

REPORT ON MISSION TO GRENADA



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in the Western Central Atlantic

Report on Mission to Grenada

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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 twenty fourth of the series WECAF Reports. The other series of documents is entitled WECAF Studies.

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1. Conclusions and Recommendations

(a) Conclusions

(1) Production

Although accurate information about fish landings in Grenada is not available, it would appear from data prepared by the Fisheries Department that in 1978 the national production amounted to 3 189 t, most of which consisted of pelagic species such as yellow-fin tuna, bonito, jacks, dolphin, flying fish, etc. Some species vary considerably in availability, being really abundant for only one or two months in the year. There are also substantial daily fluctuation in landings. Although no evaluation of the resources has been carried out, it is generally considered that catches of pelagic fish, as well as of demersal species and lobster, could be significantly increased through the introduction of improved fishing techniques.

(2) Imports

During the last ten years the quantities of fish imports have decreased by 50 percent, while the value has increased by 18 percent, a situation which has resulted from the increase in average prices. The main products imported are dried/salted codfish and pickled mackerel. However, the per caput import of these items fell from 10.7 lb in 1968 to 4.0 lb in 1978. Licences are required for all imports.

(3) Exports

There is little export of fish at present. Three Grenadians are involved in this trade and, between them, they exported 8 000 lb of lobster and 5 000 lb of conch to Trinidad and Barbados in 1978, 46 000 lb of fish (mainly red hind) to Martinique since November 1978 and 700 lb of flying fish to Trinidad since January 1978. The value of these exports was approximately EC\$ 135 000. Export licences for fish are issued on an ad hoc basis. Feeding the population of Grenada has a high priority for the Government and, apart from some short glut periods, there is insufficient fish to permit exports.

(4) Fish Distribution

There are six fish markets in Grenada which are administered by the Fisheries Department of the Ministry of Agriculture, Forestry and Fisheries. Conditions at three of the markets are very poor. The two markets in St. George's have cold storage facilities and the fishing terminal at Grenville has two ice-making machines (one in working order) and a cold store (in need of repair). A small cold store at Gouyave is also presently out of order. In fact, little use is made of the facilities that are still functioning. Generally, fish distribution is in the hands of numerous fish vendors who buy small quantities of fish to sell in the markets in the main centres of population and, to some extent, along the roadside. Records kept by the Fisheries Department suggest that, of the total fish production, about one third passes through the markets, the rest being disposed of by direct sale to the public, hotels, restaurants, etc., or consumed by the fishermen and their families.



The existing distribution system is deficient because it does not ensure a regular supply of fish and because it is basically restricted to the coastal area, with the people of the interior experiencing great difficulties in buying fresh fish. Generally, the quality of fresh fish is good because it meets a ready demand and is usually sold in a short space of time. However, the quality of the frozen fish on sale is considered unacceptable. Recommendations have been made to try to ensure that a more regular supply of fish is available in the main centres of population, it being considered inadvisable at the moment to attempt to establish a fish distribution network that would cover the entire interior of the island.

#### (5) Demand

As is usual in the Caribbean islands, there is a strong demand for fish in Grenada and per caput consumption is high, being estimated in 1978 at 82.8 lb. This required a supply of 3 762 t (live weight equivalent) and, if the present rate of population increase is maintained, demand is likely to reach 4 000 t by 1985. Fresh fish has absolute priority over other products, the consumer having a strong prejudice against frozen and even iced fish. Dried/salted and pickled fish are highly appreciated by the population and canned fish is also consumed in quantity, particularly by the people in the interior who do not normally have facilities for storing perishable foods.

#### (6) Prices

Prices paid to the fishermen vary considerably for certain species and a situation sometimes results in which it does not pay the fishermen to go to sea. This is particularly likely to arise during the height of the flying fish season. The Government fixes maximum retail prices for the different classes of fish, though these are not always observed. Fish is still regarded as relatively cheap, although it faces strong competition from low quality meat, chicken backs and other acceptable substitutes.

#### (7) Import Substitution

The main imports capable of substitution are salted/dried fish and pickled mackerel. Frozen fish imports are very small and it is felt that it will be very difficult to find a local substitute for the canned fish for which there is a strong demand. The most appropriate species available locally which could be used to make an acceptable substitute for the imported salted/dried fish would be shark (especially) and bonito. Pickled mackerel could be substituted by products made from yellow or black-fin tuna or bonito. Since flying fish is the species which is most commonly captured, it is considered that trials should be carried out with this fish as the base, to see whether products can be prepared which would be acceptable to the consumer.

### (b) Recommendations

#### (1) Short-term Recommendations

In the short term, the aim will be to improve the distribution of fish throughout the island, in particular by making it easier for people living in the interior to obtain a regular supply of fresh fish. Although, in the long term, production can be increased through the introduction of new and improved fishing techniques, in the short-term emphasis has to be given to

increasing the available supply by encouraging the fishermen to land more fish, by ensuring that they have a regular market for their catches and by reducing post-harvest losses through the development of storage facilities.

To achieve these objectives, it will be necessary to make the utmost use of the facilities which already exist on the island. In some instances this will require repairs to be effected to the machinery and equipment, but it is not considered that the total capital outlay need be very high. It is recommended that a fish distribution system be established which will be based on:

- (i) a retail fish outlet in the Central Market at St. George's, and
- (ii) the transport of fish by truck, using the existing storage facilities at Grenville with the main supplies of fish coming from Gouyave.

To carry out these recommendations, the following activities will have to be undertaken:

- (i) establish the fish retail outlet at St. George's;
- (ii) repair the installations at Grenville;
- (iii) recover - and, if necessary, repair - the six-ton truck which forms part of the Grenville fish terminal facilities; and
- (iv) repair the cold store at Gouyave.

It is not considered that the distribution of fish should be a direct function of the Fisheries Department and it is recommended, therefore, that a separate organization be established to be responsible for the whole operation of buying and selling fish and managing the various facilities. This organization might be a parastatal institution such as a Fisheries Corporation, a Fish Marketing Board or a Fisheries Cooperative. It is considered that the specific form of institution should be for the Government to decide but an appropriate organizational structure is suggested in Appendix 3. Full details of what would be required for the retail stall in St. George's are given in Appendix 1 and the transport scheme proposed is given in Appendix 2.

Since it is felt that the policy of fixing maximum prices may well discourage the fishermen from maximising the volume of their catches, it is recommended that a review of this policy should be carried out.

## (2) Long-term Recommendations

In the long-term, the improvement of fish distribution will have to be considered as part of an integrated development programme for the sector. It is not possible, therefore, to be very precise about requirements but it would seem that the following points will require attention on the distribution side:

- (i) improvement of infrastructure: for instance at Gouyave where the existing cold store is obviously inadequate;
- (ii) product development using locally available species as a substitute for the existing imports of fish (Appendix 5 indicates a number of possibilities);



- (iii) development of export markets, for which the French islands of Martinique and Guadeloupe seem to offer excellent potential for most types of fish, whilst Trinidad and Barbados could provide opportunities for the more highly-prized varieties;
- (iv) consumer education to overcome some of the existing prejudices: for instance, against frozen fish;
- (v) review of the policy of charging dues at the fish market

## 2. Introduction

The Mission's Terms of References were as follows:

- " - survey of existing marketing situation and suggest measures to improve it;
- identification of storage facility requirements for the local market and further processing;
- identification of potential for processing aiming at import substitution and eventual foreign trade".

The Mission, consisting of an expert in processing and marketing and an associate expert in development planning, spent seven days in Grenada in April 1979, working in close cooperation with the Fisheries Department of the Ministry of Agriculture, Forestry and Fisheries. Early discussions with Government representatives indicated that the main emphasis should be given to the internal market, particularly to the supply of fish in remote areas. It is the policy of the Government to ensure that the local resources are fully utilized for the benefit of the people.

Because of transport problems the Mission was able to make only one field trip, when visits were made to all the public markets outside the capital, St. George's. On the remaining days discussions were held with Government officials, fish vendors, fish importers and exporters, as well as fishermen.

Reports on Grenada submitted previously by WECAF staff and consultants were used as a basis for an analysis of the fish marketing situation.

## 3. Background Information

The country of Grenada is located near the northeast coast of Venezuela at 12 ° N and consists of the islands of Grenada (308 km<sup>2</sup>), Carriacou (34 km<sup>2</sup>), and Petit Martinique (2 km<sup>2</sup>). The islands are surrounded by a shelf area (up to 180 m) of an estimated 3 100 km<sup>2</sup>.

Statistical figures about landings, vessels, fishermen, etc. are not available and estimates vary considerably. The actual total number of fishermen might amount to 1 870, of whom 1 540 work full-time and the others part-time. The fleet consists of an estimated 700 boats ranging in size from 8-35 ft. The backbone are the "whalers", 20-35 ft open wooden boats powered by sails or outboard engines. The fleet is distributed all around the coast, the five principal fishing communities being St. George's, Gouyave, Victoria, Sauteurs and Grenville.

Fishing operations are almost completely restricted to inshore waters, using beach seines for small demersal and pelagic coastal species, gill-nets for coastal schooling fish, scoops for flying fish, trolling lines and hand-lines for big pelagics. Lobsters and conch are harvested by diving. The most productive fishing season is from January to June when the migratory pelagics are abundant in the waters around Grenada.

There are no fishermen's cooperatives or similar organizations involving the fishermen. The cooperatives which were formed failed many years ago. It is generally considered that the fishermen have a high technical level within the limits of their catching methods. Their vessels are mainly built locally.

The population, which is very partial to fish, amounts to an estimated 100 000, of which over 32 percent live in the parish of St. George's, concentrated in and around the capital.

#### 4. Supply of Fish

##### (a) National Production

According to estimates of fish production released by the Ministry of Agriculture for 1978, the catch reached 3 189 t in that year, composed of 18 percent flying fish, 16 percent jacks, 63 percent of other pelagic species, essentially yellow-fin tuna, bonitos, dolphin, ocean gar, and only 3 percent of demersal species<sup>1/</sup>. Further details of the composition of the landings are given in Table 1.

Although the statistical figures are estimated, it can be stated that most of the fish is landed on the west coast, mainly flying fish, jacks, yellow-fin tuna, sprats and round robins, while on the east coast the predominant species landed are bonito, round robin, hind and redfish. The quantities recorded at the six markets in 1978 are shown in Table 2.

The supply of certain species fluctuates considerably through the year. In Grenville, on the east coast, bonito has a peak in April/May and in December, round robin in April/May and jacks in September, while in Gouyave on the west coast tuna is being mainly caught between March and June, flying fish is abundant between January and June and jacks reach a peak in September. Details are given in Tables 3 and 4.

Though no resource evaluation has been carried out in the past, the Fisheries Department and various reports on the Grenadian fisheries suggest that catches of pelagic species could be increased significantly if the domestic market could absorb bigger quantities and export channels could be identified.

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<sup>1/</sup> It has to be pointed out that the catch has been estimated based on the throughputs of the public markets. Since, according to the official figures, the landings increased by some 40 percent between 1974 and 1978 without any significant additional input, it might well be possible that the catch has been over-estimated in recent years.

Similarly, the demersal fish potential could be exploited on a larger scale than is presently the case. As a result of skin diving, the accessible lobster stock is being heavily exploited, while lobster in deeper waters is virtually untouched. Furthermore, it is worth mentioning the possibility of increasing fishing for shark, a species which at present is only caught incidentally<sup>1/</sup>.

(b) Imports

The quantities and values of imports of fish and fish products are set out in Table 5. Whilst the value of imports increased between 1968 and 1977 by only 18 percent, the quantities imported have decreased by 50 percent. This disparity is caused by the enormous increase in the average prices of imports of 135 percent between 1968 and 1977. For the first half of 1978 the position has worsened further, with average prices now showing an increase of 240 percent over 1968. The composition of the fish imports has almost been constant, insofar as the data allow any comparison. The main suppliers are Canada and the United Kingdom.

As in the past, the main import item is dried/salted or salted fish (codfish and pickled mackerel) amounting to three quarters of the total quantity imported. The quantity imported, however, has reduced substantially, from 10.7 lb per caput in 1968 to an estimated 4 lb in 1978. Specifically, imports of dried/salted codfish have fallen from 6.6 lb to 2.1 lb. The reason for this decrease is almost certainly the increase in the international price for salted codfish of some 100 percent between 1972-77.

With the reduction in fish imports, however, has occurred a fairly substantial increase in the imports of meat and poultry, particularly of the cheaper varieties, such as chicken backs and salted meat. The total imported increased by 41 percent in quantity and by 117 percent in value, while the average price rose by 54 percent. The main import item is poultry which costs, on the average EC\$ 0.69/lb.

Fish is imported on the basis of import licenses, which are issued freely and are obtainable by importers without problem. Imports of dried, salted fish are allowed in free of import duty, while canned fish faces an import duty of 5 percent, a stamp duty of 7.5 percent, plus 5 percent foreign exchange tax.

In view of the Government's strongly expressed interest in finding local products to substitute the imported items, the possibilities are discussed in some detail in Appendix 5.

(c) Exports

(1) Present Situation

Exports of fish have played an unimportant role in the country's economy, and presently three Grenadians export fish, specializing in the supply of lobster and conch, red hinds and flying fish.

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<sup>1/</sup> Further details in M. Giudicelli's report "Grenadian Fisheries Development - Mission Findings and Recommendations".

In 1978, some 8 000 lb of lobsters and 5 000 lb of conch were exported to Trinidad and Tobago, and Barbados. The lobsters caught are frozen whole, packed in cool boxes and shipped by plane. The clients are three hotels in Barbados and three in Trinidad and Tobago. According to the exporter, the exports of lobster could be substantially extended if more lobsters could be landed<sup>1/</sup>, while the export of conch does not offer the same promise.

Another exporter started in November 1978 shipping finfish to Martinique in his own schooner. The exported fish consisted of 90 percent red hinds and 10 percent mixed fish, amounting to 46 000 lb by March 1979. During shipment the fish is held on ice. The exporter regards Martinique and Guadeloupe as good export markets.

The third exporter began to export flying fish in January 1979 by shipping 320 kg to Trinidad. The Trinidadian importer bought for the exporter three small deep freezers. Flying fish is bought during the peak season from the local market in Gouyave, packed in plastic bags containing five pieces each, frozen and packed in boxes for shipment by plane. It is also known that sometimes French fishermen buy fish from the fishermen of Carriacou and other small islands belonging to Grenada.

