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WECAF REPORTS No. 10

western central atlantic fishery commission

INTERREGIONAL FISHERIES DEVELOPMENT AND MANAGEMENT PROGRAMME

REPORT OF MISSION TO ANTIGUA,
BARBADOS, DOMINICA AND ST. LUCIA



UNITED NATIONS DEVELOPMENT PROGRAMME



FOOD AND AGRICULTURE ORGANIZATION OF
THE UNITED NATIONS

WECAF REPORTS No. 10

Interregional Project for the Development of Fisheries
in the Western Central Atlantic

Report on Mission to
Antigua, Barbados, Dominica and
St. Lucia

by

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DEVELOPMENT OF FISHERIES IN THE WESTERN CENTRAL ATLANTIC

The Interregional Project for the Development of Fisheries in the Western Central Atlantic (WECAF), which was initiated in March 1975, entered its second phase on 1 January 1977. Its objectives are to assist in ensuring the full rational utilization of the fishery resources in the Western Central Atlantic through the development of fisheries on under-exploited stocks and the promotion of appropriate management actions for stocks that are heavily exploited. Its activities are coordinated by the Western Central Atlantic Fishery Commission (WECAFC) established by FAO in 1973. The Project is supported by the United Nations Development Programme (UNDP) and the Food and Agriculture Organization of the United Nations as the Executing Agency.

As in the initial phase, two series of documents will be prepared during the second phase of the Project to provide information on activities and/or studies carried out. This document is the tenth of the series WECAF Reports. The other series of documents is entitled WECAF Studies.

W.F. Doucet
Programme Leader

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1. General Observations and Conclusions

Generally all countries welcomed the proposed WECAF/CIDA sub-project and agreed with the approach to ascertain potential pelagic stocks, to formulate individual country fishery development programmes and particularly to test and demonstrate improved methods of fishing. In all cases, the countries were interested in local training of fishermen in proven methods and equipment which could increase their production. On the other hand, very little interest was shown in regional or formalized training for fishermen. While it is felt that any of the four countries visited would be willing to host the sub-project, most enthusiasm was shown by Barbados, St. Lucia and Antigua. It was understood that if requested, either one of these countries would provide the necessary support facilities such as office and storeroom space, and mooring for the vessels.

We were particularly impressed with the enthusiasm and interest shown by Government officials in St. Lucia to develop their fisheries through increased production and a more efficient distribution system. The staff of the Fisheries Management Unit keeps in close contact with fishermen throughout the island and continually provides assistance and encouragement to fishermen's co-operatives. The proposed CIDA supported project to provide a central fish plant in Castries is well advanced and is expected to be implemented in the near future. Because of the direct relationship between this project and the proposed WECAF/CIDA sub-project, a close liaison should be established from the outset. For these and other reasons, such as centralized location, good harbour facilities, etc., it is therefore suggested that serious consideration be given to basing the sub-project in St. Lucia.

The exploratory demonstration fishing surveys to be carried out by the WECAF/CIDA sub-project cannot only provide valuable baseline information concerning fishery resources to the individual island countries, but can also give direct and immediate assistance to fishermen which might result in higher production. In this respect, the following suggestions are offered for consideration when the activities of the sub-project are organized:

(1) With the exception of Antigua, most of the islands depend largely on the seasonal availability of pelagic stocks found within the operating range of small boats. This season generally runs from January to June. During the remainder of the year, boats operate with pots and/or handlines on the limited reef areas around the islands. The survey vessels should, therefore, initially direct their activities to areas within the operating range of existing boats in order to:

- (i) attempt to locate offshore banks or seamounts which are not presently known to local fishermen; and
- (ii) ascertain the possible existence of pelagic fish during the off-season.

(2) With regards to (1), (i) above, Dominica, Barbados and St. Lucia have particularly narrow shelf areas, but it is possible that within a few miles of these shelves, there are some deep water banks which could be fished

with pots or handlines. Moreover, there are likely to be fishable areas along the deep slope of the shelf edge which would also be suitable for fishing with small craft. These areas should be surveyed with the use of a good sounder and if appropriate, marked with buoys to guide local fishermen. They should also be recorded on a fishing chart showing exact location and depths.

(3) When attempting to ascertain the availability of pelagic stocks during the offseason period, it is suggested that, among other things, the project conduct tests with a modified tuna longline for deep swimming species such as tuna, bullfish and shark, and with the use of fish shelters anchored in deep water. These tests should also be carried out initially in relatively close proximity to existing fishing centres.

Fishing shelters are used extensively in some areas of the Pacific and have proven very successful in attracting oceanic species such as dolphin, skipjack and yellowfin tuna. A typical shelter as used in some parts of the Pacific consists of a raft measuring about 6 ft x 20 ft made from bamboo poles of 4 in to 6 in in diameter. The rafts are anchored in depths ranging anywhere from 200 and 1 500 fathoms, using light synthetic rope and a concrete anchor. To help in attracting small baitfish, palm leaves are generally attached along the anchorline for some 10 to 15 fathoms from the surface. (Should the project be interested in testing the use of these shelters, a more detailed description can be obtained from the South China Sea Fisheries Programme in Manila.)

