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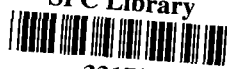
SYMPOSIUM ON THE DEVELOPMENT AND MANAGEMENT OF SMALL-SCALE FISHERIES

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THE ROLE OF THE SOUTH PACIFIC COMMISSION IN THE
DEVELOPMENT OF SMALL-SCALE FISHERIES

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Abstract

The South Pacific Commission, an international organization established in 1947, provides technical advice and assistance to the countries known as the "Pacific Islands". It has been involved in fisheries development work, mainly at the artisanal level, since 1954. This paper reviews its current and planned activities in small-scale fisheries for 1979-81. These activities involve advice, information and practical projects, and include: assessment and exploitation of deep bottom fish resources of the outer reef slopes; workshops on the management and conservation of marine turtles, tropical rock lobsters and outer reef resources; coastal resource surveys; training in processing of fishery products; research on bêche-de-mer and research on ciguatera fish poisoning; training of fishermen and aquaculture training; the holding annually of a regional technical meeting on fisheries; the production of the SPC Fisheries Newsletter and publication of reports, handbooks and other technical publications.

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CONTENTS

	<u>Page</u>
1. INTRODUCTION	1
2. SUMMARY OF SPC ACTIVITIES IN SMALL-SCALE FISHERIES	2
3. ASSESSMENT OF RESOURCES AND FISHING TECHNIQUES	2
3.1 The deep sea fisheries development project	2
4. MANAGEMENT AND CONSERVATION	3
4.1 Workshop on marine turtles	3
4.2 Workshop on tropical lobsters	3
4.3 Workshop on outer reef resources management	3
4.4 Statistics and data processing	4
4.5 Coastal resources surveys	4
5. PROCESSING OF FISHERIES PRODUCTS	4
5.1 Fish processing expert	4
5.2 Training courses in bêche-de-mer processing	5
6. AWARDS FOR APPLIED RESEARCH AND TRAINING	5
6.1 Applied research	5
6.2 Research on fish poisoning	5
6.3 Training in fisheries and aquaculture	6
7. SHORT TERM CONSULTANCIES	6
8. COLLECTION AND DISSEMINATION OF INFORMATION	6
8.1 Regional technical meeting on fisheries	6
8.2 SPC fisheries newsletter	7
8.3 Regional directory on fisheries	7
8.4 Reports and handbooks	7
8.5 Information services	7
9. CONCLUSIONS	7
TABLE 1 - Three-year (1979-1981) SPC work programme in small-scale fisheries activities	9
FIG. 1 - Area of South Pacific Commission showing approximate boundaries of proposed 200-mile exclusive economic zone	10

1. INTRODUCTION

The South Pacific Commission (SPC) is an international organization established in 1947 whose activities cover 20 countries and territories of the area known as the "Pacific Islands" (Figure 1). The principal inhabitants of the area are Melanesian, Micronesian and Polynesian. The SPC region extends over some 30 million square kilometers, less than two per cent of which is land. Within this area live 4 500 000 people, in the following countries and territories: American Samoa, Cook Islands, Fiji, French Polynesia, Guam, Kiribati, Nauru, New Caledonia, New Hebrides, Niue, Norfolk Island, Papua New Guinea, Pitcairn Islands, Solomon Islands, Tokelau, Tonga, Trust Territory of the Pacific Islands, Tuvalu, Wallis and Futuna, and Western Samoa. SPC's headquarters and secretariat are located in Noumea, New Caledonia, under the direction of the Secretary-General. SPC has a staff of about 100 people. Its working languages are English and French. SPC provides technical assistance on request to the countries and territories of the Pacific. Particular emphasis is given to assessment and development of marine resources, rural development, youth and community development, public health, cultural exchanges, expert consultancies and training. SPC carries out practical investigation projects, promotes and conducts technical meetings and training courses, assists applied research of significance to the region, stimulates contacts and exchanges between people of the region, acts as a center for collection and dissemination of information and produces English language teaching materials and technical publications. While SPC's means are modest (just over \$A3 000 000 for 1979) it is able through long experience, extensive knowledge of the Pacific Islands and contacts both within and beyond them, to attract greater resources into the region.

