GOVERNMENT OF TONGA

Report of the Minister for Fisheries

for the year 1997

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Document prepared by the Ministry of Fisheries of Tonga.

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List of Abbreviations

AB Fishermen	:	Able-bodied Fishermen
ARDP	:	Aquaculture Research Development Projects
CDS/ISIS	:	Computerised Documentation System/Integrated Set of Information Systems
CFTC	:	Commonwealth Fund for Technical Cooperation
CITES	:	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CPUE	:	Catch per Unit of Effort
EDF	:	European Development Fund
EMAS	:	Executive Management and Administrative Support
FAD	:	Fish Aggregating Device
FAO	:	Food and Agriculture Organization of the United Nations
FFA	:	Forum Fisheries Agency
FFC	:	Forum Fisheries Committee
FIMCO	:	Friendly Island Marketing Co-operation
EMP	:	Fisheries Management Plans
FOB	:	Free on board—the price of the product source before freight and insurance is added
FRD	:	Fisheries Research and Development
FY	:	Financial Year
HP	:	Ha'apai
JICA	:	Japanese International Cooperation Agency
JOCV	:	Japan Overseas Co-operation Volunteers
MLCI	:	Ministry of Labour Commerce and Industry
MRAG	:	Marine Resources Assessment Group
MSY	:	Maximum Sustainable Yield
MV	:	Motor Vessels
MT	:	Metric ton
NFS	:	Niuatoputapu Fisheries Sub-station
NUK	:	Nuku'alofa
NTT	:	Niuatoputapu
OIC	:	Officer-in-Charge
PEACESAT	:	Pan-Pacific Education and Communication Experiment by Satellite

PIMRIS	:	Pacific Islands Marine Resources Information System
SOPAC	:	South Pacific Applied Geo-Science Commission
SPADP	:	South Pacific Aquaculture Development Programme
SPC	:	Secretariat of the Pacific Community
SSTFP	:	Small Scale Tuna Fisheries Project
TAF	:	Technical Assistance Fund
UNCDF	:	United Nations Capital Development Fund
UNDP	:	United Nations Development Programme
USA	:	United States of America
USAID	:	United States Agency for International Development
USP	:	University of the South Pacific
VV	:	Vava'u

1. Letter of Submission

Your Majesty

I have the honour to submit the Annual Report of the Ministry of Fisheries for the calendar year 1997.

The total number of established and non-established posts (labourers excluded) on the 31st December 1997 was 98 and 13 respectively. There were 17 vacancies.

There continues to be a shortage of senior staff as a result of overseas training and officers on leave without pay. The most serious shortage continues to be the unfilled Deputy Secretary (technical post) which the Ministry had hoped to fill through overseas technical assistance. The absence of the senior officer responsible for establishment has also hindered the orderly development of staff matters and the proper reorganisation of the Ministry. It has also adversely affected staff training.

In July the Food and Agriculture Organization of the United Nations (FAO) and the Australian Agency for International Development (AusAID) agreed a joint programme to carry out a sector study on fisheries in the Kingdom. The review involved eight specialist consultants and the Deputy Secretary (Administration).

The Japanese Government approved a project to provide a Tuna Fishing Research and Training Vessel under their grant aid scheme at a total cost of USD6.5 million. The costs were to include payment to Maruha Corporation as consultants who were responsible for the design and Niigata Engineering Co. Ltd who constructed the vessel. Familiarisation training in Japan for four Tongan officers, as well as fishing gear, spare parts and delivery costs of the vessel to Tonga were also included in the above total.

The vessel was launched in Japan on 30th October, 1997 after an 8–months construction period and Your Majesty kindly named the vessel *Takuo*, the second Ministry vessel to bear that name, being the Tongan for the yellowfin tuna.

The total Recurrent Estimate for the Financial Year (FY) 1997/98 was increased by 11% when compared with FY 1996/97. The Maintenance and Operations allocation fell by 17.7% from $95,901 (1996/97) to $78,898) (1997/98) while the other votes were marginally increased.

New computer equipment was installed at the Fisheries Offices in Vava'u and Tuimatamoana Market in Nuku'alofa. Net–working and an Internet system were installed at headquarters in Sopu. This has strengthened the capacity to collate data as well as the information capabilities and global communications within the Ministry.

Two Japanese experts continued working at the Aquaculture Section of the Ministry in those areas identified as being suitable to conditions in Tonga such as hatchery of giant clams, and the breeding of trochus and green snails to create new commercial fisheries.

The feasibility study of oyster farming in Vava'u for pearl cultivation in 1996 conducted by a Japanese expert concluded that the farming of mabe oyster in Neiafu harbour had excellent potential and that growth conditions were very encouraging. This important aspect of fisheries is expected to be addressed in some detail in the Sector Study Review.

The Trial seaweed project with Horiuchi Co. of Japan was reviewed in December 1997. The total shipment of mozuku (limu tanga'u) for 1997 exceeded 400 tons. The price per kilo (wet) remained at 25 cents. This trial project was to be continued for a further year (1998) to assess the possibility of increasing production to 1500 tons by net culture.

Assessment and monitoring of pelagic, seamount fisheries, and inshore fisheries resources continued through the year. Work was also carried out on a trochus and green snail recapture survey. This included collection and analysis of data and statistics, stock assessment and biological considerations relating to fisheries management.

Much of the fisheries coastal resources, particularly in Tongatapu, have become threatened as a result of unsustainable harvesting. Inshore fin fish as well as beche-de-mer and lobsters are under pressure. Programmes designed to create public awareness of the dangers of illegal harvesting have had limited effect in Tongatapu. There has been a marked improvement in Vava'u as a result of meetings with the fishermen as well as successful court action. The number and location of fish fences as well as the use of inshore gill nets is under consideration in Tongatapu and it is likely that more management action will be taken once agreement has been reached with the fishing community. The Ministry also needs to strengthen its extension and outreach programme to allow better understanding with the fishing community on fisheries issues.

Following a survey on beche-de-mer stocks carried out with the assistance of SPC staff, the report concluded that restrictive measures were called for if the stocks were to be saved from extinction, Cabinet approved that a ten–year moratorium, with effect from 31st December 1997 be imposed throughout the Kingdom on the harvesting of sea cucumber for export. These measures were introduced in order to allow the stocks to recover. Because the measures had been widely discussed beforehand, the opposition from the exporters was restrained. The measures do not affect subsistence harvesting for local consumption.

The link between the fishing community and the Ministry continues to be an important aspect of the Ministry's mandate. In spite of continued staff shortages in this important area, work included public awareness programmes for schools, colleges, and the general public. Meetings and consultations were held with the growing number of fresh–fish exporters to consider how this aspect of fisheries could be further developed and enhanced.

The Ministry has made clear to the Sector Review team its priorities regarding the development of tuna fisheries as stated in the 1996 Annual Report. The final report from the consultants is expected early in 1998.

The Ministry continued to receive assistance from donor countries as well as regional and international organisations. Of particular note was the new tuna research and training vessel, MFV *Takuo*, and the Tonga Fisheries Sector Study. Important contributions were also received from the SPC and the Fisheries Forum Agency (FFA).

The Secretary continued to represent the Ministry in a number of meetings of the Forum Fisheries Committee (FFC) as well as other fisheries–related consultations. The Multi High Level Consultations continued with the second meeting held in Majuro, Marshall Islands in June. Tonga was represented at that meeting by the Minister for Labour, Industries and Commerce, the Secretary for Foreign Affairs and the Secretary and Deputy Secretary from the Ministry. That meeting agreed a number of principles under the Majuro Declaration to guide the continuing discussions. I led a delegation to the annual meeting of FAO in Rome which included the Director of Agriculture, the Secretary for Fisheries and a Deputy Secretary from the Prime Minister's Office.

In conclusion, I would like to record my appreciation to the staff for their effort and achievements during the year. More will be asked of them if fisheries is to reach its full potential but I have no doubt that all will rise to the occasion.

I have the honour to be
Your Majesty's most humble and obedient servant

……
Vaea,
Minister for Fisheries.

2. Strategic plan

The values of the Ministry of Fisheries in order of priorities and in both official languages were established by the senior staff as follows:

I. Direction
II. Achieving
III. Caring
IV. Balanced
V. Structured

2.1 Philosophy statement

(a) Direction

Establish a clear direction that is internally agreed to and is understood by all those who have dealings with the Ministry. The purpose, mission and objectives set will be easy to evaluate.

(b) Achieving

Make a worthwhile contribution towards the sustainable development of fisheries resources in Tonga whilst meeting the needs of resource users (fishers, consumers, exporters, fish merchants, association, companies and markets).

(c) Caring

Provide a people–oriented service with concern for well–being of society, customers, employees, fisheries resources and the environment.

(d) Balanced

Maintain a balanced concern towards the needs of society and the individual against the sustainability of fisheries resources according to the best information available for conservation and management.

(e) Structured

Create a framework of policies, procedures and rules according to identified strategies which will encourage competence, expertise and rewards through effective management practices.

2.2 Vision

In the year 2000, the Ministry of Fisheries will be an organisation:

(a) Whose staff has the required skills and expertise to analyse and formulate sound policies that would promote effective conservation and management of fisheries resources for their sustainable development.

(b) Which continues to provide services that are essential for the progressive development of the fisheries sector.

(c) That supports a viable fishing industry based on tuna and other fisheries resources.

(d) That ensures Tonga is a leading country in the South Pacific in aquaculture development including the enhancement of fisheries resources.

(e) That supports the sustainable development of small-scale fisheries, which provide the principal supply of seafood for local consumption.

2.3 The Key Goals of the Ministry of Fisheries

The Strategic Key Goals of the Ministry of Fisheries are to:

1. Improve the management systems of the organisation and increase the number of qualified staff.

2. Improve the capacity of staff to analyse and formulate sound fisheries policies and undertake effective sectoral planning and project evaluation.

3. Use an efficient accounting system and undertake effective financial control.

4. Improve the effectiveness of information/data collection and the safekeeping of the scientific, economic, technical and social database.

5. Improve the capacity of the Ministry to undertake and maintain routine assessment of fisheries resources which support the country's fisheries management and development programme in order to provide a scientific basis for management decisions.

6. Develop an advanced and self-sustained national aquaculture programme.

7. Increase the availability and use of oceanographic information and data.

8. Develop improved systems of providing boat–building and engineering support services to other sub-programmes within the Ministry and to the fishing industry.

