REEF FISHING IN THE TIGAK ISLANDS, NEW IRELAND PROVINCE

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INTRODUCTION

The government of Papua New Guinea intends to develop coastal reef fisheries for 3 main reasons:

1. To provide employment for coastal people.

2. To increase the cash flow to coastal areas.

3. To try to replace imported tinned fish with a local product. Imports of tinned fish in 1982 cost Papua New Guinea K23 million, so a lot of money could be saved if this country could produce its own fish.

Before a reef fishery can be developed in Papua New Guinea we need to have information about the biology of fish in coastal waters, the ecology of these waters and the present economics of coastal areas.

In this article we will talk about a study carried out on the Tigak Islands, New Ireland Province during 1981 and 1982.

THE TIGAK ISLANDS

The position of the Tigak Islands is shown on the map on page 16. There are 24 islands lying to the west of New Ireland, close to Kavieng. In 1980, 1481 people lived on about 20 of these islands.

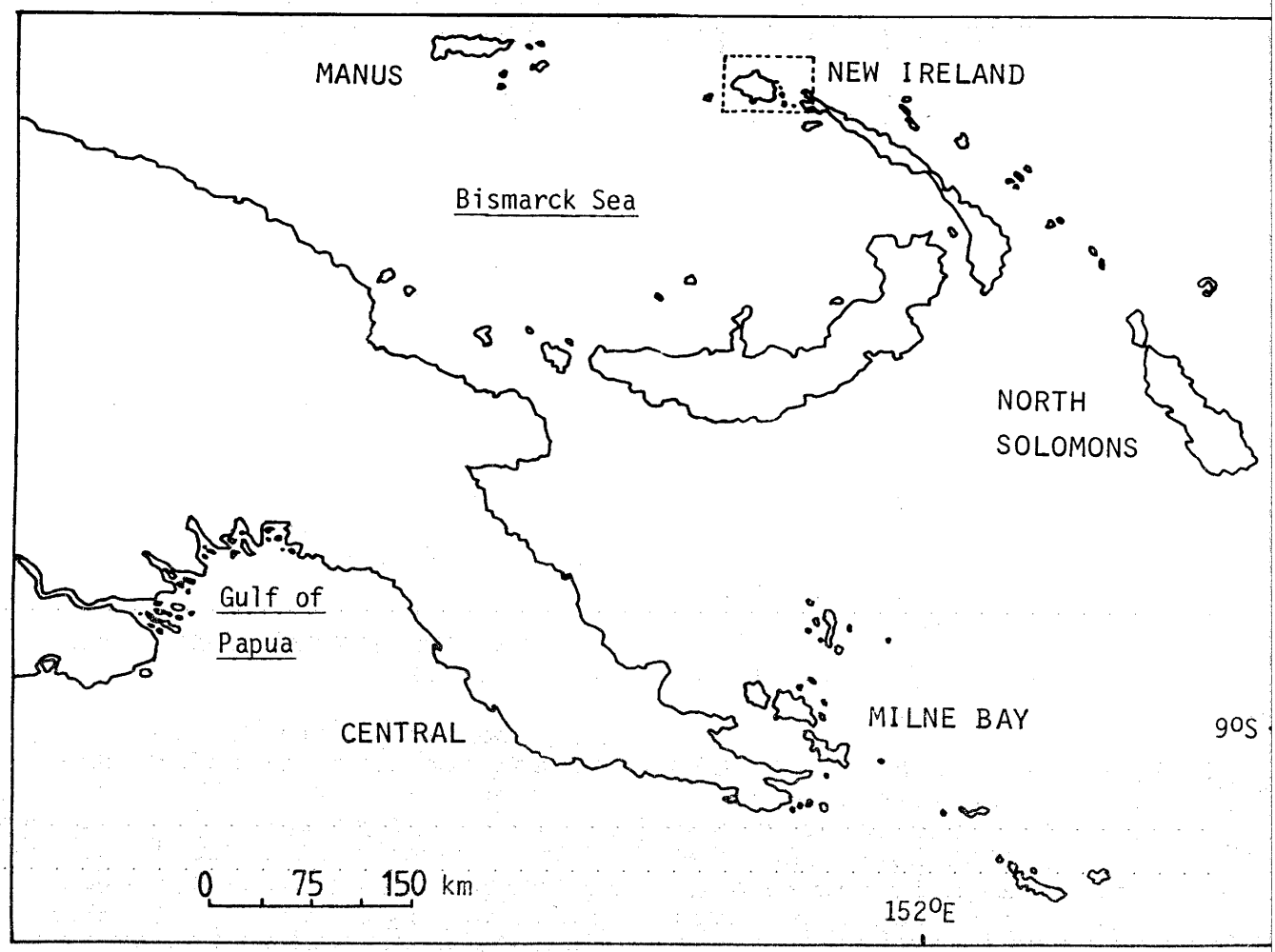
The Tigak Islanders earn money by growing and selling copra and cocoa, and by fishing. Because of the recent low prices for copra and cocoa, fish have become more important as a source of income.