#### (2) Government Export Policy

Feeding the domestic population has the highest priority. Since some species are in high demand and the supply of others varies considerably during the year, export licences are issued on an ad hoc basis only, for those species which are abundant or unpopular. In practice, it might be difficult to obtain an export licence for dolphin, kingfish, or tuna<sup>2/</sup>, while the unpopular flying fish or red hind can be exported. Export licences are issued by the Ministry of Finance, no export tax being charged.

#### (3) Freight and Transport

Transport facilities by ship in the Lesser Antilles are poor and do not serve the islands regularly. A regular service to England is provided by banana transporters. Fish exports to neighbouring islands can be done through LIAT, the regional air company, as long as the fish is properly packed. This airline flies directly from Grenada to Martinique and Guadeloupe and has connexions several times a week to the U.S. Virgin Islands. The air freight to Trinidad costs EC\$ 1.10 per kg and to Barbados EC\$ 1.15 per kg.

#### (4) Export Potential of Fish

Because of transport problems, fish exports out of the region might create serious transport problems. Therefore, the possible export markets are located in the area itself. Some of the Caribbean islands are large importers of fish (fresh, chilled or frozen) as shown below:

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<sup>1/</sup> Lobsters are caught by diving, no pots being used.

<sup>2/</sup> An application for tuna exports has already been rejected.

Imports of Fresh, Chilled or Frozen Fish (in t and US\$)

<u>Countries</u>	<u>Quantities</u>	<u>Values</u>
Barbados (1976)	389.5	467 000
Guadeloupe (1975)	500.0	686 000
Martinique	1 400.0	1 807 000
Trinidad and Tobago (1976)	79.5	86 000

Source: Yearbook of Fishery Statistics Vol. 43, 1976 and  
Fishery Statistics from the countries

All these countries are served by the regional air company LIAT, and, apart from Guadeloupe, are less than 200 mi away.

From the French islands it is known that all types of fish are imported from within the area and the prices for fish are very high, e.g., bonito fetches F 15-20/kg (EC\$ 4.20-5.6/lb), while in Grenada it was sold for EC\$ 1.50/lb at the retail market in 1978. The high prices and the large amount of fish imported might indicate a ready market for fish from Grenada<sup>1/</sup>.

In Trinidad only a few species are sufficiently high priced to suggest that exports from Grenada could become profitable, e.g., king fish, TT\$ 3.00-4.00/lb (EC\$ 3.40-4.50/lb), red fish TT\$ 3.00-3.50/lb (EC\$ 3.40-3.90/lb), while king fish and red fish are sold in Grenada for EC\$ 1.60-2.00/lb at the retail market.

Flying fish has a market in Trinidad because this species is only caught around Tobago and not in Trinidad itself. Lobsters might have good export potential to the neighbouring islands with important tourist industries, excluding St. Vincent, which itself exports lobster.

A rough comparison between the prices of some species on various neighbouring islands indicates considerable price advantages for possible Grenadian exports, even when some EC\$ 0.50/lb air fare is included, the likely export prices being considerably below the retail prices in the specific markets mentioned above. This should be borne in mind when landings increase in the future and new markets are being sought.

#### 5. Fish Marketing

There is not organized fish marketing system in Grenada, this activity being carried out either by the fishermen themselves or, more normally, by independent fish vendors. There is no fishermen's cooperative on the island, all attempts at establishing such an organization having failed, and the six fish markets which exists are administered by the Fisheries Division of the Ministry of Agriculture, Forestry and Fisheries.

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<sup>1/</sup> As Grenada has signed the Lomé Convention, imports to France are free of duty.

Landings of fish are dispersed, apart from the main centres of Gouyave, St. George's and Grenville there are some 25 smaller fishing communities scattered around the island. The capital, St. George's, and the coastal areas around Gouyave and Grenville are reasonably well supplied with fish but the existing distribution system does not reach the interior of the island, the people living there having to go to the coast if they wish to buy fish.

Given the estimated total landings for 1978 of 7 017 800 lb, it is calculated that around one third of the production passes through the six fish markets. Direct deliveries to hotels and restaurants, exports and consumption by fishermen and their families account for perhaps one fifth and the remainder presumably is sold direct to the public by fishermen and vendors not using the markets.

(a) Physical Infrastructure

The six fish market are located at Melville Street and the Carenage in St. George's, Gouyave, Victoria, Sauteurs and Grenville. The Fisheries Division is responsible for the management and control of prices and hygiene and collects the market dues which are paid to the Ministry of Finance and Trade. The estimated amounts of fish passing through these markets during 1978 are shown in Table 2. It should be pointed out that dues are not levied on some species, such as flying fish, so that they are not, therefore, weighed and the actual quantities handled at each market cannot be verified.

(1) St. George's - Melville Street

This market is located on the coast near a difficult landing place for the boats. When the seas are rough, the fishermen prefer to go to the other market at Carenage. Although the condition of the building is rather poor, neither the vendors nor the fishermen complain about the situation. The market has a number of raised concrete slabs for displaying the fish, though in practice the vendors often sell direct from their baskets. Water and electricity are available and there is small cold store nearby, in which space can be rented though it is understood that this facility is not often used. There are 14 vendors at the market and it is estimated that 300 consumers buy fish there on an average day.

(2) St. George's - the Carenage

This is a more modern building but activity is generally far less than at Melville St. The official estimates indicate that at the latter some 800 000 lb were sold in 1978, compared with only 300 000 lb at the Carenage. There is small cold store nearby.

(3) Gouyave

The facilities here consist of a small cold store, of which the dimensions are approximately 2 m x 2 m x 1.5 m and which is out of order. Some 50 vessels land at this beach, with the vendors already awaiting their arrival. The Government has approved the construction of a fish market building here at an estimated cost of EC\$ 5 000. It is estimated that some 75 vendors are operating at Gouyave. They sell their fish in the town and along the coast to St. George's and to the northward. Some have their own cars and some use public transport.

(4) Victoria

In Victoria fish marketing is carried out in a very dilapidated building which is also used for the sale of fruit and vegetables, etc. At the rear is



a slaughterhouse but it is not clear whether this is still being utilized for its intended purpose. The whole condition is very poor. Only 15 boats operate from this beach because it is covered with big boulders. After the fish is landed, it is weighed at the market and the fishermen themselves usually act as salesmen. Few vendors come to Victoria because the supply of fish is very irregular. There is no cold store or any other facilities. Until the landing area is improved, there is little likelihood of an expansion of production.

(5) Sauteurs

This market is in even worse condition than the one at Victoria and is no longer used by the fishermen. No facilities are provided. The figure given in Table 2 for marketed quantities refers in this case to the total landings rather than the amount of fish entering the market.

(6) Grenville

The Grenville fisheries complex was built with Canadian assistance. It consists of a building of solid metal structure of approximately 10 m x 15 m, plus a covered area leading to the road of some 5 m x 10 m. Inside are the following:

- offices and cloakrooms, with a storage area above, and a room containing the electrical switchboards;
- a cold store of approximately 3 m x 3 m x 4.3 m with two ice-making machines above, which supply ice directly by gravity to the store below. The refrigeration equipment of the cold store is out of order and only one of the ice-making machines is working;
- a cold store of approximately 2.2 m x 3.68 m x 4.6 m for storing fish. The refrigeration equipment for this store is also out of order;
- a Toledo clock scale with a capacity of approximately 200 lb;;
- a double sink in stainless steel, each of the sinks having dimensions of approximately 90 cm x 75 cm x 42 cm;
- some 200 rectangular plastic fish boxes made in Norway, with dimensions of approximately 83 cm x 50 cm x 25 cm.

An insulated truck of 6 t capacity (one of three originally provided by CIDA in 1974) is attached to the complex.

The scale, sinks and boxes appear to be in good condition but the vehicle was not available for inspection. It is understood that the necessary spare parts have been requested from the manufacturers for the repair of the cold stores and ice-making machine.

The retail selling of fish is carried out in a number of covered stalls alongside the terminal building. Vendors and the public buy fish from the fishermen on the beach. Some vendors travel as far as St. George's and, occassionally, to villages in the interior such as Munich or Birchgrove.

(b) Marketing System

A very fragmented marketing system has evolved in Grenada, involving large numbers of people each handling relatively small quantities of fish. Interviews with vendors showed that the average daily amount handled by a vendor would be 60-80 lb of fish, with perhaps 200 lb being reached when big fish are landed or when flying fish are abundant. There are also days, of course when landings are poor and the vendors cannot buy fish. A study carried out by the Ministry of Agriculture, Forestry and Fisheries for selected beaches suggests that the ratio between boats and vendors is very low, perhaps only 2 to 1.

When the fish is landed it is either weighed by scales in the fish markets or placed in standard-sized baskets, called by the vendors a "half hand", which contain some 80-100 lb of fish. Flying fish and some other small species are sold by number. Fishermen and vendors agree on a price, which is relatively fixed for fish with a good market, such as king fish and dolphin, but very sensitive to supply when flying fish, jacks and round robins are abundant. Fishermen therefore tend to try to land as early as possible when catches are heavy, since the later they return the less chance they have of obtaining a good price.

In St. George's and Grenville the vendors pay spot cash. In other places, the fishermen get paid after the fish has been sold by the vendor. In some cases, the vendors, or their relatives, own fishing boats. The vendors are mainly women from the fishing community and often have informal agreements to buy the catch of particular boats.

In St. George's the fish is sold by the vendors at the two markets. At the other markets and at the various small landing places around the island the fish is partly sold locally and partly taken by the vendors for sale elsewhere, often to St. George's. Though some vendors have their own cars, often the vendor will use public transport. In St. George's there are also people who are really wholesalers, buying fish from the fishermen by special arrangement and supplying the hotels and restaurants. They are mainly concerned with Class A fish. Direct sales from fishermen to the public are common on those beaches where only a few boats are operating, where the landings are too small to attract vendors. Such sales also occur on some of the more important beaches, since the fishermen receive a better price than if they sell to the fish vendors.

Fish vendors are charged a market fee of EC\$ 0.01 per lb of fish, excluding flying fish and other small species, which is collected by the market manager. Stall dues are EC\$ 0.04 per day. These fees have not been changed for many years and do not now cover the cost of collecting them.

(c) Present Distribution

The principal fishing areas are situated on the west coast and the coastal areas around Gouyave are without doubt well supplied with fish. On the east coast, Grenville is the most important centre. From Gouyave fish is taken along the road to St. George's - where the residue is sold - and northward, where even villages on the coast do not always have a supply of fish. Surplus flying fish goes to Grenville, some of it having been salted and dried. When fish is abundant in Grenville it is transported to

St. George's with sales also taking place along the route. Generally, however, fresh fish does not reach the interior.

Frozen fish is sold at two supermarkets in St. George's. However, at the time of the Mission's visit, the products on display were in very poor condition, the temperature in the cabinets not being adequate to keep the fish frozen and packaging being of a poor standard. Not surprisingly, this state of affairs tends to strengthen the prejudice held by the public against frozen fish.

Dried salted cod is sold in the supermarkets and in the Central Market in St. George's and through the normal food distribution chain. The quality of the fish on display during the Mission's visit was not very good, probably second or third grade. However, it appears to be readily accepted by its consumers, who probably have rather low purchasing power.

A very great range of canned fish and fish products is sold in Grenada through the normal food distribution channels.

## 6. Prices

### (a) Prices Paid to Fishermen

The prices that fishermen get paid by the vendors vary considerably for some species during the year and from one landing place to another. As might be expected, bargaining is mainly conditioned by the quantities of fish landed. If fish is abundant the price immediately decreases - the lack of cold storage in most places dictates that the fish be sold on the same day it is landed, placing the fisherman in a very weak bargaining position. Furthermore, the number of flying fish that can be bought for EC\$ 1.00 varies in Gouyave and St. George's between five and twelve and small jacks may sell for between EC\$ 50.00 and EC\$ 75.00 per basket in Gouyave. On the other hand, the price fluctuations for species such as king fish and dolphin are relatively small.

### (b) Retail Prices

The retail prices of fresh fish are controlled by Government regulations. The current prices, which became effective in 1978, are shown in Appendix 6. Whilst the presence of Government officials in the markets usually ensures that set prices are not exceeded, outside it could be seen that they were not observed - fish of class A being sold at up to EC\$ 2.00 per lb compared with the official price of EC\$ 1.60. However, in periods of glut prices are lower than the controlled prices.

Imported dried/salted cod is sold at EC\$ 3.60 per lb and pickled mackerel at EC\$ 1.70 per lb. Locally produced dried salted fish fetches EC\$ 1.50 per lb but is not regularly available.

Generally, fresh fish is still regarded as a reasonably priced product, an unskilled labourer having to work for around one hour to earn the equivalent of a pound of fish. There is strong competition, however, from the cheaper cuts of meat and poultry, such as pigs' trotters and chicken backs. The retail prices of the main items of meat are also controlled. Details can be found in Appendix 6.

Vendors complain that the maximum prices are too low and do not allow a sufficient margin for wastage. However, a costs and earnings calculation has been made from information supplied by vendors at St. George's which suggests that they are quite well rewarded for their work. In one month, working around four hours per day, they might earn about EC\$ 287, which compares quite favourably with the average minimum wage of EC\$ 8.00 per day. Details are given in Appendix 7. A more serious complaint against the maximum prices might be made by the fishermen who are unable, as a result, to benefit from high prices when landings are small.

## 7. Consumption

### (a) Consumer Preferences

As the official retail price list suggests, the consumer in Grenada prefers the larger pelagic species, such as king fish, dolphin and tuna, as well as snapper. Sprats and flying fish are at the bottom of the preference scale.

Fresh fish has absolute priority over all other types of fish products and there is a strong prejudice against iced or frozen fish, the belief being that fish is preserved in this way because it is no longer in good condition. Whilst it may not be too difficult to demonstrate that the use of ice can only have beneficial effects on the quality of the fish, it is likely that any attempt to market frozen fish in quantity would require considerable promotion and consumer education. The vendors in St. George's point out that fish which has been in the cold store is difficult to sell if fresh fish is available.

As on all the Caribbean islands, there is a strong liking for dried/salted fish, particularly among the lower income classes. In view of the very reduced quantities being imported now compared with ten years ago, it is probable that a reasonably priced local product would meet a ready demand.