9. Create fisheries management conditions where the reasonable business and food–security aspirations of fishermen can be attained while safeguarding the fisheries resources.

10. Improve export market development, marketing systems and conditions to ensure increased export and local consumption of fish and other marine products.

11. Create fisheries quality control standards to ensure the health security of the consumers and to improve quality of fish export and local sale.

12. Develop a self-managed fishing industry based on the sustainable exploitation of tuna and other offshore resources, and encourage greater private sector involvement in the operational aspects of fisheries.

13. Develop an extension services programme that emphasises effective delivery of services, and whose staff are identified with projects implemented by all sub-programmes.

14. Provide increased support toward the development of the special role and needs of small–scale fishermen/women and coastal fishing communities.

3. Divisions

The Ministry is divided into three main divisions: Executive Management and Administrative Support (EMAS); Fisheries Research and Development (FRD); and Fisheries Management. The EMAS Division is further sub-divided into four main Sections; Personnel and Human Resources Development; Policy and Planning; Finance; and Information.

3.1 Executive Management and Administrative Support Division (EMAS)

3.1.1 Personnel and Human Resources Development Section (PHRD)

The Policy and Planning section was responsible for this Section in the absence of the Personnel Officer who was still on leave without pay. The main tasks of this section were the completion of job descriptions and job evaluation for all Fisheries personnel under the guidance of the Establishment Division of the Prime Minister's Office. The PHRD consist of 8 staff (5 established staff and 3 daily paid labours) The established staff are:

'Akauola	Secretary for Fisheries
Mafi 'Akauola	Deputy Secretary for Fisheries (Administration)
Losaline Tafea	Senior Fisheries Officer (Personnel and HRD Officer)
Tonga Fifita	Typist Clerk Grade II
'Anaseini T Hasiata	Fisheries Trainee

Appointments and Promotions

Table 1: Promotions and appointments during 1997

Name	Former post	Post was promoted/appointed to
'Ulunga Fa'anunu	Senior Fisheries Officer	Principal Fisheries Officer
Tevita Finau Latu	Fisheries Officer	Senior Fisheries Officer
Siotame Vaipuna	Technical Officer Grade I	Fisheries Officer
Pouvalu Blake	Technical Officer Grade I	Fisheries Officer
'Aisea Tu'ipulotu	Technical Officer Grade II	Technical Officer Grade I
Uanoa 'Ahoafi	Technical Officer Grade II	Technical Officer Grade I
Silika Ngahe	Senior Fisheries Assistant	Technical Officer Grade II
Toma Kauvaka	Senior Fisheries Assistant	Technical Officer Grade II
Tevita Mafi 'Ahoafi	Senior Fisheries Assistant	Technical Officer Grade II
Sio 'Ofanoa	Fisheries Assistant	Senior Fisheries Assistant
'Isileli Ula	Fisheries Assistant	Senior Fisheries Assistant
'Inoke Mapuhola	Fisheries Assistant	Senior Fisheries Assistant
Tevita 'Atana	Fisheries Assistant	Senior Fisheries Assistant
Tevita Tonga'onevai	Fisheries Assistant	Senior Fisheries Assistant
Matafonua Langi	Fisheries Trainee	Fisheries Assistant
'Aisea Vailea	Fisheries Trainee	Fisheries Assistant
Vea Kava	Fisheries Trainee	Fisheries Assistant
Tu'iniua Tupou	Fisheries Trainee	Fisheries Assistant
Siosifa Fisi'ipeau	Fisheries Trainee	Fisheries Assistant
Feauini Vi	Fisheries Trainee	Fisheries Assistant
Koliniasi Hafoka	Fisheries Trainee	Fisheries Assistant
Lupe Fakalelu	Fisheries Trainee	Fisheries Assistant
'Emeline Tonga	Daily Labourer	Fisheries Trainee
Tevita Moa Ha'unga		Mate MFV Ekiaki
Viliami Tonga Vaka		Chief Engineer MFV *Albacore*
Tevita F Vaipuna		Accountant
Tevita Talakai	Clerk Class II	Clerk Class I

Table 1 (continued)

Name	Former post	Post was promoted/appointed to
Sekope Tiueti	Daily Paid Labour	Fisheries Trainee
Fotu Tu'i'onetoa	Daily Paid Labour	Fisheries Trainee
Sione Mailau	Daily Paid Labour	Fisheries Trainee
Talia'uli Napa'a	Daily Paid Labour	Fisheries Trainee
Siosaia Niumeitolu	Daily Paid Labour	Fisheries Trainee

Resignations, study leave & dismissals

Pouvalu Blake, Fisheries Officer, Engineering section resigned from the civil service with effect from March.

Sosaia Tulua, Computer Programmer, was granted two years study leave without pay with effect from mid 1996 to study for a Diploma in Information Technology under an Australian Merit Scheme Scholarship. Losaline Tafea, Senior Fisheries Officer (Establishment) was granted three years special leave without pay with effect from August 1995.

Henisolo Maea, Driver and Heleni K. Pou'uhila Clerk Class III, were dismissed from the Civil Service.

The death of 'Ofa Palavi of Pahu, daily paid labourer is recorded with regret. He died on the 12 April in a road accident.

Staffing

No new staff posts were submitted for Financial Year (FY) 1997/98.

The total number of established and non-established posts (labourers excluded) on the 31st December 1997 was 98 and 13 respectively of which 17 were vacant in 1997.

Table 2: Established and non-established staff of the Ministry of Fisheries as at 31st December 1997

Job category (level)	Job classification (JB)	Job abbreviation	No. of positions	No. of vacancies
L/1	Secretary for Fisheries	SF	1	-
L/2	Deputy Secretary	DS	2	1
L/5	Principal Fisheries Officer	PFO	2	-
L/7	Senior Fisheries Officer	SFO	4	-
L/9	Fisheries Officer	FO	6	2
	Technical Officer Grade I	TO1	5	-
	Accountant	ACC	1	-
	Computer Programmer	CP	1	-
L/11/9	Technical Officer Grade II	TOII	10	-
L/12	Master (*Ekiaki, Ngutulei, Albacore*)	MA	3	-
	Chief Engineer	CE	3	-
	Computer Operator Grade III	COIII	1	-
	Senior Fisheries Assistant	SFA	8	-
	Clerk Typist Grade II	C/TII	3	1
L/13/11	Clerk Class I	CCI	1	-
	Mate/Leading Fisherman	FA	3	1
L/13/12	Clerk Class II	M/LF	2	-
	Computer Assistant	CA	2	-

Table 2 (continued)

Job category (level)	Job classification (JB)	Job abbreviation	No. of positions	No. of vacancies
L/13	Fisheries Assistant	FA	14	1
	Driver	D	1	1
	Fisheries Trainee	FT	24	9
L/14A/13A	Clerk Class III	CCIII	1	1
	AB Fishermen (non established post)	ABF	12	-
L/14	Greaser (non established post)	GRS	1	-
Total			**111**	**17**

Training

Long-term training

The Ministry was awarded two postgraduate scholarships at Masters level but no funding source was identified. The Ministry also received three bachelor scholarships in science, marine engineering and communication and information but the successful candidates for marine engineering and science turned down the offers for personal reasons.

Short–term training, workshops, local & overseas meetings

Several members of staff attended short-term training programmes and meetings both locally and abroad as follows:

Table 3: Local/overseas short-term training workshops and meetings during 1997

Name	Course	Duration	Country
‘Akau’ola	5th FFC Sub-Committee on Future Management Arrangement	3 days	Vanuatu
“	Special 31st FFC	2 days	Vanuatu
“	9th Annual USA Treaty Consultation Meeting	1 week	Vanuatu
Taniela Koloa	5th FFC Sub-Committee on Future Management Arrangement	3 days	Vanuatu
“	Special 31st FFC	2 days	Vanuatu
“	9th Annual USA Treaty Consultation Meeting	1 week	Vanuatu
‘Akauola	Annual FFC Meeting	1 week	Tuvalu
Taniela Koloa	Annual FFC Meeting	1 week	Tuvalu
‘Akauola	FFA Ministerial Meeting	1 week	Marshall Islands
‘Akauola	Official bid opening tender for construction of research and training vessel	1 week	Japan
Taniela Koloa	Official bid opening tender for construction of research and training vessel	1 week	Japan
‘Akauola	Special Technical 34 FFC Meeting	1 week	Solomon Islands
Taniela Koloa	Special Technical 34 FFC Meeting	1 week	Solomon Islands
‘Akauola	Launching ceremony of the new vessel	1 week	Japan
‘Akauola	29th Session of the FAO conference	1 week	Rome, Italy
Taniela Koloa	Launching ceremony of the new vessel	1 week	Japan
Tu’iniua Tupou	14th Regional Fisheries course in coastal Fisheries		Papua New Guinea
Siosiua Finau	Familiarisation training on new tuna research and training vessel/ & delivery of the vessel to Tonga	3 months	Japan
Sione Vai Taunga	Familiarisation training on new tuna research and training vessel/ & delivery of the vessel to Tonga	3 months	Japan

Table 3 (continued)

Name	Course	Duration	Country
Vailele Taukitoku	Familiarisation training on new tuna research and training vessel/ & delivery of the vessel to Tonga	3 months	Japan
‘Aholiapi Taunisila	Familiarisation training on new tuna research and training vessel/ & delivery of the vessel to Tonga	3 months	Japan
Anitimoni Petelo	Benthic Habitats Conference	1 week	New Caledonia
‘Akau’ola	FFA Intersessional meeting	1 week	Solomon Islands
Taniela Koloa	FFA Intersessional meeting	1 week	Solomon Islands
Taniela Koloa	Aquaculture Technical meeting	1 week	Fiji
Matafonua Langi	Observer Onboard	1 month	A. Samoa
Mafi ‘Akau’ola	Fisheries Managers course	1 week	Fiji
‘Anitimoni Petelo	Regional HACCP Workshop	1 week	Fiji
‘Anitimoni Petelo	HACCP Certification	1 week	Samoa
‘Anitimoni Petelo	Fishbase workshop	1 week	New Caledonia
Sio ‘Ofanoa	Observer training	1 week	Fiji
Tevita ‘Ahoafi	Observer training	1 week	Fiji
Silivenusi Ha’unga	VMS training course	1 week	Australia
Silika Ngahe	Improved Sea Food Processing Skills	1 week	Fiji
‘Ulunga Fa’anunu	Aquaculture Training Attachment	2 weeks	Japan

Staff movements

Two JICA aid personnel were attached to the aquaculture section of the Ministry during 1997.

