

ORIGINAL : ENGLISH

SOUTH PACIFIC COMMISSION

SEVENTH TECHNICAL MEETING ON FISHERIES
(Nuku'alofa, Tonga, 15 - 19 July 1974)

FISHERIES DEVELOPMENT IN TONGA

by

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Summary

The Fisheries Section in Tonga consists of one expatriate Fisheries Officer (United Kingdom), one Technical Officer (Japanese), overseas aid and a US Peace Corps Marine Biologist. Tongan staff are one Technical Officer and five Fisheries Assistants.

The Section manages a Tuna long-line vessel, the "Ekiaki", captained by the Japanese Technical Officer and crewed by a Tongan crew of 25 fishermen. Annual catch runs at about 90 tons.

Collection of fisheries statistics have been started and the indication at present is that the shortfall of supplies of fish to Tongatapu runs at about 1000 tons per annum. Large quantities of canned fish are imported.

It is thought that there is a substantial skipjack resource and that deep water bottom fish may be caught in quantity. A Bilateral Australian aid scheme proposes the setting up of a fisheries project which will consist of six dories, ice making and freezer facilities and fisherman and technical training.

Experiments have been started with bivalve culture which show promising results. This work is to be extended.

The turtle situation is grave and it is hoped that legislation may be enacted and enforced to give further protection.

The spiny lobster landings have declined, not through drastically declining stocks but from decreased fishing and, importantly, decreased buying effort.

Two members of the Fisheries staff have been selected for training at the Fisheries Diploma Course at the University of the South Pacific in Suva, Fiji.

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1. At the Sixth Technical Meeting on Fisheries held in Suva, a short working paper on the fisheries of Tonga was submitted, outlining in general the existing fisheries in Tonga, and the importance of developing this valuable natural resource. A year has passed since this meeting, and it is perhaps opportune to review the progress made during the past year.

2. Fisheries Section

At present the Fisheries Department is a section of the Agricultural Department, under the Direct Administrative responsibility of the Director of Agriculture. Fisheries staff are recruited through the Agricultural Department, and the designation of this staff have agricultural connotations, e.g. Agricultural Instructor (Fisheries) and Agricultural Assistant (Fisheries). The section comprises one expatriate Fisheries Officer recruited under the United Kingdom O.S.A.S. terms of service, who took up this appointment in April 1973.

Subordinate staff consist of viz:-

One Agricultural Technical Officer (Fisheries)
One Agricultural Assistant (Fisheries)
Four Agricultural Assistants (Fisheries)
One U.S. Peace Corps Marine Biologist
One Technical Officer, Japanese Overseas Aid Scheme.

In addition the section has the management of the pelagic long-line fishing vessel "Ekiaki". This vessel was purchased in 1970 by the Tongan Government, and was formerly named the "Ebisu Maru No. 12". Of typical Japanese longliner design, the "Ekiaki" is of steel construction, built in 1964 in the following dimension: length overall 27.00 m; beam 6.20 m; depth 2.65 m; gross tonnage 111.79. The vessel is powered by a supercharged Niigata diesel engine of 450 H.P. and has a refrigerated hold capacity of 50 tons and manned by an all Tongan crew of 25. The "Ekiaki" fishes mainly for the local market, with occasional trips to Pago Pago, in American Samoa. During 1973/74 this vessel landed 203,243 lbs. (90.73 long tons) of miscellaneous pelagic species comprising: albacore 22.8% (of total catch), yellow fin tuna 18.9%, big eye tuna 5.7%, bill fishes 17.3%, shark 23.7%, other species 11.6%.

The main catch rate per 100 hooks including all species was 2.41%. The Kingdom of Tonga is the only Pacific Island Territory operating its own oceanic long-line vessel, and it is perhaps disappointing that the annual production for such a vessel, is below that of similar type vessels operated by Asian-Taiwanese and Korean mainly - fishing in the same area. The reason for this is almost entirely due to mechanical problems associated with the vessel's propulsion and refrigeration machinery, and the loss of fishing time resulting from this. The cause is a basic one - the lack of experienced local marine engineers, especially with experience of modern refrigerated systems with which "Ekiaki" is equipped.

