, their knowledge and the technology for exploiting the demersal resources."

However, some fishers and fisheries officers expressed concern about the damage some of the dragnets make to the seabed and the related unselective manner in which some harvest the fish, making by-catches very common.

The Catch

The catch that was reported by 54 respondents is presented in Table 11 that follows:

TABLE 12: MAIN CATCHES (SEASONAL AND REGULAR)

TYPES OF CATCHES	NUMBER	PERCENTAGE
Finfish	27	**50.0**
Finfish (Juveniles)	12	**22.2**
Sharks	12	**22.2**
Shrimp (white belly & sea bob)	1	**1.9**
Spari (Rays)	2	**3.7**
TOTALS	**54**	**100.0**

Interviewer difficulties in interpreting the question on main catches to interviewees might have resulted in the blanket finfish designation as type most targeted and harvested. The term finfish must be interpreted as standing for ground fish (demersals) and coastal and large pelagics. The total of 72.4% must also be interpreted in the same fashion. The importance of demersals to the industry in Suriname is reflected in the serious complaints by respondents about the formation of unstable mud banks in the fishing grounds (see Section 4.6 below)

It seems strange that some of the respondents were bold enough to report that they actually target and exploit juvenile fishes. It might be a matter of language translation. This might be referring to the size of the fish that might have attained adulthood but still has a small size. Note should also be taken of the fact that small fishes are used in the making of "fermented fish pastes and for other traditional dishes".

Among this group of interviewees finfish, by which we include demersals or groundfish, and pelagics (coastal and large) seems to be the chief type of fish targeted. The next table breaks down the types of finfish most of the Respondents reported that they target.

TABLE 13: TYPES OF FINFISH TARGETED (Regular/Seasonal)

NAMES OF FINFISHES	PERCENTAGE
Ban Ban *(Cynoscion Acoupa)*	**24**
Kandratiki *(C. Vierescens)*	**22**
Snappers, Groupers & Hinds	**13**
Sharks	**10**
Others (Snook, Baracuda, Kingfish, Mackerel, Spari Rays)	**31**
TOTALS	**100**

Marketing of Fish

The two tables that follow illustrate where the fishers sell their catch when the latter is landed and to whom or how they sell the catch.

TABLE 14: WHERE FISH HARVESTED ARE SOLD

PLACE OF MARKETING CATCH	PERCENTAGE
Landing Site	**37**
Public Market	**22**
Roadside	**1**
Direct to the Customer	**38**
Home	**10**
Own Company	**0**
TOTAL	**100**

TABLE 15: TO WHOM FISH ARE SOLD

CUSTOMERS	PERCENTAGE
Fish Vendors	50*
The General Public	46
Private Marketing Companies (Export)	22
Government Marketing Companies	15
Own Company	0

(Each category is calculated out of 100, hence the total will add up to more than 100 due to multiple responses).

Taken together, what these two tables illustrate is that artisanal fishers do not have much control over what they catch. With the difficulties they face in obtaining ice, they stand to lose financially during periods of glut in the catch, since they will compete with one another to get rid of the excess catch before spoilage ensues. From Table 14 we realize that the small-scale fishers are completely out of the export market and could be at the mercy of the large processing establishments in terms of prices offered them at these outlets.

The National Dialogue Group could in future explore the possibilities in fisher folk organizations becoming economically self-sufficient, and generating economic benefits for the generality of the membership. This could include gaining easy access to credit on easier terms for the organizations and for their members; investing in the processing and exporting business, aquaculture and other profit generating ventures, and encouraging the membership to also diversify their economic bases. Organizations with solid economic bases and built-in incentive schemes for the members tend to be more stable and active.

3.0 STRUCTURE AND FUNCTIONS OF THE FISHERIES DEPARTMENT

The purpose of the questions posed for data to compile this section of the report was to obtain a general overview of the size and importance of the fisheries of the country, and furthermore, to gain an insight into the structure and operations of the fisheries department. The main aspects of interest were the organizational arrangements, staffing levels and training needs.

The governmental agency with the important responsibility of supervising and coordinating the sustainable utilization and management of the fisheries resources of Suriname on behalf of the government of Suriname is the Fisheries Department in the Ministry of Agriculture, Animal

Husbandry and Fisheries. The fisheries of Suriname, according to 1998 estimates, had 4,283 fishers, both indigenous and foreign (Guyanese, Koreans and Japanese); 1,200 fishing boats made up of 1,160 commercial and 40 recreational vessels. In June 2000, the Fisheries Department put the estimated number of shrimp, finfish and sea bob trawlers registered in Suriname at 98, 12 and 24 respectively. There were 776 registered artisanal fishers, 764 commercial fishers and 12 sports fishers.

Fish landings (1998) were estimated at 12,000mt.for the artisanal sector, 4,500mt.for the industrial sector, and 4,000mt. of shrimp landings. The total export of fish was estimated for 1998 at US $38.6m and import figures for finfish, crustaceans, shrimp for that same year stood at 1,400mt. The contribution of Agriculture, including fisheries to the national economy, was 9.1% (1998 estimates).

The Fisheries Department has an enormous load of work, considering the low levels of funding and the shortage of qualified technical personnel to do the job of managing the resource on behalf of the government. Hence, there is the need to steer fisheries policy in the direction of involving the resource users, the stakeholders and the fishing communities in the co-management of the resources.

3.1 THE ORGANIZATIONAL STRUCTURE

The Director of Fisheries is the Manager of the Fisheries Department, as illustrated in the organizational chart (fig1). He reports directly to the Permanent Secretary, the top technical officer in the Ministry of Agriculture, Animal Husbandry and Fisheries. He/She is supported by three heads of Units, namely Research and Statistics, Extension and Development, and Aquaculture. Although all the units and related sub-units are essential for the management of the fisheries of Suriname, some activity areas such as Fisheries Research, Data Collection, Fisheries Information Management, the Observer Program, Licensing and Registration and Fisheries Extension will gain immediate attention under the CARIFORUM project. Other areas such as Quality Control, Processing and Aquaculture and other activity areas such as marketing will follow suit for the benefit all the 16 CARIFORUM countries, including the 12 CARICOM countries participating in CFRAMP. This suggests additional strain on an establishment that is already short of qualified technical and professional personnel.