### (b) Present Consumption and Demand Projection

If one takes into account the very approximate nature of the figure for local landings, the calculation for the per caput supply of fish must be viewed with a good deal of reservation. As was indicated earlier the total of 7 017 800 lb may well be over-estimated. However, if to this figure are added the estimated live weight equivalent of the imports of 1 358 091 lb, less 100 000 lb for exports, the total available for consumption in 1978 was 8 275 891 lb, a per caput consumption of 82.8 lb (37.6 kg). By comparison, the figures for other Caribbean islands are: St. Lucia 63 lb, Trinidad and Tobago 37 lb and Barbados 61 lb.

The future demand for fish in Grenada will be mainly determined by population growth, since the consumption already appears to be high and the income elasticity of demand may well be low. There could also be a negative impact on consumption if fish prices, particularly of imports, continue to rise disproportionately with the prices of competing foodstuffs. Assuming a constant annual fish consumption of 82.8 lb per caput and an increase in the population of 0.8 percent per annum, the demand for fish will reach 3 980 t in 1985.

Table 1. Composition of Fish Landings in 1978

	<u>Lb</u>
Flying fish	1 256 164
Jacks	1 127 775
Yellow-fin tuna	788 965
Ocean gar	714 642
Dolphin	584 992
Sharks	557 328
King fish	350 640
Bonito	314 250
Barracuda	293 295
Round robin	255 326
Moon fish	254 055
Black-fin tuna	154 165
Sprats	103 548
Red fish	59 746
Long gar	59 545
Grouper	49 813
Hind	35 274
Spanish fish	20 202
Butter fish	11 870
Others	<u>26 205</u>
Total	<u><u>7 017 800</u></u>

Source: Fisheries Department, MAFF.

Estimated figures based on the quantity of each species recorded at the six fish markets in Grenada

Table 2. Marketed Quantities at Fish Markets in 1978

<u>Fish Markets</u>	<u>Lb</u>
Carenage Fish Market, St. George's	385 098
Melville Street Fish Market, St. George's	839 203
Gouyave	617 896
Victoria	75 083
Sauteurs	71 500
Grenville	<u>306 132</u>
	<u><u>2 294 912</u></u>

Source: Fisheries Department, MAFF

Table 3. Seasonal Fluctuation of Marketed Fish in 1978

<u>Month</u>	<u>Gouyave</u>		<u>Grenville</u>	
	<u>Lb</u>	<u>%</u>	<u>Lb</u>	<u>%</u>
January	25 972	5.9	11 098	4.4
February	30 144	6.9	15 628	6.2
March	37 758	8.6	21 258	8.4
April	41 580	9.5	37 486	14.9
May	48 630	11.1	41 489	16.5
June	40 956	9.6	15 523	6.2
July	32 757	7.5	15 259	6.0
August	41 918	9.6	16 419	6.5
September	43 872	10.0	32 113	12.7
October	19 773	4.5	20 259	8.0
November	45 546	10.2	10 924	4.3
December	<u>29 201</u>	<u>6.6</u>	<u>14 887</u>	<u>5.9</u>
Total	<u>438 107</u> <sup>1/</sup>	<u>100.0</u>	<u>252 343</u> <sup>1/</sup>	<u>100.0</u>

Source: Fisheries Department, MAFF

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<sup>1/</sup> The difference between the total throughput shown above and the figures given in Table 2 is caused by the fact that the market managers increase their actual figure by estimates varying from 25-50 percent to allow for fish which, for one reason or another, was not recorded by the market authority.



Table 4. Seasonal Fluctuation of Selected Marketed Species in 1974  
(in lb)

Species	Month												Total		
	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec			
Grenville															
Kingfish	856	1 748	2 635	2 964	1 563	585	2 067	1 207	1 724	991	814	2 629	49 783		
Red Fish	265	542	1 254	130	807	-	351	1 320	5 514	7 587	4 027	691	22 488		
Bonito	1 702	3 100	3 619	7 622	5 538	3 620	5 891	3 735	3 403	1 777	2 612	5 043	47 662		
Jacks	-	-	-	3 225	3 700	650	550	-	5 345	1 050	750	2 660	17 930		
Round Robin	2 150	1 700	50	13 820	10 800	5 222	-	100	4 710	1 525	150	1 650	41 877		
Gouyave															
Yellow Fin Tuna	930	1 546	10 253	6 195	5 329	4 303	2 355	-	100	-	3 920	4 030	38 961		
Flying Fish	10 542	17 334	14 078	6 684	17 260	14 500	4 470	-	-	830	7 178	5 206	98 082		
Jacks	2 685	2 850	2 045	15 648	11 625	19 403	7 910	25 430	28 325	7 700	18 110	2 750	144 481		

Source: Fisheries Department, MAFF.

Table 5. Imports of Fish and Fish Products

Item	1978 <sup>1/</sup>			1977			1968			
	Quantity in lb	% in EC\$	Value in EC\$	Quantity in lb	% in EC\$	Value in EC\$	Quantity in lb	% in EC\$	Value in EC\$	
<b>A. Quantities and Values</b>										
Fish, fresh, chilled or frozen	189	0	1 095	0			15 251	1	13 967	2
Fish, dried/salted or salted total <sup>2/</sup>	204 783	73	318 283	64			1 118 311	76	530 278	69
Fish, canned and fish preparations	76 538	27	179 012	36			335 196	23	219 459	29
Total	281 510	100	498 390	100		902 649	1 468 758	100	763 704	100
<b>B. Average Price per Lb</b>										
Fish, fresh, chilled or frozen			EC\$ 5.79						EC\$ 0.92 <sup>3/</sup>	
Dried/salted codfish			" 2.09						" 0.47 <sup>3/</sup>	
Pickled mackerel			" 0.96						" -	
Fish, canned and fish preparations			" 2.34						" 0.65	
Total			EC\$ 1.77			EC\$ 1.22			EC\$ 0.52	

1/ January-June 1978

2/ Of this total, dried/salted codfish accounted for 107 708 lb valued at EC 225 073 and pickled mackerel 97 075 lb valued at EC\$ 93 210

3/ The combined average price of all types of dried/salted and salted fish

Table 6. Average Gross Margins for Fish Vendors for Selected Species

Species	Purchase Price EC\$/lb	Selling Price EC\$/lb	Gross Margin EC\$/lb	As Percentage of Purchase Price
<u>Class A Fish</u>				
King fish, dolphin, etc.	1.40	1.80	0.40	28.6
<u>Class B Fish</u>				
Bonito, yellow tail, etc.	1.25	1.50	0.25	20.0
<u>Class C Fish</u>				
Big jacks	1.25	1.50	0.25	20.0
Small jacks	0.75	1.00	0.25	33.3
Round robin (large)	1.25	1.50	0.25	20.0
Flying fish (4 = 1 lb)	0.52	0.80	0.28	53.8

Source: Information collected by Mission

Table 7. Per Caput Supply of Fish in 1978  
(in lb live weight equivalent)

National production of fish	<u>Lb</u>	<u>Lb</u>
		7 017 800
Imports <u>1/</u>		
Fresh, frozen or chilled fish	378	
Dried/salted fish	818 581	
Pickled Mackerel	232 980	
Canned fish	<u>306 152</u>	1 358 091
Exports <u>2/</u>		
Fresh, frozen or chilled fish		<u>100 000</u>
<u>Total Supply</u>		<u>8 275 891</u>
Population (1977)		<u>100 000</u>
<u>Per Caput Supply</u>		<u>82.8</u>
	in Kg.	<u>37.6</u>

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1 / Estimates by duplication of the imports of the first 6 months in 1978

2 / Estimates based in information supplied to Mission by exporters

Proposed Retail Fish Outlet for St. George's

As indicated in the main part of the report, neither of the existing fish markets in St. George's is very convenient to the main commercial area of the city. It is proposed, therefore, that a new retail outlet be established in the Central Market. Figure 1 indicates the location of the two fish markets at Melville Street and the Carenage and also the position of Market Square. The Central Market consists of two metal buildings and another building intended as offices (see Figure 2).

It is suggested that the retail fish stall should be located in one corner of Building B, as shown in Figure 3. This position has been chosen because:

- (a) it is situated close to an outside door which can be used for the passage of fish, thus avoiding problems of water and slime from the fish being distributed throughout the whole market area;
- (b) it will be independent and isolated from the rest of the stalls in the market, thereby avoiding complaints about the fishy smells from other stallholders;
- (c) the costs of modification will be less because of the corner position;
- (d) the stall has to be against an outside wall so that the drain which runs around the market can be used to facilitate cleaning operations.

The additional work required to adapt the site to its new purpose has been kept to a minimum and involves the following:

- (a) removal of the rubbish dump in the corner;
- (b) construction of a dividing wall to the same height as the brickwork of the market building;
- (c) moving the first line of counters back to the rear wall and reduce their height almost to ground level, to provide an area where the boxes of fish can be stored;
- (d) moving the second line of counters a few feet back, so as to permit easy passage of the public in front of the stall, and tilt them so that the produce can be more easily seen and so that the ice water will drain away naturally;
- (e) installation of a sink against the rear wall with a supply of clean, potable water;
- (f) construction of a low retaining wall - a few inches high - around the stall so as to prevent the water from the fish and from the cleaning invading the whole market area;
- (g) purchase of the following equipment:

- (1) two clock scales with the necessary supports;
- (2) a flap or additional table to close the passage entrance to the shop;
- (3) an adequate number of cleaning tables, knives, cutting blocks, rubbish buckets, etc.

The personnel required to man the stall would be expected not only to sell to the public but also to clean, cut and weigh the fish, etc. The chief salesman would be the person in charge. He would be better paid and would be responsible for supervising the whole operation and seeing that the work went smoothly. Apart from this, he would have the same duties as the other salesman. Undoubtedly, some prior training would be required for the staff. This would include:

- (a) mathematics - the use of the clock scales will require a knowledge of accounting greater than that needed with the obsolete type of scale at present in use;
- (b) cleaning - special emphasis will have to be put on aspects of cleaning so as to avoid complaints about fish smells from the other market users. To keep a fish shop clean and odourless is only a question of method and of course, hygiene;
- (c) selling psychology - it is one thing to serve in a shop; it is quite another matter to know how to sell. Some training in the art of selling and dealing with the public is considered necessary.

On balance, it is felt that the selection of the staff for the fish stall should be made from those already engaged in this type of employment. Although it will be difficult to eliminate the bad habits acquired after years in the profession, provided that relatively young people who are still prepared to accept training are selected, this will be preferable to trying to initiate a person into fish selling completely from scratch.

Mechanics of operation: The shop's operating hours would be decided by taking into account the delivery times from the Grenville cold store and also the operating hours of other establishments in the area.

The staff would be organized into weekly shifts so that each day one of the salesmen would arrive earlier than the others, to get things ready and make sure that everything was clean. He would naturally also finish earlier, leaving the main cleaning-up to the others. The sales assistants (who could be men or women) would all serve the customers, clean the fish and collect the money. The chief salesman would be stationed in the centre so as to be able to supervise operations and keep an eye on the cash box which would be in front of him.

The boxes of fish would be stacked at the rear of the stall and could conveniently be covered with damp sacks or canvas. This would ensure that the fish was not spattered with the waste from the cleaning operations, as well as maintain ice for a longer time and keep the fish in better condition. The display counters could be covered by some leaves (of banana or similar) on which would be placed ice, with the fish on top. The leaves would not only reduce the amount of heat transmitted from the stone counters but would give a more pleasing appearance to the display.



Each salesman would have a receptacle below his working table for the waste from cleaning the fish and, if otherwise not employed, he would - among other things - collect up any scales of fish offal which may have fallen on the floor or remained on the cutting block, etc. A good deal of emphasis has been given to the hygiene aspects since there seems to be some reluctance on the part of the authorities to allow fish to be cleaned in the shop, being afraid of the dirt and odours that might arise. Although the big fish will probably arrive at the Central Market already gutted, the filleting, steaking, etc. will have to be carried out by the salesmen. If the cleaning and preparation of the fish is not permitted to be carried out in the shop area, it is likely that sales will not be more than 15 to 20 percent of the figure that could be reached if these operations were performed as in a normal fish shop anywhere in the world.

Sales will be daily except Sunday. Probably Monday will always be a bad day for business since the public will be thinking that the fish cannot be good if it is already two days old. However, this suspicion will gradually be overcome if the correct attention to quality is insisted on at all stages of the operation. At present there is a prejudice against all fish which has not been recently captured, even if it has been frozen or kept in a chill room. This seems to be due to a lack of knowledge of how to use cold rooms or chest freezers. Ice is not used in the holding rooms, the fish is piled up indiscriminately, the temperature is not adequate and, of course, it is not surprising that the fish kept in this way is often not suitable for human consumption. It is felt that, as long as the correct procedures are constantly observed, there will be no problems about the acceptance of the public.

Alongside the fresh fish the shop would also sell salted and dried fish (whether imported salted cod or a locally-produced substitute), smoked and pickled fish, etc. It is not too difficult to imagine that in a short space of time this shop would be supplying fish to the hotels on the island, as well as to the expatriate population which at present eats little fresh fish because of doubts about its quality and freshness.

An attempt has been made to calculate the costs of operating such a retail fish shop and the results are included as part of the feasibility study which has been prepared for the whole operation of distributing fish (see Appendix 4).