On the fishing side of "Ekiaki" operations, Tongans have quickly mastered the technique of long-lining, and have proved they are tough and efficient fishermen. Apart from providing essential protein, "Ekiaki" is an excellent training facility for young Tongans and Fishery staff, as well as undertaking investigatory work for the Fisheries Department.

3. Present Activities

During the past years the Fisheries Section of the Tongan Government's Agricultural Department, have been involved in an assessment of the problems facing the local fishing industry in general. Of particular importance was the setting up of a statistical collection system, to obtain an evaluation of the local fishery. This is a necessary prerequisite to its development. For the first time, the Kingdom of Tonga has a reasonable estimate of the nature and value of the local indigenous fishery, which is now estimated at 716 tons. This falls far short of what is required to meet the normal nutritional demands of the Kingdom's people. Tongatapu with its current population in excess of 50,000, is capable of consuming 5/6 tons of fish a day alone. The local supply does not approach this figure, the local landing for Tongatapu and the nearby island of 'Atata, as recorded in the past year, was 251 tons (255,690 lbs.). A further

350 tons was estimated from the Northern group, in all a total of 716 long tons including the 90 tons produced by the fishing vessel "Ekiaki". This leaves a short fall of some 1,000 tons of fish to meet local demands in Tongatapu alone. During the years ending 31 December the Kingdom imported tinned fish alone to value of T\$146,000, almost entirely of Japanese origin.

Though tinned fish is obviously palatable, it is also attractive by having a good shelf life - for shopkeepers as well as consumers - it cannot compare nutritionally with freshly caught fish. The obvious dietary deficiencies in some Pacific Island Territories can be directly attributed to the increased consumption of processed foods, of which tinned fish is regrettably high on the list. The Kingdom of Tonga is no exception.

The basic priority for the Tongan Fishery Department, therefore, is to develop the local fishery to a point when it can satisfy the local demand for fresh fish.

4. Skipjack Fishing Potential

As in other Pacific Island Territories, the potential for developing a skipjack (Katsuwonus pelamis) fishery in Tonga is promising.

Since 1970 the Japanese investigation vessel "Akitsu Maru No. 20" has visited Tongan waters during the season for skipjack, generally accepted as being between October and March. This vessel is operated by the Japan Marine Fishery Research Centre of Tokyo (J.A. MARC) and the fishing investigations have been aimed specifically at the seasonal skipjack resource. The "Akitsu Maru No. 20" arrived in the Kingdom on the 19 December 1973, and commenced her investigations in the Vava'u areas on the 21 December, and completed this on the 25 January 1974. An important and necessary part of the investigation was into the availability of live bait, suitable for the pole and line method of fishing skipjack. Two methods were used - the stick held dip net or "Boki-Ami"; and a floating trap net.

The catch results from both methods were encouraging enough and provided sufficient bait fish to allow the "Akitsu Maru" to pole and line fish for 3-4 hours each day, for 11 fishing days.

The five most significant species caught by both methods were:-

<u>Scientific Name</u>	<u>Common English Name</u>
<u>Dussumieriidae</u>	Round herring or sprat
<u>Carangidae</u>	Selar Crumenophthalmus (Ox-eyed scad)
<u>Apoгонidae</u>	Cardinal fish
<u>Engraulidae</u>	anchovy

Other species in lesser abundance included Rastrelliger brachysoma (horse mackerel), Hemirhamphidae (half beaks) Trachurus sp.