The Department lists shortage of qualified personnel and lack of operational funds as the main problems it has had to live with for a considerable period. It is estimated that at present out of 80-85 professional staff needed, the department has only about 60. It was suggested to the CFU Planning Mission that technical positions are the most difficult to fill because of unattractive, low salaries and benefits and lack of career development opportunities. Training is therefore seen as of immediate significance.

Fisheries Management will be improved by creating the capacity of the department for undertaking the tasks involved. When asked to list the areas of training needs in order of priority, the department came out with the following:

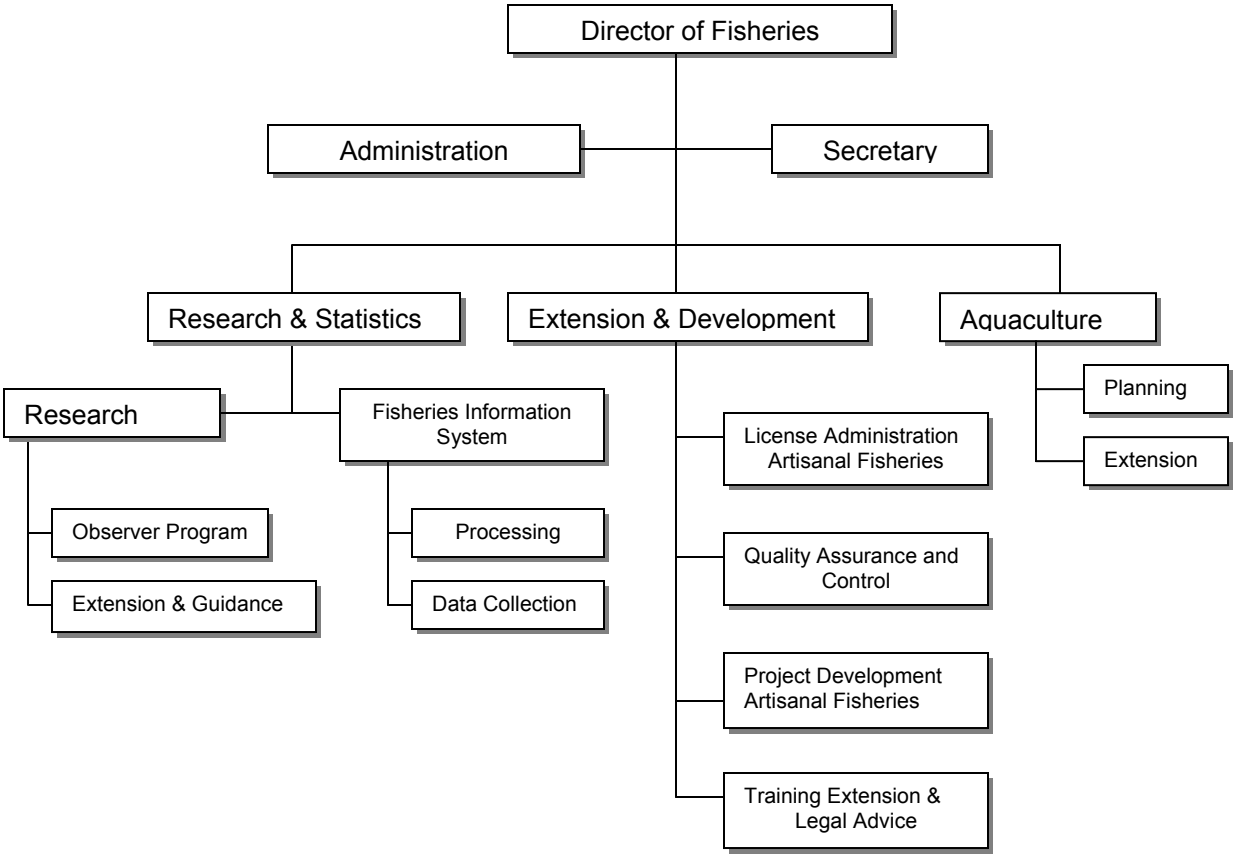
1. Fisheries Policy and Planning
2. Fisheries Statistics and Data Management
3.Community Participation and Public Education
4.Post-Harvest Knowledge and Skills
5. Fisheries Research
6. Fisheries Resource Management
7. Environmental Protection

The question of lack of funds and other resources is also an area of grave concern. When asked, in light of the present circumstances, to what areas of activity the department will apply its meager resources, as a matter of priority, the response is listed below:

1.Fisheries Data Management and Stock Assessment
2.Community Participation and Public Education
3.Surveillance, Monitoring and Enforcement
4.Fisheries Technology Transfer
5. Habitat Protection
6. Fisheries Co-Management
7. Aquaculture Training

We suggest that some attempt be made to revisit the two lists submitted above for reconciliation, and the proper authorities brought into the picture for further consideration. The CFU could be counted on to provide some technical support.

FIG. 2: THE DEPARTMENTAL TECHNICAL UNITS



3.2 RESEARCH AND STATISTICS (FISHERIES INFORMATION SYSTEM)

Enquiries were made on this subject area to determine the existing capacity, the past and present records of fisheries research in Suriname and to develop an understanding of the existing status of data collection system vis-à-vis data collection, analysis and reporting.

For more than thirty years the Belgian Administration for Development Co-operation had been the main source of technical and financial assistance in the planning and implementing of various fisheries research projects in Suriname. The latest project was in 1993-94 when an investigation was launched on the recruitment mechanisms of *Penaeus Subtilis.* It was found among other things that recruitment was generally at depths of 10-30 meters. The latest of many Research Vessels to arrive in Suriname was in 1988, when Belgian aid in this area ended. The research sub-unit has since then been faced with the usual problems of lack of funds, human resources and equipment to continue work in this area. Fisheries research has been identified as one critical

area where the CARIFORUM project could make some worthwhile contribution. Of immediate priority, according to the Department, should be some research into the incidence and effects of Ciguatera and Histamine, laboratory assessment of fish quality, and training in the techniques involved. No reasons were provided for the interest in ciguatera since, according to T. Phillips, " there is no history of ciguatera in the Guianas' area". We recommend that there should be more research into this issue.

Data Collection has been identified as the key step towards Stock Assessment, which is a critical component of fisheries management. The department now has a computerized system for storing data collected in the field. Data Collection began since 1990 on daily basis at selected landing sites and in the public markets. There an Observer Program through which data is collected at sea by observers and recorded on foeld data collection forms. It was observed that this latter system needs revamping.