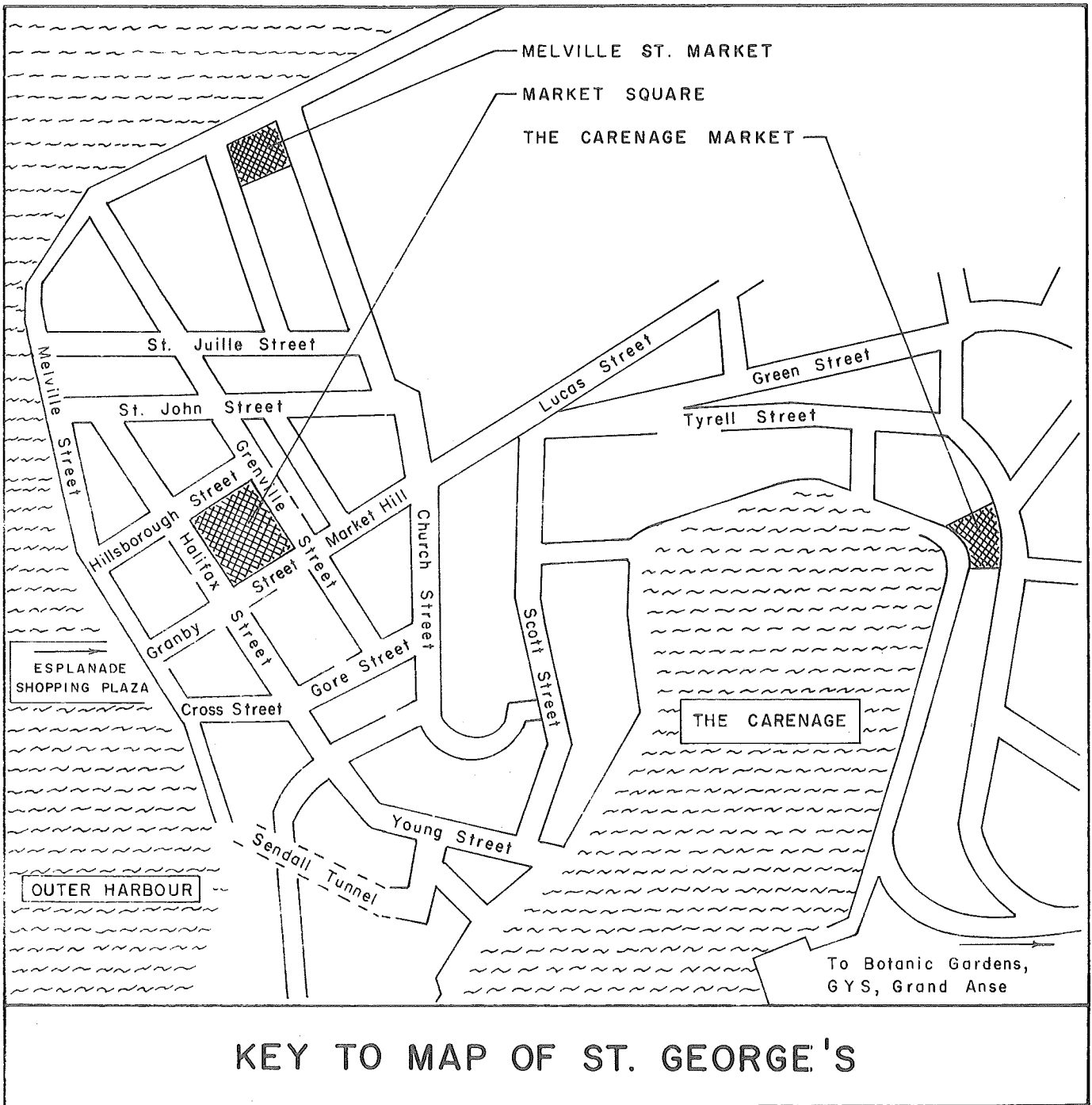


FIGURE No. 1. - LOCATION OF MARKETS

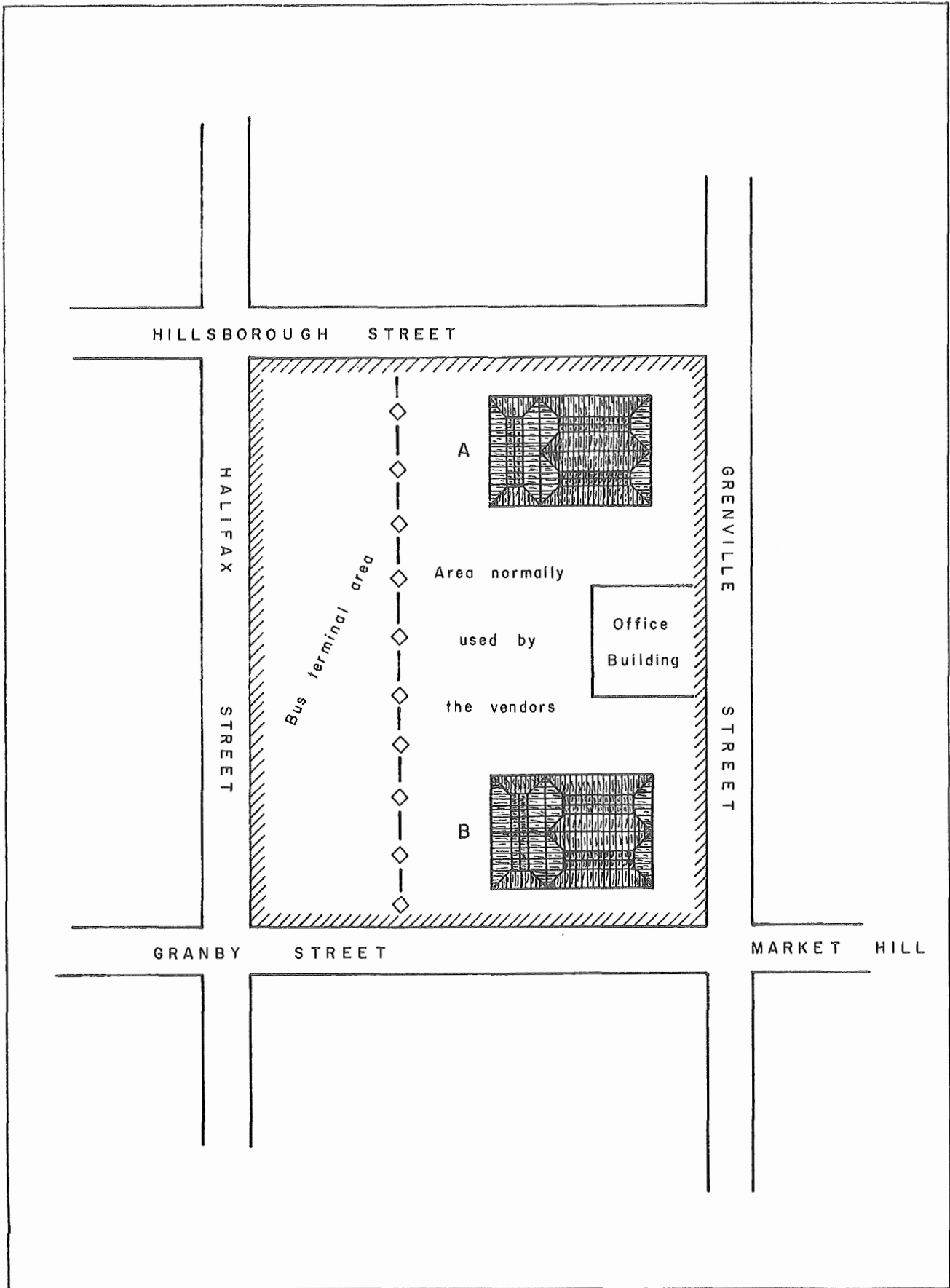


FIGURE No. 2.- CENTRAL MARKET AREA

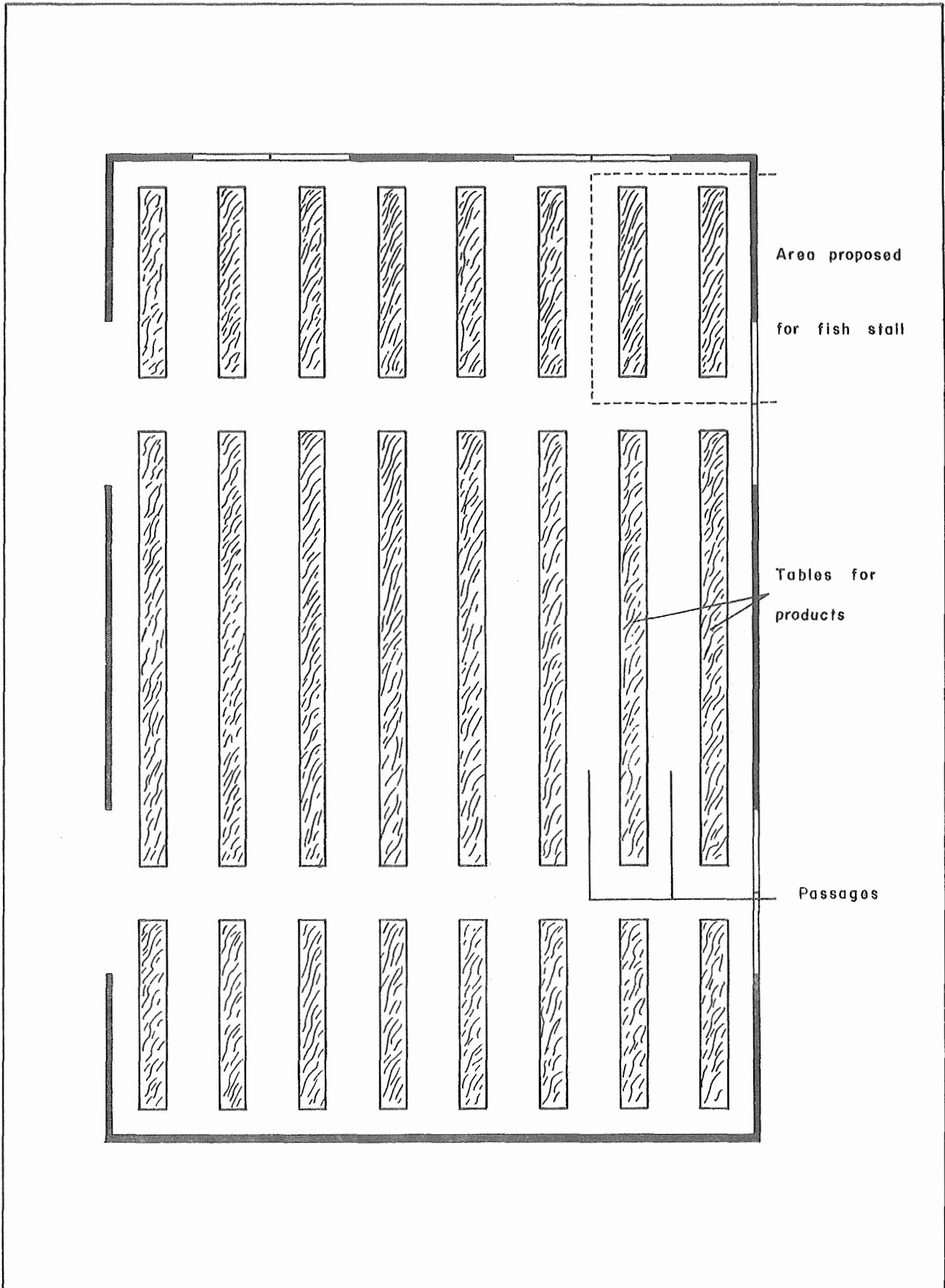


FIGURE No. 3.- PLAN OF BUILDING B SHOWING POSITION OF STALLS

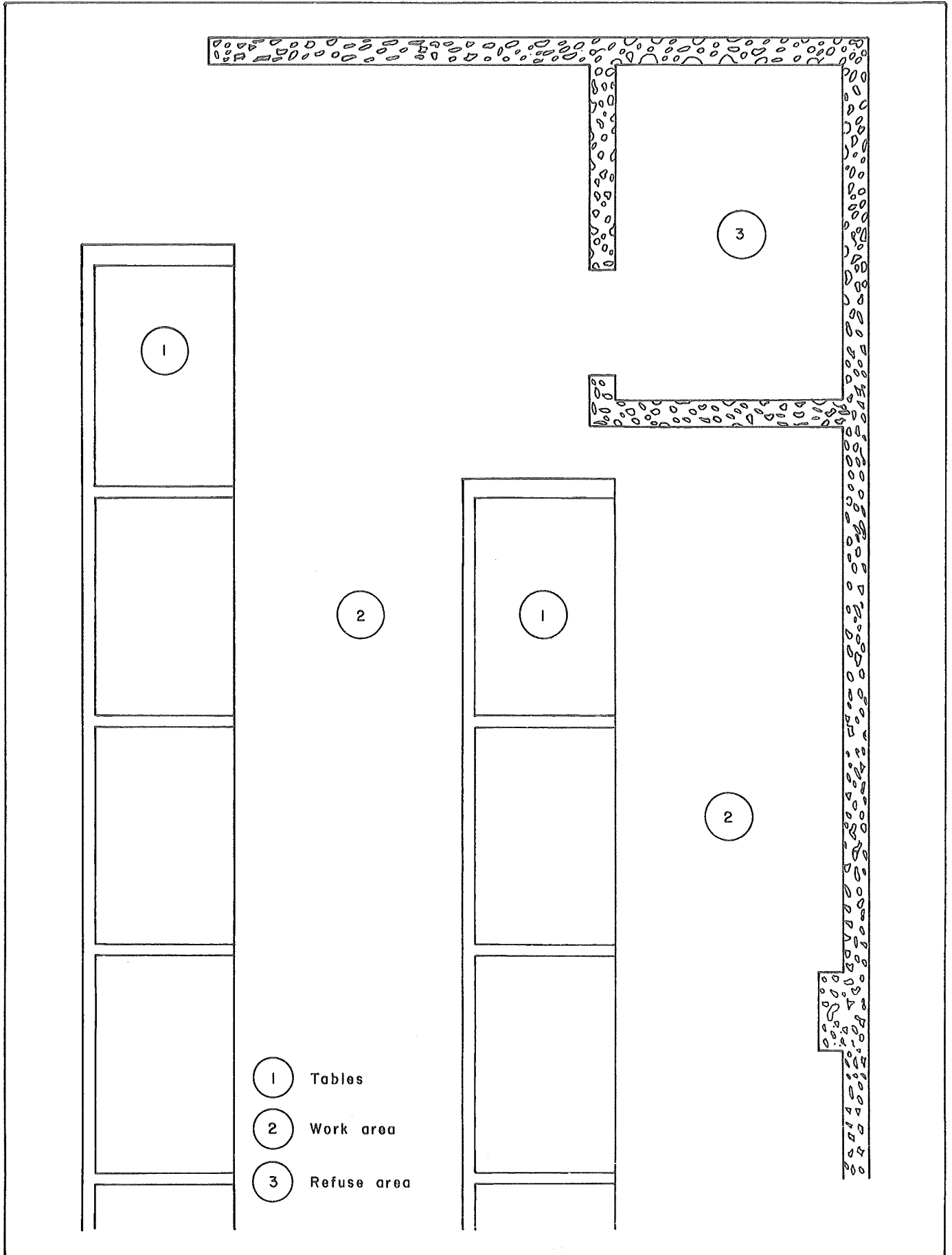


FIGURE No. 4.- FISH STALL AREA - PRESENT SITUATION

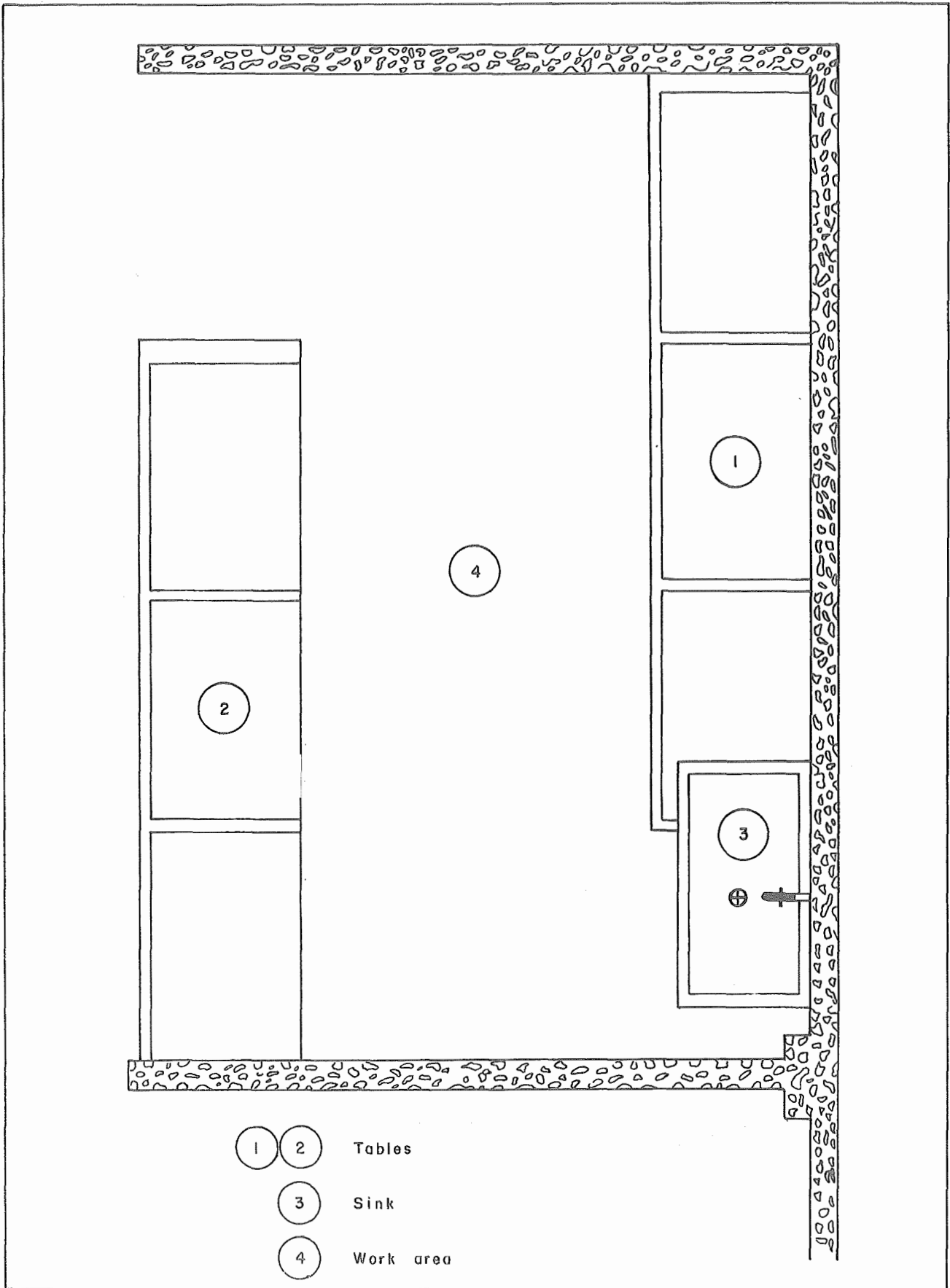