As stated above, only two per cent of the total area of the SPC region is land. Apart from Papua New Guinea, which has a land area of 46,000 km², the region includes numerous islands, many of them small, scattered throughout the Pacific Ocean. These islands are of two main geomorphological types, high volcanic islands surrounded by a fringing reef or sometimes a barrier reef, and low atolls encircling a lagoon. With the exception of some areas in Papua New Guinea where there is a small area of continental shelf, the outer reef slope drops steeply down to the oceanic depths. Because of volcanic activity both past and present, there are a great number of seamounts, some of them yet to be recorded on marine charts, or perhaps still remaining to be discovered. The open sea is typically tropical in the characteristics, with high surface temperatures, a deep isothermal layer, and a weak or non-existent thermocline. In some places, however, the complex Pacific current patterns cause upwellings and frontal zones. The wake effect is also of considerable importance to the productivity of areas in the lee of islands or archipelagos. These features have a direct influence on the fish resources. Shallow and protected areas like reefs and lagoons have been traditionally fished for centuries. Because of increased population and the introduction of new and more efficient fishing methods and gear (monofilament line, metal hooks, plywood and fibreglass

boats, outboard and inboard engines, etc.) there has been a dramatic decrease in the standing crop. Most of the shallow areas are heavily exploited and some are overfished. Any further fisheries development must therefore concentrate on the exploitation of the open sea or the often unexploited outer reef slopes.

The SPC fisheries programme is aimed at the management and conservation of the shallow water fisheries and the development of pelagic and deep bottom resources. SPC has a major programme on skipjack, the Skipjack Survey and Assessment Programme, a three year tagging project which covers the whole of the SPC region. This project concerns a fishery which cannot be considered small-scale, and it will not be developed further here. Let us then come to SPC activities in small-scale fisheries.

2. SUMMARY OF SPC ACTIVITIES IN SMALL-SCALE FISHERIES

The SPC fisheries work programme falls under six main headings:

- (a) Assessment of resources and fishing techniques
- (b) Management and conservation
- (c) Processing of fisheries products
- (d) Awards for applied research and training
- (e) Short-term consultancies
- (f) Collection and dissemination of information

Table 1 summarizes the three year (1979-1981) work programme.

3. ASSESSMENT OF RESOURCES AND FISHING TECHNIQUES

3.1 The Deep Sea Fisheries Development Project

A separate paper will be devoted to a detailed description of this project. In short, its main objectives are to demonstrate deep bottom fishing gear and techniques suitable for the exploitation of the outer reef slopes in depths of 100-400 m, using local fishermen's or government boats. Other fishing techniques (trolling, netting, etc.) are also occasionally demonstrated. As well as carrying out on-the-job training of local fishermen the project keeps a careful record of catches, fishing hours, fuel consumption, etc. so that the economic viability of this type of fishing can be evaluated. The project is served by two master fishermen who work at different places.

At the time this paper was written (July 1979), the project had operated in American Samoa, New Hebrides, New Caledonia, Niue, Tonga (twice) and the Trust Territory of the Pacific Islands (Yap district, Kosrae district). The project is also scheduled to visit Fiji, Kiribati, the Marshall Islands, Palau, Papua New Guinea, Tokelau and Truk in the coming months.

A similar SPC project operating with its own boats has previously visited the Cook Islands, the New Hebrides, Solomon Islands, Tuvalu and Western Samoa.