Catch data on fish weight and types of species; effort data on number of boats engaged in fishing; gear types and numbers involved; and biological data on fish weight frequencies are some of the information garnered and recorded on special forms by about 10 field enumerators on a daily basis. They combine the latter task with conducting fisheries regulation enforcement and license inspection duties.

There are major gaps in the system that need to be plugged, such as the collection of fish hard parts for determining the maturity levels of fish. The department prepares quarterly and annual reports and produces Technical Reports for the FAO of the UN and for the general public by request. Lack of qualified personnel and funds are the main problems hindering improvement in the data collection system. It is expected that the CARIFORUM project will examine the existing system and introduce some improvements.

3.3 AQUACULTURE

The Aquaculture Unit is the newest in the department but there are plans for it to expand rapidly. At present there is only one officer manning the unit, hence there is need for training more technical personnel for this unit. At present there about 5 aquaculture establishments in the country, and even though the total and export value is not known, it has been estimated by the department that this sub-sector is responsible for 80% - 90% of the national exports in shrimp.

3.4 POST HARVEST TECHNOLOGY: QUALITY ASSURANCE & CONTROL

Quality Assurance has become a critical issue in the CARIBBEAN Region recently because of the high standards set for the handling and packaging of fish for export to European and North American markets. The European Community (EU) has been most demanding in this respect. There are between 10-15 known Fish Processing Plants, both private and public in the country, four of which are shrimp processing plants, two privately run and two operated by government. Regulations to control this sector have been in draft form since 1996, and not yet dealt with by the National Assembly. As one Fisheries Officer put it, the Department has entered into a "Gentlemen's Agreement" with the Processing Plants without being backed by law on required standards.

Some officers in the Quality Assurance and Control Unit have undergone training in Hazard Analysis and Critical Control Point (HACCP) principles and regulations. They in turn have been training staff of processing plants, and provide advise to the latter in total quality management. It is important that the small-scale artisanal fishers should also benefit from such training programs considering the fact that they handle more than 90% of the fish consumed by the general public. Local people in the fishing communities have also been processing the catch from the artisanal sub-sector, through drying, salting and smoking for the local markets. **We are suggesting that this issue of training for the small-scale operators should be one of the critical matters to be deliberated at the two-day National Fisheries Conference and to be continued by the proposed National Fisheries Dialogue Group.**

Another critical problem, also relating to fish handling, is the problem facing small-scale fishers in obtaining ice for keeping the fish caught at sea fresh until they are brought to the landing site and sent to the public markets, public eating places and processing plants. The most common complaint by artisanal fishers to the joint team of CFU and the Fisheries Department encountered at the landing sites and the fishing communities was the reluctance by the processing plants to sell ice to them. There are no ice- making machines to serve the public besides the processing plants. The lack of icing facilities downgrades the quality of fish landed by small-scale fishers, and essentially limits their chances of competing effectively in the market place.

We submit that this issue must also appear on the agenda of the National Fisheries Conference and if possible, the deliberations could continue by the National Fisheries Dialogue Group. It is hoped that through this some solution might be found for this problem.

3.5 FISHERIES EXTENSION SERVICES

The purpose of the enquiries made for writing up this section was to gain some insight into the nature and extent of fisheries extension services delivered by the fisheries department, and to examine the working relationships between the fisheries department representing government interests and the resource user groups, if there were any.

The Fisheries Department admitted that there is no functioning Extension Services Unit in the department in terms of mobilizing fishers, promoting the organization of professional organizations among them, holding regular meetings to discuss issues relating to the management of the fisheries, holding consultative meetings to disseminate information and discuss new developments in the industry, and organizing awareness and capacity building programs targeting these organizations. The far-between meetings held with fishers usually dealt with issues such as quality control and fish processing; not about strategies for participating in, and jointly managing the fisheries resources. The Department has a unique organizational arrangement that appends an Extension sub-unit to each of the main units in the department (see Fig.1 above). None of these however, is currently operational, partly due to lack of qualified personnel.

A critical vacuum identified by the CFU Mission Team in the fisheries management set-up of the fisheries department and in the country's fisheries as a whole, is the virtual absence of active fisher folk organizations in the country. The data from the Community Baseline Survey revealed the existence of one fisher folk organization, variously described by the few respondents as dormant or semi-active or occasionally active. The 8 (10.53%) respondents who mentioned this organization also opined that it was not well organized, or not quite representative of the fishers, and that it held no regular meetings. This is the *Visiery Cooperatie Nickerie* or the Fishery Cooperative of Zeedijk in Nickerie District, whose existence is mainly dependent on the sale of fishing equipment to fishers.

We have characterized this situation as being critical because without organized resource user groups, it would be near impossible to involve the generality of them in the decision making process, and even more difficult to coordinate and control the observation of fisheries resource conservation regulations. **We consider this as one of the most critical issues that should engage the attention of the National Fisheries Conference and subsequently, the National Dialogue Group. An effective strategy should emerge from these forums that will see the**

emergence of active fisher folk organizations, playing active roles in the management of the fisheries resources of the country.

To effectively meet the challenges posed by these proposed developments, a vibrant and proactive Fisheries Extension Service Unit must also be established. The CARIFORUM project should be of assistance in this regard.

4.0 FISHERIES RESOURCE CONSERVATION AND MANAGEMENT

4.1 STATUS OF FISHERIES MANAGEMENT

The Department of Fisheries has been operating without a legally approved Fisheries Management Plan (FMP). A draft FMP for Suriname, financed by the FAO, has been in existence since 1993. The draft FMP highlights the following:

- Revamping and Extension of the Fisheries Information System (FIS), including Catch & Effort Data Collection; Biological Data Collection and the reactivating of the Observer Program.
- Studies on, and monitoring of Ciguatera and Hestamine.
- Assessment of Fish Quality and Control
- Revamping of TEDS and Licensing controls.

