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FURTHER DEVELOPMENT OF FISHERIES IN THE CARIBBEAN

Discussion paper*

Prepared by
the FAO Secretariat

7/24

* This document has not been edited.

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SUMMARY

Part I of this paper discusses some of the issues and constraints to the further development of fishery industries in the region and notes that any development programme should be directed away from currently heavily exploited inshore resources.

Part II provides comments on the state of development in selected countries, information on resources and a list of development and technical assistance projects relevant to the region.

PART I: ISSUES

Introduction

1. In 1968, FAO held an international conference on Fishing Ports and Market Places in Bremen, Federal Republic of Germany. At that time, an attempt was made to provide a definition for the term "fishery harbour". FAO drew on the definition of Alonzo de F. Quin (1966) that a harbour is "a water area partially enclosed and protected from storms as to provide safe and suitable accommodation for vessels seeking refuge, supplies, refueling, repairs or the transfer of cargo". Applying this to the fishing industry, a fishery harbour could cover any facility from the semi-protected beaches and coves for canoes and small boat landing areas seen so frequently in the developing world, to the ancient ports of the Mediterranean coastline, or the more sophisticated harbours and large ports.

2. The development of harbours in the Caribbean certainly illustrates the attention given to protection from storms since, with few exceptions, the main ports of the small island States of the Lesser Antilles are located on the more sheltered western coasts. Unfortunately, in most cases, the main fishery of the islands are on the exposed coastlines to the south, east and to the north. These islands are also categorized by the general inadequacy of the landing places on these exposed coasts and by the types of fishing vessels used.

3. The larger islands, Cuba, Haiti, Dominican Republic and Puerto Rico, for example, are served by a number of ports and harbours and their fisheries differ from the smaller islands of the Lesser Antilles.

4. Trinidad and Tobago, being close to the mainland, has its main fishery in the sheltered Gulf of Paria, but in common with the smaller islands, the exposed east coast and the north coast lack suitable landing places for reasonably sized fishing vessels.

5. In general, the difficulties in locating landing places or ports closer to the fishing grounds, and in particular to the more offshore areas, has led, in many cases, to heavy exploitation of the inshore resources. Greater diversification of effort is needed if fisheries managers are to act effectively in ensuring that the fishing industry and the targetted resources are indeed sustainable.

6. Such diversification of fishing effort will require an adjustment in the composition of the fleet with new types of vessels and fishing gear, improved landing places and better service facilities.

7. However, long-term planning for further development of shore-based facilities and fishing craft will depend to a great extent on:

- i) knowledge of the resources;

- ii) the availability of the means to exploit these resources;
- iii) level of local demand for fish products and access to export markets;
- iv) access to offshore resources (including accessing the EEZ's of other states);
- v) government development policies; and
- (vi) access to credit and/or investment sources.

Knowledge of the resources

8. With regard to resources, many inshore areas to which fishermen currently have access, are heavily exploited. Consequently, it is unlikely that further development would be directed to an increase in fishing effort in such areas. There are, of course, some exceptions, but these are rather special cases.

9. Knowledge of the resources requires research and stock monitoring activities and few of the countries in the region, if indeed any, are in any way self sufficient. This has perhaps been partly acknowledged under the umbrella of the UNDP/FAO Global Programme "Survey and Identification of World Marine Fish Resources" (GLO/82/001) through a survey off Suriname, Guyana, Trinidad and Tobago, and Venezuela, by the R.V. Dr. Fridtjof Nansen from January to November 1988. In addition, the International Centre for Ocean Development (ICOD) is conducting a much wider spread regional resources survey; other related projects are listed in Appendices 1 and 2 of Part II.

10. In addition to knowledge of abundance of the resources by species, there is also a need to consider the effects of fishing gear interaction which could arise from a change in fishing methods and operations. This could be pertinent in targetting offshore resources and migratory species in particular.

11. In general, however, there is a need for greater support to fishery research units and for closer collaboration between institutions. Such collaboration could extend beyond arrangements for the exchange of information, to cooperation through the exchange of scientists and sharing of research vessel time and research equipment. In addition, links with institutions outside the region should also be strengthened. Present collaboration is facilitated through membership of the Western Central Atlantic Fishery Commission (WECAFC), which is described in paragraphs 25 and 26 of Part II of this paper.

Availability of the means to exploit fishery resources

12. Under the prevailing circumstances and with the knowledge of the pressures on inshore stocks, most countries are therefore looking at ways to expand or develop offshore fisheries that would require

vessels capable of staying at sea for 3 to 5 days. However, in order to achieve an economic return, the steaming time should be kept to a minimum which means harbours or landing places closer to the fishing area; it also means that adequate fish handling procedures are applied on board and ashore.

13. Ideally, the new types of vessels should be built locally (or nearby) and locally maintained. There are no technical reasons for not being able to do this in most countries and a number boast adequate boatbuilding and repair facilities. If new techniques are to be introduced, the technology will also have to be transferred, but again, from the technical point of view, this could be readily accomplished. The building of the GRP "CARIB SPIRIT" in Grenada in 1989, using the foam sandwich construction technique, is a case in point. This 10 m catamaran was designed by FAO and constructed in Grenada by local labour under the supervision of the designer.

14. This is, in fact, a classic case of TCDC as a consequence of a visit to the South Pacific by officials from Grenada. They spotted the aluminium hulled "Alia" (designed by FAO) as an ideal design of a vessel for Grenada waters.

15. The change in hull material was made to suit local construction, but the choice of materials in general usually reflects the availability of raw materials, level and variety of local skills and traditional practices. This is evident in the region, with ferro-cement being used in Cuba, wood and fibreglass in most countries, and in places such as Guyana, steel is a widely used construction material for hulls.

16. It is also worthy of note that in the 1960's, the largest aluminium hulled vessel in the world (at that time) was built in Guyana, the skills and equipment being available.

17. With regard to the smaller vessels, most small-scale enterprises in the region tend to concentrate on the construction of wooden hulled vessels and use traditional methods and designs. The supporting trades also follow a similar pattern and their upgrading may be achieved through investment in small-scale industries since all of the trades need not be under the same roof. Most of the countries in the region will have to address this issue with the development of a more advanced artisanal fishery and they will have to meet the need for new or improved technology through training schemes and courses.

18. Of course not all vessels to be built or serviced fall into the smaller range of vessel sizes. Others, related to the development of industrial fisheries, such as shrimp fisheries and distant-water fisheries for large pelagics, demand more exacting standards of equipment and infrastructure. Shrimp trawlers, for example, need fairly substantial slipping or drydocking facilities and an assortment of trades since these vessels are commonly produced in steel, wood and GRP and most have refrigerated holds. Facilities of this nature require substantial investment and a steady flow of work to keep them viable. For this reason, even a repair yard dealing with a fair sized

fleet has to seek repair work on other types of vessels and offer services to non-fisheries based industries if they are unsubsidized or not tied to a specific fishing company.

19. Indeed, a number of ship and boatbuilding yards in the region have been forced to close down in recent years due to a turn down in the economy or as a result of national or regional competition or simply not being able to procure equipment and spare parts or materials. This is a particular issue due to the small number of manufacturing industries in the region.

20. Competition is a real threat to the larger yards since the units to be serviced are mobile and the customer wants the best price and a job well done in a reasonable time. This, of course, is quite normal in servicing ships anywhere in the world and it points to the need to look at what the region or sub-region has to offer before investing in high cost national facilities in what is a high risk industry.

21. There would also be a need to look closely at the training needs for both the large-scale and small-scale operations, manpower planning being a common denominator.

22. Some countries in the region are fortunate with sound structures in place in the form of trade schools and technical colleges. Others are not so fortunate and it may be more convenient to institute closer regional or sub-regional cooperation in this respect.

23. The multilateral and bilateral aid agencies could also assist through balanced training programmes at national and regional level covering shipbuilding/ship repair trades and fishing technology.

24. However, another aspect of the development of new boatbuilding yards or even the upgrading of existing enterprises is the question of suitable ports and shore facilities. Care has to be taken to ensure that such development is an integral part of the whole fisheries sector and the needs of the fishermen after taking delivery of a vessel must be considered at the planning stage.

25. It is most important to bear in mind the need for an integrated approach in the planning and construction or improvement of harbours and in providing safer landing places on exposed coasts. Nevertheless, these are necessary components of an expanded fishery in all of the island States. The landing places offer a technical challenge to overcome the problems at a reasonable level of investment.

