SPC/Fisheries 24/Information Paper 20
3 August 1992

ORIGINAL: ENGLISH

SOUTH PACIFIC COMMISSION

TWENTY-FOURTH REGIONAL TECHNICAL MEETING ON FISHERIES
(Noumea, New Caledonia, 3–7 August 1992)

COUNTRY STATEMENT

KINGDOM OF TONGA

700/92

South Pacific Commission
Twenty-fourth Regional Technical Meeting on Fisheries
(Noumea. New Caledonia, 3-7 August 1992)

Country Statement - Kingdom of Tonga

1. Introduction

The newly created Ministry of Fisheries has the overall responsibility for Tonga's fisheries resources and the development of the fishing industry. As of April 1991, the Ministry had its new Director with a total staff compliment of 50 established and 49 non-established staff. The total budget (recurrent and development) for the financial year 1992-1993 is T$4,034,886.00.

There are now seven existing divisions in the Ministry including the Administration Division. Each of which has its own head who consults with the Administration from time to time as needs arise.

Tonga's Fisheries Sector is one of Tonga's major exporters and there is potential for further development. To this end the Ministry of Fisheries is actively pursuing its objectives. The long term objectives of the Ministry of Fisheries, as referred to the Annual Report 1991, are to:

a. increase production of fish and other marine products in order to maximize an economic benefits for Tonga, having full attention to the biological constraint of maximum sustainable yield;
b. expand and improve the technical capabilities of the Fisheries Sector to overcome increasing demands through training and recruitment;
c. consolidate existing artisanal development projects and promote further expansion as imposed by market and resource constraints;
d. expand the development of the deep sea fisheries, as identified by the analysis of available options;
e. create additional employment opportunities thereby increasing income throughout the Fisheries Sector;
f. improve fish marketing, including processing and handling for both the domestic and overseas markets; and to
g. improve the administrative structure of the Ministry for effective management.

The text of this country statement intends to give a brief description of the present activities and development of the Ministry of Fisheries since it has only separated from the former Ministry of Agriculture, Fisheries and Forestry within the last eighteen months. Thus, it is necessary to summarise the present administrative structure of the Ministry; the present research programme is given in the Appendix.

2. Existing Divisions within the Ministry and their present activities

2.1 Administration

The Administration consists of the director, the principal fisheries officer, a fisheries officer who acts as the assistant secretary and an accounant. In addition, typists, clerks, and the computer personnel are included in this section.

2.2 Boatyard

The Boatyard Division involves itself in its own boatbuilding programme which was initiated in 1983 and ended in 1988. By then, 41 boats were constructed under the Fishing vessel construction project funded by UNCDF Project Ton/83/001.

In January 1991, the Artisanal Fisheries Committee approved the construction of an extra 10 boats. The accumulated UNCDF fund administered by the Tonga Development Bank through the program was used as capital to finance this ad hoc task. It was also agreed that the existing stock (engine, fishing gears) supplied under Japanese aid be provided as a subsidy to those fishermen who will purchase the boats. This project however is being delayed fo further reconsideration.

2.3 Engineering

The demand of the Ministry for mechanical, electrical and motor repairs has been the basis for the creation of this division.

2.4 Extension

The Extension Division continues to carry out its tasks towards helping the Tonga Fishermen Association (TFA). Working together with the Association promotes better cooperation among fishermen.

Personnel from this Division are also assigned to the outer islands thus enabling them to help the fishermen on an individual basis.

The Ministry has ice-making machines and deep freezers in the outer centres/islands which help fishermen to store their fish.

With the assistance of the Administration Division, the Extension involves in managing the vessels of the Ministry (Table 1). The MFV Lofa which was formerly owned by the Ministry has been transferred to the Sea Star Fishing Company Limited (SSFCL), a public company with the Tonga Government as its major shareholders.