The fishermen's cooperatives in St. Lucia have set an example of how development efforts can be successfully organized to the benefit of small-scale fishermen. When properly formed and managed, cooperatives provide the framework through which needed incentives can be offered to stimulate increased production, such as credit availability, tax free fuel, supplies and equipment at reasonable prices and, possibly, an improved market structure. Moreover, a society acts as the focal point through which the fisheries administration and other government agencies can direct development efforts and more importantly, can get fishermen directly involved in development planning. It is felt that the St. Lucia Goodwell Cooperative in particular has successfully demonstrated these attributes of a cooperative movement and could be valuable in serving as a model and training ground for other islands. It is, therefore, suggested that the WECAF/CIDA sub-project examine the possibilities of employing this approach to promote fishery development in other parts of the region.

The countries visited, except St. Lucia, are lacking adequate and effective fisheries administration. This undoubtedly derives from the fact that little attention has been paid to fisheries in the past; and the situation is likely to continue as long as the fisheries are in a stage where fishing is carried out on a subsistence level and where catches are sold on the beach to all and sundry.

As of late, there has been a growing recognition that the development of fisheries is a means of meeting some of the countries' food requirements,

of reducing dependence on imports and of creating much needed opportunities for employment. Governments are now in fact turning their attention to uplifting the technical level of the fishing industry and recognize the need of technical assistance and training to attain that end.

Unfortunately, there is considerably less importance attached to the need for developing an appropriate capability to deal with fishery administration and management. Somehow the requirements in this area must be assigned a higher rating on the scale of priorities, for without an adequate staff to cope with the problems of development, little progress will in the end be achieved.

In general, what is required in the countries visited is a planned structure for a fishery administration which can grow in harmony and in accordance with the needs of development. Such a structure will provide a basis to give effective support to development in all sectors of the fisheries - identification of new needs, follow up on assistance programmes, introduction of appropriate measures for the protection of resources and the environment, the introduction and application of new technologies, financial assistance to fishermen, collection of fishery statistics, etc.

It is considered that the WECAF Project has an important role to play in alleviating the constraints to development just described. It is suggested that the possibility be investigated of including in the Project's activities a programme designed to establishing a suitable structure for fishery administration and management in all countries where such is needed. In the first instance, assistance could be provided through the distribution of publications on basic fishery legislation and on the principles of fishery administration, as well as by assessing the type and extent of services governments require to make an impact on improving the efficiency of fishermen. At a later stage, when the needs of various countries have been fully identified, a workshop could be organized to meet the requirements, and decide on a future course of action.

2. Purpose of Travel

To discuss with governments the present status of fisheries and, in accordance with development policies, ascertain the types of assistance which could be provided through WECAF.

To discuss various aspects of the impending WECAF/CIDA sub-project planned for implementation in the Windward and Leeward Islands.

3. Itinerary

	<u>Arrival</u>	<u>Departure</u>
Barbados	10-6-78	15-6-78
St. Lucia	15-6-78	19-6-78
Dominica	19-6-78	21-6-78
Antigua	21-6-78	24-6-78

4. Antigua

(a) Conclusions

With the exception of a semi-retired part-time fisheries adviser, there is no one in the Government experienced in fishery matters. The present Acting Fishery Officer has been more involved with office administration and is now nearing retirement. There is, therefore, some concern about who will eventually succeed as fisheries officer.

Considering the possibility that the Government may embark on a sizable development project, there is an urgent need to strengthen fisheries administration and since it appears that suitably qualified personnel are unavailable in the country, it will be necessary to provide training. In this respect, it is recommended that the WECAF/CIDA sub-project assist the Government in securing one or two long-term fellowships for training future fisheries personnel.

In view of the long-term nature of such training, it would be advisable for the Government to consider requesting the services of a full-time fisheries adviser from a bilateral or multilateral agency. He should be an experienced fishery officer capable of developing a realistic and meaningful fisheries programme.

The greatest potential for substantially increasing fish production in Antigua would appear to be the exploitation of pelagic species. Considering that other Windward Islands rely primarily on pelagics, it is reasonable to assume that there are also seasonable stocks of such fish off Antigua. This, however, can be substantiated by the surveys to be conducted by the WECAF/CIDA sub-project. The known season for pelagics in the other islands run from December to the end of June. It is therefore suggested that one of the project's survey vessels be scheduled to operate off Antigua sometime during that period to assess pelagic resources. It is further suggested that a number of floating fish shelters be anchored in deep water in areas lying within the operating radius of existing boats and that they be monitored periodically by the project's vessel.

The deeper waters from 50 to 150 fathoms along the edge of the reef, also offer a good possibility for increasing production of valuable reef fish. In this respect the sub-project could provide an important service by surveying the deep edges of the reefs with the use of a good white-line fish finder, in order to ascertain the extent of areas which could be fished with pots or deep water reels. Accurate records of fish catches and fishing charts should be kept during the course of the survey.

There seems to be little or no effort to collect fisheries data in Antigua. Boats are not registered and, there is no evidence that sample surveys are taken to determine the quantity of fish landed throughout the island. It is therefore recommended that, when available, WECAF provide the services of a statistician to advise the Government on how to establish a simple system of data collection.

(b) The Fishery

The commercial fishery of Antigua is based almost entirely upon the exploitation of demersal species on the extensive reef areas between Antigua and Bermuda. There is virtually no effort made to harvest pelagic species such as tuna, kingfish or dolphin. This is an interesting contrast to the Leeward Island where pelagic fishing predominates. This is, of course, due to the fact that other islands do not have large shallow areas off their coast and, therefore, must rely on the available pelagic resource.