COLLECTING INFORMATION ON THE FISH CATCH

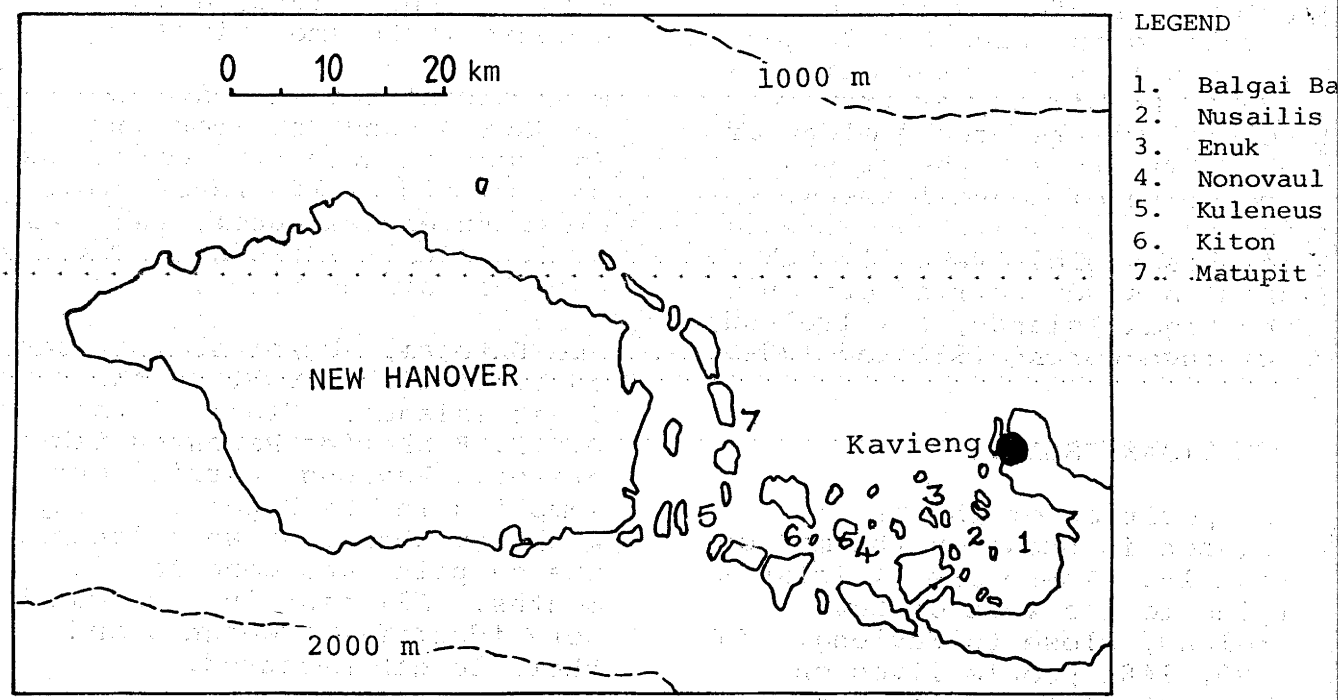
On the Tigak Islands, most fishermen catch fish for subsistence - to feed themselves and their families. Some fishermen catch fish to sell, or they may do both. The amount of fish caught for subsistence purposes was worked out by weighing all fish eaten by 4 families on two islands over 3 weeks in April 1982, and over 4 weeks in November 1982.