Table 1: MINISTRY OF FISHERIES VESSELS 1992

Vessels	Utilisation
MFV Albacore 12.08 m	Bait Fishing Operation
MFV Ekiaki Multipurpose vessel	Deep Bottom Handline Fish Transportation
MFV Ngutulei Transporting vessel	Transporting Fish from Outer Stations

In essence the MFV EKIAKI, a 19.08 metres vessel that contains a gross tonnage of 12.8 metric tonnes, operates as a bottom handliner and is currently employed in commercial fishing. The target species for the employment of this vessel involves fishing for longtail snapper (*Etilis coruscans*) and yellow finned opakapaka (*Pristipomoides flavipinis*). This is sent to the Hawaii market.

2.5 TU'IMATAMOANA FISH MARKET

The fish market contains 4 by 10 ton blast freezers, 4 by 10 ton chiller rooms, one 10 ton/day capacity ice-making machine and a fish sale area.

A fish marketing infrastructure has been developed in the Kingdom to facilitate the growth of the fishing industry. The Japanese Government donated freezers and ice-making machines to the outer islands in 1987 giving them capability to produce ice and store fish. The fish are then shipped to Nuku'alofa for sale.

2.6 Research

The Research Division started several Resource Assessment Projects in 1986/88. Two of the most important projects are those of the Inshore Reef Resources and the Seamounts Resources.

The inshore Reef Resources project deals with processing of sea cucumbers (*Aspidochirotid holothurians*) i.e. by boiling, smoking and drying to produce bech-de-mer. The end product is a Chinese delicacy normally exported to dealers in Hong Kong,Singapore, and other parts of South East Asia. At the moment the Ministry is still engaging in an exploratory experiment to test its economic feasibility and potential for export. Its progress is hampered by lack of funds.

Additionally, the Stock Assessment of the bottom fish of the seamounts covers the whole of the Kingdom of Tonga. The purpose of which was to investigate the abundance and hence the composition of the deep water snappers and groupers (*Lutjanidae* and *Serrenidae*) since they are essential fisheries resources in Tonga.

The composition of catch for the Tongan line fishery for the year 1991 based on the seven major species found is shown below.

Table 2: COMPOSITION OF CATCH FOR THE TONGAN LINE FISHERY 1991

2A: Depth > 200m

Species	Tongan Name	Weight(tons)	Numbers
Etilis coruscans	Palu tavake	116.18	36303
Etilis carbunculus	Palu malau	17.05	4880
Epinopholus septemjasuatus	Mohuafi	76.50	2620
Epinepholus morrhua	Ngatala	3.70	1158
Total		213.46	44961

2B: Depth < 200m

Species	Tongan Name	Weight(tons)	Numbers
Lethrinus chrysostomus	Manga	11.23	9363
Pristipomoides filamentosus	Palu hina	40.10	12153
Pristipomoides flavipinis	Palu sio'ata	5.93	4238
Other species		52.75	20058
Total		323.45	907790

2.7 Aquaculture/Mariculture

A number of projects involving winged pearl shell culture development, giant clam project, and mullet stocking have been identified as being probably suitable to conditions in Tonga. The reasons for promoting aquaculture are varied and well known, such as, source of income in agriculturally poor countries; to relieve pressure on overexploited traditional inshore fisheries resources; or an unused area of natural water may be converted to useful production. For these various reasons, establishment of appropriate aquaculture/mariculture are currently underway.

2.7.1 Winged Pearl Shell (*Pteria Penguin*) Culture Development in Vava'u, Tonga

A report by a Peace Corps volunteer who worked for the Ministry in 1988 recommended that a study be carried out on *Pteria Penquin* to see if adequate spat can be collected to establish an oyster farm in Vava'u. A preliminary survey was then undertaken in October 1989 by the FAO-SPADP (South Pacific Aquaculture Development Programme) to:
(a) confirm the presence of giant winged pearl shell population in Vava'u;
(b) observe spat falling, preferred substrata and identify suitable location for the setting of a spat collector; and (c) determine if the natural stock has a potential for an adequate spat collectiion and culture trials to be undertaken.

The result of the survey suggested that only a small number of the pearl oyster broodstock were available and their aggregation was restricted to FAD anchor ropes. Regardless of this unpromising result, the Ministry of Fisheries with support of the FAO-SPADP undertook a spat collection survey in December 1989 fully funded by FAO-SPADP.