Table 4: Aid Personnel

Name	Title	Funding Agency & Status	Station
Mr S. Sone	Shellfish Culture Expert	JICA	SOPU
Mr K. Kikutani	Stock Assessment Expert	“	“

3.1.2 Policy and Planning Section (PP)

The Policy and Planning section was responsible for Personnel and Human Resources Development and assisted with financial matters as well as the development and review of the Strategic Plan 1996–2000. So far there is only one staff member in this section: Vilimo Fakalolo, Senior Fisheries Officer.

The Ministry of Fisheries Strategic Plan 1996–2000 was completed and reflects Fisheries core business as well as providing direction for the development of strategic goals that are practicable and achievable by the Ministry, Government, industry, and the community.

The second review of the Strategic Plan showed that some of the objectives set by each Section to be completed in 1996 and 1997 were not achieved due to a number of reasons including lack of competent and qualified staff. Other reasons included senior officers on long term training and special leave, limited funds, delays in promised assistance from overseas donor agencies and the unavailability of consultants within the time frame set. Although some of the negative factors were beyond the control of the Ministry, it did underline the importance of setting realistic objectives and targets.

Consultancy works

The following short-term consultancies and studies were implemented in 1997.

(a) Tonga Fisheries sector review

In July 1997 the Food and Agriculture Organisation of the United Nations (FAO) and the Australian Agency for International Development (AusAID) commenced a review of the fisheries sector in Tonga. The review involved eight specialist consultants and a Government of Tonga representative. The team consisted of FAO Team Leader and Fisheries Management Specialist (Robert Gillett), AusAID Team Leader and Fisheries Development Specialist (Peter Cusack), Economist (William Pintz), Planning/Aquaculture Specialist (Garry Preston), Institutions Specialist (Chris Lightfoot), Post Harvest Specialist (David James), Legal Specialist (Blaise Kuemlangan), Human Resource Development Specialist (Hugh Walton), and Government of Tonga Representative (M. 'Akau'ola).

This Fisheries Sector study will be completed in early 1998.

(b) Tuna fishing research and training vessel

Mr. Toshio Hosonuma, Project Manager from Maruha Corporation and his team conducted the basic design study on the construction of a tuna fishing research and training vessel. Basic construction and the fitting out of the vessel was completed by the end of the year.

(c) Pearl oyster farming, Vava'u

The report of the study by Mr Tetsu Yamamoto, Japanese consultant on oyster farming in Vava'u in 1996 was received. The work was funded by South Pacific Aquaculture Development Project (FAO) at the request of the Ministry.

(d) Tuna fish stock in Tonga's EEZ

Dr A.D Lewis and Mr Keith Bigelow from the Oceanic Fisheries Programme of SPC presented their report on tuna fish stocks in Tonga's EEZ. The report was discussed with Senior Fisheries Officers, the private sector and local fishermen both in Nuku'alofa and Vava'u.

(e) Tonga gender and development programme design study

Ms Marion Quinn visited Tonga in October 1997 under the NZODA gender and development programme to carry out a study. Her main recommendation related to the design and implementation of a detailed rural time–use study to supplement census information on the profile of women in rural areas of Tonga. The results generated from this study should assist in identifying the roles and training needs of women in rural life especially in the agriculture and fisheries area.

Projects

The following projects were funded and implemented in 1997:

(a) Tuna fishing research and training vessel

The project for the construction of a tuna fishing research and training vessel under the Japanese grant aid scheme amounting to USD 6.5 million was near completion by the end of the year. The four Tongan officers left for Niigata for familiarisation training in November. It is anticipated that the vessel will be delivered at the beginning of the new year.

(b) Construction and renovation of staff houses, three new vehicles and three boats with outboard engines

This project was funded from the Project Development Fund administered by FFA.
The details of the project and cost estimates are shown in table 5, on next page.

Table 5: Project Development Fund (FFA)Project

	Details	Cost (pa'anga)
(a)	upgrade two staff houses in Vava'u	11,015.00
(b)	upgrade five staff houses in Ha'apai	10,281.40
(c)	three new staff houses for Ha'afeva, Neiafu, Niuatoputapu	50,883.00
(d)	new library for Tongatapu	10,791.18
(e)	three vehicles (1 Toyota double cab 4WD, $22,663 (Vv); 2 Toyota double cab, total $39,980 for TBU and HP)	62,643.00
(f)	3 x 23 ft FRP boats and 3 x 40 HP outboard engines for Nomuka, Niuatoputapu and Ha'afeva.	32,100.00
	Total	**177,713.58**

Three Fisheries staff plus three daily paid labourers from the boatyard section left Nuku'alofa in October 1997 in order to construct and renovate six staff houses in Ha'afeva and Pangai, Ha'apai respectfully. The work was completed early December. The three new vehicles were ordered from Japan and were delivered in Nuku'alofa before the Christmas holidays of 1997. The other components of this project will be carried out in 1998.

Assessment of fish landings at Tuimatamoana Market

The total landings of fish at Tuimatamoana Market by month (excluding road–side sales, Vuna wharf site, Sea Star Fishing Company, Tonga Maritime Project, 'Alatini Fisheries and village markets) are as follows:

Table 6: Total landings of fish (in kg) at Tuimatamoana Market by month

Months	Longline	Artisanal	Middle men	Sold locally	Exported	Total
1	637	100	23	760	-	760
2	6,141	1,926	330	375	4,655	5,029
3	4,435	4,229	1,447	6,485	3,626	10,111
4	3,197	3,575	480	4,411	2,841	7,251
5	7,367	1,701	1,067	6,118	4,017	10,135
6	2,164	670	908	2,796	946	3,742
7	7,819	3,886	1,148	11,401	1,452	12,853
8	11,593	4,164	2,505	14,584	3,676	18,260
9	12,132	5,337	2,341	16,585	3,223	19,808
10	8,890	3,908	3,217	14,537	1,478	16,015
11	12,714	1,736	2,028	13,544	3,082	16,626
12	15,552	515	511	11,664	4,914	16,578
Totals	**92,641**	**31,747**	**16,005**	**103,260**	**33,910**	**137,169**
Percentage	68%	23%	12%	75%	25%	

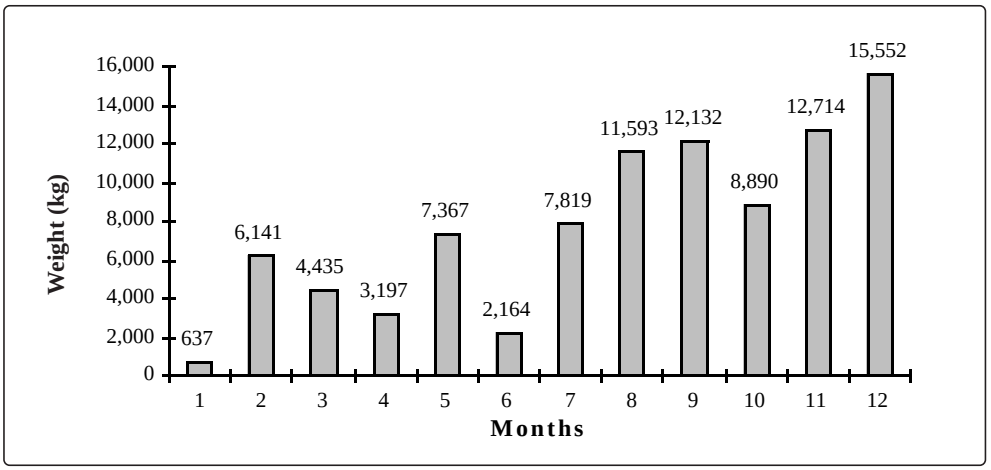

Figure 1

Total monthly fish landings at Tuimatamoana Market by longline vessel.
68% of total landings in 1997 at Tuimatamoana Market are caught by longliner vessels only.

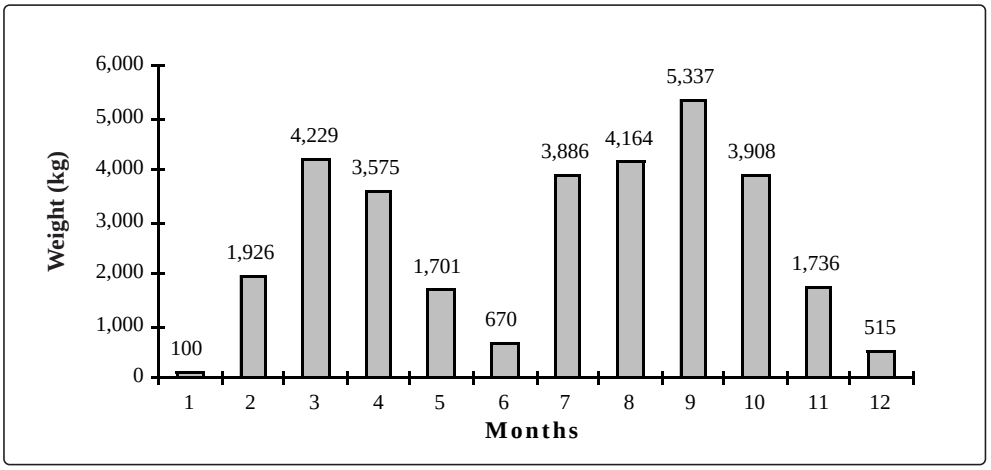

Figure 2

Total monthly fish landings at Tuimatamoana Market by artisanal fleet only.
The artisanal fleet only accounts for 23% of total landings in 1997