Two slightly different pictures emerged when the top administration staff members were asked to arrange a number of items representing the department's likely objectives for fisheries management strategies in order of priority. The table below summarizes the responses:

TABLE 16: OBJECTIVES OF FISHERIES MANAGEMENT SRATEGIES

PRIORITIZED OBJECTIVES	POSITIONS: FIRST SET OF RESPONSES	POSITIONS: SECOND SET OF RESPONSES
Sustainable Management	**1**	**4**
Full Employment	**2**	**2**
Fisheries Development	**3**	**5**
Foreign Exchange Earnings	**4**	**1**
Food Self- Sufficiency	**5**	**3**
Social Stability	**6**	**6**
Environmental Protection	**7**	**7**

We would suggest the administration revisit the situation and reconcile the two positions. The only significant process of consultation with stakeholders was the national Workshop held in June-July, 2000 to discuss the draft management plan. New Regulations are officially published only in the National Gazette, the Newspapers and the TV & Radio. No Public Relations exercises are done and no Public Consultations are organized. Publications are made after the fact. We contend that it should be imperative for the fishers, stakeholders and the fishing communities to be consulted and their input obtained when decisions that will affect them, as in the case of the FMP and fisheries legislation, are being made. **We further suggest that the issues of public awareness building and the consultation process should be on the agenda of both the National Fisheries Conference and the National Dialogue Group's deliberations**.

4.2 FISHERIES LEGISLATION AND REGULATIONS

A Marine Decree, Decree C-14 of January 1981 continues to be the only legislation governing the marine fisheries of Suriname. A new draft fisheries law, prepared in 1993 with the financial and technical support of the FAO of the UN has still not gained the attention of government. Both the draft FMP and the draft fisheries legislation await the authorization of the government of the day. The draft management plan was revised in 1998, "…and could serve as guideline for fisheries management, even before the new law becomes officially adopted." (Charlier, 1999). There are at present, regulations on mesh sizes, restriction of access through the licensing system, licenses for the use of TEDS for fishing, and regulations limiting Trawlers from

encroaching on the inshore fisheries areas. In practical terms however, the only fisheries laws which the fisheries department and other enforcement agencies attempt to enforce, and which the fishers are aware of, are the licensing provisions for fishing boats and TEDS.

By these provisions, all industrial fishing vessels for shrimp, sea bob, finfish and snapper are to be licensed to operate in the waters of Suriname. In the case of artisanal vessels, those operating along the coast are licensed according to boat type such as license for Decked Guyana boats and license for Open Guyana type boats. Those artisanal boats operating in the inland areas are issued licenses according to the gear type used such as Chinese seine, long line, fixed gillnet, pin seine and drifting gill net. Finally, fishers using TEDS in their nets have been expected to obtain licenses according to regulations introduced in 1992.

Two weaknesses have been identified with the implementation of the licensing system. The first is the ridiculously low fines imposed on violators, which do not deter the latter enough. The second is the practice whereby some boat owners lease their license to others. The department has been considering plans to closely monitor and find ways to end this practice in the near future.

4.3 MONITORING, SURVEILLANCE AND ENFORCEMENT

Fisheries Management regulations that are not effectively enforced will fail to achieve the goal of sustainable conservation of the resources. The Department of Fisheries has limited capacity to organize regular surveillance to ascertain the observation of the limited number of regulations it has in place. There are only three officers in the department with surveillance responsibilities, but they lack the requisite facilities to carry out the responsibilities involved. That responsibility has been given to the Ministry of Defence (the Military Coast Guard) and the Harbour Master. The Ministry of Justice takes over at the prosecutorial stage.

The surveillance activities are however carried out on an ad-hoc basis, since no single instituted body co-ordinates these activities. The usual problems of lack of funds, personnel and equipment apply in this case also. The License control inspectors on the Rivers and the Harbour and Sea Space Inspectors are severely handicapped in carrying out their duties. The ultimate outcome is that regulations are not sufficiently enforced. Adequate funds and skilled personnel

need to be injected into the system for it to achieve any semblance of efficiency and effectiveness.

4.4 SOURCES OF CONFLICT AND CONFLICT MANAGEMENT

Where competition over access to dwindling resources becomes commonplace and no effective, functioning institutional arrangements exist for their resolution, it could result ultimately in unsustainable conservation and management of the resources. One of the areas where conflicts emerge is where ages old traditional rules are broken with impunity. When asked if fishers usually had particular areas where they set their gear or fished, or whether they could fish anywhere, there was almost a split result, with 49% responding that fishers have particular fishing locations, whilst 45% said that fishers can fish anywhere. Such a result is pregnant with potential conflict among fishers. Some Respondents felt that the traditional system, founded on the social values of discipline, respect, co-operation and equity was under siege from the activities of younger and inexperienced new entrants into the profession. Among these respondents, 26 (53.1%) claimed that fishers whose territories are intruded tend to defend their territories, whilst 22 (44.9%) said they don't.

Forty percent (40%) of all the respondents said that conflicts exist among fishers, whilst 55% did not think so. The next table provides a breakdown of the causes of conflict among fishers:

TABLE 17: KINDS OF CONFLICT BETWEEN FISHERS

CONFLICT AREAS	NUMBER OF RESPONDENTS	RESPONDENTS
Fishers competing for Space & Access to Resources	**17**	**42.5**
Fishers stealing from each other	**13**	**32.5**
Trawlers intruding into inshore areas, causing damag	**7**	**17.5**
Others	**3**	**7.5**
TOTAL	**40**	**100.0**

Fishers complain that some of their colleagues have formed the habit of stealing fish from the set nets of their neighbours, stealing expensive nets and gear, and putting the blame on some intruding illegal, unlicensed fishers. Others pointed out that this is an indicator of dwindling resources, since in past periods of resource abundance there was enough to go round, making

such nefarious activities unnecessary. It would seem that this is partly caused by relatively recent developments of overcrowding, and increasing pressure on the resources. The second major source of internal conflict among fishers identified by interviewees, can be summarized as follows:

- Too many fishers targeting fewer resources
- Fishers drifting away from traditional space settings into other grounds.
- Competition for access to well-known lucrative grounds, including likely spawning grounds.
- No specific rules in place or enforced to limit entry or limit areas for fishing.
- Drift nets moving too close to fuiknets.
- Competition between 'industrial' and 'artisanal' fishers for greater catch of shrimp.

New sources of conflict tend to become manifest when new fisheries such as stern trawling for seabob and lane snappers are introduced.