FIGURE No. 5.- FISH STALL AREA - PROPOSED LAYOUT

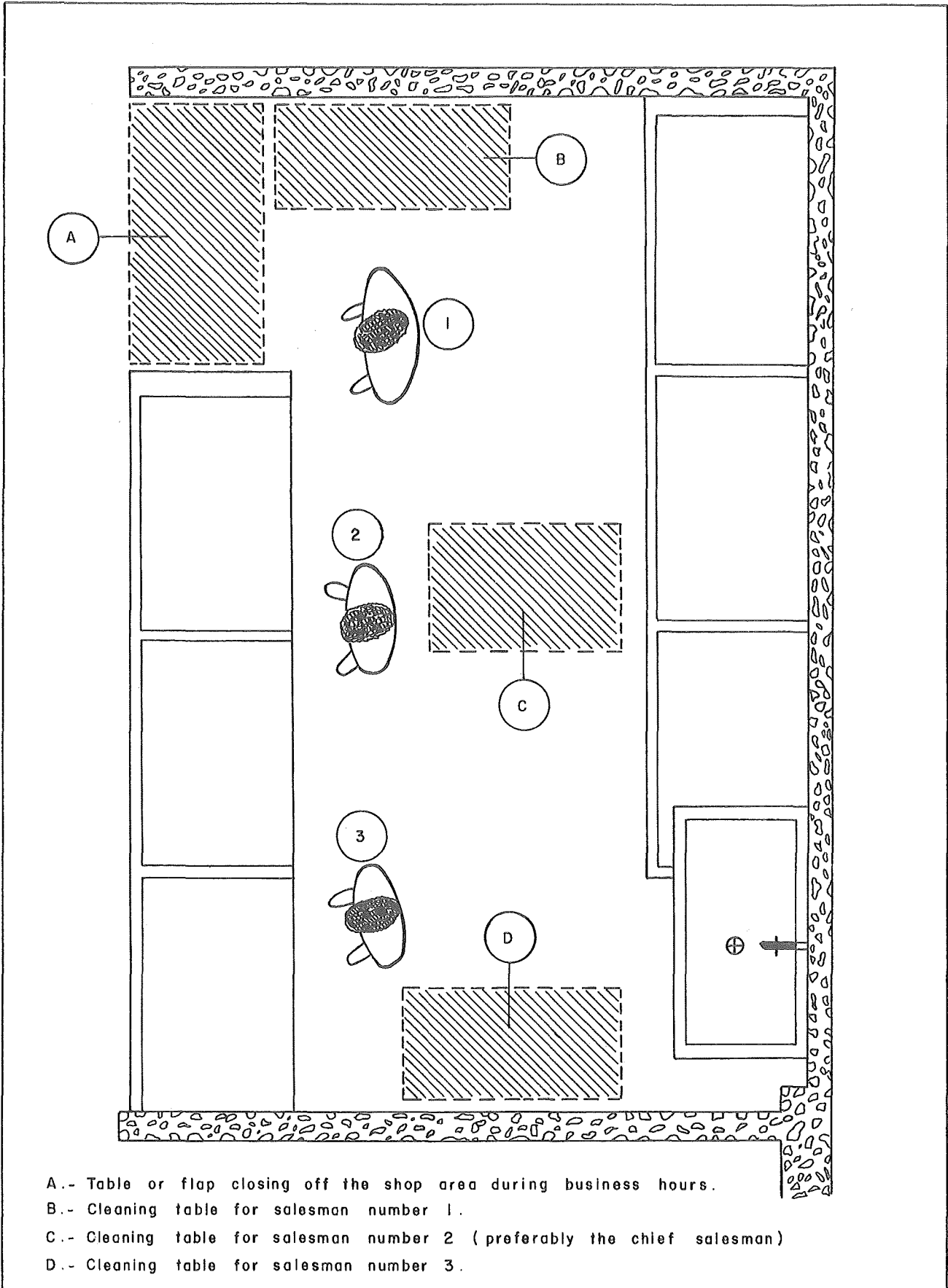
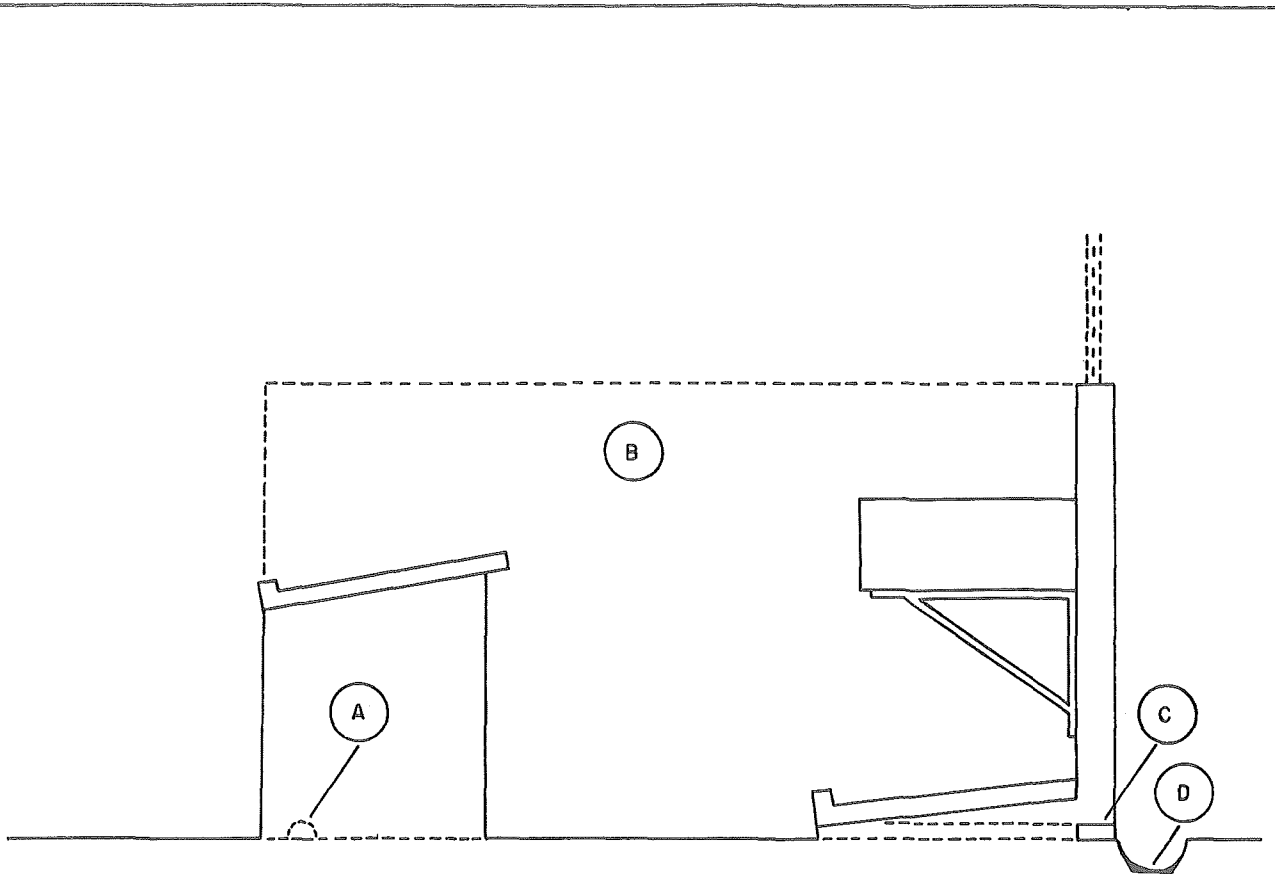


FIGURE No. 6.- FISH STALL AREA-WORKING ARRANGEMENTS



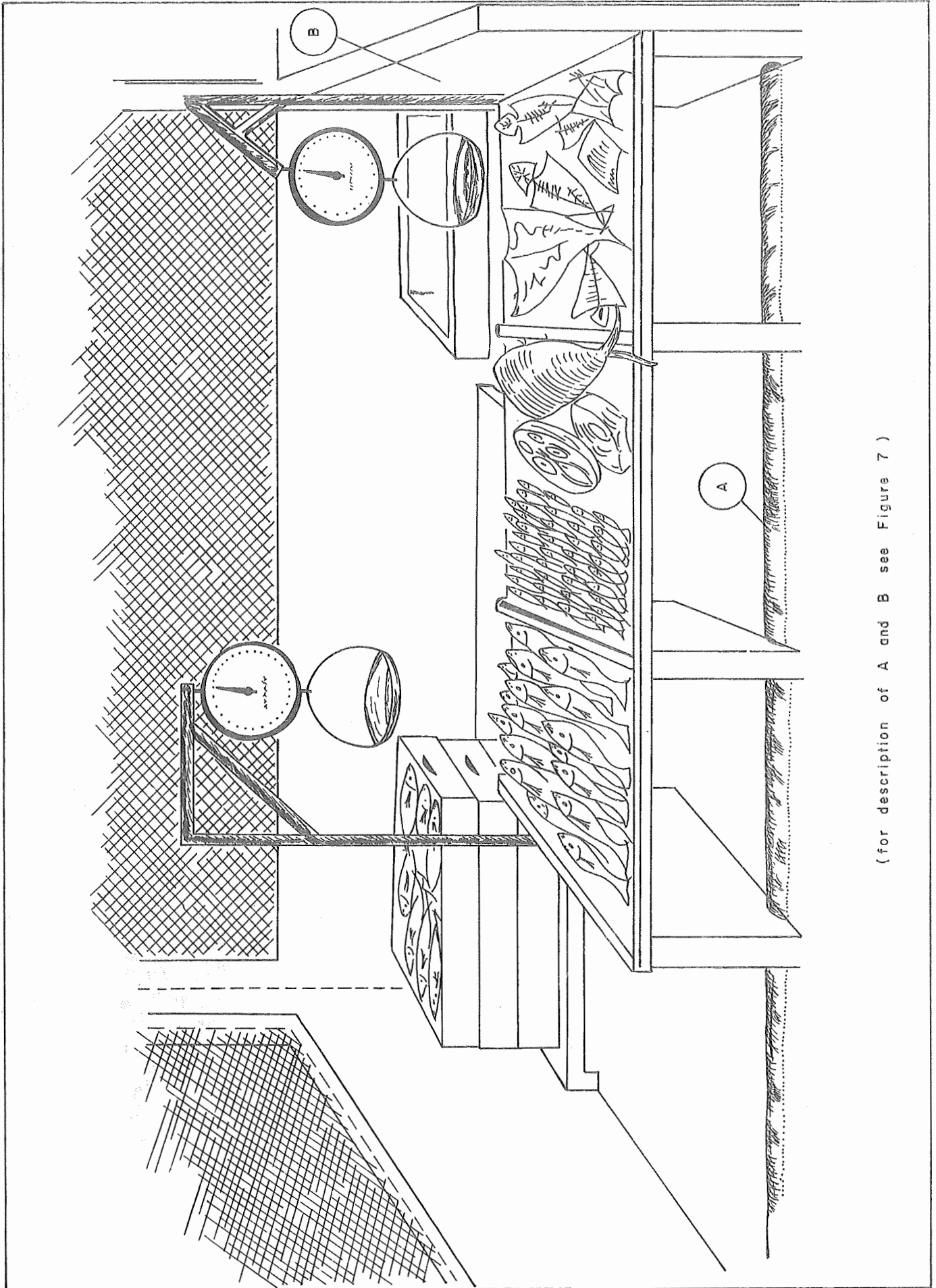
The principal reason for the dividing wall (B) and the raised strip (A), which will run round the whole of the stall area, is to isolate the stall from the rest of the market.