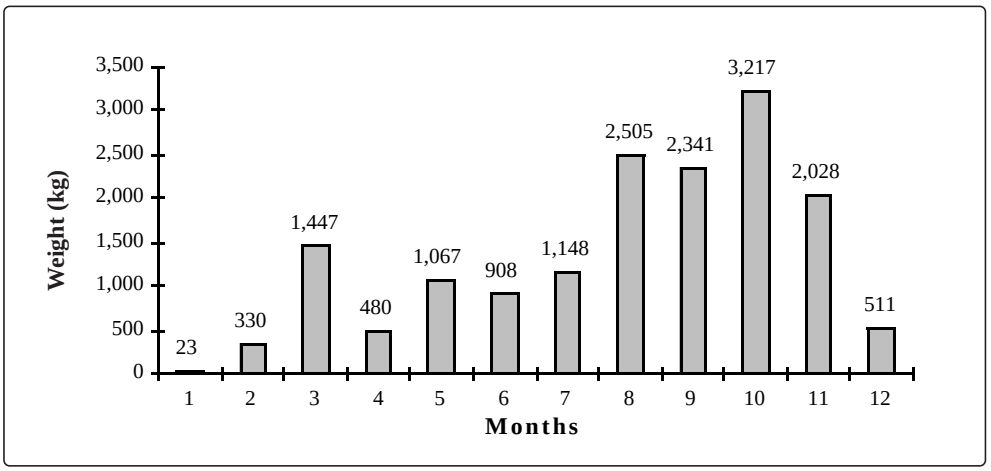

Figure 3

Monthly contributions to fish landings at Tuimatamoana Market by fish buyers from outer islands (mainly Ha'apai). Contributions represent 12% of total landings in 1997

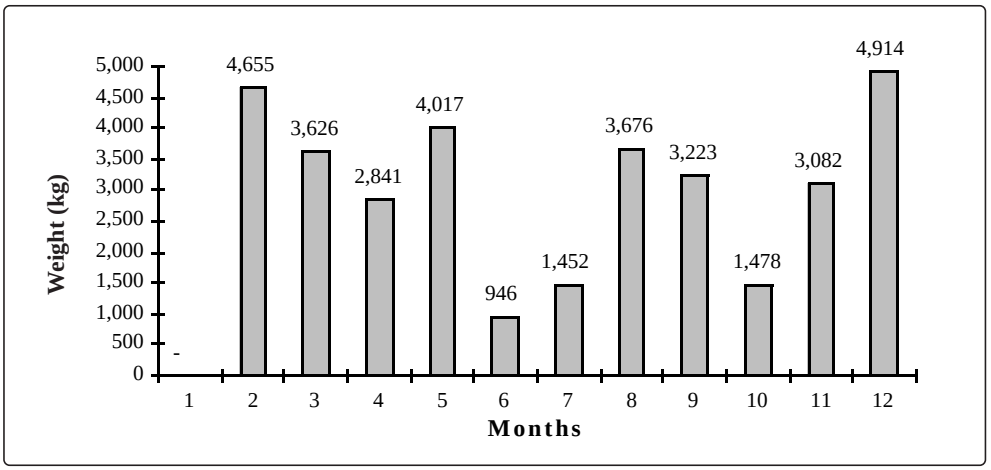

Figure 4
Monthly exports (kg) of fish landed at Tuimatamoana Market during 1997.
Note: Exports comprised 25% of total landings, and were mainly tuna species

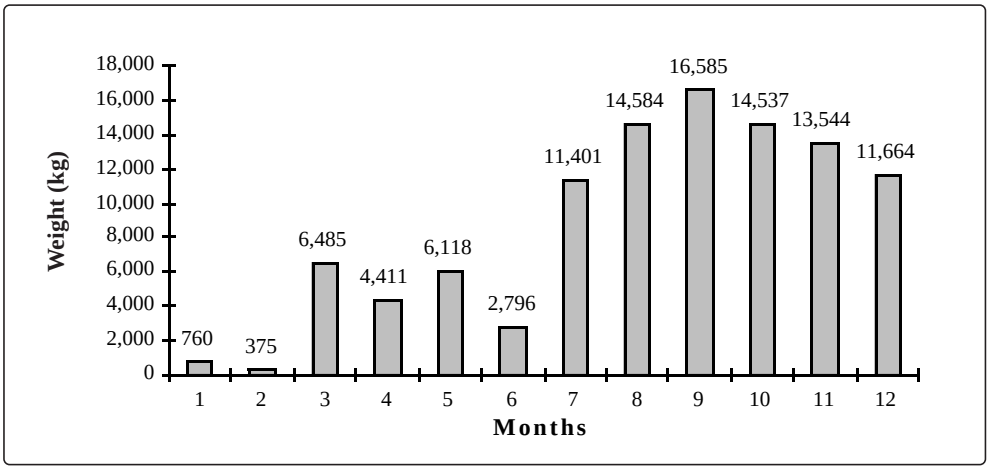

Figure 5
Amount of fish (kg) consumed/sold locally at Tuimatamoana Market
(75% of total landings)

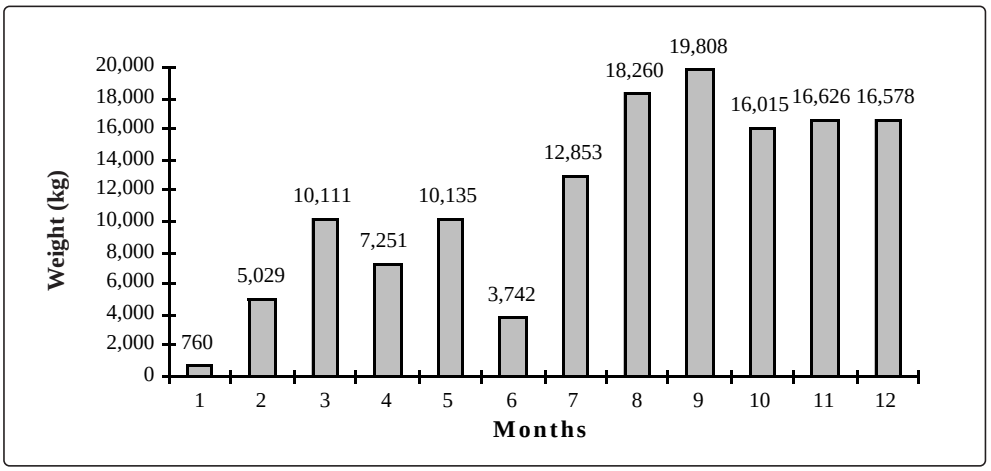

Figure 6
Total amount (kg) of fish landed at Tuimatamoana Market each month in 1997
(average July–December of > 10 ton)

3.1.3 Finance Section

The post of Accountant, which had been vacant since 1996, was filled by Tevita Vaipuna in July after completion of overseas service with the Ministry of Foreign Affairs. The Finance section consists of four staff.

Tevita Vaipuna	Accountant
Tevita Talakai	Clerk Class I
Makalita V. Mafile'o	Clerk Class II
Sione Moahengi Hakeai	Clerk Class II

Recurrent Estimate

The total Recurrent Estimate for the Financial Year (FY) 1997/98 increased by 11% when compared with FY 1996/97. The Establishment Vote was increased by 1.3% from $520,145 (1996/97) to 527,136 (1997/98); and the Maintenance and Operations allocation decreased by 17.7% from $95,901 (1996/97) to $78,898 (1997/98); other votes were increased dramatically. Table7 shows details.

Table 7: Percentage increase/decrease of the Recurrent Estimate (pa'anga)

Recurrent Estimate	**1995/96**	**1996/97**	**1997/98**
Established staff	423,576	520,145	527,136
Unestablished staff	23,800	12,002	34,401
Travel and communication	27,900	27,500	59,103
Maintenance and operations	89,802	95,901	78,898
Purchase of goods and services	110,563	148,548	194,273
Total	**675,641**	**804,096**	**893,811**
Percentage increase/decrease	**%**	**%**	**%**
Established staff	15.07	22.8	1.34
Unestablished staff	– 44.78	– 49.57	186.63
Travel and communication	76.69	– 1.43	114.92
Maintenance and operations	13.46	6.79	– 17.73
Purchase of goods and services	39.52	34.36	30.78
Total	**15.42**	**19.01**	**11.16**

In FY 1997/98, the Established Staff vote accounted for 58.9% of the total Recurrent Estimate of the Ministry; Maintenance and Operations, Purchase of Goods and Services accounted for 30.5% and Unestablished Staff, Travel and Communication for 10.4% as shown in Table 8.

Table 8: Percentage allocation of the Recurrent Estimate (pa'anga)

Percentage allocation by vote	**1995/96 %**	**1996/97 %**	**1997/98 %**
Established staff	62.69	64.69	58.98
Unestablished staff	3.52	1.49	3.85
Travel and communication	4.13	3.42	6.61
Maintenance and operations	13.29	11.93	8.83
Purchase of goods and services	16.36	18.47	21.74
Total	**100**	**100**	**100**

The following graphs indicate changes in the spending pattern of the Ministry over the last three years.

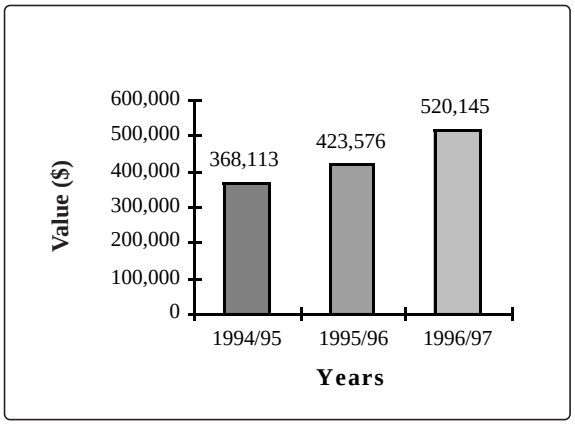

Figure 7
Money spent (pa'anga) on established staff from 1994/95 to 1996/97 financial year

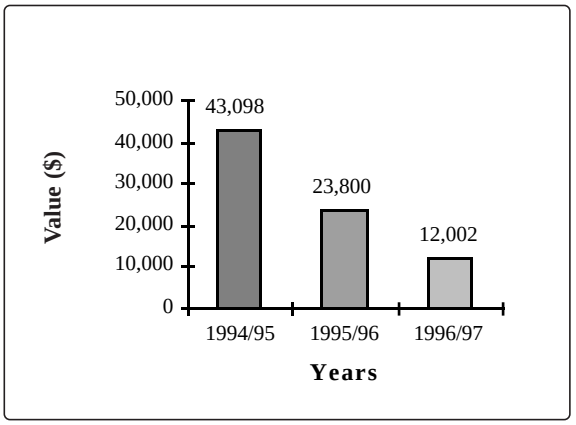

Figure 8
Money spent (pa'anga) on unestablished staff from 1994/95 to 1996/97 financial year