On the subject of existing means of conflict resolution among fishers, only 28 respondents responded as follows: **TABLE 18: APPROACHES TO CONFLICT RESOLUTION**

METHODS	NUMBER	PERCENTAGE
Encouraging Dialogue	14	50
Reporting to Authorities without positive results	10	36
Can't Resolve/ Don't Know	4	14
TOTAL	**28**	100.00

Persistent conflict among Resource Users is not a healthy development for sustainable conservation and management of the resources. The response provided by the respondents on conflict resolution is not encouraging and unless strategies are developed to reduce these to a minimum, the whole fisheries management programme will be negatively affected. **These issues- stealing and competition for space-are so serious they will need the attention of the stakeholders at the National Fisheries Conference and the National Dialogue Group.**

The same recommendation goes for conflicts that set fishers and other resource user groups against each other. The following table summarizes the sources of such conflicts:

TABLE 19: SOURCES OF CONFLICT BETWEEN FISHERS AND OTHERS

CONFLICT SOURCES WITH OUTSIDERS	PERCENTAGE
Illegal poaching by foreigners e.g. Guyanese	**25.0**
Piracy and high jacking at sea e.g. Guyanese	**20.0**
Sea bob Trawlers encroaching on inshore grounds	**35.0**
Sports fishers competing for space	**6.5**
Large processing companies discriminating in ice sales	**8.5**
Others	**5.0**

A major confrontation between Guyanese fishers and their Surinamese counterparts could emerge soon unless some solution can be found urgently to reduce the tension. **The problem with sea bob hunting Trawlers also will need the attention of the national Fisheries Conference and the national Fisheries Dialogue Group.**

4.5 KEY INFORMANTS ON FISHERIES MANAGEMENT

The open-ended instrument used to gather the information analyzed in this sub-section targeted stakeholders with the requisite recognition based on experience and knowledge of the fisheries of Suriname, both from historical and contemporary perspectives. The next table depicts the categories of stakeholders interviewed during the planning mission.

TABLE 20: KEY INFORMANTS INTERVIEWED

STAKEHOLDER GROUPS	NUMBERS
Fisher/ Boat owners/ Traditional Leaders	**5**
Fisheries Field Officers – Data Collectors & Fisheries Inspectors	**5**
Decision Makers (Senior Bureaucrat & Political Representative)	**2**
Vendor & Processing Plant Manager	**2**
Academic (University Lecturer)	**1**
TOTAL	**15**

Problems of Fishers and the fishing industry

When asked individually to identify the critical problems that faced the fishers and the fishing industry, the respondents, as expected, came out with a list of problems quite identical to those espoused by many fishers, who the planning mission team interacted with, on the beaches and in the fishing communities. These identified the problems that small-scale fishers have to contend with on a daily basis in their fishing operations. The following is a list of the issues and problems raised by interviewees as the most critical, needing immediate attention:

- Not enough importation of inputs for the fishers, creating shortages and high prices.
- Discrimination against small-scale fishers in the selling of ice to fishers, with the large industrial fishers gaining unfair advantage.
- High cost of fuel and long distances inland fishers have to travel to obtain fuel.
- Difficulties faced by artisanal fishers in obtaining bank loans and high interest rates.
- Problems processing plants face in meeting stringent Quality Control requirements of the European Union.
- Too much fishing pressure and diminishing catches especially in the shrimp and red snapper fisheries.

Respondents said that there is a higher level of awareness of these problems and the implications these issues may have on fisheries management among the bureaucrats, big boat owners and industrial fishers, than among immigrant, inland river and lagoon fishers and coastal-based small-scale fishers, due to the poor level of information dissemination. They opined that one way of getting the latter groups involved is to encourage unity and co-operation among them, and gradually persuade them to form fisher folk organizations. Some had however, lost faith in organizing fishers to form co-operatives because of past failures.

Some respondents called for the installation of ice machines and the establishment of fuel stations near and/or in the fishing communities, and the introduction of special low interest loans to small-scale fishers. The lone voice from a processing plant called on government to pass new laws and regulations to increase the competitiveness of Surinamese exporters in the international markets, and to negotiate with the EU and the USA to modify the stringent Quality Control standards they have set for Third World exporters of sea foods.

The above include genuine issues of deep concern to small-scale fishers in their daily operations and need to be further examined for answers as to how to deal with them**. We suggest that these issues should be discussed further at the National Fisheries Workshop and the National Dialogue Group**.

Institutional Arrangements for Fisheries Management

As expected, when asked if they were aware of any institutional arrangements dealing with fisheries management matters, almost all the responses were limited to legislation on the vessel-specific licensing system for industrial fishing and the gear-specific licensing for artisanal fishers. Some respondents were more specific, mentioning the Fisheries Division Fish Protection Act of the 1950s for Inland Fisheries and the Sea Fisheries Decree of 1981. Whilst most were aware of the draft laws awaiting enactment, others admitted they were not aware of it. Generally, interviewees agreed that no new laws are needed at this moment, rather calling for more stringent surveillance, and heftier fines for those who contravene the existing regulations.

Institutional Arrangements for Community Participation

All the 15 interviewees agreed that there were no existing institutional requirements for community participation in making decisions on fisheries management. They would however want the fishing communities to organize themselves to participate in the management of the fisheries. For some, government should take the initiative, and to others there should be joint government and fishers' organizations, though none could explain what form the latter would take.

Central management versus Co-management

When asked to choose their preferences among a number of fisheries management regimes namely, fishers alone managing the resources or government managing the resources alone, or by a joint management regime of government and fishers as management partners, 12 (80%) preferred the co-management arrangement. **One of the major issues which should engage the attention of the proposed National Dialogue Group is Co-management, by thinking further through, given the peculiar circumstances of Suriname, what the objectives, content and form such an institutional arrangement should take, and to explore the practical means of bringing this to reality.**

4.6 Fishers and Fishers Communities on Fisheries Resource Conservation and Management

Traditional Fisheries Management

Respondents to the Community Baseline Survey were asked if they were aware of any Traditional Fisheries Management methods for protecting the fish and shrimp outside any laws and regulations instituted by government. Only 23% responded in the affirmative. This may reflect the youthfulness and inexperience of the majority of the interviewees. When faced with alternatives management measures that largely were not yet instituted in Suriname to choose from, the outcome is presented in the next table:

TABLE 21: SELF-IMPOSED MANAGEMENT MEASURES

ALTERNATIVE METHODS OF MANAGEMEN	YES	NO	BALANCE
Do not catch undersized fish or release them if caught.	22	13	+
Closed Seasons	4	10	_
Closed Areas	3	11	_
Avoid destructive gear	6	11	_
No Response	5	5	_
TOTAL	40	50	_

The data shows that there are more respondents agreeing with measures to protect juvenile fishes than opposing such a measure, whereas it is the opposite in the case of the other measures. Fishers are not favourably disposed towards measures which would limit access to resources, or which might involve change in technology that might reduce the catch. The result presents a good starting point for training programs in resource conservation. Negative balances are indicators of levels of awareness that should also be grounds for public education and awareness building programs. Where alternative responses are provided, respondents tend to avoid management measures that threaten to curtail their freedom to operate unhindered, particularly those that have the prospect of hitting them directly in the pocket, such as Not catching undersized fish is neutral enough to warrant some appreciable level of support.

Perceptions on the Health of the Stock

In order to enquire into the respondents' perception of the status of the health of the fish stock in Suriname, they were presented with various alternatives portraying different scenarios for them

to choose from. The outcome is presented in the table that follows. (It should be noted that because of multiple responses allowed, the total number of responses would surpass 100).

TABLE 22: PERCEPTIONS ON THE HEALTH OF THE STOCK

PERCEPTIONS AND OPINIONS	PERCENTAGE
Concerned about the condition of the fish population	69
Catch Weight have declined	49
Catch size declined	48
Species composition changed	20**
Some species location changed	48
Previous good fishing grounds now empty	47

** (The level of response here might be due to conceptual problems with the word composition during the interviews)

Almost 70% of the respondents expressed concern about the status of the health of the stock. Besides the case with the composition of the fish, it would seem that other perceptions are partial indicators of over fishing and migratory trends respectively. The latter was further confirmed by the responses given to the following enquiry: Are there fishing grounds that you know of that used to have a lot of fish, but which now have few fish? The respondents who answered in the affirmative provided evidence ranging from specific locations to sweeping responses such as “All around the coast’, ‘everywhere’ and ‘the whole shoreline.’

Causes of the Deterioration of the Condition of the Stock in Suriname

Further enquiries gave the respondents the opportunity to explain what they perceived to be the main causes of the deteriorating condition of the stock. The list provided next, summarizes the categories of responses, arranged from the most frequent to the least frequent:

- Unstable mud banks formation, linked with causing migration of fish from their traditional habitats and spawning grounds, particularly due to shallower waters forming in those areas.

- Sea bob Trawlers encroaching into the inshore areas, with their destruction of fish habitats and the gear of small-scale fishers. They are also accused of scaring away fish from the inshore fishing grounds.

- Illegal poaching activities particularly by Guyanese fishers because, as one interviewee put it, “there are no effective government immigration controls.”

- Too much fishing pressure and competition for space and access to resources, due to increased number of fishers, fishing boats, and more recently, sports fishers.

- Changing weather conditions.

General Causes of the reduction in the amount of fish caught

When the same question on the causes of the reduction in the amount of fish caught was posed in general terms, the responses changed a little, with changes in the weather becoming the top choice,
as the table below shows:

TABLE 23: CAUSES OF THE REDUCTION OF FISH CATCHES

FACTORS CONTRIBUTING TO REDUCING CATCHES	PERCENTAGE
Changing weather conditions	**70**
Greater Fishing Pressure	**58**
Catching of undersized and underage fish	**34**
Net mesh too small	**14**
Poaching by Foreigners	**9**
Pollution	**5**

These are issues that could be further explored at the National Fisheries Conference and/or by the National Dialogue Group.

Respondents were asked what could be done to achieve the recuperation of a fishery that had stock with deteriorating health condition. The multiple responses are presented in table 23.

TABLE 24: TECHNIQUES FOR REBUILDING STOCKS

OPTIONS TO CHOOSE FROM	PERCENTAGE
Every fisher must have a license and keep it up to date	83
Persons fishing without a license should be fined	76

Protect the small fishes from being caught	63
Protect mangroves and sea grass beds	44
Establish fish sanctuaries for the fish to breed there undisturbed	43
The number of fishers should be limited or controlled	40
Establish “Closed Seasons” for certain species	39
Limit the number of large boats	38
Ban some types of gear	20
Net mesh should be made wider	19
The quantity of fish caught should be limited/controlled	19
Heavy fines and punishment for dynamiters	14

It is not surprising that respondents chose the most familiar management measures in Suriname, namely the licensing system. A close examination of the rest of the options interviewees chose in order of priority, reveals that the most neutral options were preferred to those that might end up affecting their income earning chances. Protecting fishes and their habitats from being destroyed are more preferable to the banning of certain gears, making bigger meshes mandatory, and limiting the quantity of fish fishers are allowed to catch. Yet, essentially in the long run, the preferred ways for preventing the complete destruction of the stock is through implementing these kinds of management measures that are unpopular with fishers. **We recommend that such issues should be the main material for the conduct of training programs for fishers, students and stakeholders in the fishing communities.** They would need to be exposed to the biological and socioeconomic bases of such management measures.

Choice of Approaches to Fisheries Management

In order to prepare the grounds for respondents to make a choice of their preferred approach to the management of the fisheries resources of Suriname, they were asked to identify who was taking management decisions at that point in time. The responses are presented in the table below:

TABLE 25: EXISTING DECISION MAKING POWERS FISHERIES MANAGEMENT

EXISTING MANAGEMENT DECISION MAKERS	PERCENTAGE
The government alone	35
The fishermen alone	35
Nobody	17
Don't know	10
The government & the fishermen	2
No response	1
TOTAL	100

It is clear that some respondents are not quite sure, nor do they think anybody is in charge at all. For the majority it seems either government alone or the fishermen alone make management decisions. The fact that centralized management was the order of the day has not been fully realized. The main point is that respondents are convinced that no collaborative type of management exists. For quite a sizeable number of respondents, the fact that centralized management is the order of the day, had not properly registered.