Last year the project reached the stage which pearl grafting was very successful. The project continues.

2.7.2 Giant Clam Project

This ACIAR funded project ended last year although continuing support from Australia is being offered through AIDAB.

A concern for the depletion and extinction of the population of giant clams in Tonga had been the catalyst behind implementing of this project. Earlier survey by this Ministry found out that the only species of giant clams living in Tonga is *Tridacna squamosa*, *T. maxima*, *T. derasa* and *T. devoroa.* In addition, evidence of the remains of other species such as *T. gigas* and *Hippopos hippopus* had been found but had earlier become extinct. Thus 10,000 *T. gigas* and 20,000 *Hippoppos hippopus* juveniles were sent from the James Cook University hatchery in Australia. A biofilter with recirculation was set up to maintain elevated water temperatures for these clams over the cooler winter months. Survival of the *T. gigas* was 60% to early October when they were placed in the ocean nursery. There was 75% survival of the *H. hippopus* to December when they were placed out in the ocean nursery.

At the end of 1991 the ocean nurseries consisted of the following:

(i) Tongatapu : 4 cages - *T. gigas*.....3,000
14 cages - *H. hippopus*.....14,000
20 cages - *T. derasa*.....13,000

(ii) Ha'apai : 4 cages - *T. derasa*.....3,000
- *T. gigas*.....1,000
2 cages destroyed by storm and most of the clams

(iii) Vava'u : 15 small box *T. derasa*.....2,000
and 8 cages *T. gigas*.....2,000

TOTAL.....38,000

2.7.3 Mullet stocking of Lake Ano, Tu'anuku

Mullet is a highly regarded fish in the diet of the Tongan people. In 1983 it was estimated that 110 tons of mullet were caught in the waters of Tonga. Information gathered from the local fishermen suggested that the size of mullet captured had declined in recent years. One possible solution to this problem is the development of mullet aquaculture. Initial proposal for a mullet farm in Vava'u was evaluated by the Tongan Government but it was rejected due to its low projected profitability.

In order for the mullet culture to be established in Tonga certain facts had to be identified such as the species present and its respective biology.

The mullet stocking of Lake Ano was imported from the Oceanic Institute Hatchery in Hawaii. Accordingly, in June 1990 a trial shipment of 10,000 fry (*Mugil cephalus*) were brought from Hawaii with financial assistance from FAO-SPADP. The survival rate upon releasing into the lake was 95% ; the average fork length and weight of fry were 33.08mm and 12mg respectively.

In September 1991 (that was sixteen month after the release of the fry in the Lake) thirty mullet were measured. Their average fork length and weight were 28.07cm and 302.3gm respectively.

This FAO-SPADP programme ended this year. However, to ensure that the project meets its objectives, the Ministry will continue stocking the Lake with fry collected from the wild.

Alternatively, the fry may be cultured in a hatchery, however, it would be very expensive and requires intensive experience.

2.7.4 Other Aquaculture Research and Development Projects

A five years project on aquaculture research and development funded by JICA was officially started in October 1992.The beginning of the project started with the renovation of the existing mariculture centre which was partly damaged by hurricane Isaac in 1982. As such, five longterm experts in fish culture, seed producton, shellfish culture, stock survey and a coordinator work full time to implement and conduct the project.

There are two major objectives of the project:

(1) to strengthen aquaculture and resource assessment capabilities at the existing Mariculture Centre, Sopu in Tongatapu Island, and

(2) to provide technical assistance through technical supervision and advice to the Tongan counterpart personnel in the following areas;

a. aquaculture research and development, consecutively in order of priority, for finfish mullet, rabbit fish and milkfish;
b. aquaculture research and development for shellfish to be carried out by introducing of valuable species and enhancing the stock of depleted species; and
c. basic fisheries and biological study in coral reef and lagoon for shellfish basic fisheries and biological investigation on shellfish resources in coral reef and lagoon to be conducted for rational fisheries management.

More detailed notes on this are attached as Appendix.