This isolation is needed in connexion with the cleaning operation. The raised strip will prevent water from the fish from going outside the shop and when the floor is scrubbed the water can either be mopped up or directed through the exit (C), which already exists, and from there into the channel (D) which encircles the building

Although it is generally held that a fish shop must be associated with bad smells, experience shows that with thorough cleaning a fish shop may smell of chlorine but never of decomposed fish.

FIGURE No. 7.- SOME CONSIDERATIONS ON CLEANING





(for description of A and B see Figure 7)

FIGURE No. 8 .- GENERAL IDEA OF APPEARANCE OF FISH STALL .

Proposed Fish Distribution Scheme

The fish distribution scheme described below has been designed to make use of the existing facilities in Grenada, keeping the additional investment required to an absolute minimum. The object of the scheme would be to introduce a distribution system that would make regular supplies of fish accessible to the people of the interior.

Implementation of the scheme will require the use of the following facilities and equipment:

- (a) the fish terminal buildings at Grenville, including the ice-making machine and ice store and the cold room for fish storage, which would be used as a simple insulated chamber;
- (b) the plastic fish boxes (about 200) and the weighing machine - both at Grenville;
- (c) one of the 6 t insulated trucks, provided by the Canadians for use with the Grenville fish terminal;
- (d) a retail sales outlet at the Central Market, St. George's (for details see Appendix 1);
- (e) the cold room at Gouyave which is presently not operational and must be repaired.

Obviously the existing facilities and their present condition are not ideal and a good deal of improvisation has been necessary in designing the proposed distribution scheme. For instance, in place of a 6 t truck it would be much better to have two of 3 t. It would then be possible to cover more routes and have a spare vehicle in case of breakdown. Also, at least in the initial stages, the capacity of the truck will make it rather uneconomic to use. A possible solution to this problem might be to carry other goods with the fish, using the spare space available and charging the normal tariff for this service, though perhaps the variety of goods which could be carried in this way might be rather limited.

The situation of the cold room at Gouyave will be critical to the whole operation. Although supplies of fish are expected to be available in Grenville, the main source is likely to be in Gouyave and it will be essential to have there a suitable building for holding ice and fish. Because of its small size and exposed position, an insulated chamber without refrigeration equipment will not be suitable here.

In addition to Gouyave, it may also happen that surplus fish will be available for collection at Victoria or Sauteurs but this will not be a regular occurrence and it is not considered necessary to have a special facility for fish storage at these points.

These places, and also Grenville and Gouyave, are important since at each of them a market is held every Saturday to which come many people from the surrounding areas. It is felt that, rather than attempt to take fish to the interior, with all the attendant financial risks, it is preferable to try to

make sure that good quality fish is available for them to buy when they make their normal Saturday excursion to the nearest big centre of population.

The routine suggested for the fish distribution scheme is as follows:

(a) Monday-Friday: The vehicle will leave Grenville in the morning around 8.00 hours loaded with ice and fish. It will go by one of the different routes to St. George's, depending on the day of the week, selling fish at various points on the way to fish vendors or (possibly) shops. In St. George's it will leave the fish at the sales point in the Central Market and the cash from the previous day's sales will be collected. On the return trip, ice will be left in Gouyave and fish will be picked up, bought from the fishermen the previous afternoon. The agent will be responsible for seeing that the fish is weighed, iced and properly stored prior to collection. He will pay the fishermen and be reimbursed the following day. If fish is available in Victoria or Sauteurs, the truck will go to these places by the coast road, otherwise, it will use the shortest route between Gouyave and Grenville, which is the one which cuts across the middle of the island. At Grenville the fish will be unloaded, iced and placed in the cold store. The daily turnover figures will be checked.

(b) Saturdays and holidays: The truck will make the usual trip to St. George's, selling fish at point along the way. It will then go to Gouyave to pick up fish and leave ice and return directly to Grenville, which should be reached by mid-day. Ice for Gouyave on Saturdays will have to be in larger quantities since it will need to last until Monday.

To supply the markets in Victoria and Sauteurs on Saturdays and holidays it will be necessary to hire an additional truck, since it will be impossible with only one vehicle to get fish to all the markets early enough to catch the best sales period. However, this would not have to be an insulated truck as the fish would be kept in good condition in boxes with adequate ice and covered by a canvas or tarpaulin.

Running such an operation will be no easy matter. There are a number of activities which would need to be dealt with at the same time, such a staff training and the establishment of suitable sales points, However, it is believed that the proposed scheme would, even without actually taking fish to the people of the interior, make it possible for these people to buy fish regularly in one of the supply centres.

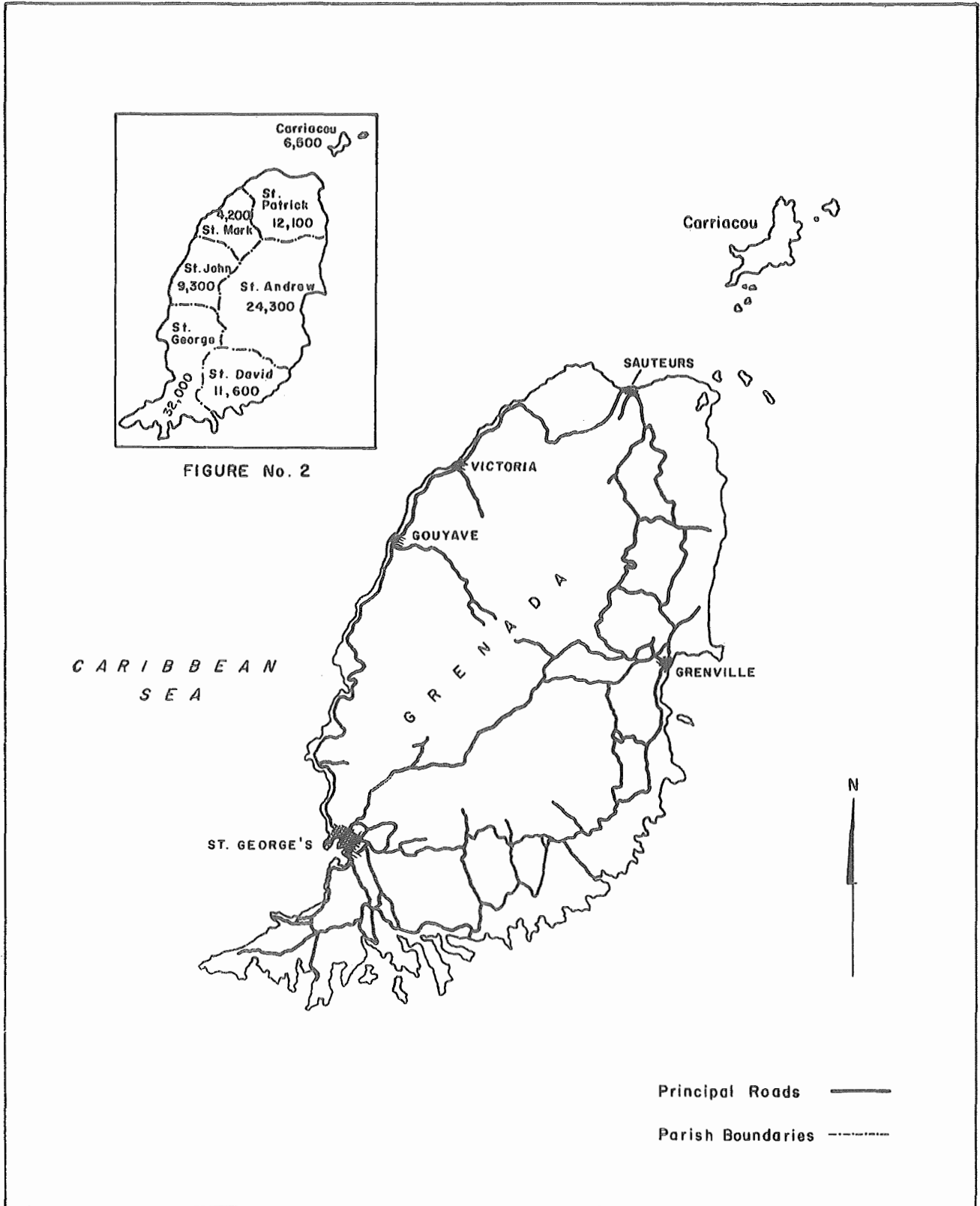


FIGURE No. 1.- MAP OF GRENADA SHOWING THE MOST IMPORTANT CENTRES OF POPULATION WHICH IT IS INTENDED TO PROVIDE WITH A SYSTEM FOR SUPPLYING AND COLLECTING FISH.

FIGURE No. 2.- MAP SHOWING PARISH BOUNDARIES AND ESTIMATED POPULATION FOR EACH.

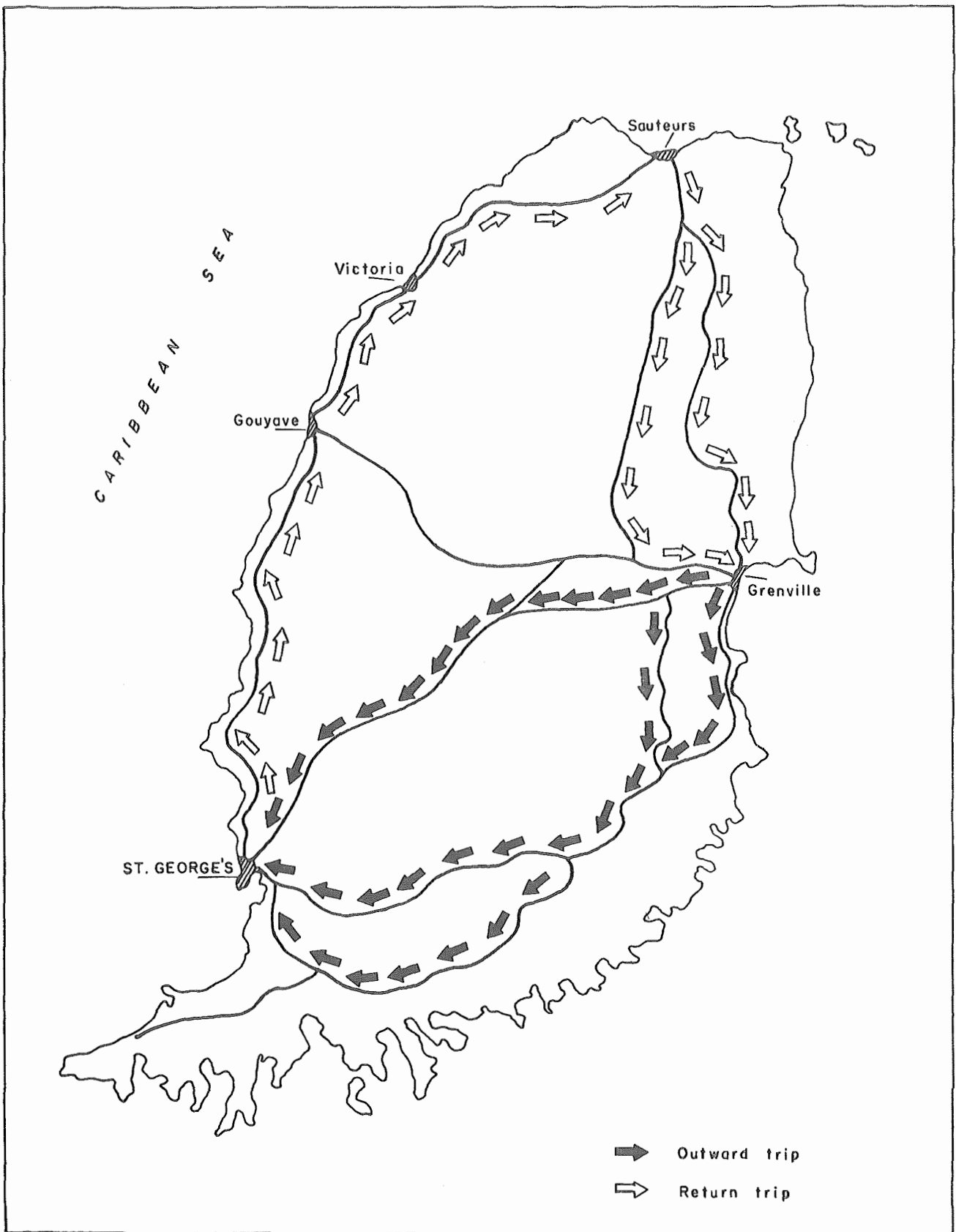


FIGURE No. 3 .- MAIN ROAD NETWORK SHOWING THE ROUTES PLANNED FOR THE SUPPLY AND COLLECTION OF FISH. (Routes for Monday to Friday inclusive)