Marketing needs

26. In parallel to developments in fishing technology, development of fish utilization and marketing should be considered as a prime necessity for the effective use of increased catches. Generally, increased catches would most likely be used to reduce imports of fresh and frozen fish to begin with and perhaps, in a limited number of

countries, exports could be increased.

27. However, in the past, although encouraging results were achieved in fish utilization and marketing in the region, these were mainly related to industrial fisheries and much has yet to be done to improve the small-scale fisheries sector. Many of the problems are due to landing places lacking the required standards of hygiene and sanitation. The problem becomes greater during peak fishing periods and bottlenecks in the fish marketing system become more pronounced.

28. Further investment in equipment and facilities required for the proper handling, storage and distribution are needed and, in this respect, it should be noted that fresh/chilled fish is the consumers' preference in the region. In some countries, where the consumers are scattered or are far from the landing place, the distribution network and post landing care (of the catch) would need special attention.

29. Further development of the catching sector could also lead to an increase in the landings of less popular species and most likely greater emphasis would have to be placed on product development, consumer education and promotional activities.

Access to offshore resources

30. Access to offshore resources is not only achieved through the construction of suitable craft. In many cases there would be a need to enter into access agreements with other states and to respond to regional management measures in the case of migratory stocks. Within the region, this subject has been addressed several times at various meetings of the Western Central Atlantic Fishery Commission (WECAFC) and its working groups. It is an important element in the decision-making chain since there is little point in developing national fleets and harbours without guaranteed access to a sufficient resource or, in the case of harbours, a long-term commitment to service other fleets.

Government development policies

31. The above certainly influences government policy, be it directed at fisheries, tourism or as a transit centre. In certain cases existing underutilized shore facilities and harbours might be put to better use by other than the national fleet. Such arrangements could include foreign flag vessels (non-Caribbean), albeit seasonally, as well as vessels from other countries in the region.

32. Governments should also consider the special nature of fishing vessel harbours and attendant facilities for fish selling and storage which is often a constraint to their use by others unless designed accordingly. This is often the case at fishing complexes of a dedicated nature with the need for good hygiene standards and also security.

33. These facilities tend to be costly, demanding a reasonably high level of investment requiring loans to be provided by development banks. Even the improvement of simple landing places, such as to be found on the east coast of Dominica, can be costly and difficult to finance from local resources.

34. From the foregoing, it can be seen that in virtually every country, the development of the fishing industry cannot be seen in isolation, it must be a component of the main industry development plan. New landing sites will often mean new roads to urban centres; it could mean the relocation of families and the need for social welfare support; it could also lead to parallel development of cash crops.

35. However, although the fishing industry must be seen as part of the overall development policy of a government, the living resources of the seas know no boundaries and their abundance can fluctuate as a consequence of natural causes as well as fishing effort. Furthermore, unlike agriculture, recruitment is not under the direct control of governments and it is no easy task to accurately assess stock sizes or to set maximum sustainable yields in multi-species fisheries. This is perhaps also illustrated in Part II, Table 3, which demonstrates a steady growth in catches by the larger island States and the mainland States whereas the annual catches for many of the smaller islands are more erratic.

36. Therefore, if fisheries are to be truly sustainable, governments must give special attention within its development policies to the management of fisheries. In this respect, licensing arrangements would have to be reviewed if a more advanced small-scale fishery or offshore fishery is to be developed, gear specifications would have to be controlled and it may also be necessary, consistent with safety requirements, to apply design limits with the various size ranges of vessels to be considered; it would certainly be essential to review standing fisheries regulations.

Access to Credit/Investment

37. The most pressing needs for most of the smaller island countries include further development of landing sites and the construction or procurement of larger vessels to operate further offshore. Both need reasonable levels of investment and both governments and individuals are likely to need access to credit.

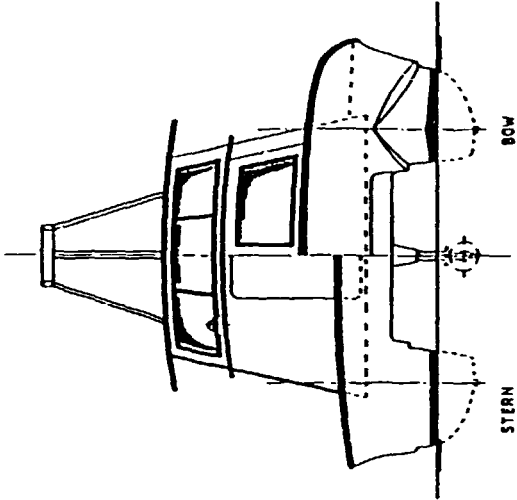
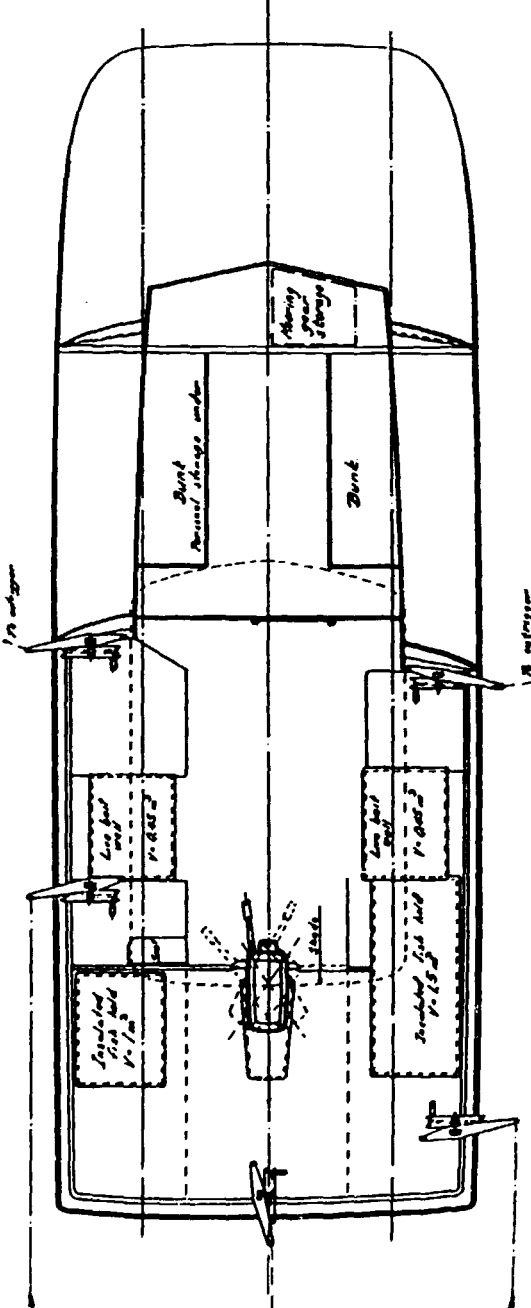
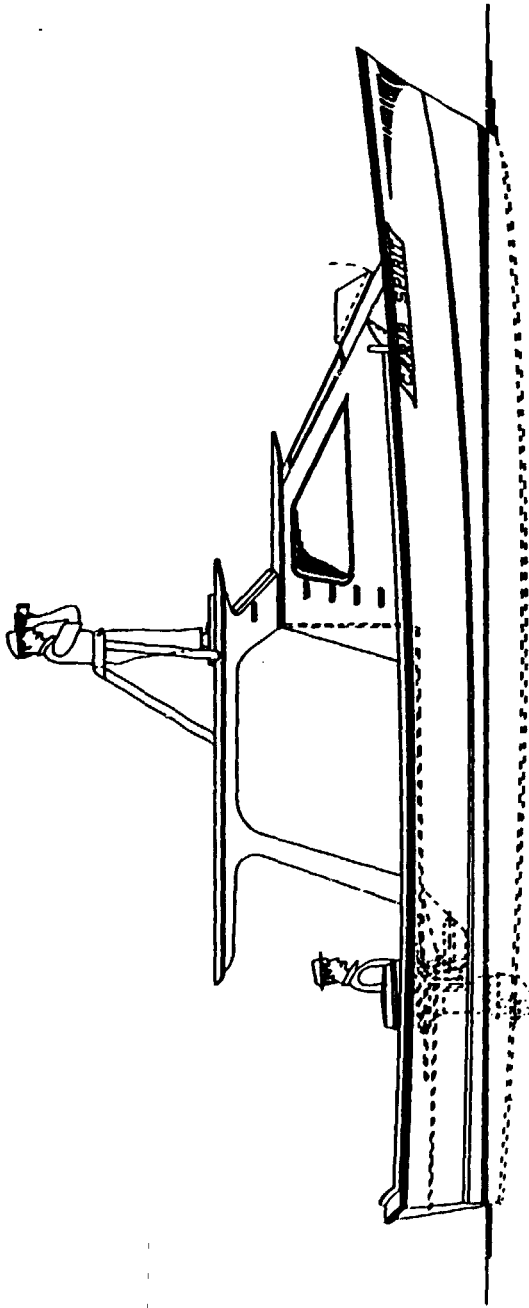
38. There are a number of recent examples of investment programmes involving substantial loans to governments such as the fish harbour complex at Bridgetown in Barbados. This particular installation was preceded by well prepared feasibility studies and the loan subsequently justified.