The total amount of bait fish caught in 19 operations was 117.0 kilos which enabled the "Akitsu Maru" to catch in all 16.4 tons of skipjack (Katsuwonus pelamis) and Euthynnus affinus, and other pelagic species in 11 fishing days. The shortage of readily available bait curtailed fishing on several days when large shoals of fish were still present. The size of the skipjack caught - these averaged 5.34 kilos - would seem to indicate that the population are clearly fully adult. The locations of greatest skipjack abundance would seem to be to the West of the Island group, that is, generally West of the entire chain from Tongatapu in the South, to Vava'u in the North. During the early part of March very large concentrations of shoaling skipjack were also sighted to the East of Tongatapu, by the Department's fishing vessel "Ekiaki" indicating a fairly wide seasonal distribution of this resource in Tongan waters.

Since any major skipjack fishery must include a substantial cold store facility, the seasonality of the skipjack (October to March) makes it difficult to plan an economic enterprise on a large scale, as for 6 months of the year, this expensive capital investment would lie unused. This fact, and the uncertainty of the sufficient availability of suitable live bait, must inhibit the interest of possible foreign participation. This may well be advantageous to Tonga and should give the impetus to exploit this resource on a local basis. The fishing for skipjack using the pole, line and live bait method is not a sophisticated technique, in fact the nature of the fishery is well suited to Tongan conditions, as the fishing trips will be of only 2-3 days duration at most. Skipjack fishing does not compare with the labour intensive long-line fishing for tuna, which necessitates weeks spent at sea, on a 'round the clock' basis - conditions which are perhaps alien to the Polynesian way of life. A local skipjack fishery could provide a useful source of much needed employment for many young Tongans, as well as satisfying the local demand for fresh fish. There can be little doubt that this unexploited skipjack resource is a valuable one, which must be given priority in the country's fishery development programme.

5. Australian Pacific Aid Scheme

During the year a delegation from Australia visited the Kingdom and received submissions for Development Aid from Government departments. The development plan from the Fisheries Department was accorded top priority, and the Australian Government has since agreed in principle to the proposals. This provides an infrastructure on which the development of the local fishing industry would be based. Included were the provision of 6 dual purpose dory type fishing boats, designed and fitted to exploit the demersal stocks, i.e. deep water bottom fishing for various species of snapper, and for exploiting the seasonal skipjack resource. Both these valuable resources are unutilised at present.

The proposals also called for the provision of Fishery Extension Centres in the Northern Ha'apai and Vava'u Group, from which fishermen would be trained. Ice making and cold storage facilities (now lacking) would be provided with suitable refrigerated transport to bring the fish to the main internal market, which is in Tongatapu.

The provision of a combined Headquarters and training centre to be built in Nuku'alofa, which would be the Fisheries Department's Headquarters. Two trained fishery extension officers, and a marine engineer would be recruited under the scheme. It is intended that the proposed plan will enable the local fishery to be developed over the next five years, and place a new emphasis on the importance of a primary industry, which should become of increasing value to the Kingdom in the future.

6. Bivalve Culture

The Kingdom of Tonga is fortunate in having inland waters which are as yet, free from any harmful pollutants, and which would appear to be suitable for the cultivation of bivalves, such as oysters and mussels. The Fisheries Section has undertaken salinity and temperature readings for the past year, which confirmed that the Fanga'uta Lagoon on Tongatapu would seem to offer possibilities. With the assistance of Dr Theodore Ritchie, UNDP Oyster Culturalist, assigned to the Fiji Fisheries Division, a trial batch of 7,000 oyster seeds (Crassostrea glomerata) was imported on the 4th December. The young seedling oysters were placed in netlon lined trays and suspended from a floating raft anchored in what was considered the most sheltered area, as far possible away from human habitation and possible interference. It was decided to place trial batches in 3 other localities and to compare relative growth rates.

In a comparatively short time it was clear that, not only had the oysters survived, with negligible mortalities, but that the growth rate was most satisfactory - in some trays as high as 5.1 mm in three months.