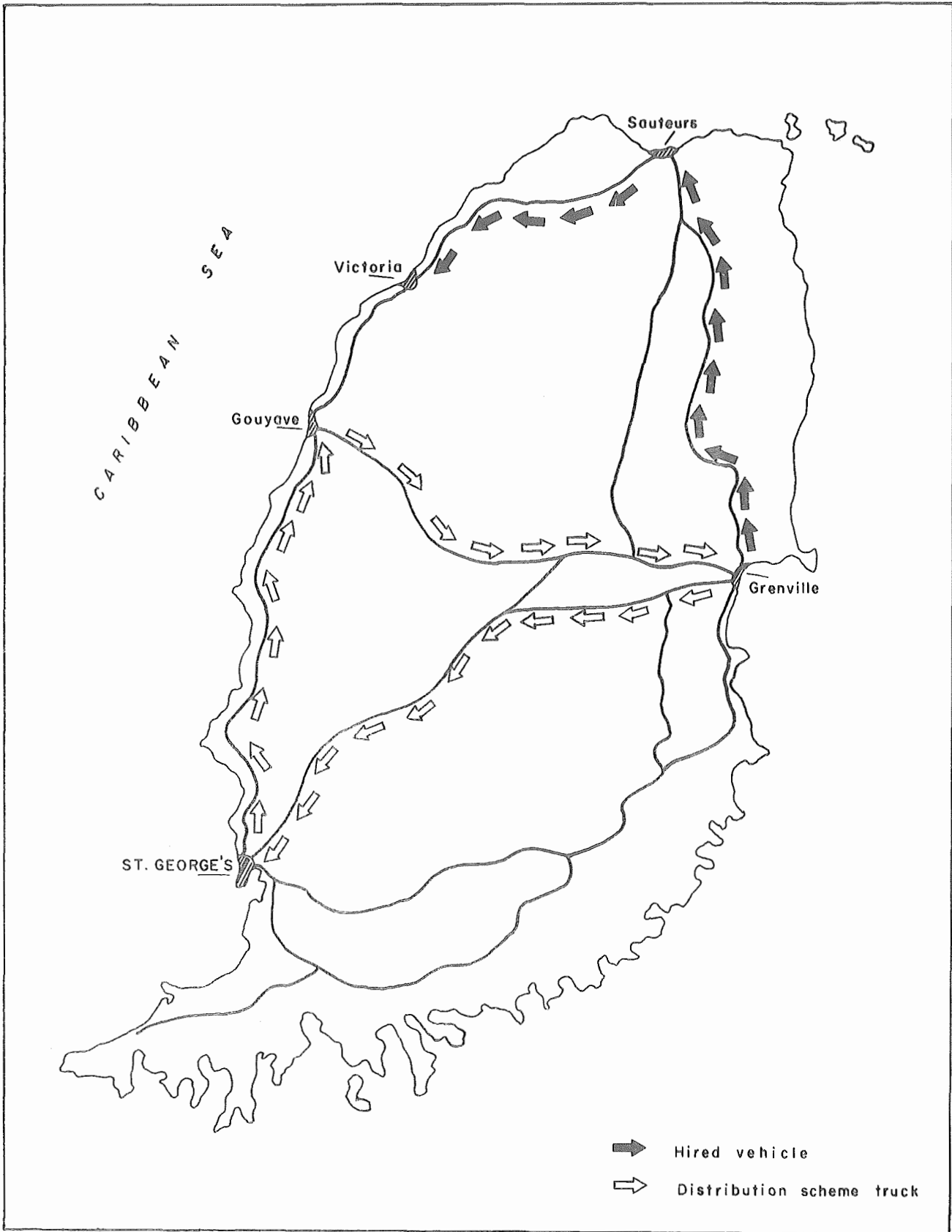
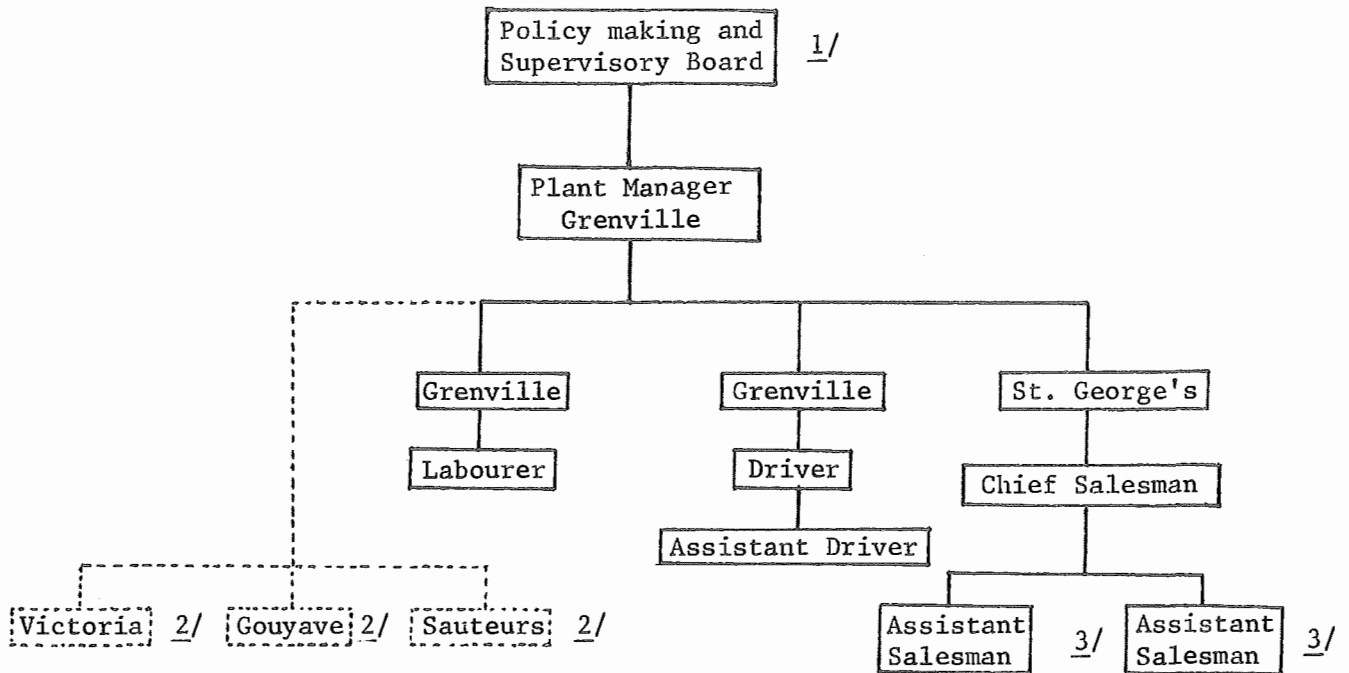


FIGURE No. 4.- MAIN ROAD NETWORK SHOWING THE ROUTES PLANNED FOR THE SUPPLY AND COLLECTION OF FISH. (Routes for Saturdays and holidays)

Organizational Structure for Proposed Distribution Scheme



- 
- 1/ Depending on Government preferences, this might be: (a) a Board of Directors, (b) a Board of Trustees, (c) an Executive Committee of a Fishermen's Cooperative, (d) any other alternative.
- 2/ It is unlikely that full-time employees would be required at these beaches. Indeed, at Victoria and Sauteurs it may be that no surplus fish will be available for distribution. At Gouyave, it will be necessary to have at least an agent who would be responsible for collecting fish from the fishermen and subsequently handing it over to the truck driver.
- 3/ Initially it may be necessary to employ only one or neither of these.

Feasibility Study for the Proposed Fish Distribution System

1. <u>Investment</u>	<u>EC\$</u>	<u>EC\$</u>	
A. Transport			
- insulated vehicle <sup>1/</sup>	-		
- 100 plastic boxes <sup>1/</sup>	-		
- large scale	1 485		
- small scale	<u>162</u>	1 647	
B. Retail Shop			
- construction work	5 000		
- 2 small scales	324		
- 4 wooden tables	<u>96</u>	5 820	
C. Working Capital		<u>5 000</u>	
		<u>12 467</u>	
2. <u>Fixed Costs</u> (not related to volume of production)			
A. Depreciation			
- construction work (5 percent)	250		
- scales (5 percent)	99		
- tables (10 percent)	40		
- knives (25 percent)	<u>24</u>	413	
B. Interest			
- 8 percent on capital		997	
C. Labour Costs Per Annum <sup>2/</sup>			
(i) Grenville			
- plant manager (50 percent of time)	5 625		
- unskilled labourer	4 500		
- driver	6 750		
- assistant driver	<u>6 000</u>	22 875	
(ii) St. George's			
- chief fish salesman	6 000		
- 2 assistant fish salesmen	<u>10 500</u>	16 500	
(iii) Gouyave			
- part-time agent		600	
D. Vehicle Expenses <sup>3/</sup>		12 000	
E. Miscellaneous Expenses		<u>6 000</u>	
		<u>59 385</u>	
3. <u>Costs and Earnings Statement</u> (for 300 operating days)			
- Daily quantities handled (lb)	1 000	1 500	2 500
- Variable costs-cold <sup>4/</sup> storage charges	6 000	9 000	15 000
-ice <sup>5/</sup>	<u>7 500</u>	<u>11 250</u>	<u>18 750</u>
Total variable costs	13 500	20 250	33 750
Total fixed costs	<u>59 385</u>	<u>59 385</u>	<u>59 385</u>
Total costs	<u>72 885</u>	<u>79 635</u>	<u>93 135</u>
Gross margin on fish handled <sup>6/</sup>	72 000	108 000	108 000
Profit/loss	<u>(885)</u>	<u>28 365</u>	<u>86 865</u>
4. <u>Break-even Point</u>			
- a daily throughput of 1 015 lb or			
- an annual throughput of 304 538 lb			

<sup>1/</sup> The vehicle and the plastic boxes were provided by the Canadian Government and are available for use in the proposed distribution scheme

<sup>2/</sup> All labour costs are calculated on the basis of salary plus 25 percent overhead costs

<sup>3/</sup> Vehicle expenses are in part dependent on the volume of fish transported and number of trips made

<sup>4/</sup> Based on assumption that all fish will be stored for one day at a cost of EC\$ 0.02/lb per day

<sup>5/</sup> Based on cost of EC\$ 0.05/lb and on ratio of fish-ice of 2 to 1

<sup>6/</sup> Based on the average gross margin for sales of fish of EC\$ 0.28/lb, less an allowance for loss and wastage of EC\$ 0.04/lb.



### Commentary

This feasibility study has to be considered as giving only an approximate idea of the likely costs and earnings of the proposed distribution scheme. The value of some items already available for use has not been included in the investment total and the figures for depreciation and interest are therefore understated. The most important of these items is the insulated vehicle which is absolutely fundamental to the whole scheme. If, for any reason, this vehicle cannot be made available, then a substitute will have to be found. This could involve a quite considerable capital outlay, though a vehicle with a capacity of 6 t is certainly not required. If the existing insulated truck cannot be made available for the scheme, the cheapest alternative would probably be to build locally an insulated box which could then be fitted onto a 2 1/2 or 3 t truck. As the existing truck was supplied by the Canadian Government in 1974, there must anyway be some doubt about its ability to stand up to regular use for any length of time and thought will soon have to be given to its replacement.

Apart from this, it will be seen that no charge is included in the estimates for rent for the retail stall to be established in the Central Market at St. George's. This is because the market is Government-owned and administered, and because no use is being made at present of the proposed location. However, for a private fish-seller some charge would no doubt be made.

On the basis of the estimates shown, the operation will break-even with a daily throughput of 1 015 lb. In the early days this figure will certainly not be reached, though it would not seem impossible to attain after several months of regular operation. However, it ought also to be borne in mind that these calculations are based on an average gross margin between selling price and purchase price of EC\$ 0.24, which assumes that all the fish will be sold retail. It is believed, though, that some fish will also be sold to vendors and, possibly, to shops on the routes covered by the truck and, in such cases, the margin would have to be much less since the maximum retail prices are Government-controlled. It is probable that the margin of fish sold wholesale might be such as merely to cover the cost of handling and transporting and this would mean, therefore, that retail sales would still have to be around the 1 000 lb a day mark if losses are not to be made.

In the long term, if the scheme proved workable, the organization responsible for its running would need to take over completely the facilities at Grenville, together with all the attendant financial obligations and possible benefits such as, for instance, the income from sales of ice. However, in these calculations it has been assumed that the Government will continue to operate this plant, and costs have been included for the ice and cold storage facilities that will be required for the smooth running of the fish distribution scheme.

It will be noticed that only half the salary of the plant manager at Grenville has been charged. This is because it is envisaged that the person at present in charge there, who is a paid Government employee, would need to spend only half his time looking after the fish distribution scheme. This sharing of his time might not be possible as turnover increased.

Obviously, considerable care has to be exercised in the early days so as not to run up crippling losses. Perhaps only one fish vendor would be needed at St. George's, additional staff being recruited as business developed. Perhaps in the early days also it would not be necessary to have an assistant

driver and, in addition, the Government could help by making available without charge individuals already on its payroll to assist the enterprise, of whatever form it might be, to get on its feet.

In conclusion, therefore, it can be stated that a fish distribution scheme of the type suggested would have a reasonable chance of success and would achieve one of the Government's main objectives which is to use the country's natural resources to feed the population as well as possible. However, the scheme would certainly not be easy to establish and its success would require a great deal of dedication and hard work from the staff and strict control from whatever policy making and supervisory board was decided upon.

Possibilities of Import Substitution

The current situation of fish imports into Grenada is described in detail in Section 4 (b) of this report. Imports of fresh, chilled or frozen fish are very small and the products on which attention must be concentrated are salted/dried cod, pickled mackerel and canned fish (particularly sardines).

(a) Salted/Dried Cod

Traditionally, salted cod has always been a major import item for the islands of the Caribbean. In Grenada, in 1960, a total of over one million pounds were imported, a per caput supply of 15 lb. The estimated total for 1978 is only 220 000 lb which, if correct, will provide 2.2 lb per person. Clearly, unless habits have changed drastically, there must be a substantial unsatisfied demand for products of this type. Almost certainly, the huge rise in the average CIF price of the salted cod (from EC\$ 0.25 per lb in 1960 to EC\$ 2.09 per lb in 1978) is responsible for the lower consumption.

It would seem reasonable to assume that if a local salted/dried product could be prepared and marketed at a reasonable price it would not be difficult to sell. The problem is, however, to establish what species among those available to Grenadian fishermen would be a suitable raw material.

The two most important varieties in terms of quantity landed in 1978 were flying fish and jacks. Generally, there are no marketing problems with jacks, though obviously at glut periods there may be difficulties in disposing of the small fish, so that at present only flying fish would be available in quantity for processing.