The Antiguan fishery is comprised of an estimated 800 fishermen who operate some 250 boats ranging from small inshore rowing boats to 45 ft offshore vessels. Though the majority of the boats are of the small inshore type, there are reported to be some 20 open motor boats powered with outboard motors or small inboard diesel engines, and 40 rather modern decked boats ranging from 25 ft to 45 ft in length and powered by marine diesel engines. These larger class boats all fish with the traditional thatch or wire fishpots. Most fishing is done only on a daily basis, pulling pots generally two or three days a week. Only the larger boats carry ice obtained from the ice plant of the Fisheries Division. The 10 t/day ice plant was provided through an FAO/FFHC project and is the only commercial ice supply in St. John's.

Annual fish landings appear to have remained fairly constant during the past few years. It was reported that annual landings have increased from 3 million lbs in 1975 to 3.3 million lbs (17 500 t) in 1977. FAO gives an estimated catch of 800 t for 1976, which appears too low. In contrast to the pelagic fishery in other islands, which is seasonal, landings in Antigua are rather evenly distributed throughout the year. (It is likely that the catch from the larger boats is somewhat larger than the overall average, although there are no statistics upon which to base this assumption.)

The main landing sites are St. John's, Valley Church Bay and Old Road Bay. There are also numerous beaches around the island where small inshore boats land and sell their catch locally. All the larger boats land their catches in St. John's.

(c) Traditional Fishing Boats

The traditional fishing craft of Antigua is somewhat larger and relatively more modern than the traditional type boats seen in the other islands. Originally designed as sailing sloops, these larger boats are now all mechanized. As a result, there has been a major modification in the design of the stern section. Previously, these boats used large heavy wooden rudders mounted on the transom but, since mechanization, new boats are designed with a counter-stern and fitted with steel rudders mounted on a skeg. All these boats are built locally in either of the two small shipyards in St. John's. We were informed by the manager of the yard, Mr. Vincent Simon, that they are now building this type of fishing boat up to 50 ft in length. They can be constructed in about four months at a cost of about EC \$ 1 000 per ft for the hull. During the time of our visit, four fishing boats ranging from 44 to 50 ft were under construction at the two yards, plus an 80 ft inter-island trading vessel.

(d) Training

With respect to the training of fishermen, there appeared to be very little interest in any institutionalized or regional type of training programme. There is, however, a keen interest in training of fishermen locally, through demonstration, in the use of improved fishing methods and equipment. Such training would not be applied to the existing reef fishery but, rather, towards the possibility of developing a fishery for pelagic species and for demersal species on the deeper slopes. The Government would, for example, welcome the services of a fishing technologist to introduce and test fishing methods for catching deep swimming tunas, kingfish, dolphin and flying fish, and for various reef species found among the reefs in 50 to 150 fathoms of water. The U.S. Peace Corps has been requested to provide the services of a fishing expert but, as yet, there has been no response.

(e) Proposed Fishery Loan Project

The Caribbean Development Bank is in the final stages of preparing a loan project for further develop fisheries in Antigua. The proposed project would provide for a total of twelve 50 ft fishing vessels and shore facilities for handling, storing and processing fish. An excellent site has been allocated by the Government on reclaimed land near the new deep water port in St. John's. The preliminary cost figures for the project amount to a US\$ 1.2 million loan from CDB and US\$ 1.2 million from local contribution. The bank suggested that the local contribution include a US\$.5 million grant from CIDA. The operation of the proposed shore installations would be based primarily upon landings of pelagic species by the new vessels plus purchases from the existing fleet. There is no provision for technical assistance to the project, but it is being suggested that the Government seek assistance from various bilateral agencies, such as the Peace Corps, Retired Executive Organizations, etc.

(f) Fish Marketing and Demand

Fishermen generally go out fishing in the early morning between 04.00 and 05.00 hours and return about noon the same day. They sell part of their catch at the landing place and send part by public transport to the market in St. John's. Fishermen do not have holding facilities and, therefore, have often difficulty selling all their catches locally on the day landings are made. However, there are buyers who export fish to Guadeloupe, the amount exported in this way being unknown. As a consequence of this practice, Antiguan consumers often cannot get local fish, have to resort to buying imported supplies, while local fish is being exported to neighbouring islands.

In the light of this situation, the fishery adviser to the Government of Antigua considers marketing the main problem hampering fisheries development at present. As an approach to a solution, a new fish market which has been under construction for some time will be opened soon.

The new fish market under construction has been made possible by the British Development Division. The facilities consist of a market hall, an ice plant and a chill room. The Government's intention is that its Marketing Corporation will buy the fish, sort it, store it if necessary in the chill

room and sell it to vendors who, in turn, will retail it in the market hall. The Marketing Corporation, which deals with agricultural products, is said to be reluctant to handle and market fish. As an alternative, it has been suggested that the fish market should be operated by a fishery organization.

In addition to the problem of fish marketing, it appears that distribution needs also to be investigated. Except for fish which is sold at the beaches, marketing is centralized at the fish landing places in St. John's although there may be a need to sell fish in other places as well.

Data on fish consumption in Antigua are lacking so local demand can only be estimated. From import statistics one can derive a reasonable appreciation of the demand for fish which is not satisfied by present landings. In 1976, Antigua imported 500 t of salted and dried fish (corresponding to about 1 900 t fresh weight) and 100 t of canned fish (about 200 t fresh weight). These figures indicate a demand of about 2 100 t which is not covered by present local landings assuming no reexports. Allowing for some local trade with Guadeloupe, it may be supposed that the local fleet would have to land an extra 2 000 to 2 500 t per year to meet local requirements and replace present imports. As a consequence, total local fish landings of about 3 700 to 4 000 t would be required to meet the local demand.