4. MANAGEMENT AND CONSERVATION

Management and conservation have been, and in some places still are traditionally carried out at the village level. For example part of a reef or of a lagoon was declared tabu for a given period, showing that the early local inhabitants were already sensitive to the conservation concept, which is wrongly considered as new by many people. Some species are in real danger of extinction, particularly those which are considered as luxury products and consequently as a potential source of substantial incomes (as for example, marine turtles). Other coastal species also need regulation or management (clams, rock lobsters, some fishes, sea cows, etc.).

4.1 Workshop on Marine Turtles

In the Pacific, the cultural and dietary significance of turtles makes the management and conservation of this resource very important. Information is needed on the present state of knowledge on marine turtles (biology, catch, rearing and breeding experiments, etc.) to draw up recommendations for future action. Fisheries officers, scientists and top level experts will attend a workshop to be held in Noumea, New Caledonia from 11-14 December 1979 under the joint auspices of the South Pacific Commission and the U.S. National Marine Fisheries Service (Southwest Fisheries Center), Honolulu Laboratory.

4.2 Workshop on Tropical Lobsters

Rock lobster fishing has long been a traditional activity in the Pacific. However, since the demand for lobsters by hotels and for export has increased they have become a luxury product. Local and overseas firms have begun lobster fishing on a commercial basis. As most of the species appear to have a low growth rate and therefore a slow turnover of the stocks, such industries could either quickly become marginal, or cause an irreversible overexploitation. The lobster workshop (scheduled for 1980) is aimed at gathering as much biological information as possible in order to draw up management regulations. Another topic studied will be the feasibility of live storage of lobsters; an SPC field project carried out a series of trials on live storage and also tagging experiments in Solomon Islands between 1975-1977.

4.3 Workshop on Outer Reef Resources Management

Artisanal deep bottom fisheries are entering a developing phase in almost all countries within the SPC region. In many places the stocks are untouched or have been only slightly exploited. Studies of the sustainable yield have been made in other parts of the world (Caribbean Sea) but so far nothing is known of the Pacific deep snappers and groupers (life span, growth, fecundity, spawning, turnover of the population, etc.). As they are probably slow growing species, what will be the impact of heavy fishing on the existing stocks? The aim of the workshop, scheduled for 1981, will be to define a plan of action including applied research.

4.4 Statistics and Data Processing

Collection of statistics is essential not only in oceanic fisheries but also in small-scale fisheries. It is the only way to follow changes in any fishery, particularly a developing one. The level of sophistication of the system of statistics collection depends upon the financial resources of the local fisheries division. Standardization, computation and analysis of data at a regional level are obviously a help. This requires training in collection of statistics, processing facilities and expertise. SPC plans to recruit an expert in fisheries statistics in 1981.

4.5 Coastal Resources Surveys

Coastal waters of many areas - estuaries, mangrove swamps, reefs and lagoons - are being increasingly subjected to pollution and damage from development and destructive overfishing. If these resources are to be protected from further damage or restored there is a need for more reliable information on their present state and management requirements. SPC has developed a simple survey procedure for reef and lagoon areas which can be used by local personnel after limited training. It is assisting governments to make coastal resources surveys for planning purposes and environmental monitoring. In addition SPC has on several occasions initiated or been requested to assist in the setting up of national parks and reserves.

5. PROCESSING OF FISHERIES PRODUCTS

The main traditional processing techniques of drying, salting and smoking have proved to be effective. However, these techniques are unknown in many places and could therefore be profitably introduced. They also require improvement if a better quality product for local consumption, as well as for marketing to urban centers or for export, is to be obtained. Modern processing techniques such as preservation in ice, deep freezing and canning are more reliable than the traditional methods but they require higher investment. In many places considerable effort is devoted to installation of ice-making machines and walk-in freezers, even in remote areas. There is consequently a need for advice on proper handling of the catch, on maintenance and repair of plants, and for economic studies on proposed processing and marketing schemes.

5.1 Fish Processing Expert

SPC proposes to recruit an expert in fish processing in 1981 to act as an adviser to governments and fisheries divisions on the economics of establishing freezing plants, cooperatives and marketing schemes. He will organize regional training courses for fishermen and people in charge of ice plants. He will also design and supervise projects on experimental trials in the use of solar energy, silage production, etc.