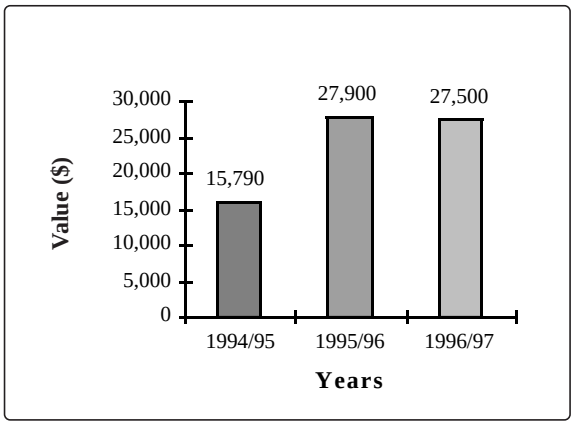

Figure 9
Expenditure (pa'anga) for travel and communication from 1994/95 to 1996/97 financial year

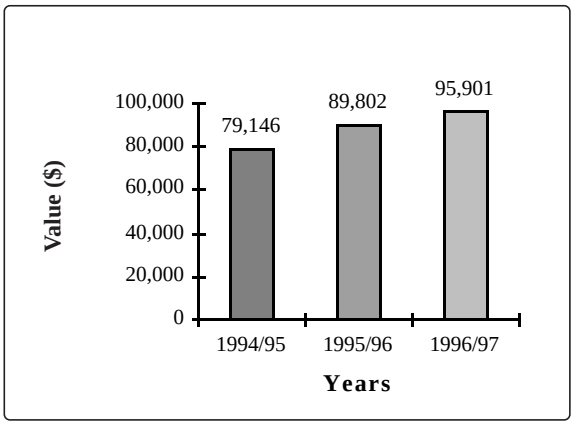

Figure 10
Expenditure (pa'anga) for maintenance and operations, from 1994/95 to 996/97 financial year

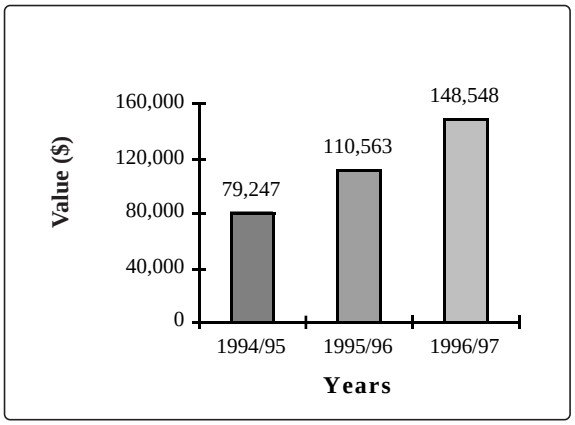

Figure 11
Expenditure (pa'anga) for goods and services from 1994/95 to 1996/97 financial year

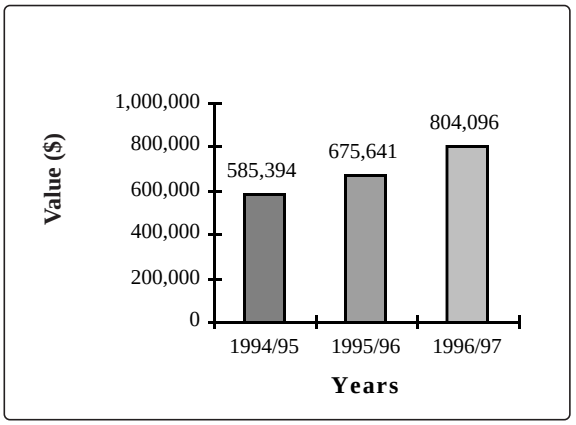

Figure 12
Total Recurrent Estimate of the Ministry of Fisheries from 1994/95 to 1996/97 financial year

Revenue estimate

The major revenue source was the FFA Treaty Funds amounting to US$149,723.00. In addition the revenue collected for the financial year 1996/97 was approximately $82,160.00 plus miscellaneous revenue collected from various Fisheries Centres in the northern islands.

3.1.4 Information Section

The Information Section continued to fulfil its obligations regarding the collation and dissemination of fisheries information to the Forum Fisheries Agency, the Secretariat of the Pacific Community, FAO and other regional organisations.

The Section operated and maintained all computer hardware and software, provided computer services to all sections, trained Fisheries personnel on the use of computer equipment and applications, and co-ordinated the Ministry's inputs to regional computer, satellite and network systems. The Section also maintained the library.

There were four full–time staff in1997. One staff member was transferred from the Extension Section to operate the PEACESAT satellite. Responsibility for SSB radio communication with outer centres and the Ministry's fishing vessels was shared with the Extension Section.

Sosaia Tulua	Computer Programmer
Silivenusi Ha'unga	Technical Officer Grade II
Lavinia Vaikona	Computer Operator Grade III
Losilini K. Loto'ahea	Computer Assistant
Hinemoa Moli	Computer Assistant

Training

The Head of Section, Sosaia Tulua, is still in Australia on two years study leave without pay to undertake a diploma course in Information Technology.

Information network services

The operating system for *TOFISH* network is Microsoft Windows NT Server 3.51. It is a fairly advanced system and easier to operate than the Netware and other Network systems. The Network has one NT file server called *TAKUO*. The NT is installed with 20 client licences per server, which means that there can only be 20 connections to the server at any time. Currently, there are only 11 connections to the server.

A few problems were experienced by the section due to electricity fluctuation, resulting in two of the workstations malfunctioning. The faulty units were repaired in New Zealand.

The list of computer hardware and software used is as follows:

Hardware:

1 HP NetServer LH 5/100
5 Hp Vectra VL 5/100 Series
5 Toshiba T110CS Notebooks
3 Hp 486 Computers
5 Hp LaserJet Printers

Software:

MS Office Professional 95 which includes:

MS Word 95	MS Access 95
MS Excel 95	MS PowerPoint 95
MS Scheduler 95	MS Plus for Windows 95
Windows NT operating system	MS Mail 3.5 Post Office
MS Remote Mail V3.20	

The Peacesat satellite

The Section continued to operate and maintain fisheries PEACESAT under a project supported by the Social Science Research Institute, University of Hawaii and the FFA member countries. These network terminals communicate with each other in point-to-point and point-to-multipoint modes, offering both voice and data services. The project has helped to reduce expenses as well as speeding up communications.

The library

Proper library space is urgently needed. Plans have been drawn up to move the library to the Fisheries Awareness Centre but priority has been given to completing staff housing in the outer islands. Concern has been expressed regarding the valuable information held by the section which needs to be properly housed as soon as possible.

Constraints

(a) Training: Because of the high demand for computing skills within the Ministry there is need for staff to undertake long-term training.

(b) Personnel: A trained librarian will be needed for the library when completed.

(c) Computer equipment: The library as well as the Ha'apai office needs to have computers installed. Modems are required to link Tuimatamoana and Vava'u to the network.

(d) UPS: To avoid problems caused by fluctuation of electricity and damage to the computers, a proper UPS system needs to be installed.

3.2 Fisheries Research & Development (FRD)

The Fisheries Research Division is subdivided into four main sections; Aquaculture & Research, Oceanic and Coastal Fisheries, Development of Commercial Fisheries and Oceanography.

3.2.1 Aquaculture and research

Background

A number of projects involving the propagation and/or growing of marine organisms were identified as being suitable to conditions in Tonga. Promotion of aquaculture is to relieve pressure on over-exploited traditional inshore fisheries; convert unused areas of natural water or agriculturally poor areas to useful production; revive and enhance over-exploited resources and introduce commercially exotic species. Programmes included enhancement of giant clams, introduction of trochus and green snails to create new commercial fisheries, attempt mullet culture to relieve fishing pressure on mullet, and to develop pearl oyster farming and seaweed culture to earn foreign currency.

The Research Programme responsibilities include assessment and monitoring of pelagic sea mount and inshore fisheries resources as well as trochus and green snail recapture surveys. This requires collection and analysis of data and statistics, stock assessment and biological considerations relating to fisheries management.

Major funding of the section is provided by the Japanese Government with the following exceptions:

- pearl oyster programme by Government (US Treaty Funds)
- assessment of deep bottom fishes by the Marine Resources Assessment Group, (MRAG) UK
- seaweed culture by FAO/ SPADP.

Personnel

The Aquaculture and Research Section consisted of 8 (5 established staff and 3 labourers) and 2 Japanese Experts (Stock Survey and Shellfish) A short term expert, Mr Hiroshi Yamakawa, assisted the Aquaculture and Research Project in a shellfish habitat survey from March to April.

Training and staff development

Training programmes were aimed at developing staff skills and included both overseas and local training as well as attachments.

Two members of staff continued diploma courses and another was on the 2nd year of a degree programme, all in aquaculture, at the University of Tasmania.

A number of national and international training workshops were undertaken to provide practical training. One member attended a one–month training programme on shellfish genetics in Japan. Two others participated in an international workshop on green snail seed production and release at Sopu.

Shellfish culture

Giant clam

The giant clam hatchery started in 1989 to enhance coral reefs and to revive wild stocks. Local demand for clam meat is under-supplied. The overseas aquarium market offers good prices for relatively young clams. Clams of 1 to 8 inches shell length were sold to aquarium exporters and a total of 9058 clams (2739 *Tridacna derasa* or tekanoa, 513 *T. squamosa*, or matahele and 5806 *T. maxima* or kukukuku) worth $14,349.10 were sold. The monthly operational costs of the hatchery and income earned from sale of clams were $1,200 and $1,195 respectively. The selling price of the clams and size distribution of the market demand are given in Table 9&10 below.