This brings up the question of whether the small-scale fishery can meet local fish requirements. Klima (1976), gave a potential demersal fish yield of about 3 500 t on the banks under Antigua jurisdiction. This estimate includes all demersal species of which some are most likely unacceptable to the consumer. If 80 per cent utilization is assumed, it may be concluded that about 2 800 t of demersal fish could be caught and placed in the domestic market, if fished stocks were fully exploited. This suggests that while there is room to increase demersal fish landings in Antigua, additional resources must be exploited if the potential local demand of 4 000 t is to be met.

What are the prospects? There are snapper and grouper stocks on the outer slope of the reefs but no information is available on their magnitude. There is evidence that there are good fishing opportunities but it is unknown what fishing pressure these stocks can stand. Another possibility is to exploit pelagic fish resources, which would mean establishing a new type of fishery in Antigua. But, at best, this fishery would be seasonal. A third possibility is to extend demersal fishing to waters outside Antigua's jurisdiction.

Ciguatera poses some problem as regards demersal fish, but from the exploratory fishing data obtained during the Caribbean Fisheries Development Project, it appears that the most common species in waters under Antiguan jurisdiction is the silk snapper, found in depths of 60-100 fathoms and is ciguatera free (Klima, 1976).

5. Barbados

(a) Conclusions and Recommendations

The Government has been seeking assistance in the formulation of a comprehensive fisheries development plan. While CIDA had been specifically requested to provide this assistance some months ago, no action has yet been taken. It is therefore, assumed that this delay is due to the fact that the pending WECAF/CIDA sub-project is expected to provide the necessary inputs to prepare a development plan. During the interim period, however, it is suggested that if possible, WECAF provide the services of a statistician to assist in setting up a practical data collection system. Any long-range development plan must be based on reliable data and the sooner they start recording this information, the better it will be for those who will be given the responsibility of preparing a plan.

The International Seafoods, Ltd., is obviously undergoing financial difficulties, surviving only through Government subsidies. There seems to be some doubt on the part of management that shrimping off Brazil will be profitable.

It is felt that this doubt is justified considering the distance to fishing grounds and current high operating costs of vessels. There is therefore, some merit to the present thoughts of converting the operation to fish trawling. It would be necessary, however, to undertake a study in order to first determine the economic viability of such an operation. WECAF could provide a valuable service to the company by assisting in such a study and advising them on the results of a viability test. The company can provide reliable data concerning catch rates, catch composition, vessel operating costs, crew salaries, processing costs, etc. What is needed is information on marketing, first the quantity and price that could be sold locally and, more importantly, the potential for export. As a first step, it is suggested that the company manager be requested to provide information on the quantities and species that could be available monthly and in what form the fish could be processed, i.e., filleted and frozen in blocks, headed and gutted, etc. With this information, perhaps the FAO/UNDP Fish Market Information Project could explore the various international markets upon which to base a viability test.

(b) The Fishery

As in some of the other nearby islands where the shelf area is extremely limited, fisheries in Barbados are primarily based on the seasonal pelagic species, mainly flying fish, dolphin and kingfish. The main difference, however, is that Barbados is the most densely populated island in the region with some 275 000 inhabitants, as compared to 100 000 in St. Lucia, 70 000 in Dominica and 70 000 in Antigua. Therefore, the demand for fish is considerably higher than in other islands. It is understood that the total annual demand for fish approaches 10 000 t, with local production ranging from 3 500 to 4 000 t.

Close to 500 boats are operated from 21 landing sites around the island with about a third of these operating from Bridgetown and Oistins. As in other islands, fishing is done on a daily basis with boats going out during early morning hours and returning the same afternoon. The boats, ranging from 20 ft to 35 ft in length, are all planked, have a relatively wide beam with a trunk cabin and open cockpit, and are powered with inboard engines of 10 to 45 HP. None carry ice nor are they equipped with navigational aids or mechanical fishing devices. These boats generally operate within 20 to 25 mi offshore using trolling lines and gillnets for pelagic fish, and handlines and fishpots for demersal species.

The fishing industry also includes a Government-owned distant water shrimp operation which consists of a fleet of 20 shrimp trawlers and processing facilities. The crews of these boats include fishermen from Barbados, St. Vincent, Trinidad and Guyana. Until the recent trend towards extended territorial jurisdiction, these boats operated off the NE coast of South America. They now expect to operate only off Brazil, through a special arrangement between the two countries.

(c) Fisheries Administration

The Fisheries Division of the Ministry of Agriculture is presently staffed by an Acting Fisheries Officer and an assistant. At the time of our visit, they were busy preparing for a National Fishing Festival to be held on 24-25 June. This was to be the first time that fisheries would be included in the traditional Crop Over Festival which is held each year. It is understood that this would now be an annual event as a means of giving more recognition to local fishermen.

The Ministry of Agriculture appears keenly interested in further developing the fisheries sector. In discussions with the Senior Assistant Secretary, the need for training was particularly stressed. This includes training of personnel for the Fisheries Division and fishermen. It was mentioned that the type of training offered by the CFDI in Trinidad did not meet the particular needs of fishermen in Barbados. Preferring a national and less sophisticated training scheme, they envisage on-the-job type training of fishermen in simple navigation, improved fishing methods, fish handling and boat maintenance. One reason for this emphasis on training is that the Government wishes to introduce new boats of approximately 40 ft, capable of carrying ice and operating a further distance from the island and staying longer at sea (2-3 days). A design for such a boat is being prepared by a consultant naval architect who visited Barbados in April on behalf of WECAF.