5.2 Training Courses in Bêche-de-Mer Processing

There is a growing interest in bêche-de-mer (trepang) in the Pacific. The demand for this luxury product and its price are constantly increasing. Bêche-de-mer processing is a typical village-level or family activity which does not require much investment nor storage facilities. It can provide a substantial income even in places where there is a lack of regular transport services. The SPC sponsors trainees from within the region to attend processing courses organized by the extension services of Solomon Islands and Fiji Fisheries Divisions.

6. AWARDS FOR APPLIED RESEARCH AND TRAINING

6.1 Applied Research

Several institutions and organizations have been approached to discuss the establishment of a regional research programme on deep bottom fishes similar to the one which was carried out in the Caribbean Sea under the auspices of the United Kingdom. So far nothing has been finalized. The planned workshop on outer reef resources management will contribute to arranging the funding of this project.

As noted there is an increasing interest in bêche-de-mer but unfortunately nothing is known of the biology of the commercial species and consequently of the turnover of the populations. A scientist is presently funded by SPC to carry out a research programme on bêche-de-mer. He is based in Fiji and works under the supervision of the Fiji Fisheries Division and SPC. Rearing experiments and culture of the larval and juvenile stages are also in progress.

6.2 Research on Fish Poisoning

Ciguatera fish poisoning is an important limitation on fish consumption in many islands of the South Pacific. For many years SPC has supported and promoted studies and research into this field by scientists at the University of Hawaii, the University of Tohoku in Japan and the Louis Malardé Institute for Medical Research in Tahiti. Spectacular progress was made recently when the primary source of ciguatera, a dinoflagellate (Gambierdiscus toxicus), associated with bottom-fixed algae around coral, was discovered. It is believed that the successive biological concentration of ciguatoxin through the food chain leads to high toxicity in large carnivorous fish. The SPC Expert Committee Meeting on Ciguatera held in Papeete in 1978 determined the following research priorities:

- (a) Laboratory production of a pure culture of the organism producing ciguatoxin to determine its chemical structure and pharmacological action so that a rational approach to therapy can be developed.

- (b) Development of sensitive, practical and specific tests to detect the toxin in the sea, fish and man.
- (c) Determination of the ecological requirements of the organism producing ciguatoxin.

The recent analysis of 3,009 cases of fish poisoning from several South Pacific Islands has shown notable differences in the symptoms depending on the species, part and quantity of fish consumed, season, location, age and ethnic origin of the consumer, etc.

6.3 Training in Fisheries and Aquaculture

Lack of trained manpower is a most important obstacle to fisheries development. With additional aid from outside funding sources, (e.g. New Zealand, Commonwealth Fund for Technical Cooperation, Commonwealth Foundation) SPC organizes and funds training courses. Recently nine Pacific Islanders attended a specially arranged fishing cadet course at Nelson Polytechnic, New Zealand. Other islanders have been trained in aquaculture techniques (milkfish, mollies, fresh and saltwater shrimp cultivation). Awards have been given to fisheries division staff to visit boat building workshops and fishing projects. Grants for inter-territorial study visits are also provided.

7. SHORT TERM CONSULTANCIES

The expertise of consultants is required in various fields. Consultancies on the following topics are planned for the coming years:

- (a) Specific fishing techniques (skipjack pearl lure fishing, floating objects)
- (b) Boat building
- (c) Drawing up national fisheries development plans
- (d) Resource assessment (bêche-de-mer, molluscs)
- (e) Deep bottom fish research
- (f) Fish identification
- (g) Aquaculture: salt and fresh water shrimp, fish, green mussel, oysters
- (h) Shell transplantation (trochus, green snail)

8. COLLECTION AND DISSEMINATION OF INFORMATION

This represents a very important part of SPC activities.