It is known that some fishermen in Grenada already salt and dry flying fish, for consumption by themselves and their families and for sale to the public. Obviously this is not a real substitute for the imported salted cod. The gutted flying fish is merely salted for 24 h then sun-dried for 48 h. However, it can be sold cheaply and should be a perfectly nutritious food. Flying fish could also be packed in boxes or casks, with a light sprinkling of salt on each layer of fish, and in this way it would remain in good condition for two or three days. Another possibility would be to make a pressed salted product. In this process, the fish is left in brine for several days (experiments would be necessary to determine the optimum length of time), then the moisture is pressed out and the fish is packed in boxes or barrels. This product should keep for two to three weeks without requiring refrigeration. Flying fish is very bony, which is one reason why it has a limited market, but in Tobago, for example, the women are able to produce excellent fillets of flying fish. A possible future development (not in the short-term) would be the production of frozen fillets of flying fish which could be sold in Grenada outside the main season and which should also be able to find an export market if production were sufficient.

However, apart from flying fish, it is accepted that there are other species in Grenadian waters which are not fully exploited, among them tunas, snappers and shark. Among the tunas, it would be possible to use bonito to make a suitable

dried/salted product capable of competing with the rather poor quality, imported salted cod available on the island. Actually, shark would be the best species to use to make a salted and dried product but this species already meets a firm demand in fresh form, particularly in St. George's, and the supply is not adequate at the moment to warrant the production of a salted dried product. It should also be pointed out that before bonito and shark are used for this type of product it is necessary to determine which methods of salting and drying are the most appropriate. Consideration should also be given to the possibilities of producing salt from sea-water, for use in the salting process.

(b) Pickled Mackerel

During the first half of 1978 imports of pickled mackerel were not much inferior to those of salted cod, though again in absolute terms there has been a significant decline in recent years. Of the species which are not fully exploited in the waters around Grenada, the most suitable for marinating or pickling would be yellow-fin or black-fin tuna and bonito. However, before any attempt is made to produce this type of product, it is essential that landings be increased so that the fish can be bought at a price which will permit the product to be sold at a competitive price (the imported pickled mackerel currently sells at EC\$ 1.70 per lb).

It should be noted that for both salted and pickled fish it would be necessary to have wooden casks or barrels, and the craftsmanship of the local ship-carpenters might well be utilized for their construction. Also, the labour required for preparing these new products might well come from the existing "mammies" or fish-sellers who are very numerous at present but whose livelihood might be placed in jeopardy once organized fish distribution channels are established.

(c) Canned Fish and Fish Preparations

It is felt that it will be very difficult to find an adequate substitute for the present imports of canned fish. The habit of eating canned fish, particularly in the interior of the island, is obviously deeply ingrained in the people of Grenada. From the statistics available for the first half of 1978, it would appear that the per caput live weight consumption is still the same as in 1968, in spite of the increase in the average CIF cost of 260 percent during this time and in marked contrast to the situation of salted and dried fish and pickled mackerel which has been discussed above.

It is likely that imports of canned fish can only be substituted successfully by a locally-produced canned product but there seems to be no economic justification for the establishment of a fish canning plant in Grenada in the foreseeable future.

Appendix 6

Maximum Retail Fish and Meat Prices  
(under the provisions of S.R. and O. No. 23 of 1978)

<u>1. Fish</u>	<u>EC\$/1b</u>
Class A (king fish, dolphin, snapper, grouper, moon fish, barracuda, cavally, Spanish mackerel)	1.60
Class B (tongan, bonita, skipjacks, ocean gar, red hind, squadron, rainbow runner, whiting, yellow tail, snapper (dulgie)	1.50
Class C - jacks 4 or less to the pound	1.50
- round robin - large	1.50
- jacks - more than 4 to the pound	1.20
- round robin - medium	1.00
- jacks - more than 12 to the pound	1.00
- round robin - small	0.80
- ballahoo	0.80
- flying fish	0.80
- sprats	0.50
Class D - all other varieties	1.25
<u>2. Meat</u>	
Mutton	2.50
Beef (local) - without bone	2.75
Beef (local) - with bone	2.50
Pork	1.75
<u>3. Chicken</u>	2.64

Estimated Costs and Earnings Statement for Fish Vendors at St. George's

1. <u>Class of Fish Sold</u> <sup>1/</sup>			
	<u>Percentage</u>	<u>Purchase Price EC\$/lb</u>	<u>Selling Price EC\$/lb</u>
Class A	2.9	1.40	1.80
Class B	11.2	1.25	1.50
Flying Fish	63.7	0.52	0.80
Others	22.2	1.00	1.25
2. <u>Monthly Costs</u> (based on 20 working days)			<u>EC\$</u>
Purchases (1 650 lb <sup>2/</sup> at average price of EC\$ 0.73/lb)			1 204
Fish market dues - stall EC\$ 0.04/day			1
- on weight of fish EC\$ 0.01/lb excluding flying fish			6
Cold storage			<u>2</u>
			1 213
3. <u>Earnings</u>			
Sales (average selling price of EC\$ 1.01/lb, less 10 percent for wastage)			<u>1 500</u>
4. <u>Profit</u>			<u><u>287</u></u>

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<sup>1/</sup> Calculated from Fishery Statistics for 1978

<sup>2/</sup> Based on average purchases of vendors for five days in 1978 and 1979

Appendix B

Estimated Costs and Earnings Statement for Salting and  
Drying Flying Fish and Small Jacks

<u>Investment</u>	<u>EC\$</u>	
Brining tank, plastic, 56 gal capacity		135
Small wooden table		50
Knives (2)		54
Wooden frames covered with chicken wire (5 m <sup>2</sup> )		<u>125</u>
		<u>364</u>
<u>Fixed Costs</u>		
Depreciation (20 percent on total investment)		73
Interest (8 percent on investment)		<u>29</u>
		<u>102</u>
<u>Processing Costs for 100 lb of Fish<sup>1/</sup></u>	<u>Flying fish</u>	<u>Jacks</u>
Purchases of fish <sup>2/</sup>	29.17	75.00
Salt (50 lb at EC\$ 0.24/lb) <sup>3/</sup>	12.00	12.00
Labour (6 h at EC\$ 1.00/h) <sup>3/</sup>	6.00	6.00
Fixed costs (based on annual production of 5 200 lb)	<u>1.96</u>	<u>1.96</u>
	<u>49.13</u>	<u>94.96</u>
<u>Profit Analysis</u>	<u>Flying fish</u>	<u>Jacks</u>
	<u>EC\$</u>	<u>EC\$</u>
Retail value of final product	70.00 <sup>4/</sup>	90.00 <sup>5/</sup>
Less - processing costs	49.13	94.96
- gross margin for vendors <sup>6/</sup>	<u>11.67</u>	<u>15.00</u>
	<u>60.80</u>	<u>109.96</u>
Profit/loss on operation	9.20	(19.96)
<u>Cash Flow</u>		
Profit <sup>7/</sup>	9.20	(19.96)
Labour <sup>7/</sup>	6.00	6.00
Depreciation (and Interest)	<u>1.96</u>	<u>1.96</u>
	<u>17.16</u>	<u>(12.00)</u>
<u>Break-even Point</u>		
Raw material required	914 lb	-
Minimum number of operations	10	-
Maximum price at which jacks can be bought to break even assuming full operation and present maximum retail price		EC\$ 0.55
Minimum retail price required for jacks to break even assuming full operation and current average purchase price		EC\$ 1.90

- <sup>1/</sup> It is estimated that to process 100 lb requires a cycle of three days and that two such cycles could be completed each week during a 26-week season
- <sup>2/</sup> One hundred pounds of flying fish = 350 fish for which the cost is EC\$ 2.00 for 12 fish
- <sup>3/</sup> Based on 2 h for gutting, 1 h for salting and 3 h for drying
- <sup>4/</sup> Dried/salted flying fish are sold by number, 5 for EC\$ 1.00
- <sup>5/</sup> Assuming processing loss of 40 percent in weight and present maximum retail price of EC\$ 1.50/lb
- <sup>6/</sup> Calculated so as to provide vendors with 20 percent on purchases and still not exceed maximum retail prices
- <sup>7/</sup> The labour will be provided by the fishermen and their families and will not involve any financial payment

Commentary

Though in Grenada almost all types of fish are salted or salted and dried during glut periods, the calculations have been made for two species only, flying fish and small jacks, which are very abundant at certain times in the year. The investment shown is quite small but could very probably be reduced through the use of second-hand or scrap material. The whole operation would be carried out by fishermen and their families.

It is assumed that surplus fish will be available for six months in the year and that two operations involving the drying and salting of 100 lb of fish will be carried out each week. Although a price of EC\$ 1.00 for 12 fish has been used in the calculation for flying fish, it is likely that the value to the fisherman will often be less than this and, on occasion, will be nil since if he does not salt and dry it, he will have to throw it away. The same situation is not so likely to arise in the case of small jacks, though even with this fish if there are heavy landings for a couple of days the fisherman who does not have access to some storage facilities may well find that he cannot dispose of his fish at any price.

The present method of processing in Grenada is to gut and wash the fish, after which it is brined for one day. Sun-drying takes two days and is normally carried out on the beach. From a quality and hygienic point of view, it would obviously be far better if the drying were done on racks.

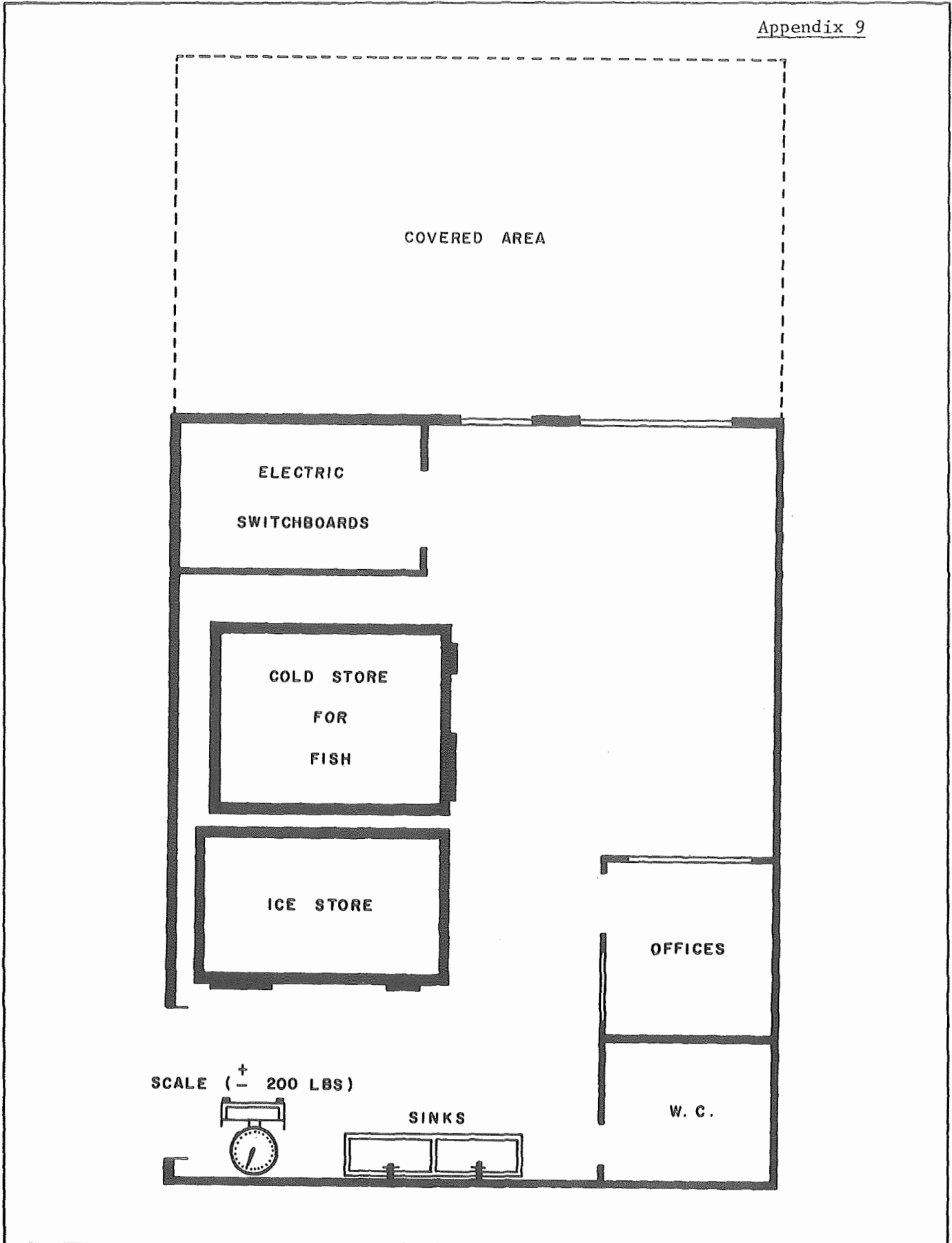
Although the fisherman can presumably sell dried/salted fish direct to the public, it is likely that if he is producing significant quantities he would need to sell in bulk to fish vendors. In calculating the profit on the operations, therefore, allowance has had to be made for a reasonable margin to the vendors. This has been estimated at 20 percent of the price paid by the vendors to the fishermen. In the case of flying fish, which are sold by number, this would probably mean that the vendors would buy six fish for EC\$ 1.00 and sell at five fish to the dollar.

As can be seen from the figures, salting and drying flying fish during glut periods could be a reasonably profitable operation for the fishermen. Since the fixed costs are low, only ten operations are necessary for the break-even point to be reached. This calculation has been made using a labour charge of EC\$ 6.00 per 100 lb of fish but, in practice, it is extremely unlikely that any payment for labour would be made, so that the actual profit to the fisherman and his family would be that much greater if, as seems probable, the work would be mainly carried out by his wife and children in their spare time.

On the other hand, it would not be profitable to salt and dry small jacks unless:

- (a) the raw material did not cost more than EC\$ 0.55 per lb, or
- (b) the maximum permitted retail price were raised from EC\$ 1.50 per lb to EC\$ 1.90 per lb. As the retail price of imported dried/salted cod is EC\$ 3.60 per lb, an increase in the retail price of the local product would not seem unreasonable.





DETAILS OF FISH TERMINAL AT GRENVILLE

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19. Extension Training of Artisanal Fishermen and Other Fisheries Personnel in the WECAF Region by W. Brownell. October 1978.
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