Table 9: Selling prices per species of giant clam (*Tridacnidae*)

Shell length (inches)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Price ($) of *T. squamosa*	1.25	1.75	2.50	4.50	6.00	8.00	11.00	16.00
Price ($) of *T. derasa*	1.00	1.50	2.00	3.50	6.00	7.50	10.00	15.00
Price ($) of *T. maxima*	1.00	2.00	3.00	4.50	6.50	8.50	12.00	17.00

Table 10: Market demand and size distribution

Shell length (inches)	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**Total**
No. of *T. squamosa*	-	314	1,163	936	-	-	-	-	**2,413**
No. of *T. derasa*	131	2,672	1,784	552	189	135	133	29	**5,627**
No. of *T. maxima*	5,806	-	-	-	-	-	-	-	**5,806**

The demand for *T. derasa* was highest for 2 and 3 inches, which represented 79.2% of the total sale. The demand for *T. squamosa (2* inches) was strong but the supply was limited. In the last two years there was no spawning of *T. derasa* nor *T. squamosa*. As a consequence there were insufficient stocks of small-sized clams (1 and 2 inches) to meet demand. The demand for *T. maxima* was higher due to its beautiful mantle colour, but stocks on hand were only 1 inch in length.

Induced spawning of *T. derasa* was carried out. In the process enough eggs were collected but no sperm. One clam had to be sacrificed and the male gametes extracted to fertilise the eggs. The result was very successful, but is not recommended for stock enhancement because all the F1 are expected to have very few genetic differences.

A national workshop on giant clam farming was conducted in December with financial support from the Commonwealth Secretariat. Sixteen participants were selected from island resorts (4), village/island development groups (7) and individuals (5) from Vava'u (10), Ha'apai (4) and Tongatapu (6). After the training programme, all participants were given 250 clams, free of charge, to start their own farm.

At the end of the year the total number per species of clams at ‘Atata, Kolonga, ‘Euaiki and the Ministry’s ocean nursery were as follows:

Species	Ministry	‘Atata	Kolonga	‘Euaiki
Tridacna derasa	12,000 (3–8 yrs old)	5,300 (3-8 yrs old)	5,000 (3-8 yrs old)	700 (3-8 yrs old)
T. gigas	500 (7 yrs old)	1 (7 yrs old)	-	-
T. squamosa	2,000 (7 yrs old)	700 (7 yrs old)	-	-
T. maxima	70,000 (2 yrs old)	-	-	-
T. tevoroa	14 (5 yrs old)	-	-	-
Hippopus hippopus	700 (7 yrs old)	-	-	-

Green snail, Turbo marmoratus *(‘elili lanumata)*

About 1000 snails from last years spawning were measured and transferred to Vava’u to compare their growth rate with those in Tongatapu. These were kept in a floating cage and fed with *Gracilaria* spp. from the lagoon area adjacent to Makave and Houma. In the first 5 months the average size of those in Vava’u was higher due to higher water temperature and better water parameter.

The successful result of seed production in 1995 and 96 attracted the interest of other countries. The first international training workshop on green snail seed production was organised, upon request from various countries in the region, and held in Sopu from 17 February to 27 March. The programme was funded by FAO-SPADP and technical co-operation was provided by JICA. The number of participants from abroad were limited to four due to limited facilities and equipment available for the training. The participants from abroad were from Samoa, Solomon Is., Kosrae Is. (FSM), and Cook Islands. During the training participants compiled and produced a video tape and a manual on seed production for future training and references.

Given below are the number of green snails that survived from each year’s spawning at the end of the year.

Year	No. of snails still at the hatchery	Average size (mm)	Others/Remarks
1995	85	80	10 snails were released at 'Euaiki in Feb. during the workshop for demonstration
1996	6,000	55	1000 were transferred to Vava'u in June. Average shell height in December was 57mm compare to 55mm in Tongatapu
1997	2,000	20	The survival and growth rate compared to last year were lower due to a prolonged cold season. Average shell height last year was 27mm.

Tapestry turban, Turbo petholatus *(‘elili)*

The *T. petholatus* shell is extensively used in shell jewellery. Because of the natural smooth shell with beautiful colour, they are commonly used by aquarium traders to control weeds biologically in aquarium tanks.

In May a trial spawning of *T. petholatus* was carried out with a view to export to aquarium markets. A total of 13,000 creeping–stage larvae were collected four days after fertilisation. In December about 3,500 juveniles (4 to 6mm shell diameter) were counted and transferred to the final culture stage before exporting.

Trochus, Trochus niloticus *(takaniko)*

The technique of spawning trochus was demonstrated during the green snail seed production workshop. A total of 120,00 creeping stage larvae were collected four days after fertilisation. In December about

4,000 juveniles (18 to 30mm shell diametre) were counted and transferred for polyculture with giant clams. The trochus helps to clean the weeds that grow on the tank and the clams.

About 500 trochus from the spawning in December, 1995 were maintained in the hatchery to control the weeds in giant clam tanks. Some shells tested had reached maturity. All the shells had reached a suitable size for release and will be released early in the new year.

Finfish culture

Mullet culture

The former Chief Advisor of the Tonga-Japan Aquaculture Research Development Programme, Dr. Hiromi Ikenoue, conducted a feasibility study of mullet culture. The conclusion was that intensive culture of mullet in pen is not feasible. The reasons given were: the cost of high protein feed compared to average price for mullet at local markets; insufficient and irregular supply of *Mugil cephalus* fry due to extreme fishing pressure on stock and the slow growth rate of *Liza* spp.

On the other hand he suggested that an extensive culture of *Liza* spp, with minimum stocking size of 5cm, would be feasible without supplementing feed. The pen size needed to be more than 1 1/3 ha. The calculated internal rate of return for 1, 1 1/2 and 2 ha fish pen would be -7%, 14% and 29% respectively.

Some interest was shown in mullet farming using the extensive culture method. However damage sustained by strong winds at the beginning of the year to the demonstration fish fences dampened interest and no one wanted to conduct extensive culture trials of *Liza* spp. as recommended by the consultant. The project was terminated due to high risk and the prolonged culture period of at least one year for *Liza* spp to reach marketable size. The schooling (swimming in group) behaviour of mullet is another disadvantage as the whole group will escape once a single fish finds a hole in the net.

Seaweed, Cladosiphon *sp. (limu tanga'u) export*

According to the H&H Co. Ltd Representative that is exporting seaweed (*limu*), the Tongan variety is different from that found in New Caledonia or Okinawa and requires different culturing and processing methods. Overall, Tongan seaweed is a more preferable product and better suited to Japanese tastes.

Harvest and processing methods improved significantly when compared to 1996. During the peak months the company was able to process 8 to 9 tons a day. H&H Co. employed 25 labours at the beginning of the season which gradually increased to 90 when the daily harvest of seaweed increased to more than 10 tons. Total export was 403 tons compare to 43 last year. It was estimated that 20% of the final product was lost due to high water content and mixing with other seaweed.

Farm trials of seaweed were conducted with technical and financial support from the FAO-SPADP. Sporophytes were successfully obtained using two different methods. The first method was placing the culture nets together with mature stocks in a culture tank and the other was placing the culture nets in natural stock grounds. Higher germination rates were observed on nets using the later method. Grow-out method was exactly the same as that used in Okinawa. It took one month to obtain new sporophytes and grow-out to intermediate cultivation stage. Average production per net was 31kg with a max. and min. of 56 and 8 respectively. Production per net depends on germination rate and the environment.

3.2.2 Oceanic & coastal fisheries

Inshore fisheries statistics

Data on sales volumes, species composition, price and fishing methods were collected from Faua and Vuna wharf fish landing sites between 6–8am, 10am–12.30pm and 2pm–6pm everyday except Sundays and public holidays. The estimates given do not represent the total landing in the whole of Tongatapu. Fish consumed by the fishermen and those that were sold in other places are not included. Nevertheless, the estimates represent more than 80% of the total landing in Tongatapu.

Total fish landings were estimated at 425 metric tonnes. All the species were grouped into 35 families and 5 major families made up more than 82% of the total landings. These were Scaridae (*Hohomo, 'Ufu,*

Olomea, Menenga, Pongongo and *Pose*), Scombridae (*Takuo, 'Atu* and *Valu*), Lethrinidae (*Mu, Hoputu, Manga, Tanutanu* and *Koango*), Acanthuridae (*'Ume, Pone* and *Manini*) and Carangidae (*Lupo* and *'Otule*).

Night diving landed the most catch which was estimated at about 49.2% of the total landings. Net fishing came second with about 21.6%. Both fishing methods and most of the other methods obtained optimum yields during May, June and December. The highest landing for night diving during cold months reflected the high demand for seafood during Church Conferences, May Sunday, and Mother and Fathers' Day Sunday.

The high monthly landing from night diving may be attributed to the large number of fishermen involved in this type of fishing. About 60% or more of the inshore fishermen are night divers. The most effective fishing method with highest CPUE is net fishing.

Stock assessment programme: management of multi-species tropical marine fisheries

The stock assessment project, in collaboration with Marine Resources Assessment Group (MRAG) of London, was extended for another 3 years until April 98. The report of the first stage was presented in last year's annual report.

3.2.3 Development of commercial fisheries section

The Development of Commercial Fisheries Section consists of three vessels (MFV *Albacore*, *Ekiaki*, and *Ngutulei*). The vessels were employed in exploratory work as well as searching for new fishing grounds. The Fleet Manager and Fishing Masters involved in the fishing operations have considerable fishing experience, both in bottom fishing and longlining. Section staff are as follows:

	Taniela Koloa	Principal Fisheries Officer
MFV *Ekiaki*	Afemui 'Ufi	Master,
	Sioeli Pasikala	Chief Engineer
	Vacant	*Mate*
		(4 AB Fishermen and 1 Greaser)
MFV *Albacore*	Haani Lave	Master
	Siosifa 'Utumoengalu	Mate
	Vili Vaka	Chief Engineer
		(4 AB Fishermen)
MFV *Ngutulei*	Sione Sositeni	Master
	Vacant	*Mate*
	Paea Mapu	Chief Engineer

MFV *Albacore*

This vessel was used for baitfishing; the targeted species being sardines and big-eye scads. Vava'u was considered the best fishing grounds for this type of fishing.

Table 11: MFV *Albacore* operational days for 1997

Month	Number of days fishing	Fishing ground	Quantity (Kg)
September	7	Vava'u	1,634
October	6	Vava'u	1,244
November	5	Vava'u	216
December	4	Tongatapu	188
Total	**22**		**3,282**

MFV *Ekiaki*

MFV *Ekiaki* is used for exploratory fishing, particularly longline fishing for tuna. The boat conducted seventeen fishing trips during 1997. Details are shown in Table 12.