39. Loans to individuals are perhaps generated through normal banking services and credit institutions such as the Agricultural Development Banks. In many of these cases, the justification for the loan is

generally on the economic viability of the individual proposal and the security of the loan and does not, in every case, address major policies.

40. Fortunately, the issue of credit in fisheries is receiving attention on a global scale and FAO held the first of a number of planned workshops on Fishery Credit and Marketing Development in Bangkok, Thailand, 13-17 November 1989. FAO also conducted a series of case studies on credit programmes and revolving loan funds (which include a study from Barbados) and these are contained in the FAO Fisheries Technical Paper No. 312.

41. Clearly, each government contemplating further fisheries development, should shoulder the responsibility to ensure that investment programmes attract not only appropriate credit but also technical assistance where required. They should also ensure that in each and every case, thorough feasibility studies are carried out incorporating all of the issues previously mentioned and also the socio-economic impact on fishing communities caused by development.



MAIN PARTICULARS

Length Over All:	32.8 ft
Beam Maximum:	12.3 ft
Centre Distance:	2.2 m
Depth Moulded:	1.05 m
Length DWL:	9.2 m
Beam DWL, each hull:	30 ft
Displacement to DWL:	0.87 m
Engine Power:	2.3 tons 5600 hp
Outboard Motor:	25 hp
For Trailing:	12 knots
For land live ball:	60 hp
Spare engine:	8 hp

10 m FISHING CATAMARAN

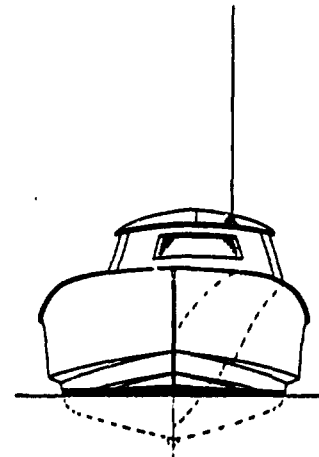
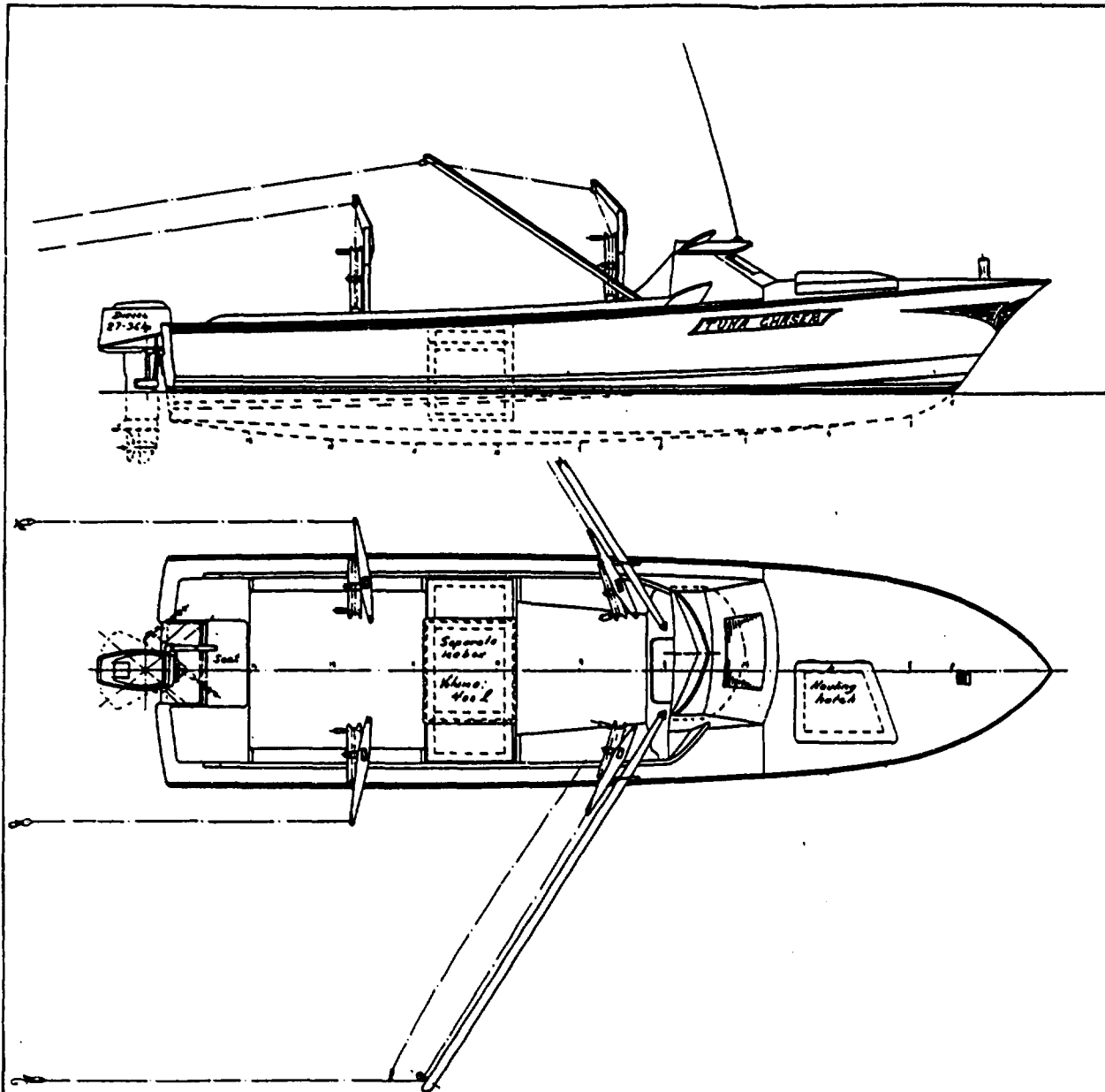
General Arrangement

Scale: 1" = 20' Boat No: Dwg No:

Design: *[Signature]*

HULLNOBOS AUG 64 GND-1 1



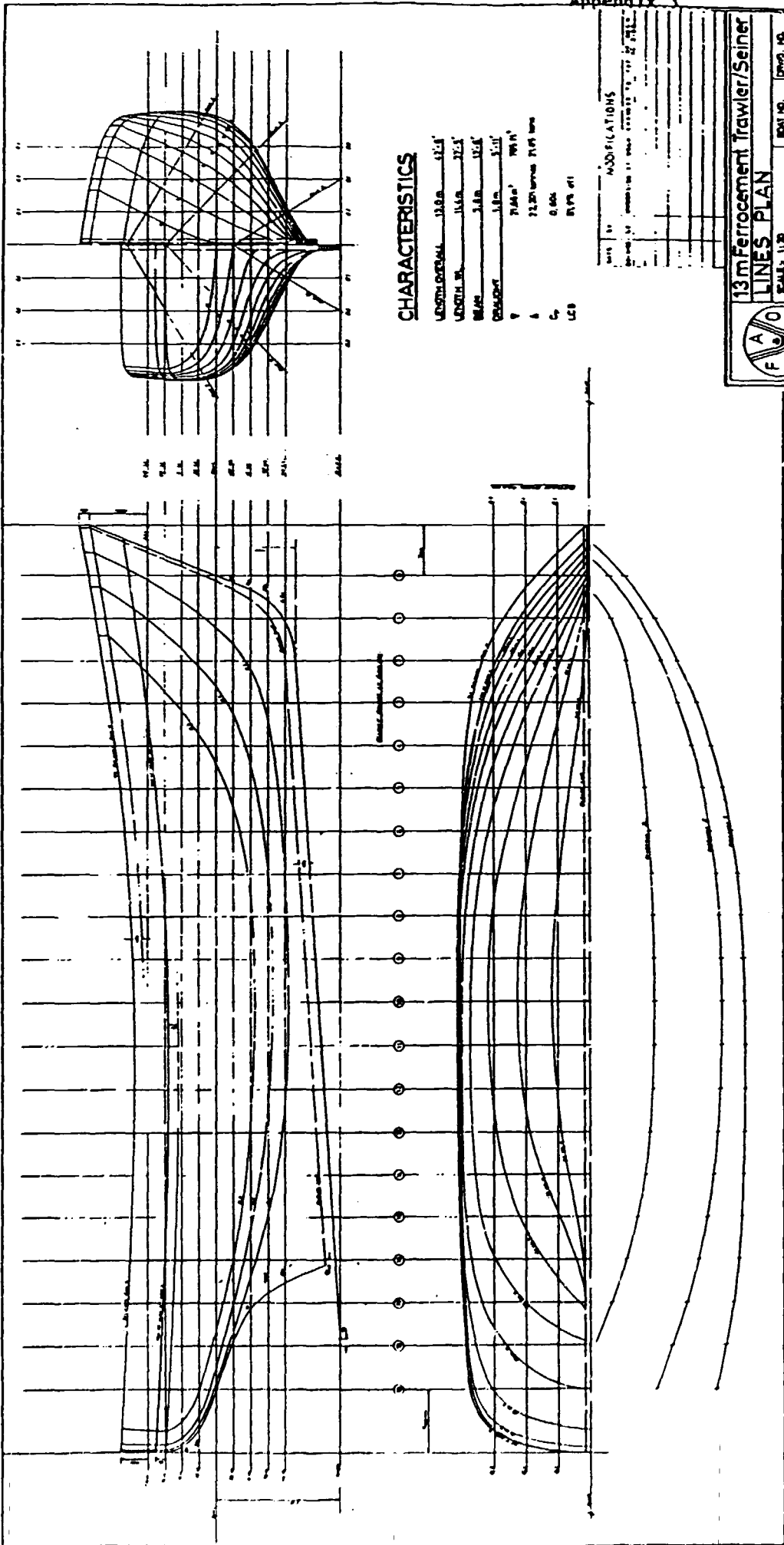


Main Particulars:

Length Over All:	LOA:	7,32m	24 ft.
Length Designed Water Line:	DWL:	6,44m	21 ft.
Beam Moulded:	B :	1,92m	6,3ft
Beam DWL:		1,60m	5,2 ft.
Depth Moulded	D :	0,94m	3,1 ft.
Draught:		0,38m	1,25 ft.
Displacement : (To DWL)	Δ :	1,53 T	3360 lbs.
Cubic Number, C _w No (LOA = B = D)		13,2 m ³	468 ft ³
Propulsion :		20-30 kW	25-40 hp
Speed :		12 - 18 knots	
Fish Hold Volume:		400 litres	16 cuft.



	24 ft. TUNA TROLLING BOAT		
	General Arrangement.		
	Scale: 1 : 20	Boat No:	Drwg. No:
	Design: A. Overa	GRN-2	1
Hijungavag, Feb. 90			



CHARACTERISTICS

LENGTH OVERALL	13.00	42' 6"
LENGTH	11.60	38' 1"
BEAM	3.00	9' 8"
DRAUGHT	1.00	3' 3"
V	71.00	236 ft ³
A	22.20	700 ft ²
C _w	0.40	
LCB	81%	of l

MODIFICATIONS	
NO. 1	
NO. 2	
NO. 3	
NO. 4	
NO. 5	
NO. 6	
NO. 7	
NO. 8	
NO. 9	
NO. 10	
NO. 11	
NO. 12	
NO. 13	
NO. 14	
NO. 15	
NO. 16	
NO. 17	
NO. 18	
NO. 19	
NO. 20	

13 m Ferrocement Trawler/Seiner
LINES PLAN

DESIGN: J. T. S. CO.
 SCALE: 1:120
 NORWICH, OCTOBER, 1964

BOAT NO. IND 102
 DWG. NO. 001

Reference Material

Available

FAO in the Eastern Caribbean
FAO Investigates Ferro-Cement: Fishing News Books
Design of Small Fishing Vessels: Fishing News Books
Fishing Boat Designs: 3 FAO T188
Fishing Boat Designs: 4 FAO T239
Definition and Classification of Fishing Gear Categories FAO T222
Definition and Classification of Fishing Vessels FAO T267
Fisheries Credit Programmes and Revolving Loan Funds Case Studies

Under Preparation

Manual on Building Fishing Vessels in Ferro-Cement
Manual on Building Fishing Vessels in Fibreglass
Pop Manual on Small Harbours and Landing Places for Fishing Vessels

CREDIT INSTITUTIONS IN THE CARIBBEAN

ANTIGUA *

The Managing Director
ANTIGUA AND BARBUDA DEVELOPMENT BANK
27 St. Mary's Street
St. John's

BAHAMAS

The Managing Director
BAHAMAS DEVELOPMENT BANK
Bay Street at Rawson Square
P.O. Box 3034
Nassau

BARBADOS *

The Managing Director
BARBADOS NATIONAL BANK
11 James Street
Bridgetown

BELIZE *

The Managing Director
DEVELOPMENT FINANCE CORPORATION
P.O. Box 40
Belmopan

The Managing Director
BELIZE CANE FARMERS ASSOCIATION
Corozal Division
P.O. Box 28
Corozal Town

BRITISH VIRGIN ISLANDS *

The Managing director
DEVELOPMENT BANK OF THE B.V.I.
Road Town
Tortola

CAYMAN *

The Managing Director
AGRICULTURAL & INDUSTRIAL DEVELOPMENT BOARD
Georgetown
Grand Cayman

DOMINICA *

Mr. Vans T. Leblanc
AGRICULTURAL AND INDUSTRIAL DEVELOPMENT BANK
P.O. Box 215
64 Hillsborough Street
Roseau

GRENADA *

The Managing Director
GRENADA DEVELOPMENT BANK
St. Georges

GUYANA *

The Managing Director
GUYANA COOPERATIVE AGRICULTURAL & INDUSTRIAL DEVELOPMENT BANK
126 Parade and Barrack Street
Georgetown

HAITI

The Managing Director
BUREAU DE CREDIT AGRICOLE
23 Rue Roosevelt
Port au Prince

JAMAICA *

The Managing Director
AGRICULTURAL CREDIT BANK LTD.
11a-15 Oxford Road
Kingston 5

Mr. A. Coulton (Secretary-General of CACRA)
AGRICULTURAL CREDIT BOARD
P.O. Box 457
8 Ocean Boulevard
Kingston Mall
Kingston

MONTSERRAT

The Managing Director
DEVELOPMENT FINANCE & MARKETING CORPORATION
Plymouth

ST. VINCENT *

The Managing Director
DEVELOPMENT FINANCE & MARKETING CORPORATION
Plymouth

ST. LUCIA *

The Managing Director
ST. LUCIA DEVELOPMENT BANK
P.O. Box 368
Castries

ST. KITTS *

The Managing Director
DEVELOPMENT FINANCE CORPORATION
Basseterre

SURINAME

The Managing Director
LANDBOUW BANK
P.O. Box 1418
Paramaribo

TRINIDAD

The Managing Director
AGRICULTURAL DEVELOPMENT BANK OF TRINIDAD & TOBAGO
86 Duke Street
Port-of-Spain

TURKS & CAICOS *

The Managing Director
DEVELOPMENT BOARD OF TURKS AND CAICOS ISLANDS
Grand Turks

* Members of the Caribbean Agricultural Credit Association

N.B. Participants may wish to contribute names of other institutions
in order to update this list.

PART II

INTRODUCTION

1. Fisheries development in the countries bordering the Caribbean show a range of development, from the private enterprise philosophies of some, through centralised economy attitudes, to the vast majority of the small island states that have little or no industrial development in their fisheries. In this respect the area is unique.

2. A study of the demographic factors in the various countries both in terms of general indicators such as population, area, coastal zone and in terms of specific fisheries indicators such as No of fishermen, landings, exports etc has been carried out for the various countries and this is shown in Tables 1 & 2.