8.1 Regional Technical Meeting on Fisheries

Held annually, this meeting is the only venue in the South Pacific where all personnel engaged in fisheries development and research can meet and exchange information. All countries provide written country statements.

The activities of SPC and other organizations are reviewed, seminar sessions and workshops are held in conjunction with the meeting. The meeting's recommendations are taken into consideration to draw up the SPC work programme.

8.2 SPC Fisheries Newsletter

This quarterly publication, produced both in French and English, includes articles on fisheries research, development, fishing gear, etc., of particular interest to the region. It is widely distributed both within the Pacific and outside, to government fisheries divisions, research establishments, universities and private individuals.

8.3 Regional Directory on Fisheries

The first issue of the directory will be available in August 1979. It is planned to have it updated approximately every two years. This publication provides for the first time information on fisheries activities and fisheries research within the SPC region. It includes information by country on government fisheries divisions, fishing facilities, local fishing boats, catches of fishery products, fishing companies, aquaculture, exports, imports, etc. There is also a section on the organizations, universities and research centers involved with fisheries activities in the SPC region.

8.4 Reports and Handbooks

Reports are prepared on the work of SPC fisheries projects in all countries visited. In some cases these are the first published accounts of fish catches or species of fish caught for a particular place and provide essential baseline data. Handbooks for fishermen have been produced on such topics as fishing nets, fish ponds and the bêche-de-mer fishery. A handbook on the live storage and transport of rock lobsters is in preparation.

8.5 Information Services

A major part of SPC fisheries activities is answering requests for information on any aspect of tropical fisheries from within and outside the region, and from both government and private individuals. Through long experience in the region and from knowledge of the right organization or expert to contact, these requests can almost always be satisfied.

9. CONCLUSIONS

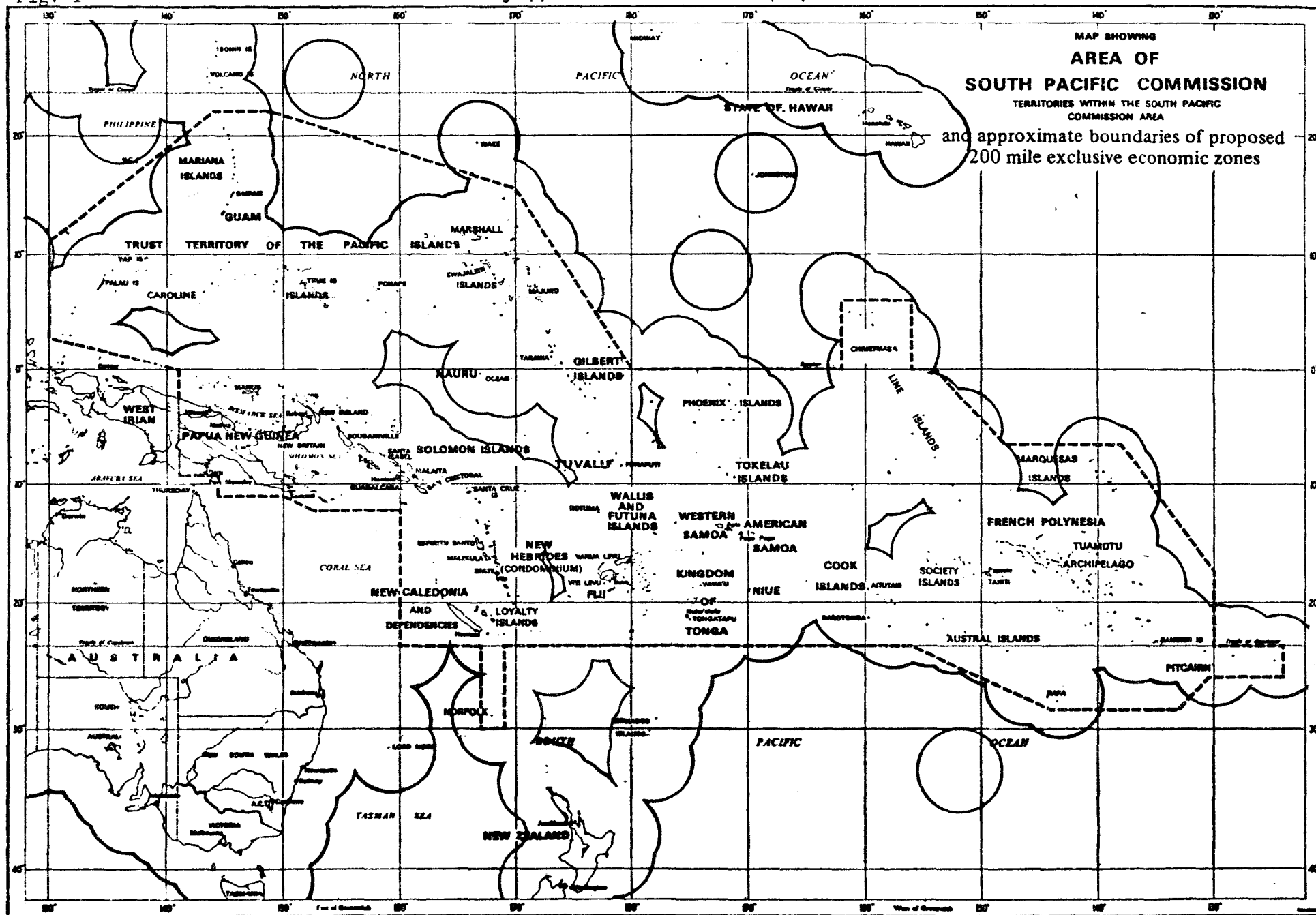
In 1954, when SPC first appointed a fisheries officer to its staff, fisheries in the Pacific were mostly at the subsistence level. Very few countries even had a fisheries service. Since then the situation has changed greatly - fisheries are developing everywhere, they use more modern