Also mentioned were the needs to establish a realistic data collection system, to improve fish distribution around the island and to look into the possibilities of establishing fishermen's cooperatives which would be involved with marketing operations and the selling of fishing supplies and equipment. With regards to the WECAF/CIDA sub-project, the Government would be pleased to have it based in Barbados and offered to provide the necessary support facilities.

(d) International Seafoods Ltd.

Discussions were held with Mr. R. Stuart, Manager of International Seafoods, Ltd., a Government-owned company which operates 20 shrimp trawlers. The company is apparently having financial difficulties at the moment, as the vessels have been tied up pending inter-government arrangements with Brazil to permit fishing in Brazilian waters. However, an agreement is expected shortly and 10 vessels have already departed for Belem to begin shrimp fishing. The other 10 vessels are undergoing repairs and maintenance and are expected to sail shortly.

Though the fleet will primarily fish for shrimp, Mr. Stuart has also instructed the skippers to bring in 10 000 lbs of fish on each trip to sell locally. Because shrimp landings in the past have been below expectations, he is considering the possibility of converting their operations to fish production entirely. He is interested in harvesting mainly sea trout and croaker, which are found in considerable quantities off South America and are easy to catch. He realizes, however, that if all their vessels were to catch only fish, they would soon flood the local market. He would therefore appreciate advice on potential international markets for these species.

(e) Office of the European Economic Community

A meeting was held with Mr. Kelly, Caribbean Delegate of the EEC, to discuss the role of the EEC in fisheries development. Initially, the EEC considered supporting some form of sub-regional type programmes. These programmes were to be based on the resources available in three sub-regions including the northern countries of Jamaica, Belize and the Bahamas, the small island territories in the northern Leewards, and the more southern islands plus Guyana. It was decided, however, that such an approach was not feasible and the idea was dropped.

While still interested in supporting fisheries development, Mr. Kelly takes the view that development efforts should be based on an individual country or territory approach. Since conditions vary in all the island territories, he feels that country project proposals should be based on comprehensive studies to determine requirements and priorities. As this is the approach expected to be taken by the WECAF/CIDA sub-project, the Caribbean Office of the EEC would welcome close collaboration. The EEC has agreed to support the construction of a fish landing complex in Oistins, Barbados. Work is expected to start early next year and will include reclamation, a jetty, a cold store and ice making facilities.

6. Dominica

(a) Conclusions and Recommendations

Dominica will require considerable assistance if anything is to be done to improve fisheries in the country. Certainly, training of a future fisheries officer should be given high priority. In the meantime, however, it is recommended that WECAF explore the possibilities of funding an international fisheries officer under the OPEX Programme. There was a positive

response from the Permanent Secretary when this suggestion was made. The first step should be to determine if and when UNDP/IPF funds could be made available to provide an expert, and then to assist the Government in preparing an official request.

A comprehensive development plan for the country is now being formulated by the Government with the assistance of a UNDP planning project. The WECAF Project should certainly be involved in the formulation of the fisheries sector, particularly as it will shortly be involved in carrying out detailed studies and surveys in the Windward and Leeward Islands. The manager of the UNDP planning project would welcome the assistance of a WECAF staff member in preparing this plan, preferably during the last quarter of this year.

Because of various limiting factors including a very small shelf area and poor boat landing conditions, the opportunities for greatly increasing local fish production are not promising. There are, however, some things that should be tested which might prove beneficial to fishermen. These would include locating and marking with buoys possible sea mounts or deep water reefs which would be accessible to the existing boats for pot fishing or handlining. Also, to anchor a series of floating fish shelters as described in General Observations and Conclusions, page 2. It is therefore recommended that during the course of exploratory surveys to be made by the WECAF/CIDA sub-project, an attempt be made to locate such offshore reefs where depths are 100 fathoms or less, and to set a number of fish shelters in deep waters within the operating range of boats from a few of the main fishing villages.

(b) The Fishery

Fisheries in Dominica are the least developed of any of the islands visited. Because of the very narrow shelf area, it appears that fishing is primarily for pelagic species during the period from January to June when flying fish, dolphin, tuna and kingfish are found offshore. Beach seines, fishpots and handlines are also used along the coast, but as no data on landings are available, it is difficult to determine which type of fishing provides the bulk of the landings. It is obvious, however, that local catches fall far short of supplying local demand.

Though there are no accurate statistics, it was estimated that there are some 600 fishermen, virtually all of whom fish only part-time. The main fish landing areas include Roseau, Soufriere Bay and Portsmouth on the west coast, and Vielle Case, Marigot, Atkinson, Saint Saveur and Woodford Hill Bay on the east coast. It was reported that Marigot is the largest fishing area with 168 active fishermen. Most boats are the dugout canoe types up to 20 ft in length. Some of the newer boats are planked and it is estimated that 50 to 60 per cent of the boats are mechanized with outboard motors ranging from 6 to 40 HP. During a visit to Marigot, it was learned that many of these boats are owned by non-fishermen. These owners hire fishermen on a share basis, generally taking one share each for the boat and motor.

There is no organized marketing of fish in Dominica. Because of the relatively small catches landed each day, fishermen sell directly to consumers who wait at the beach for the boats to return. In some cases,

there are vendors who purchase small amounts of fish to sell in nearby communities. It appears that fishermen have little problem in disposing of their catch, except perhaps for an occasional glut during a particularly good fishing day. It was learned, for example, that the price of flying fish fluctuates from four to six fish per EC\$ 1.00 during the course of the season.