Fish caught for sale are taken to Kavieng and sold for cash. Information about the catch was collected from the Kavieng Fisheries Extension Depot, the Kavieng General Produce Market and the Kavieng Hotel.

The Extension Depot is the main buyer of fish caught in the Tigak Islands. Staff of the D.P.I. Fisheries Research Laboratory, Kavieng, carried out sampling in the Depot on every week day when fish were landed. The sampling was done for 13 months. All fish in each catch were identified, weighed and their length measured.



Map of Papua New Guinea showing the location of the study area



Detail of the boxed area in the map above, showing the Tigak Islands between Kavieng and New Hanover, with the seven most productive fishing villages during 1981.

Details were also recorded of the methods used to catch the fish, the time spent fishing, the number of fishermen involved and the places where the fish were caught.

RESULTS

The kinds of fish that were caught

During the study, 41% of all the fish bought by the Depot was weighed and measured by Fisheries Research Staff. In all, 30,679 fish weighing 22.5 tonnes were measured.

There were 253 species of fish caught. However, over 80% (by weight) of the catch was from 42 species. The most common were:

- *Valamugil seheli* - the blue-tailed mullet (22.5% of the catch)
- *Caranx sexfasciatus* and *C. melampygus* - trevally (5.5%)
- *Bolbometopon muricatus* - the double headed parrotfish (6.3%).
- *Lutjanus gibbus* - the red paddle-tail (5.2%).

Fishing methods

Netting: Netting gave 35% of the catch. In the Tigak Islands, 3.1 - 5.9 kg of ungutted fish can be caught by a man in 1 hour using 1 net. Nets are the best method of catching fish like mullet in shallow lagoons.

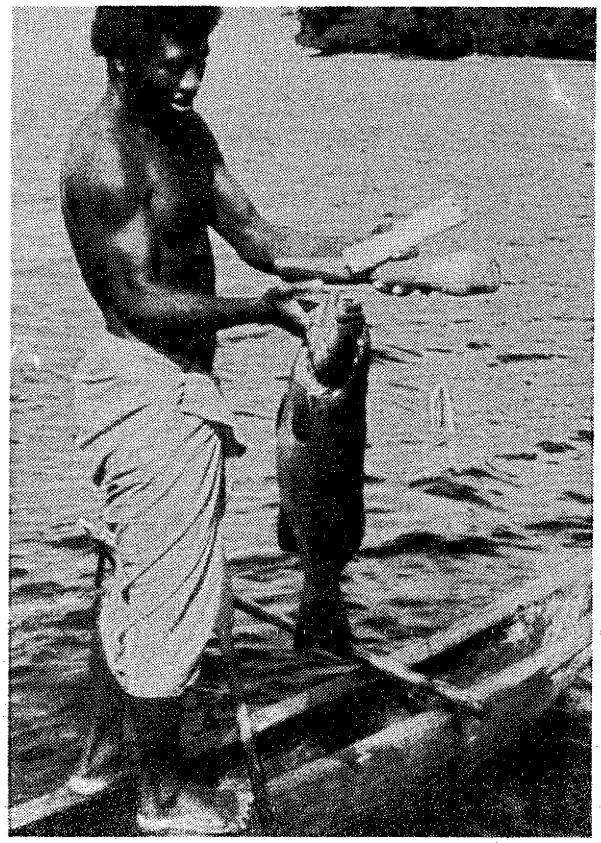
Line fishing: 21% of the catch was taken using lines, at an average rate of 1.2 kg/line/hour.

Spearing: This provided 6% of the catch. The catch rate was 3.6 kg/man/hour for spearing at night, and 1.2 kg/man/hour for spearing during the day.