3. For the purpose of this section of the paper, two categories of countries are considered

i) coastal countries and the larger island states having population levels above a certain size and having a sufficient coastal zone in which to harvest resources have substantially higher landings than the smaller island states. These larger countries include Cuba, Haiti, Jamaica, Trinidad and Tobago, Venezuela, Guyana, Suriname and the Dominican Republic.

ii) the smaller island states, categorised by the islands of the Lesser Antilles

4. N.B. The French Departments of Guadeloupe and Martinique, find that their development needs are met by a industrialised country and although they could form a third grouping, they will not be considered here.

5. The following descriptions of the fishery in each of the countries concerned, with comments on constraints to, and/or possibilities for further development is based on data available to FAO, and is intended to provide background material for participants. In some cases, the information may require updating to reflect the actual situation in 1990.

SMALLER ISLAND STATES

ANTIGUA AND BARBUDA

6. The local fleet consists of some 250 vessels of which the majority are less than 9m long and are powered by outboard motors. There are about 65 fairly modern decked vessels ranging from 12 to 17 m in length powered by inboard diesel engines. Fish traps are the most popular method of fishing, they are hauled after 3 or 4 days and yield 4.5 kgs of fish on average. Most of the fish are landed at St John's where fishermen sell their catch directly to fish traders, some of whom

export the fish to overseas markets (particularly the French Departments of Martinique and Guadeloupe).

BAHAMAS

7. Although the landings of the numerous islands of the Bahamas are very typical of the smaller island states, because of its proximity to the USA and its consequent huge tourist industry, it has a high demand for its fishery products. It also has fish exports of \$28 million, which are characterised by the high value, low volume nature that are again typical of the island states. In addition, the local demand of the tourist industry, both for fish products and for sport fishing, sustains a very thriving fishing community. Crawfish amount to 35% of the landings, and snapper and grouper about 30%. The very high valued conch comprise about 12%, and other fish including pelagics are only about 20%. A fish landing terminal has been established at New Providence. The fleet consists of over 255 vessels ranging in size from 6m to 27m of which 240 are powered vessels and the others are sloops. Approximately 1600 fishermen are employed on these vessels. An undetermined number of dinghies ranging in length from 3m to 5.5m are used in conjunction with the larger vessels and in many instances as the primary fishing unit.

BARBADOS

8. Barbados is different from the remainder of the islands in that it has a greater number of its vessels mechanised. Of 618 vessels, 63% are fitted with inboard diesels. 28 vessels (with a total tonnage of 368 tons) are powered with inboard diesels from 120hp to 215 hp. These relatively new vessels make trips of 5 to 10 days over a range of 300 to 400 n. miles. A fisheries terminal was opened in 1983 at Oistins Town, which serves 80 of the traditional boats and 8 of the newer 12m class. A much larger facility has been built at Bridgetown to service 150 traditional boats and upwards of 30 of the larger 12 to 15m vessels, and one is planned for Speightstown. There are about 25 landing places around the coast. The landings suffered a severe drop between 1983 and 1987 (ie from 6648 to 3702 tons). Barbados has the highest population density of all the islands.

DOMINICA

9. The fleet comprises of 443 small boats powered by 25 to 48 hp engines. Canoes are found all around the island and are powered by 6 to 28hp. Around 1500 fishermen are employed most of whom are part-time. The fishery is very seasonal harvesting the migrating pelagics from January to June. Fishing is limited to day-time operations, partly because of the lack of safe landing sites on the east side of the island. A proposal has been made by the World Food Programme to fund a system of feeder roads and landing places by food aid. Particularly lacking in facilities is the east side of the island, where potentially good fishing grounds are located. Consideration is being given to the resumption of boatbuilding for up to 10m boats operated by inboard diesel engines so that the fishermen can spend up to 2 to 3 days at

sea. The Government is encouraging the formation of Cooperatives and has provided practical help with a mechanical workshop in Roseau.

GRENADA

10. Beach seines produce 30% of landings. Craft consist of 420 boats of between 6 and 9m (9 to 48 hp) and 110 boats of 9m to 15m (12 to 45 hp inboard engines). Seasonal variations influence catch rates and create problems of supply and demand. High valued species are exported to other islands, particularly the nearby French Departments. Fish landings have not significantly increased over the last few years despite noticeable inputs of boats etc. 1300 to 1500 fishermen are employed, 40% of them full-time and 60% subsistence. The most economically important fisheries are those for the oceanic migrating pelagic species.

ST LUCIA

11. Nearly all the boats are of the dug-out canoe type. A few of the larger boats have inboards but 90% are fitted with outboards between 6 and 60 hp. The standard of construction is good and the vessels and engines are well maintained. About 600 vessels are operated on which 2,500 fishermen are employed of whom half are full-time. A fisheries complex was built at Castries by the Canadian International Development Agency , which has ice making, cold storage facilities, a blast freezer, landing facilities for canoes and a wharf to accommodate larger craft. At present a major effort is being made to encourage a transition from the traditional type canoe to an open type fibreglass pirogue. Glut periods occur in Jan/June and surpluses are sent to Castries or to Martinique. Nine fisheries cooperatives are now registered and the most successful has a membership of 150.

ST VINCENT AND THE GRENADINES

12. There are 250 to 300 small traditional type boats, but only a few of the boats are powered by outboards and even these are used as an auxiliary to sail. An export trade exists from the Grenadines to Martinique, but buyers restrict their purchases to prime species and sometimes up to 40% of the catch remain unsold and have to be dumped. Approximately 60% of the fish landed in St Vincent passes through Kingston market. There are 10 landing beaches along the west and south west coasts of St Vincent. The Grenadines are a series of small islands with a cold storage facility at Canouan which is used to hold fish prior to shipment to Martinique.

ST KITTS AND NEVIS

13. In St Kitts there are reported to be about 270 to 280 people engaged in fisheries . Of these about a third can be regarded as fulltime. This is mainly because of seasonal employment in cane-cutting. There are about 165 boats of about 4 to 5m, operating, of which 130 are fitted with outboard engines. Most of them fish with lines and traps, the others with beach seines. Traps are set in 5 to 30 ftms and hauled every two to three days. A few fishermen operate their pots in deeper water but without mechanised pot haulers the lifting of

pots is laborious. Handlining is carried out in depths of up to 100 fthms. It is estimated that on good grounds yields of 35kg per boat/day can be caught and on poorer grounds about 24kg boat/day. In Nevis, there are about 133 boats employing about 275 fishermen, the majority of which are employed full-time fishermen. The boats tend to be larger than on St Kitts (6 to 7m) and one boat of 9m has been built fitted with electronic equipment. There is a cold store in St Kitts, but because of improper storage of fish in the past and the dumping of the spoiled fish, the fishermen are reluctant to use it. There is no cold storage on Nevis.

MONSERRAT

14. Around 220 fishermen are employed on 80 boats of 4.5 to 6m planked built open dory type boats. 50 of these are powered by outboard engines. Some bigger boats from 9m to 15m are sometimes built on the island. About 12 beach seines are also operated from the leeward shore. The total estimated production is around 200 tons, and half of this is demersal catch. Marketing operations are carried out directly by the fishermen and do not present major problems.

NETHERLAND ANTILLES

15. The Netherland Antilles are split into two distinct groups. The first are the islands of St Eustatius and Saba in the Leeward Islands and the second the three main islands near the South American coast, ie Bonaire, Curacao and Aruba. The first group have about 30 open boats of less than 9m producing around 60 tons/year, while on the other hand a rather extensive exploitation of the Saba Bank is carried out by a foreign fleet which is estimated to catch some 1000 tons per year. The Saba Bank is described as having (i) a 2,200 sq km in the 0 - 200m interval (ii) a total margin of 260 kms, and (iii) an approximate area of 1,600 sq kms in the 200 to 600m zone. The southern group of islands lie along the coast of Venezuela and the total catch has been recorded as 1,000 tons for a number of years. There are 182 vessels recorded but specific details are missing but it is thought that these are mainly decked vessels in the 9 to 12m range with inboard diesel engines

LARGER ISLAND AND COASTAL STATES

16. The larger countries of the regions have had greater natural opportunities to develop their fisheries because of higher populations creating market demands for fish. In the case of the coastal states, the run-off from rivers provides the environment for penaeid shrimp fisheries, and the consequent development of industrial fisheries. The market demand for fish has led in the case of Cuba to develop the most highly industrialised fleet in the region, but in most of the other countries lack of an industrial base, lack of qualified personnel, or lack of resource in the final analysis, has limited development.