The dolphin fish is preferred by consumers, although flying fish has a good market, in particular when the larger species are not available. Usually, fish is eaten fresh. In Marigot, many homes have refrigerators or deep freezers, and dolphin especially is frozen. Some fish is salted and pickled, if large quantities are available. In Marigot, fishermen sometimes hire a truck and sell the fish to plantations.

It appears that the greatest problem encountered by fishermen is the lack of harbours or protected beaches. This is particularly the case of the east coast, where most landing sites are very small and exposed to the open sea. In the Marigot area, beach space for hauling out boats is at a premium requiring some boats to be carried across the main road. At a cost of EC\$ 7 000, the Government filled in a small area on the beach where about a dozen boats can be kept. Because of this problem, the Ministry of Agriculture requested CIDA to provide the services of an engineer to advise on ways to improve landing sites. It is understood that this request was forwarded to the Canadian Retired Executive Agency for possible action.

The Government of Dominica is interested in an association with Guyana to obtain increased fish supplies for the Dominican domestic market. The Minister of Agriculture has recently had preliminary talks in Guyana on this matter, with the result that fish caught in Guyana fishing vessels may be delivered to Guyana. It appears that this arrangement includes only a limited amount of fish and is for a relatively shorttime. The WECAF Project may follow up this seemingly interim solution.

(c) Fisheries Administration

The post of Fisheries Officer remains vacant, as the Government has been unable to locate a suitable qualified candidate. Fishery matters are handled by an extension officer with limited fisheries experience. As a result, there is little evidence that much has been done during recent years to improve the fisheries sector. Realizing the need to train a man who could eventually take over the Fisheries Division, the Government has obtained a three-year fellowship in fisheries training from CIDA. Applicants for this fellowship are being solicited through advertisements in the local newspaper and on radio. Since it is unlikely that the post of Fisheries Officer can be filled until someone is trained, it was suggested that the Government consider requesting the services on an OPEX expert through FAO/UNDP.

A 55 ft English trawler was donated to the country by the British Government in 1972. There are however, no reports available on the work done by this vessel, and because it has not been used nor looked after for a year or more, the boat is almost to the point of being beyond repair. It should be inspected by a marine engineer and boatbuilder to determine if it is actually worth salvaging.

There is currently a UNDP Project in the country which is assisting the Government in the preparation of a five-year development plan to begin in 1979. As the plan will include a section of fisheries, the Project Manager would welcome the assistance of WECAF to provide a fisheries development specialist for a period of about one month during the last quarter of 1978.

(d) Dominica Fisheries Cooperative Ltd.

There are presently 367 fishermen who are registered members of this cooperative, which was formed in January 1973 as an all-island association. The membership fee is EC\$ 2.00, and each share is sold for EC\$ 5.00. Though by regulation, each member should hold a minimum of 20 shares, this is apparently not enforced. The cooperative does not provide marketing services but maintains a shop where engine parts and fishing equipment can be purchased on credit. It also operates two gas pumps located at Roseau and Portsmouth where fuel is available to members tax free.

The cooperative is managed by a Secretary, Mr. Austin Harris, who is employed by the Harbour Department. His staff consists of three persons, employed by the cooperative to handle sales of fuel and supplies. At present, a small shop is being rented in downtown Roseau but the Secretary is pressing the Government to donate a small unused building near the waterfront. The cooperative also hopes to open four engine repair shops around the island which would carry spare parts and tools for outboard engine maintenance and repair.

7. St. Lucia

(a) Conclusions

St. Lucia has a progressive fishery administration and its serious and well conceived endeavours to uplift the small-scale fisheries are bound to enhance progress in this sector. In addition, the construction of the Castries Fish Plant seems to progress as scheduled. This plant, when in operation, will generate considerable changes in the marketing and distribution of fish, and this in turn will most likely have a favourable influence on fish production.

It was observed that in connexion with the creation of a strong central market and an improved marketing system, a study is required to assess the demand for fish and fish products in inland and coastal areas of St. Lucia. The study should relate the demand for fish in these areas to the amount of fish landed at nearby landing places. It should aim at designing a scheme for supplying the various inland and coastal areas with fish directly from fishing villages. Such a scheme would give guidance to the Government and to any marketing organization which may be established. It would facilitate planning the most economic way of meeting the demand for fish and fish products throughout the island. Assistance from WECAF in conducting such a study would be appreciated by the Government.

The Government of St. Lucia considers the WECAF/CIDA sub-project of great importance for the future growth and general development of the fisheries of the islands under consideration and it is aware of the general stimulating influence of such activity on the spirit in fishing communities, especially if such communities are in close contact with the project. For technical as well as social reasons the Government is very keen in having the sub-project located in St. Lucia, and is prepared to provide all support facilities required.

The Government would appreciate it if the WECAF Project would send publications on basic fisheries legislation principles of fisheries administration as soon as possible.

(b) The Fishery

The fishery of St. Lucia is almost exclusively a small-scale fishery in which about 2 000 fishermen are engaged. The number of boats is between 500 and 600. These are small canoes, 5 to 6 m in length, which have been developed from the traditional dugout canoe. Almost all boats are now powered by outboard motors. The Government, in order to modernize the small-scale fishery, is attempting to replace the presently used boats by the similar but somewhat larger boat used in Trinidad. One fibreglass pirogue imported from Trinidad is being tested by fishermen in Vieux Fort. To stimulate the acquisition of the new type of boat, the Government has worked out a loan scheme for fishermen. A fisherman who buys a boat at a price of about EC\$ 10 000, gets 20 per cent of the cost of the boat as grant and the rest on loan.