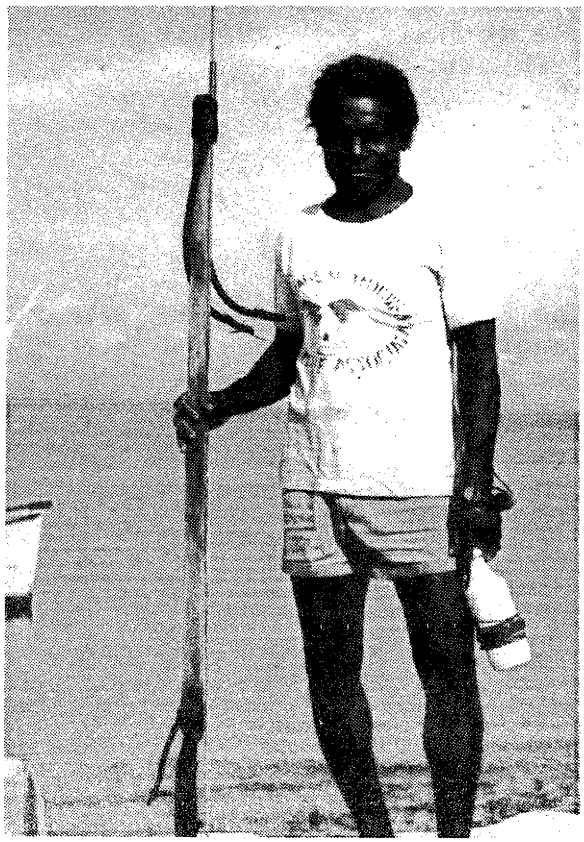
Trolling: Trolling is fishing using a line and bait drawn along behind a boat. 6% of the catch was taken by trolling. We could not estimate the time spent trolling by Tigak Island fishermen. However, staff of the Kavieng Fisheries Research Laboratory caught an average of 4 kg of fish per line per hour by trolling. Because expensive fuel has to be used to power the boat, trolling was not the most economical way of fishing.

Combinations of these methods were used to take 32% of the catch.

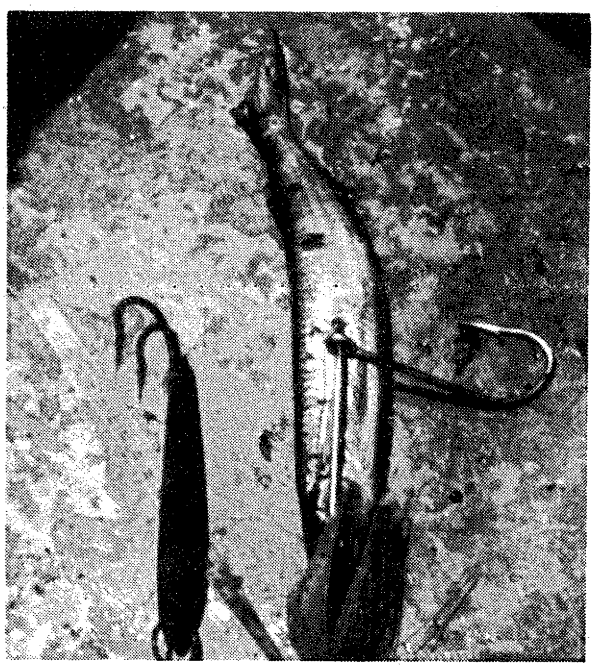
Carrying a net-caught catch to market



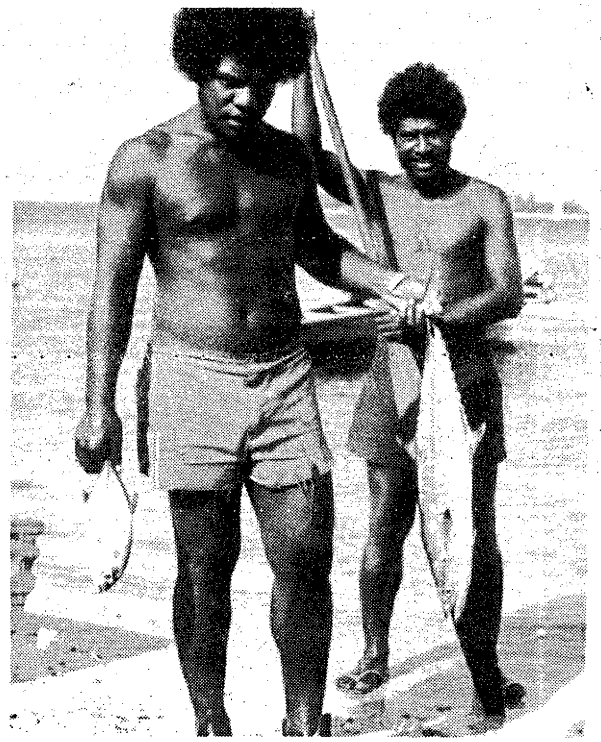
A Tigak fisherman using a jig to catch coral trout



A spear-fisherman with his equipment



Trolling lures used by Tigak fishermen



A trolled catch of trevally and Spanish mackerel

THE YIELD OF THE FISHERY

The yield of a fishery is an estimate of how much fish is caught in an area in a certain time. The time is usually one year.