The next table shows the system that stakeholders would prefer to be institutionalized. When asked to state what system of fisheries management they would prefer in Suriname, the outcome is summarized in the table below:

TABLE 26: PREFERRED MANAGEMENT APPROACH

PREFERRED APPROACH TO MANAGEMENT	PERCENTAGE
By the government and the fishermen	57
The government alone	15
The fishermen alone	13
Government and all the stakeholders	3
Everybody involved in the fish business	3
Don't Know	6
TOTAL	**100**

It is obvious that stakeholders would prefer a system of management by which government and resource users collaborate to manage the resources. A second look at the other responses that

prefer all the stakeholders, or all others in the fish business to be involved in the management of the resources, should force us to examine again what really constitutes co-management.

5.0 CONCLUSIONS AND RECOMMENDATIONS

We reiterate the main objectives of the multidisciplinary survey of the fisheries of Suriname, conducted by a multidisciplinary team from the CFU, Belize, during a Planning Mission to Suriname in May-June, 2000 as follows:

- Provide additional and alternative information for making adjustments to the preliminary work plan and programmes prepared from the initial information garnered from the survey.
- The findings to signify benchmarks from which progress arising out of interventions made over the duration of the implementation period would be measured.
- Provide indicators to the policy-making establishment of issues of major concern to the resource users and other stakeholders, which might ultimately inform future policy directions.
- Generate issues for the deliberations of the impending **National Fisheries Workshop**, and eventually, issues for the proposed **National Dialogue Group** to work on, and generate policy recommendations.

There could be no better forums than these, for discussing and debating such issues of critical importance to the resource users and for generating policy recommendations. The Workshop and the Dialogue Group will be forums at which the stakeholders would be well represented. There could be no better opportunity for the government to serve notice of, and demonstrate its seriousness to involve the resource users and the stakeholders in the resource management, decision-making process.

The multidisciplinary survey has brought to the surface a number of issues and problems that would need further consideration by stakeholders, and to which the policy makers would have to pay attention. The following are some of these issues, not necessarily arranged in order of priority:

ISSUE # 1: Organization Formation and Capacity Building

If, as both the CFRAMP and the ICRAFD projects expect, fishers are to actively participate in the decision-making processes which would ensure the sustainable management of the fisheries resources, they cannot do so as individuals but as formal groups. They need to be motivated to come together and act as coherent groups, able to engage in meaningful dialogue with government functionaries and engage in active advocacy to promote their interests. Organized resource users could collectively benefit from information dissemination and exchange and other capacity building programmes such as group meetings and training workshops. Through these they could be prepared to play their future role as resource co-managers.

This issue should be very high on the agenda of both the National Fisheries Workshop, and the National Dialogue Group. Their deliberations should be guided by, but not limited to, the following propositions:

- Identify stumbling blocks that hindered the sustenance of past organizations.
- Chart various courses for averting a repetition of these in future.
- Identify motivational factors and incentive schemes that could engender the formation of new resource user organizations.
- Identify means of attracting new members and keeping them active.
- Identify ways of maintaining organizational stability and sustenance.
- Identify the role of government and its functionaries in the process.
- Identify the role which the resource user groups themselves should play.
- Examine the role Non-Governmental Organizations (NGOs) could play, and
- Make appropriate recommendations for follow up action.

ISSUE #2: Operational Difficulties facing Small- scale Fishers

Through both formal and informal enquiries by the Planning Mission, the following are the problems identified by artisanal fishers as confronting them in their daily operations:

- Difficulties in obtaining ice for keeping their catch fresh at sea and to the market.
- Lack of training in fish handling and HACCP and related disadvantages they experience in the market.
- High and unstable fuel and gear prices.

- Difficulties in obtaining reasonable access to credit facilities.

As we have argued above, the problem with ice-making and distribution facilities is of the greatest concern to the artisanal fishers, as it downgrades the quality of fish landed, and essentially limits their chances of competing effectively in the market place. Group discussions at the National Fisheries Workshop should chart the way for further deliberations by the National Fisheries Dialogue Group on how to find solutions to these daily problems, including examining the possible role of government, the private sector and the fisher folk organizations themselves. The possibility of linking some or all of these to membership of fisher folk organizations should be explored.

ISSUE #3: Sources of Conflict and Conflict Management

The Multidisciplinary Survey unearthed areas of conflict involving Surinamese fishers and between them and outsiders who engage in poaching illegally in Surinamese waters. Besides the likelihood that these could result in physical confrontation, they could also lead to developments inimical to the conservation of marine biodiversity.

The internally and externally induced conflict areas identified by the fishers include,

- Too many fishers targeting fewer resources in their traditional settings, hence drifting away into other communities' territories, and competing for access to well-known lucrative grounds.
- Fishers stealing fishes from the set nets of other fishers.
- Competition between 'Industrial' and 'artisanal fishers for greater catch of shrimp.
- Related to the latter, sea-bob-targeting trawlers encroaching on inshore grounds, causing destruction of the gear of the artisanal fishers, in spite of the fact that there is a law which sets limits to how far towards the inshore areas the trawlers could go.
- Illegal poaching by foreign vessels from neighbouring countries.
- Piracy and 'high jacking' on the high seas by foreign intruders.

These are serious problems that are causing a lot of disquiet in the fishing communities that need to be thoroughly discussed both at the National Fisheries Conference and the National Dialogue Group, and policy recommendations made, spelling out not only what government

could do, but also what the organized fishers themselves could do, either by themselves or in collaboration with the government.

ISSUE # 4: Causes of Increasing Stock Depletion in Suriname.

In dealing with the health of the stock in Suriname, almost 70% expressed concern about the unhealthy condition of the stock, reporting that fish weight and sizes are considerably reducing, the location of some species of value changing and former lucrative grounds becoming almost desolate.

On the specific causes of these changes in Suriname, fishers cited changing weather conditions, greater fishing pressure, the exploiting of juvenile fish, undersize net meshes, poaching by foreigners, destruction of fish habitats by trawlers and drag nets, pollution and unstable mud banks. These should become subjects for intense discussions and evaluation, with the aim of generating likely solutions, again not only by governmental action alone, but what the resource users can also do to find solutions. Both the fisheries conference and the dialogue group should come out with policy advisories on these problems.