and efficient equipment, the pressure on stocks is at its highest level ever. All but the smallest island countries now have their own fisheries services and their degree of expertise is constantly increasing. However because of greater demand for fish products resulting from population increases and the growing importance of fisheries in Island economies, the demand for expertise has also increased. The scattered nature of the countries in the Pacific and their small populations means that fisheries development in the region could benefit from the assistance of international organizations for some time to come. SPC's role in this has not basically changed over the years - it still remains directed to optimum development through the introduction of new ideas, techniques, training, and the exchange of information - but like the fisheries themselves, the level of its input has increased both in quantity and sophistication.

Table 1. Three-year (1979-1981) SPC work programme
in small-scale fisheries activities

Activities	1979	1980	1981
<u>Assessment of resources and fishing techniques</u>			
Deep sea fisheries development project	+	+	+
<u>Management and conservation</u>			
Workshop on marine turtles	+		
Workshop on tropical lobsters		+	
Workshop on outer reef resources management			+
Statistics and data processing			+
Coastal resources surveys	+	+	+
<u>Processing of fisheries products</u>			
Fish processing expert			(+)
Training course on bêche-de-mer processing	+	+	+
<u>Awards for applied research and training</u>			
Research studies	+	+	+
Research on fish poisoning	+	+	+
Training in fisheries and aquaculture	+	+	+
<u>Short-term consultancies</u>	+	+	+
<u>Collection and dissemination of information</u>			
Regional technical meeting on fisheries	+	+	+
Fisheries newsletter	+	+	+
Regional directory on fisheries	+		+
Reports and handbooks	+	+	+
Information services	+	+	+

Fig. 1-Area of South Pacific Commission showing approximate boundaries of proposed 200-mile exclusive economic zone.



Estimated boundaries by courtesy of ORSTOM, Noumea

Estimation des limites de l'aire à l'aimable concours de l'ORSTOM, Nouméa