We estimated that the yield of fish for subsistence on the Tigak Islands was 0.63 kg per ha per year. This figure was calculated from: the amount of fish eaten by the islanders per day (see COLLECTING INFORMATION above); the total population of the Islands; and the area of the fishing grounds. Most fishing in the Tigak Islands is done in water less than 30 m deep. There are 20,765 ha of such reef. Most fishing is done near the villages.

The production of fish for sale was estimated at 3.54 kg/ha per year. This was worked out from the catches landed at the Extension Depot, sales at the Kavieng Market and sales to hotels and stores in Kavieng.

The harvest of fish from the Tigak Islands is low when compared with similar reef and shallow water areas in the Pacific.

VESSELS USED FOR FISHING AND TRANSPORT

The Tigak Islanders use two types of canoe.

1. The 'mon' is a large hollowed-out log, without an outrigger. It can take a 25 h.p. outboard motor. This type of canoe is used to carry people and cargo around the islands and to Kavieng. They are rarely used for fishing. The largest 'mon' canoes carry up to one tonne of cargo.
2. Smaller (3-4 m) single outrigger canoes cannot take a motor, but are powered by paddles. They take up to 3 people, and are used mostly for fishing in sheltered water.

Some islanders now own aluminium or fibreglass dinghies powered by outboard motors. These vessels can be used either for transport or fishing.

HOW MUCH DEVELOPMENT IS POSSIBLE?

In the Tigak Islands, the amount of fish caught by the islanders depends on various things:

- Is suitable transport available to carry the catch to Kavieng?
- Does the villager need cash?
- How much land is available for agriculture?
- Islanders who do not have much land depend on fish for a source of cash.
- Religious ceremonies also affect fish production. Sometimes all fishing is stopped. At other times extra fish are caught to produce food for special celebrations.

The islanders now rely more on fish to provide cash. This is because the value of cash crops such as copra has decreased. Production of fish could increase a lot if the islanders could fish the large stocks of mackerel tuna, frigate mackerel and shark mackerel which are found near the islands. To do this, they will have to replace the canoes used at the moment for motor vessels, which

are more suitable for fishing.

If the government is going to spend money on coastal fisheries, production from small fisheries such as the Tigak Islands should be constant. At the moment, most village fishermen only catch fish to sell when they need some money.

Finally, one big problem that will limit development is traditional ownership of fishing areas. As the values of the resources in these areas become known, there are likely to be more disputes. The problems of ownership are also increasing because people are moving from coastal villages to other parts of the country.

For the successful development of our coastal fish resources, we should aim to bring the maximum benefit to people who live in the villages. At the same time, their traditions and way of life should be considered in development proposals.

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A NOTE ON PARAQUAT

In the article 'Paraquat Poisoning in Papua New Guinea' (HARVEST, Volume 9, No. 2, pp. 96) Mr. A.E. Charles stated:

'Amongst the agricultural chemicals, only a few are more dangerous than paraquat if they are drunk. However, paraquat does not poison the environment as it breaks down very quickly when it reaches the soil'.

This second sentence is not strictly correct and should be changed to read:

'However, paraquat is not dangerous to the environment as it is inactivated very quickly when it reaches the soil'.

Clay particles in the soil adsorb (attach themselves to) paraquat. Paraquat has special properties which mean that it holds on to the clay very strongly. When the clay and paraquat have joined you can get paraquat back again only by boiling the clay in 50% hydrochloric acid for several hours.

As a result paraquat in the soil is no longer poisonous to plants or animals, although it does not actually break down.

We thank Mr. S. Day, Agricultural Chemist, D.P.I. for pointing out the error.