ISSUE # 5: Management measures for restoring and sustaining the health of the stock.
As their counterparts in the CFRAMP participating CARICOM countries are inclined to do (See Espeut, 1994) the small scale fishers of Suriname demonstrated a strong aversion to management measures that tend to put limits on their usual ways of operating unhindered under open access conditions, and that might affect their incomes in the short run. They would welcome the more familiar licensing system and neutral measures like protecting juvenile fishes and fish habitats or establishing fish sanctuaries, but not measures that would introduce quotas, reduce the number of fishers and boats by attrition, ban destructive gear which they have become used to, introduce closed seasons for certain species, impose legal net mesh sizes or impose heavier fines for dynamiters and users of poison in fishing.

In the case of the latter two, they differ considerably from their CFRAMP counterparts, and public awareness and education programs need to be organized in Suriname to explain the biological and socioeconomic basis for such seemingly drastic measures. Both groups of management measures (those readily welcomed by the fishers and those they oppose) should be the subjects of critical examination at the National Fisheries Conference and by the National

Dialogue Group, with respect to the unique circumstances of Suriname, to produce environmental- and species-specific policy recommendations.

ISSUE # 6: The Radio as a means of communication between fishers and government.
The survey has shown that the radio and the TV are the main communication media easily accessible to the fishing communities. However, due to the relatively higher cost of disseminating information via the TV, we have suggested in this report that the Radio be used for the regular dissemination and exchange of information with the fishing communities, and that the use of the TV be strictly reserved for occasional dissemination of critical, more focused, short and crisp messages to the fishing communities. This proposal should constitute the subject matter for Group Discussion sessions at the National Fisheries Workshop for the development of strategies for bringing this into being, the forms they should take, the roles of both the government and the fishers to be articulated, and the question of financing critically examined. The recommendations could further be developed at the proposed National Dialogue Group.

ISSUE # 7: The Radio as an instrument for facilitating safety of fishers at sea.
Small-scale fishers are usually at the mercy of the elements when they go far out to sea, with some getting completely lost at sea. The fishers of Suriname have added another critical element, which is sea piracy, where they are attacked by armed assailants and robbed of their catch and other belongings, with their lives virtually at stake. With the popularity of the radio among fishers, consideration could be given to persuading and training them to adopt the use of the VHF, Two-way radio system at sea. This proposition could be considered at the Group Discussion sessions at the National Fisheries Workshop, at which strategies for introducing, financing and setting up of the infrastructure and development of rules and regulations for implementing this measure, would be given preliminary consideration and further deliberated on, at the National Dialogue Group meetings.

ISSUE # 8: Introducing and Institutionalizing Resource Co-Management in Suriname.
As their CFRAMP participating CARICOM countries did (see P.Espeut, 1994) the fishers and their communities, including the Key Informants, showed strong preference for the system of co-management of the fisheries resources of Suriname. Some added that all the stakeholders,

including all those involved in the fish business, should be involved in the co-management arrangements.

The concept of co-management has become popularized by the CFRAMP project particularly in the participating CARICOM countries, but has fallen in danger of taking on a variety of meanings, depending on the specific agenda of the user at any particular time. The definition of the concept, the forms that it could take, the specific geographical, environmental, socioeconomic conditions most suitable for the system, the roles that organized fishers, fishing communities, government and NGOs could play in institutionalizing the system and ensuring its sustenance, and the working relationships that should be forged between the partners, should become the subject of intense examination, both at the fisheries conference and by the dialogue group.

ISSUE # 9: Training of Small-scale Fishers in Quality Assurance and Control

One of the major problems that the fisher-respondents felt deeply about is the difficulty they face in obtaining ice to take out to sea for the preservation of their catches. It is also clear that they have not as yet begun participating in any significant way in the external fish trade and therefore may not be aware of the stringent standards being imposed by the European Union and the Unites States for fish and fish products being exported into their markets. Whether for health or economic reasons, the suppliers of fish for the local market must be au fait with the basic quality standards required. They also must be prepared for a future participation in the export trade.

It is for these reasons that it would be necessary to train them in the Quality Assurance and Control systems, the HACCP, and the preservation of their catch from the time of the catch until entry into both the local and the external markets. This issue is worth examining fully at the national Workshop, and if need be, to be continued by the National Dialogue Group, for a policy recommendation to be presented to government for consideration.

ISSUE # 10: Objectives of Fisheries Management Strategies

One of the major tasks of the ICRAFD project is to assist the Fisheries Departments in improving their Fisheries Management Plans, that must necessarily have an input by the Resource Users and other stakeholder groups. The items for discussion are listed in Table 16,

page 23. Discussing these issues would be a good beginning of their input into the fisheries management planning process. The National Workshop could consider giving attention to this matter in their deliberations.

ISSUE # 11: **IMPROVING RELATIONS BETWEEN THE FISHING COMMUNITIES AND GOVERNMENT FUNCTIONARIES**

The Multidisciplinary Survey report indicates that the Fisheries Department does not have a functioning Fisheries Extension Unit. The interaction of fisheries officers with the resource users both at the beach and in the fishing communities is far between. Generally, there are no regular meetings between the fisheries administration and resource users, except an ad-hoc basis. Furthermore, there are no institutional arrangements for promoting the participation of the fishing communities in the management decision-making processes. This deliberation is to find ways of reversing the situation and improving relationships between these two central players in any co-management institutional arrangements, beginning with the formation of fisher folk organizations, and the development of the institutional framework for improving the relations.

ISSUE # 12: IMPROVING SURVEILLANCE AND ENFORCEMENT

As in the case of other CARICOM/CARIFORUM states, both the fisheries department and the national security agencies, lack awareness of the legal aspects of the management of the fisheries and particularly, lack of the required resources to effectively patrol the fisheries and enforce the existing regulatory measures have led to laxity in keeping violators from breaking the law. This situation pertains to both the inshore fisheries and the high seas, contributing to conflict situations and indiscipline in fishing practices. The stakeholders are to review the situation in Suriname and come out with realistic measures to improve the situation, including defining roles for all the stakeholders in the process.

The findings of this multidisciplinary survey have paved the way for identifying means of continuing to include the fishers and stakeholders of Suriname in the decision making process, through the National Fisheries Conference and particularly, the proposed National Dialogue Group. We are however assuming that the government will be willing

to lead the way, by accepting the inclusiveness process, and taking strong interest in the deliberations and recommendations which would come from the National Fisheries Conference and the National Dialogue Group. Unless government demonstrates intense interest in these institutional arrangements, the process cannot be sustained.