CUBA

17. Cuba is the only country in the Caribbean region to sustain a fleet of deep-water fishing vessels. This fleet has been in existence since 1962. There are 30 large stern trawlers with 6 transport and refrigeration vessels. The fleet fishes in the North-East, Central and South-East Atlantic. A fleet of 19 long-liners and one purse-seiner operate in the Central Atlantic. 49 vessels of 23m fish in the Mexican economic zone under a bi-lateral agreement. A fleet of 1900 ferrocement boats have been built and fish in local areas and catch high value fish. A fishing port was created in Havana with considerable infrastructure to support the fleet. Frozen fish is kept in 12 refrigerated stores with a 36,300 ton capacity. A fleet of refrigerated lorries and other vehicles distribute fish throughout the country.

DOMINICAN REPUBLIC

18. An inshore fleet of 2300 small craft of which about 70% are motorised and 37 offshore vessels from 7 to 22m powered by inboard diesels fish on the Plata and Navidad Banks undertaking trips of 5 to 15 days duration. Pelagic fish comprise only about 20% of the catch and 93% of the total catch is consumed domestically. The introduction of sixty 9m vessels under the auspices of the IDB, has so far failed to produce a significant increase in production. To date (1980) six co-operatives have been established. There are problems with quality and hygiene, as may be seen from the high number of exports rejected by the USA.

HAITI

19. The 2800 craft are principally small wooden boats of around 3.5 to 4.5m in length operated by 8000 fishermen of whom the majority are part-time. Few are mechanised. Reports do exist of pelagic resources of tuna and mackerels offshore but the present fleet is unlikely to exploit it. Lobster catches are exported as frozen tails to the USA. The demersal resources are said to be over-exploited. For an island, Haiti is remarkable in that it has very low catch rates, in fact the imports of fish are recorded as 21,000 tons against a local supply of only 7,700 tons. This is perhaps explained by its very narrow shelf area. Haiti has received remarkably little foreign aid to help her fisheries.

JAMAICA

20. There are 4000 canoe type craft of which 55% are motorised. Some of these canoes fish on the Pedro Bank and Morent Cays, staying on the fishing grounds for up to three months supported by 11 carrier vessels which supply fuel, water and provisions and also transport fish to Kingston. The catch on these banks were said to have declined by 80% between 1973 and 1986. It is also significant that although the fishing effort in Jamaica doubled between 1968 and 1981, the catch remained at the same level as in 1968. There are also three large vessels capable of deep sea activities. A fisheries terminal for 35 offshore vessels (Florida snapper type vessels capable of operating at a distance of 1000 mls from Jamaica) is being constructed at Kingston.

TRINIDAD AND TOBAGO

21. Trinidad tends to lie in the category of the larger islands while Tobago tends to have the characteristics of the smaller islands. 28 shrimp trawlers fish in the shallow Gulf of Paria sometimes in the territorial waters of Venezuela. 2684 artisanal vessels use outboard motors and many are constructed with GRP. There are 23 landing beaches with infrastructure, cold storage facilities at 6, and fish markets at three. One large processing facility owned by the Government is having difficulty in acquiring raw material for processing due to price competition for fresh fish for human consumption. At present there is some conflict between the artisanal fishing fleet and the larger commercial vessels operating in the same area, and depressing fish prices when they sell their fish in the same market. A recent development has been the participation of 10 multi-purpose vessels in the swordfish fishery, however there are reports of large reductions in the average size of fish caught which might indicate overfishing.

VENEZUELA

22. One of the mainland states with 14,400 vessels. 13,500 of these are between 4 and 12m and fish in coastal waters and river basins. The medium depth fleet include 285 shrimp trawlers and 600 vessels catching snapper and grouper. In the deep sea fleet there are 106 tuna fishers (handliners, purse-seiners and long-liners). The total catch is 313,000 tons of which around 50% is distributed fresh within the country, and about 15% processed for export. 6,000 tons of frozen shrimp tails were sent direct to the USA in 1989. There are 33 plants processing fish products. Of these 21 deal with frozen products, 9 are canning fish and 3 drying and salting fish. A modern port infrastructure for shrimp fishing has been built up in the east of the country, but facilities for small scale fisheries throughout the country are still unreliable. Since 1975 there has been a programme for the construction of collection centres for artisanal fisheries, but it has not achieved the desired results.

GUYANA

23. The artisanal fleet consists of 1400 boats on which around 4000 fishermen are employed. Over 80% of the total catch comes from this sector (ie tonnage). The offshore fleet consists of 128 trawlers of which 74 are foreign owned. 98 vessels fish for penaeid shrimp, while the others exploited sea-bobs and fish. The penaeid shrimp are landed to two processing plant and exported to the USA and Japan. A large portion of the sea-bobs and the white-belly shrimp are now being processed (peeled) and exported to the USA. The catches of the shrimp fishery has, however, been facing difficulties in terms of falling landings, supposedly due to problems of the resource. With external assistance, attention is being paid to the development of the artisanal fishery by means of inputs of fishing requisites and the provision of onshore infrastructure. The facilities when completed will be managed and operated by 13 Fisheries Cooperatives.

SURINAME

24. There are approximately 1,100 fishermen in the artisanal fishery operating in 500 small boats. They include 120 boats fishing with drift-nets and there are two types - 8 to 14m open boats powered by 25 to 50hp engines and 15m long decked boats fitted with inboard diesels of 45 to 50hp. These vessels are estimated to land 2,400 tons per year. The penaeid shrimp fishery has fluctuated between 114 and 170 vessels (most of them foreign owned) since 1978. A drop in the number of trawlers to 114 was observed in 1984 when the average catch per boat fell to 16.7 tons from 23.3 tons in 1980. The total number of fishermen in the country is stated to be 2548 (including 1000 fishermen of foreign nationality). The shrimp caught by the trawlers is processed at two plants for export to the USA and Japan. Most of the fish caught by the artisanal fishermen is sold at the Central Market of Paramaribo, but there are a few less important markets in the smaller cities. A major constraint is the lack of experienced Surinamese fishermen. Training of future crews for trawlers is already taking place locally.

FAO INITIATIVES

25. The nature of the problem facing the countries of the Caribbean and the surrounding area, led to the setting up of WECAFC (Western Central Atlantic Fishery Commission) in 1973. The purpose of the Commission is "to assist international cooperation for the conservation, development and utilisation of living marine resources of the Western Central Atlantic". The major fisheries problem confronting the Caribbean countries is the estimation of the available resource. It is on these parameters that all development, whether industrial or not, must be based. Recognising this need the Commission established three subsidiary bodies:

- Committee for the Development and Management of the Fisheries of the Lesser Antilles,
- Working Party on Assessment of Marine Fishery Resources, and
- Working Party on Fishery Statistics

26. In 1987, recognising that some of the original objectives of the Working Parties had been achieved, there was a review of the terms of reference of the working parties. This led to new priorities being set and the Working Party on Fisheries Statistics being renamed the Working Party on Fisheries Planning and Economics to reflect the new emphasis.

27. In the early 1970s a Regional Caribbean Development Project was initiated to provide support and activities for the objectives of WECAFC. This was followed by an Inter-Regional Fisheries Programme INT/77/016 in the period 1977-1980 and INT/79/019 in 1981-1982. The word "programme" was used rather than "project", because it was considered that the programme would be made up of a number of projects, some of which might be primarily national in character while others might include a number of nations. The WECAFC Fishing Technology

section achieved the following outputs during its lifetime

75 technical assistance missions of which 22 were at sea
6 other missions were carried out outside WECAFC
16 published technical reports
6 unpublished technical reports
27 mission and recommendation reports
43 project and programme proposals

28. An FAO Fisheries Officer is outposted from the Regional Office in Santiago to Port of Spain in Trinidad, and until fairly recently a FAO Fishery resource Officer was based in Barbados. These officers work closely with the the Organisation of Eastern Caribbean States Fisheries Unit in Kingston, St Vincent, liaise with all governments in the region and provide support for the ongoing FAO projects in the area (see Appendix 1). The FAO Fisheries Officer and staff of the Caribbean Fisheries Training and Development Centre publish and distribute Artisanal Fisheries Network News, a newsletter to keep staff working in the small island states abreast of current developments.