Table 12: MFV *Ekiaki* fishing trips and catches for 1997

Fishing Trip	Date Fishing	Total Fish Catch	Total Kg
No. 1	13–18/1/97	29	679
2	10–15/2/97	-	744
3	24–28/3/97	26	551
4	7–12/4/97	49	1,036
5	12–25/4/97	16	316
6	12–17/5/97	77	1,490
7	26–1/6/97	74	1,485
8	12–14/6/97	17	285
9	16–21/6/97	48	905
10	30–6/7/97	34	646
11	14–19/7/97	72	1,204
12	30/7–9/8/97	33	545
13	10–31/8/97	130	2,577
14	21/10–25/10/97	21	816
15	19–22/1197	87	1,909
16	1/12–6/12/97	73	1,577
17	10–16/12/97	73	1,655
Total		**859**	**18,420**

Table 13: Fish species caught by MFV *Ekiaki* in 1997

Fish species	Number of fish	Quantity (kg)
Albacore	412	8,240
Bigeye	91	2,164
Marlin	22	205
Yellowfin	121	2,235
Skipjack	4	27
Shark	129	2,511
STM	46	1,488
Swordfish	1	50
Other	33	500
Total	**859**	**18,420**

MFV *Ngutulei*

This vessel was used for bottom line fishing and transportation of building materials for construction of Fisheries staff houses at Ha'afeva. Other duties in 1997 included assistance to the Ha'apai Agricultural Show 1997 and the annual dry docking

Table 14: MFV *Ngutulei* operational days for 1997.

Details	Days
Fishing days	25
Annual dry docking	10
Agricultural Show	8
Transportation of materials to Ha'afeva	10
Days at port	312
Total	**365**

3.2.4 Oceanography Section

Although no qualified staff has been assigned to oceanography, the Ministry has included this section in the Strategic Plan for 1996 to 2000 and the Organisation Structure. This section is to be established in the future and staff properly trained.

3.3 Fisheries Management (FMD)

The Fisheries Management Division is further sub-divided into Management and Licensing, Support Services, Marketing and Market Development, Post Harvest and Quality Control, and Extension Services in Vava'u and Ha'apai.

3.3.1 Management and licensing section

Introduction

The Management and Licensing Section was responsible for fisheries management, monitoring and control including surveillance, enforcement, licensing and legislation.

Management duties include preparation of fisheries management plans (FMP) in conjunction with other sections such as Planning and Research. Additional responsibilities include screening applications for licences issued under the Fisheries Act 1989 and its Regulations such as fishing vessels (local, commercial & sports fishing), fish processing establishment, fish fences, marine products, etc.; conveying views of the Ministry to the public/private sectors and other government institutions/departments such as: the Ministry of Labour, Commerce and Industries (MLCI) with regards trading & development licenses, Ministry of Lands, Survey and Natural Resources (MLSNR), and the Ministry of Marine and Ports for safety and seaworthiness of fishing boats and other departments such as Customs, Health and Tourism.

Monitoring and Control responsibilities include: (a) co-ordinating fisheries enforcement and prosecution in accordance with the Act and its Regulations e.g. fishing with dynamite and other fisheries offences, (b) surveillance programmes such as aircraft/boat patrolling in Tonga's 200 mile zone, (c) Observer Programme in the FFA member countries under the Fisheries Treaty with the United States of America, (d) Regional Register of foreign fishing vessels and (e) examination and inspection of marine products for export. The importance of international quality standards was specially highlighted in 1997 with the introduction and implementation of HACCP (Hazard Analysis and Critical Control Point) by the United States of America.

Licensing responsibilities include: (a) registration and licensing of fishing vessels and fish fences, (b) collection of 0.5% resource rent of the local value of marine products commercially exported and other licence fees.

Legislation responsibilities included co-ordinating the review of fisheries legislation.

Other miscellaneous tasks of the Section included preparation of letters of authorisation for export of all marine products designated by Fisheries Act or required under CITES (Convention on the International Trade of Endangered Species).

Table 15: List of Exporters of Marine Products

Name of exporter	Address	Marine products exported	Year of establishment
Dateline Aquarium Fish Company Ltd (Paula Vi)	Haveluloto	live tropical fish & invertebrates	1994
Intra Pacific (Willis L. 'Unga) *	Kolofo'ou	live tropical fish & invertebrates; lobsters	1992
Sea of Color (Eddie Kelly) *	Kolomotu'a	live tropical fish & invertebrates	1993
Mele D. Vaha'i (Mele's Export) *	Niutao	live tropical fish & invertebrates	1995
Walt Smith International (Walt Smith)	Ma'ufanga	live tropical fish & invertebrates	1980
South Sea Investment & Development Co. Ltd. Fung Shing Co. Ltd	Kolofo'ou	beche-de-mer	1994
Ocean Fresh Investment Ltd (Philip Gu & Sione Taumoefolau)	Ma'ufanga	shark fin, beche de mer, tuna & lobster	1993
Pacific Seafood Ltd (Lonimar Australia Pty Ltd)	Neiafu	beche-de-mer	1993
T & L Trading (Taniela Foliaki & Li) *	Sopu	shark fin and beche-de-mer	1994
South Pacific Seafood (Owen Kami & Tom Trudgeon) *	Olota'ane	shark dried fin & beche-de-mer	1994
'Ainise Tohi *	Ma'ufanga	shark fin and beche-de-mer	1994
Suntex (Johnson Lee) *	Kolofo'ou	beche-de-mer	1994
FIMCO *	Kolofo'ou	fresh fish	1994
Sea Star Fishing	Small Industries	fresh fish	1990
Maritime Projects Co. (Tonga) Ltd	Sopu	fresh fish, shark dried fin & beche-de-mer	1980
'Alatini Fisheries Co. Ltd (Bill Holden)	Small Industries	fresh fish	1990
Capricorn Fishing Co. Ltd (Peter Hurrell & Siotame Taunaholo)	Kolofo'ou	fresh tuna	1993
Sea Eagles Fishing (Tukua Tonga & Rev. Taniela Moala)	Fasi	lobster & tuna	1995
KM Fishing (Koli Moa)	Fanga	fresh tuna	1994
Sea Food Products (Tonga) Ltd *	Ha'avakatolo	fresh fish	-
Fehoko Trading (Ane Maquier. Nee Fehoko) *	Kolofo'ou	lobster & beche-de-mer	1995
Sione Kiteau Topui *	Sopu	lobster	1995
Rev. Lehopoame To'a Tonga'onevai *	Haveluloto	lobster	1994
Pupunga Mahe	Kolofo'ou	tuna	1997

* inactive

Many exporters were inactive in 1997 for various reasons: Beche de mer exporters experienced a rapid decline in sea cucumber stocks, especially the high valued species such as sandfish (nga'ito), white teatfish (huhuvalu) and black teatfish (mokohunu). Cabinet on the advice of the Ministry imposed a 10 year moratorium starting in 1998 on beche-de-mer exports to be reviewed after 5 years. The lobster exporters did not receive supplies from fishermen, the fresh–fish exporters suffered from engine problems and an ageing fleet and some exporters considered the current government tax levies as a disincentive pushing their operational funds below the break-even point. Other problems may have been related to poor management.

Local meetings

At the beginning of 1997, the bottom fishing vessel MV Hakautapu was lost at sea for a number of days before it was found after an intensive search and rescue operation in the southern waters of Tonga. The vessel was not registered nor did it fulfil the safety requirements of the Marine Department vide the Fisheries Act.

A meeting with boat owners and boat captains was called in early February by the Ministry of Fisheries and the Ministry of Ports & Marine to discuss the requirements of the Act and also to be informed that no boat shall leave for fishing until it complies with safety requirements.

A further meeting was held on the 7th August at which boat-owners raised their concern about the expenses that would be incurred if safety equipment was to be mandatory. At present only one firm imported the equipment at a cost of over $9,000 for the full set. Boat-owners requested that Government assist by providing relief from customs and port and service duty on such imports. The Ministry of Fisheries, Ports & Marine and other interested agencies such as Tonga Telecommunication Commission, Tonga Development Bank, Ministry of Labour Commerce & Industries are of the view that duty–free exemptions should be granted on all life–saving equipment. No decision has so far been made on the request.

Marine exports from Tonga

Fisheries products commercially exported include beche-de-mer, dried sharkfin, aquarium fish, soft coral & coral rock, lobster, tuna, snapper, and grouper. Exports for home consumption include all forms of reef fish, octopus, pelagics and marine products such as mollusc shells, turtle shells, and other souvenirs made from black coral and oyster shells. Although Tonga is not a party to CITES, destinations such as New Zealand, Australia and Japan, require letters of authorisation for clearance.

Recent studies have shown that the contribution of fisheries to the economy of Tonga has increased. The fisheries sector made a direct current price contribution to the Gross Domestic Product (GDP) of about 10–13% in 1996/1997. Fisheries products are the second largest export earner for Tonga with an estimated value exceeding T$4.6 million in 1997. Although the beche-de-mer fishery has collapsed, other products such as seaweed have become valuable substitutes.

Below are the FOB value of marine products from data collected by the Ministry of Fisheries. Currency shown are expressed in Tongan pa'anga unless otherwise indicated.

Table 16: Summary of the marine exports of products (by species) in 1997

Species/group	FOB value (TOP) in 1995	FOB value (TOP) in 1996	% proportion of increase (↑) or decrease (↓) of FOB revenue in 1996 compared to 1995	FOB value (TOP) in 1997	% proportion of increase (↑) or decrease (↓) of FOB revenue in 1997 compared to 1995
Sea cucumber	1,156,782.60	884,923.50	↓ 23.50 %	65,651.00	↓ 94.3 %
Dried sharkfin	38,160.00	52,650.00	↑ 38.00 %	12,936.00	↓ 66.0 %
Lobster	44,439.00	7,950.00	↓ 82.00 %	1,875.00	↓ 95.8 %
Tuna	392,648.70	136,745.00	↓ 65.20 %	158,631.55	↓ 60.0 %
fresh tuna					
frozen locally				700,000.00	
cannery				300,000.00	
Snapper & grouper	409,959.00	651,311.50	↑ 59.00 %	605,640.00	↑ 47.7 %
Aquarium fish & coral (including giant clams and live coral)	346,144.50	563,590.60	↑162.80 %	445,693.75	↑ 28.8 %
Seaweed	-	8,250.00	-	112,500.00	
Total	2,388,133.80	2,326,993.85		2,402,927.30	

Miscellaneous

450 metric tonnes of seaweed were exported in the second trial year amounting to $112, 500.00. Summary of the FOB Value of the marine/fisheries resources exported is shown in Table 16.