The commercial fishery exploits demersal fish stocks from July to December using pots, handlines and beach seine nets; from January to the end of June, pelagic fish stocks by means of trolling and gillnetting. As a consequence there is a great variability in fish supplies on the local market.

St. Lucia's main fish landing places are in seven villages and three towns, Castries and Vieux Fort being the largest. As in most of the Windward and Leeward Islands, the greater part of the fishermen (two thirds), are part-time operators as it appears difficult to make a living from fishing alone.

Vidaeus (1969) and the CIDA Report (1974) estimate the local annual landings of the artisanal fisheries at 3 500 000 lbs (1 575 t), while the Fisheries Management Unit estimate the annual fish landings in 1977 at 5 000 000 lbs (2 500 t). The latter figure includes the relatively small amount of trawl fish landed by the shrimp trawlers (about 64 000 lbs or 320 t). Statistical recording of the landings at all main landing places was started a few months ago. The seasonal character of the fisheries and the varying size of the catches according to the season are factors which need to be taken into consideration when calculating the possible future increase in fish landings by artisanal fishermen.

Fishing villages are small but all are accessible through a good network of roads in the island. The mountainous west coast road is narrow and traffic slow because of the hundreds of sharp curves. By this road, it takes three to four hours to drive from Castries to Vieux Fort, but on a new road on the east of the island, the same distance can be covered in less than one hour. Because of generally poor landing sites at coastal villages, the Government hopes to make small improvements, such as constructing concrete ramps to facilitate beaching the boats.

In these villages fish marketing takes place at the beach. Some of the fish is marketed by members of a fisherman's family or by vendors who display and sell the fish right at the landing site. Sometimes a few wooden boards form a kind of marketing stall or shelter, or there may only be wooden bench for displaying fish. There is, in most places, no supply of running water. Most fish appears to be sold by fishermen directly from the boats. In Castries, there is a section for selling fish in the market with stalls for vendors. In general, the conditions are better along the east coast where a recently opened highway has improved traffic connexion with Castries considerably. Fishing villages situated on this coast, have no difficulties in sending the bulk of their catches to Castries. None of the fishing villages has facilities for handling and storing fish and, except in Castries and Vieux Fort, there are no ice plants. It is apparent that fishery development on a large scale has not yet started in St. Lucia. It is, however, encouraging to see the great effort made by the members of the Fisheries Management Unit to pave the way for development which is intended to include all fishing villages.

(c) Fisheries Administration

The Government has recently strengthened the Fisheries Office by establishing a Fisheries Management Unit. This Unit is attached to the Office of the Ministry of Agriculture. A Fisheries Officer is in charge and has direct access to the Minister. The arrangement facilitates fisheries development considerably and indicates the great interest the Government is taking in the development of the fisheries of the country. The staff of the Fisheries Management Unit consists of one Fisheries Officer, one Assistant Fisheries Officer and one Extension Officer. In addition, some six field workers are stationed at the main landing places and, among other duties, are responsible for collecting fisheries statistics. The staff of the Fisheries Management Unit have close contact with the fishermen and make frequent visits to main fishing villages.

The Government is improving fisheries legislation and would welcome advice (publications) from the WECAF Project.

(d) Fishermen Cooperatives

The formation of fishermen cooperatives has the strong support of the Government. Six cooperatives have to date been registered. It seems, however, that only the Goodwill Fishermen Cooperative Society in Vieux Fort

is operational. This cooperative is housed in a small building at the water front and sells outboard motors, fishing gear and other supplies, as well as fuel to its members. The Fisheries Management Unit supports the retail sale of fish through the cooperative, which is now constructing a retail shop for fish. The manager of the cooperative recently returned from Trinidad where he attended a course on cooperatives sponsored by ILO.

The Government has arranged for the sale of tax-free gasoline to fishermen through cooperatives. Fishermen initially pay the full price of EC\$ 2.50 per gal. Tax rebates amounting to EC\$ 0.57 per gal are paid quarterly, EC\$ 0.42 to the fisherman and EC\$ 0.15 to the cooperative. These rebates are handled by the Fisheries Management Unit.

(e) The Castries Fisheries Complex

A fisheries complex will be established in the harbour area of Castries with the assistance of CIDA (Canada). The port authorities have indicated a site for setting up the complex and the Fisheries Management Unit is expecting to obtain the design of the complex soon in order to carry out the necessary site work. The site appears well chosen and will eventually centralize all landing activities in this area, except retail marketing. Fishing boats will land the fish at the complex where storage and wholesale facilities will be available. The vendors will continue to retail the fish in the municipal market, which is close to the fisheries complex. The complex is also intended to serve as a centre for the distribution of fish to inland and coastal areas (CIDA report). The facilities for this complex will include:

- (1) a fish plant for storing and wholesale of fish;
- (2) a landing ramp and repair facilities for canoes;
- (3) a pier for trawlers and canoes for landing the catch and taking on supplies;
- (4) insulated vehicles for transporting ice and fish.

Facilities for storing and selling fish and for the repair of gear and outboard engines will be provided at Vieux Fort, Soufriere and other fishing communities.

(f) Marketing

Marketing of fish in St. Lucia was studied by L. Vidaeus in 1969. Data and findings published in this report were, with some updating, also used in the study on Fisheries Development in St. Lucia prepared by CIDA by C.L. Mitchell, et al. (1974). These studies describe the prevailing situation with regard to fish marketing. The general findings need not to be repeated here but the data given on fish landings and fish consumption are also used in this report.