APPENDIX A

TONGA'S RESEARCH PROGRAMME SINCE 1986

The main objective of the research programme is to assess and monitor those species which are important for local consumption or which form a basis for commercial industries. Some of these programme have been finished and its benefit are invaluable for the advancement of fisheries management measures in Tonga. These projects are also worth mentioned since they depict some of the activities carried out by the Ministry/Fisheries Division in the past 3-4 years.

TIME SCALE	TARGET SPECIES	TYPE OF RESEARCH
1. 1986-1990	Demersal species on seamounts	Full stock assessment program
2. 1987-190	Inshore reef fishes	Stock assessment
3. 1986-1990	Pelagic Species	Data collection for SPC. Tuna and billfish programme and South Pacific Albacore Research
4. 1986-1988	Seaweed (*Euchema* spp.)	Aquaculture
5. 1986=1988	Mullets	Biological study of mullet
6. 1989-1990	*Trochus*	Survey and introduction
7. 1987-1988	*Tridacnidae*	Comparative study
8. 1987-1988	Deep water prawns	Trap surveys
9. 1989-1990	Lobsters	Follow up study of distribution and biology
10. 1987-1989	Local oysters	Identification and assessment of local oyster species for culture purposes

APPENDIX B

OUTLINE OF AQUACULTURE RESEARCH AND DEVELOPMENT PROJECT IN TONGA

(Ministry of Fisheries, Kingdom of Tonga; Japan International Cooperation Agency)

1. OBJECT

The Project will be implemented for the purpose of strengthening aquaculture and resource assessment capabilities at the existing Mariculture Centre, Sopu in Tongatapu Island.

2. DURATION

Five years (from 2 October 1991 - 1 October 1996)

3. MASTER PLAN

The technical cooperation will be implemented through technical guidance and advice to the Tongan counterpart personnel in the following fields:

A. Aquaculture Research and Development for Finfish

Mullet, rabbit fish and milkfish are targeted. Among the three mullet has the first priority, rabbit-fish the second and milkfish the third.

A-1. Biological and ecological research on natural stocks to identify distribution, spawning season, seasonal occurrence, growth rate, etc.

A-2. Identification and development of appropriate methods to collect natural seed.

A-3. Experiment of finfish culture by using tanks (nursery) and pen-culture system (grow-out).

A-4. Examination of economic feasibility of mullet culture in pen-culture system.

B. Aquaculture Research and Development for Shellfish.

The above mentioned are conducted by transplantation of valuable species and stock-enhancement of depleted species.

B-1. Transplantation experiment of *trochus* and green snail.

B-2. Stock enhancement experiment of Giant Clams, mainly *Tridacna squamosa* and derasa by planting seed clams produced in the hatchery.

C. Basic Fisheries and Biological Research in Coral Reef and Lagoon for Shellfish.

The above mentioned are conducted for national fisheries management.

C-1. Surveys to obtain reliable fisheries statistics of Giant Clams, lobsters and other important shellfish.

C-2. Research on status of shellfish stocks and their living environment before releasing seed-shell of giant clams.

C-3. Research on ecological and environment conditions for transplantation of *trochus* and green snail.

C-4. Follow up surveys after releasing seed shells of giant clams and transplanting *trochus* and green snail in order to establish appropriate stock-enhancement techniques.

C-5. Resource assessment study for stock management of important shellfish, mainly *Anadara* spp.

Tongan Personnel	:	Director of the Project, Counterparts.
Japanese Experts	:	Five long-term experts Chief Adviser, Project Coordinator Fish Culturist, Shellfish Culturist, Stock Survey Expert 2-4 short-term expert per year.

Equipment and Material

1. Machinery, equipment and material for seed production, seed collection and pen-culture.

2. Machinery, equipment and material for stock survey.

3. Work boats with outboard motor and vehicles.

4. Other equipment, material sand spare parts necessary for the implementation of the Project.

Outcome so far obtained

Still 5 months after all long-terms experts on the duty station.

So far, a large number of *Liza macrolepis* availability is confirmed.

Spawning seasons for important clams, including giant clams and *Anadara* spp. have been elucidated partly.

Fisheries product consumption survey (market survey) was conducted and a short report is under preparation.

Present fisheries statistic collection method was studied and a comment was given to the counterpart.