APPENDIX I

Past FAO Projects

1974	Turks and Caicos	Advisor in Fishing Boat Construction	
1970	Cuba	Fishery Biology and Fishery Technology	
1970	Dominican Rep.	Fisheries Technology	
1970	Jamaica	Fishing Technology	
1971	Cuba	Fisheries Development	
1972	Bahamas	Fishery Development Study	
1974	Montserrat	Fishery Advisor	
1975	Bahamas	Fishery Development Study Phase II	
1975	Cuba	Development of Research in Shrimp Fisheries	
1975	Cuba	Fisheries Research Development	
1977	Bahamas	Fisheries Development and Training	
1977	Trinidad & Tobago	Assignment of National Fishing Company	
1978	British Virgin Is.	Assistance to Fisheries	
1978	Cuba	Investigation and Control of Marine Pollution	
1978	Haiti	Fishing Advisor at the Ministry of Agriculture	
1975	St Lucia	Fellowships in Fisheries	
1963	Latin America	Caribbean Fishery Development Phase I	
1969	Latin America	Caribbean Fishery Development Phase II	
1969	Latin America	Regional Advisor on Fish Processing and Marketing	
1970	Latin America	Training Centre on Research Methods in Shrimp	
1972	Latin America	Regional Central Fisheries Development Advisor	
1974	Latin America	Caribbean Fisheries Training and Development Institute	
1974	Latin America	FAO\UNDP Training Seminar, Vigo, Spain	
1975	Inter Regional	Development of Fisheries in WECAF Phase I	
1976	Inter Regional	Development of Fisheries in WECAF Phase II	
1976	Latin America	Prep. Assist. for Comm. Fish. Inform. Service.	
1977	Latin America	Est. of Latin American Regional Aquaculture Centre	
1979	Latin America	Marketing Information Service	
1974	Cuba	Raising of Marine and Salt Water fishes	
TCP/EHA/2302	Tech. Ass. to South Andros Cooperative		Bahamas
TCP/CUB/4401	Drift net and Bottom net Fishing Trials		Cuba
TCP/CUB/2310	Fishing for Bonito		Cuba
TCP/DMI/4503	Assistance to the Rehab. of Fisheries		Dominica
TCP/DMI/4506	Training in Fisheries Technology & Proc.		Dominica
TCP/DMI/6652	Strengthening Fisheries		Dominica
HAI/81/001	Rehabilitation of Fish Production		Haiti
HAI/82/101	Artisanal Fisheries Development		Haiti
TRI/82/001	Activation of the CFDTI		Trinidad
TCP/TRI/	Development of Fisheries		Trinidad
TRI/82/003	Development of Shark Fishery		Trinidad
TCP/GRN/5754	Rehabilitation of Ag & Fish.		Grenada
TCP/CUB/6758	Forecasting of Lobster catches		Cuba

TCP/BAR/6753 Fisheries Co-operative Development
TCP/STV/2201 Formulation of Fisheries dev. program
TCP/STL/4401 Assist. in Dev of Fish Harbours & Fac.
STK/80/003 Policy and Planning Advice

Barbados
St Vincent
St Lucia
St Kitts & Nevis

Currently Operational FAO Projects

APPENDIX 2

TCP/BHA/8851	Statistical Management of Fisheries Data
TCP/BAR/6753	Fisheries Co-operative Development
CUB/86/004	Assistance for the Development of Prawn-Farming
TCP/CUB/6756	Cultivo y Cria de la Rana Toro
TCP/CUB/6758	Forecasting the Capture of Lobsters
TCP/DMI/6652	Strengthening Fisheries in Dominica
TCP/DOM/8853	Estadisticas Pesqueros
TCP/GRN/8852	Transfer of Fishing Technolgy
HAI/85/006	Formation Professionelle en peche e artisanale
HAI/88/003	Development of Rural Aquaculture in Haiti
TCP/HAI/6753	Development of Aquaculture of Grande Saline
HAI/86/006	Fish Marketing
GCP/RLA/095/MUL	Infopesca
TCP/RLA/8963	Factors Responsible for Low Catches of Large Pelagic Fish
TCP/RLA/0052	Desarrollo de la Acuicultura

IOOD (International Council for Ocean Development) Projects

Technical Assistance

- OECS Fisheries Unit
- Fisheries Data Management
- Sea Moss Cultivation Programme
- Fishermens Assistance Programme
- Advisory Support for Fisheries Development
- Fisheries Surveillance
- Consultancy in Fisheries Management Operation
- Workshop on Regional Fisheries Access
- Maritime Boundary Workshop
- Statistical Sampling Methods Workshop

Information

- Technical Publication Support
- Seamoss Bibliography

Training

- Caribbean Fishermens Training (Phase II)
- CFDI Institutional Enhancement

Table 1: General Indicators

	Shelf Area	Coast- line	Popula- tion ('000)	GDP (mill.)	Agricult. GDP	Fisheries GDP
Antigua & Barbuda	3400	232	84	161	9.7	0.96
Bahamas	116550	3000	252	2200	100.0	28.0
Barbados	320	90	257	955	66.0	7.0
Dominica	716	152	79	72	14.8	1.94
Grenada	900		100	107	18.0	2.8
St. Kitts & Nevis	992		55	13	0	2.5
St. Lucia	522	130	133	56	4.0	1.3
St. Vincent	7800	150	108	86	19.0	3.5
<hr/>						
Cuba	70000	6100	10154	14602	1868	102.0
Dominican Rep.	8950	1350	6867	2822	334	22.8
Haiti	5500	1082	6263	984	175	3.2
Jamaica	4170	519	2440	2432	334	23.0
Trinidad & Tobago	20400	470	1244	3512	90	7.3
Venezuela	912068	2813	18272	52182	2491	348.0
Guyana	48665	432	989	285	88	108.9
Suriname	54550	380	383	877	71	33.0

Table 2: Fisheries Indicators

	Production '000 tons	Imports US\$ mill.	Exports US\$ mill.	No. of Fishermen	No. of Boats (Unreg.)	No. of Boats (Reg.)	Tonnage Reg.
Antigua & Barbuda	2.4	0.53	1.14	1200	-	-	-
Bahamas	5.9	3.73	17.9	2500	1316	9	1433
Barbados	3.7	4.2	0.1	1600	680	27	368
Dominica	0.36	0.7	0	1500	641	-	-
Grenada	4.8	0.32	2.9	1300	635	-	-
St. Kitts & Nevis	1.5	0.55	0.16	555	315	-	-
St. Lucia	0.9	0.68	0	2500	650	-	-
St. Vincent	0.5	0.6	0.38	2000	600	2	596
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Cuba*	79.0	60.5	180.9	13482	-	1945	139300
Dominican Rep.	18.6	12.63	2.3	6900	2760	35	190
Haiti	7.7	27.0	0.8	10000	3500	8	2209
Jamaica	9.2	25.7	2.2	12000	4000	6	1029
Trinidad & Tobago	3.2	14.0	2.86	3535	1288	21	3135
Venezuela	304.0	0.9	25.7	49417	12554	180	12112
Guyana	41.6	-	20.6	4500	1043	45	4657
Suriname	9.8	0.02	5.2	2548	500	17	1870

* Only Cuba's activities within CECAP area considered
Data derived from FAO Fishery Statistics 1987, Fishery Country Profile, and Fisheries Vessels Statistics.