According to these reports and our own findings, marketing constitutes a main problem in fisheries development in St. Lucia and priority has to be

given to changing the present situation. Unless fishermen are insured a regular outlet for their catch at improved prices, it will be difficult for an increased number of them to make a living from full-time fishing. Still, increasing the number of full-time fishermen seems essential for increasing the production of the small-scale fishery. In the long run, fishery development must result in uplifting the status of fishermen to an economic and social level equal to that of farmers and primary producers in St. Lucia. According to the CIDA report referred to above, fishermen are at present at the lowest social and economic level. Organized marketing, which gives fishermen a fair share of the financial value of their catch, is an important incentive for increasing the fishing effort. Vidaeus reports that in Vieux Fort less than 40 per cent of the fleet operated at any one time (1969). It is also reported that the price control system which existed then and is still now in force favours the consumer more than fisherman, who has to market his catch himself. When landings exceed the daily demand the fisherman has to sell his fish for a lower price since there are no cold storage facilities.

The CIDA report lists the main fish production and market areas in St. Lucia as follows:

MAIN FISH PRODUCTION AND MARKET AREAS, ST. LUCIA, 1974

Administrative Areas	Artisanal Landings (lbs)	Extent of Market	Surplus or Deficit
Gros Islet	218 000	210 000	8 000
Castries	768 000	1 561 000	793 000
Anse-La-Raye	288 000	175 000	133 000
Canaries	109 000	60 000	49 000
Soufriere	563 000	248 000	315 000
Choiseul	557 000	182 000	375 000
Laborie	186 000	165 000	21 000
Vieux Fort	650 000	276 000	374 000
Micoud	74 000	326 000	- 252 000
Dennery	87 000	297 000	- 210 000
Total St. Lucia	3 500 000	3 500 000	

Including imports and fish landings by the shrimp trawlers, the total available fish to the population amounts to 6.1 million lbs for a per caput consumption of 55 lbs/year. Based only on the production from the artisanal sector, the per caput consumption amounts to 32 lbs/year. The table gives an analysis of the landings in the different parts of the island based on a per caput consumption of 32 lbs/year, and shows that there is generally a surplus of fish on the west coast.

Organized marketing as planned and the concentration of facilities at Castries aim obviously at making this town the centre of fish marketing and distribution in the island to which the bulk of the landings from all fishing villages will go; thus, waste of fish in these villages will be avoided.

However, if landings from the small-scale fisheries increase substantially, and if additional catches from a greater number of larger boats are discharged in Castries, the supply could exceed the demand in this town. A situation could then arise where surplus fish shipped from various fishing villages would have to be redistributed to other parts of the island, maybe to the area from which it originally came.

There seems to be a lack of information on the demand for fish in the different inland and coastal areas. Such information would be most valuable at an early stage of planning fisheries development and in formulating a distribution plan for the entire island. It could be provided by a study which would relate the demand for fish in the different inland and coastal areas to the amount of fish landed in these fishing villages which are conveniently situated. The study would include investigations on the approximate demand for fish as well as on consumer preference for particular fish or fish products. Furthermore, the distribution and storage facilities needed at each landing place could be determined. A study of this kind was discussed briefly with the Minister of Agriculture and he was interested in the assistance of WECAF to carry it out.

Annex 1

List of Persons Met

1. Antigua

Mr. Christian	Permanent Secretary, Ministry of Agriculture and Cooperatives
Mr. A. Christian	Acting Fishery Officer
Mr. C. Comacho	Fisheries Adviser

2. Barbados

Mr. R.V. Jones	Acting Fishery Officer
Mr. L. Austin	Senior Assistant Secretary, Ministry of Agriculture, Food and Consumer Affairs
Mr. R. Stuart	Manager, International Seafoods, Ltd.
Mr. G. Kelly	European Commission Delegate
Mr. H. Squires	Caribbean Development Bank
Mr. S. Kirwan	Caribbean Development Bank

3. Dominica

Mr. E. Castro	Permanent Secretary, Ministry of Agriculture
Mr. A. Harris	Secretary, Dominica Fishermen's Cooperative
Mr. M. Petkovich	Project Manager - DMI/76/002

4. St. Lucia

Mr. D'Auvergne	Minister of Agriculture
Mr. H. Walters	Chief, Fisheries Management Unit
Mr. N. Lawrence	Assistant Fishery Officer
Mr. A. V. Charles	Fisheries Extension Officer

WECAF Reports Already Published

1. Fishery Training Needs in the Western Central Atlantic by R.C. Cole. 1976 (Restricted distribution).
2. Review of Status of Fishery Statistics and Fishery Research Capabilities in the WECAF Project Area by L. Villegas. November 1978.
3. Shark Fishing in the Western Central Atlantic by S. Springer. March 1979.
4. Report of the First Session of the Executive Committee of the WECAF Project. 18-20 May 1978.
5. Aspectos Técnicos de la Pesca Artesanal en la República Dominicana y Recomendaciones para su Mejoramiento y Desarrollo por M. Giudicelli. Junio 1979
6. Report on Fish Handling, Processing and Quality Control in Jamaica by C.A.M. Lima dos Santos. July 1979.
7. Programme of Fisheries Development and Diversification in Jamaica by M. Giudicelli. July 1979.
8. La Pesca Artesanal Marítima en la Costa Caribeña de Colombia: su Situación, sus Posibilidades y sus Necesidades para el Desarrollo por M. Giudicelli. Agosto 1979.
9. Report of Mission to Suriname to Evaluate a Fishermen's Training Proposal by E. Oswald. June 1978