The initial results would appear encouraging enough to justify the importation of other species such as the Pacific oyster, Crassostrea gigas, which is a recognised fast grower and is adaptable to varying degrees of temperature and salinities. Though not considered an immediate priority for Tonga, bivalve culture must not be overlooked. The beds of 'kuku' in the Fanga'uta lagoon have now been virtually depleted, mainly as a result of population pressures and over exploitation. The importation of mytilus seed suitable for local conditions would provide a local source of protein, and help to regenerate natural stocks.

7. The Turtle Situation

A survey of the main turtle nesting areas in the Ha'apai and Vava'u groups was carried out during the year, by Fishery Department staff and Volunteer Peace Corps. The results from the survey vindicated the pessimistic predictions made resulting from the 1971-1972 survey. The conclusion made from this survey was that the turtle population would become non-existent in Tonga within the next 5-10 years, unless better laws, more strictly enforced, and a rearing programme implemented. The nesting population has been at a critical low level in the Vava'u and Ha'apai group for the past few years. This year, it was even more critical, with a number of the traditional nesting islands completely devoid of nesting turtles. There is no doubt that human predation on the eggs during the peak nesting period (December - January) is a serious contravention of existing preservation laws, - this, and the indiscriminate use of the modern spear gun to kill marine turtles, has seriously decimated the populations. The fisheries section has now drafted new protection laws, which, if approved by the Government, and strictly enforced, could yet save these interesting aquatic reptiles from complete extinction. The new measures call for the creation of inviolate seasonal sanctuaries on several of the smaller traditional nesting islands in the Ha'apai and Vava'u group, these islands would be under the jurisdiction of the Fisheries Department during this period, to ensure the minimum of interference by humans during the critical period of the turtle's reproductive cycle.

The measures also call for the abolition of the spear gun for killing turtles. The species Dermochely coriacea (Leather Back) would be completely protected, as well as the imposition of a size limitation on the sale of any marine turtle over 35 inches carapace length. It is realised that legislation for the protection and preservation of animal life can only play a supportive role. A campaign must also be mounted to create an awareness of the long term danger of the over exploitation of the marine resources. The marine turtle in the past has been a large protein source in Tonga, as well as providing material for local crafts. The fisheries section does not wish to deny the Tongans the right to kill and eat turtles, it would, however, like to think that this resource will be there to eat in 5 or 10 years time.

8. Crawfish Industry

There has been a decline in the number and value of the spiny lobster, or tropical crawfish, caught and sold during the year. This can be attributed to a lessening interest in the trade by the local buying company - Fathom Fisheries Ltd. This firm which is locally based, is now concentrating on its shipping interests. As this is the only commercially buying organisation within the Kingdom, this section of the Fishing industry is virtually at a standstill. Another factor which has affected the trade was the departure to New Zealand of some of the Company's most experienced crawfish divers. There is, as yet, no other successful catching method being used in Tonga. Total weight of whole crawfish purchased by Fathom Fisheries Ltd. during the year was 17,332 lbs. valued to the fishermen at T\$3120.76.

The future development of this lucrative trade must certainly depend on whether another entrepreneur will replace Fathom Fisheries. Past records indicate a useful resource exists. However, a complete re-assessment of the trade is required. This could form the basis of a very useful project which the South Pacific Commission could undertake. This could cover every aspect from new catching methods, processing, and marketing, and evolving ultimately towards co-operative control by local fishermen.

9. Training

Two members of the Fisheries Section's staff left the Kingdom during the year for further studies. Both were enrolled in the University of the South Pacific, Suva, and they will study for a Fisheries Diploma. It is gratifying that this regional educational facility is now being utilised for training Fisheries staff. The two selected are the first Tongans to be enrolled on this useful study course in Fisheries.

10. Priorities and Policies

The priorities in Tonga's Fisheries Development can be summarised under two main categories:-

(1) Social Economic

The need to provide food, employment and revenue for an increasing population.

(2) Education - Conservation

The need to educate and train a new generation of Tongans, and to create an awareness that a valuable natural asset exists in the Country's Marine Resources. That this natural asset cannot be rationally exploited without some measure of control, supported by realistic and enforceable Legislation.