Table 3: Catch (over 10 year period) in tons

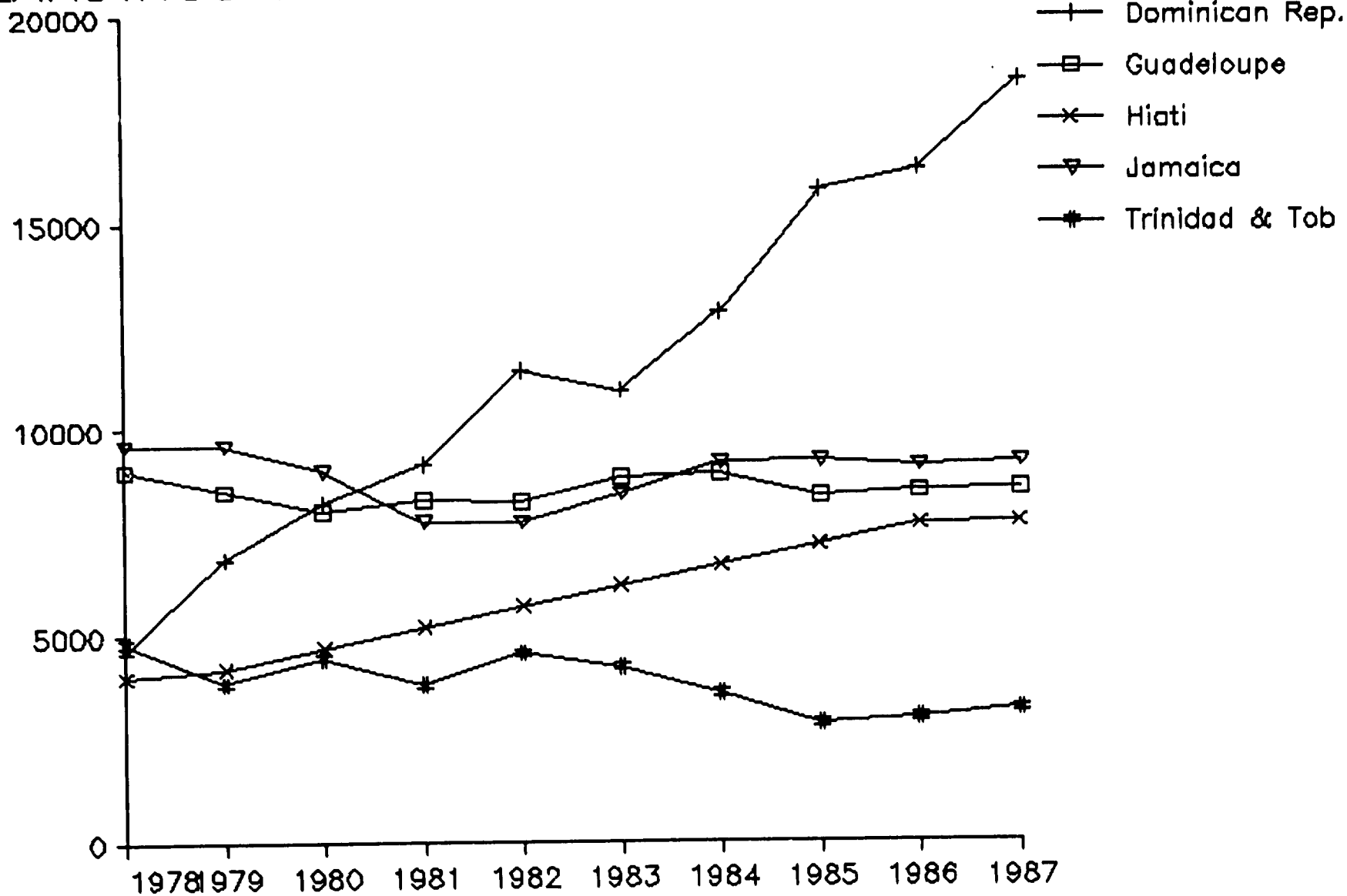
	High	Low
Antigua	2400	950
Bahamas	5978	3762
Barbados	6648	3702
Dominica	1545	366
Grenada	4881	1435
St. Kitts	1800	1500
St. Lucia	2600	900
St. Vincent	698	547
Martinique	5500	4375
Guadeloupe	9000	8000
Montserrat	100	111
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Cuba	79228	59997
Dominican Rep.	18472	4572
Haiti	7750	4000
Jamaica	9600	7741
Trinidad & Tobago	4823	3200
Venezuela	240743	154858
Suriname	5080	3444
Guyana	41429	35978
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Table 4: Fishery Imports and Exports ('000 US\$)

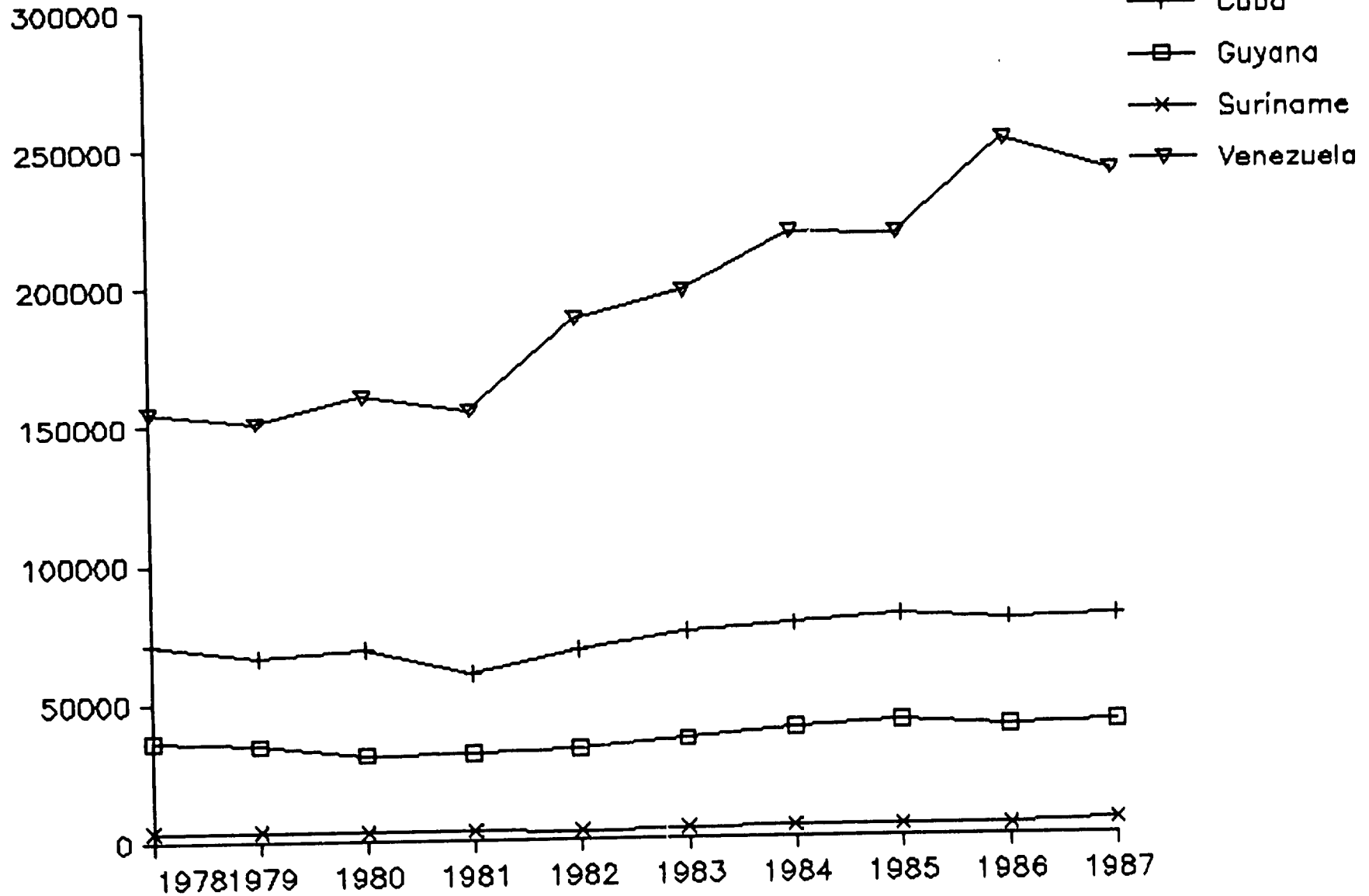
	Imports		Exports	
	1977	1986	1977	1986
Antigua	821	1375*	78	500*
Bahamas	1625	563	8744	21375
Barbados	1950	2500	1049	47
Dominica	492	700	-	-
Grenada	480	800	14	1*
St. Kitts	258	390	157	58*
St. Lucia	679	1125	24	220
St. Vincent	353	580	94	180
Martinique	8296	17242	48	107
Guadeloupe	4752	10736	55	243
Cuba	38977	39780	65203	123080
Dominican Rep.	14412	15855	1101	2180
Haiti	1727	5290	651	226*
Jamaica	10777	17242	105	2000
Trinidad & Tobago	4553	13404	885	2076
Venezuela	11189	617	13989	188452
Suriname	3156	200	28800	28650
Guyana	10	2	4835	5835

* estimates from last reported year

LANDINGS FROM MEDIUM SIZED ISLANDS



LANDINGS FROM COASTAL COUNTRIES AND LARGE



LANDINGS FROM SMALL ISLANDS OVER 10 YEAR