Beche-de-mer

Only about three exporters operated in 1997; an indication of the stock decline. The exporters were Ocean Fresh Investment, South Sea Investment (Fung Shing), and Pacific Marine Products. Table 17 shows a summary of the quantity of beche-de-mer species exported from Tonga in 1997.

Only about 10 metric tonnes (MT) total weight (dried biomass) of beche-de-mer were exported in 1997, almost a 90% decline from 1996 exports (approx. 86.4 MT in 1996, and 108.7 MT in 1995). The total FOB value of beche-de-mer exports in 1997 was $65,651 (approx. $884,923.5 in 1996 and $1,156,782.60 in 1995).

Highly valued species such as *huhuvalu* and *nga'ito* were not abundant. Although there was a lack of data from previous years, a report by Dr Patricia Kailola on "Food security in Tonga" speculated the catastrophic decline of both species. The low-value species such as *holomumu*, *lomu*, *loliloli* and *lolilalahi* also showed a decline. The industry also exported low-value species such as *matamata*, *pulukalia*, and *'elefanite* in order to stay in business. A field study conducted early in 1996 by SPC Coastal Fisheries scientists indicated that only about 10% of the sea cucumber population remained. The study recommended that harvest and export of sea cucumber should be banned for 10 years to ensure complete recovery of the stock.

Table 17: Quantity and FOB value of beche-de-mer exports in 1997

Species (common, Tongan & scientific names)	**Weight (metric tonnes)**	**FOB value of dried product (T$/kg)**	**Estimated FOB value (T$)**
White teatfish	1.2 (↓ 94.8%)	-	13,180.00
Huhuvalu	12.3 (↓ 47.2%)	25.00	307,975.00
Holothuria fuscogilva	[23.3]	[20.00]	[465,854.00]
Black teatfish	0.6 (↓ 88.7%)	-	5,600.00
Mokohunu	4.4 (↓ 17.0%)	10.00	44,270.00
H.nobilis	[5.3]	[10.00]	[52,727.00]
Sandfish	0.1 (↓ 96.4%)	-	3,150.00
Nga'ito	1.7 (↓ 39.3%)	30.00	51,750.00
H. scabra	[2.8]	[25.00]	[70,850.00]
Greenfish	0.01 (↓ 99.0%)	-	450.00
Holomumu	2.5 (↓ 81.2%)	9.00	22,086.00
Stichopus chloronotus	[13.3]	[9.00]	[119,601.00]
Tigerfish / leopardfish	2.8 (↓ 67.8%)	-	22,000
Matamata	8.7 (↑ 141.7%)	8.00	69,440.00
Bohadschia argus	[3.6]	[8.00]	[28,720.00]
Prickly redfish	0	0	0
Pulukalia	2.7 (↑ 107.7%)	8.00	21,384.00
Thelenota ananas	[1.3]	[8.00]	[10,213.60]
Curryfish	0.01 (↓ 99.5%)	-	250.00
Lomu	3.1 (↓ 51.8%)	10.00	30,800.00
Stichopus. variegatus	[6.3]	[10.00]	[63,485.00]
Stonefish	0.3 (↓ 94.0%)	-	1,699.00
Teleheamaka	3.6 (↓ 28%)	7.00	25,382.00
Actinopyga lecanora	[5.0]	[7.00]	[35,226.00]

Table 17 (continued)

Species (common, Tongan & scientific names)	Weight (metric tonnes)	FOB value of dried product (T$/kg)	Estimated FOB value (T$)
Elephant trunk	0.5 (↓ 76.2%)	-	1,250.00
'Elefanite	10.5 (↑ 400%)	4.00	41,960.00
H. fuscopunctata	[2.1]	[2.50]	[5,362.00]
Lollyfish	2 (↓ 73.0%)	-	5,000.00
Loliloli	3.6 (↓ 51.4%)	2.50	9,037.50
Holothuria atra	[7.4]	[2.50]	[18,614.00]
Surf redfish	0.7 (↓ 97.5%)	-	6,160.00
Telehea	28.2 (↓ 0.7%)	8.00	225,664.00
A. mauritiana	[28.4]	[8.00]	[227,556.00]
Black lollyfish	0.8 (↓ 86.7%)	-	6,112.00
Loli lalahi	1.1 (↓ 81.7%)	8.00	8,440.00
A. mauritiana	[6.0]	[8.00]	[48,208.00]
Mixed species	0	-	-
	0.00	-	-
	[3.0]	[2.50]	[700.00]
Deepwater redfish	0.1 (↓ 89.0%)	-	800.00
Telehea/funefune	0.95 (↑ 5%)	2.50	2,375.00
A. echinites	[0.90]	[2.50]	[2,125.00]
Brown fish	1.2 (↓ 60.0%)	-	1,200.00
Mula	3.0 (0%)	8.00	24,360.00
Bohadschia vitiensis	[3.0]	[2.50]	[7,500.00]
Total	**10.3 (↓ 90.0%)**		**65,651 (↓ 94.4%)**
	86.4 (↓ 19.6%)	**143 (10.20 per kg)**	**884,923.50 (↓ 26.7%)**
	[108.7]	**[140 (10.0 per kg)]**	**[1,156,782.60]**

The table shows the species of beche-de-mer exported from Tonga in 1997. The weight in metric tonnes of each species exported are shown together with approximate FOB value per kilogram. Relative values in 1996 are underlined and in 1995 are shown in square brackets for comparison. The percentage proportion of the decrease (↓) or increase (↑) in metric tonnes using 1995 weight (dried biomass) as bases are shown in parentheses

Dried shark fin

Sea Star Fishing and Pacific Marine Products exported about 235. 5 kg of dried shark fin in 1997 valued at $ 12, 936; i.e. $55 per kg. (approx. 1,170 kg in 1996). It is believed that a lot of dried shark fin was exported without proper Fisheries authorisation.

Lobster ('uo)

A total quantity of 127 kg lobster (most of which were lobster tails) with an FOB value of $15 per kilogram was exported in 1997 (approx. 530 kg lobster in 1996, and 2962.6 kg lobster in 1995) earning $1,875. The exporters of lobster in 1997 included KM Fishing, Fung Shing, and Lasalo Vaitai. Amount of export is an indication that the stock is heavily depleted.

Snapper & grouper

Three companies, 'Alatini Fisheries, Maritime Projects and Capricorn Fishing exported 151.4 metric tonnes of snappers and groupers (approx. 186 mt in 1996) valued at $651, 311 FOB (137 mt in 1995 valued at $409,959 FOB). Both years were based on $3.50 per kg FOB value although the true returns to the Kingdom are greater.

Tuna

45.5 metric tonnes of fresh tuna were exported and valued at $158, 631. 55 (approx. 39 metric tonnes at $136,745 FOB in 1996.) The FOB value for tuna was $3.50 per kilogram. Exporters were Capricorn Fishing, KM Fishing and Sea Star Fishing. Sea Star Fishing Company fishing vessels caught about 327 MT of which more than 120 MT were exported as frozen tuna to the cannery in America Samoa. Using $2.50 pa'anga as FOB value for frozen tuna, income was $300,000 pa'anga. In addition, 200 MT of tuna caught by Sea Star were sold locally at $3.50 pa'anga totalling $700,000 pa'anga. Overall FOB value for tuna in 1997 was at least $1,158, 631. 55

The tuna operators encountered various difficulties in developing the industry in 1997. Some of the fresh tuna vessels spent more time in port because of engine problems. In addition, El Niño occurred in 1997 affecting the catch of favoured tuna such as big eye and yellowfin for the fresh fish market resulting in the decrease in fresh tuna FOB value. Sea Star tuna catches decreased in 1997 in part due to El Niño as well as other factors.

Aquarium fish & coral rock

Two companies collected and exported live tropical aquarium fish, coral rock and cultured giant clams (see section 3.2.1). They were Walt Smith International and Dateline Aquarium Fishing. Previous companies such as Intra-Pacific Marine Products and Mele's Exports which operated in 1996 did not function in 1997. The live fish FOB value ranged from $1.25 pa'anga for Fiji devil and other fish, to $9 for flame hawk, $20 for imperial angel, and $25 for clown trigger.

The mean value of $3.50 pa'anga is used to estimate fish, invertebrates, and soft coral FOB value. For cultured clam, slab, solid and branch corals, a FOB value of $3.00 is used. Live coral FOB value depends on the species harvested and since most of the export are small and medium pieces, the FOB value used is the mean value between the values of small and medium coral. Each company was recommended to harvest within a ceiling of 100,000 fish and 100 tonnes coral rock per annum. Table 18 below summarises the number of fish and weight of coral (including branch, slab, soft coral and solid/ coral rock) exported in 1997.

The aquarium production for 1997 was 20 per cent less than 1996 even though live coral harvest resumed at the end of the year. There was a decline in the production of the bigger company, Walt Smith International. The smaller company, Dateline Aquarium Fish Company increased its production.

The aquarium industry generated exports valued at $445, 693. 75 FOB value in 1997 compared to $563,590.60 in 1996. Non-active companies faced management problems. Although the technology used in the industry can be complex, a more modest operation can still produce good results with careful management.

Table 18: Quantity and FOB value of aquarium fish & invertebrates exported in 1997

Company	Species	Total weight (kg)	Total no. of pieces	Value (T$/piece or /kg)	Total value (T$)
Dateline Aquarium	Soft coral		13,277	3.50	46,469.50
	Giant clam		4,494	3.00	13,482.00
	Invertebrates		22,673	3.50	79,355.50
	Live Fish		8,536	3.50	29,876.00
	Branch	5,592		3.00	16,776.00
	Solid	1,977		3.00	5,931.00
	Slap	705		3.00	2,115.00
	Live coral		4,432		20,208.75
Total					**214,213. 75**

Table 18 (continued)

Company	Species	Total weight (kg)	Total no. of pieces	Value (T$/piece or /kg)	Total value (T$)
Walt Smith Int'l	Soft coral		5,320	3.50	18,620.00
	Live Fish		19,716	3.50	69,006.00
	Giant clam		4,552	3.00	13,656.00
	Invertebrates		7,211	3.50	25,238.50
	Branch	29,888		3.00	89,664.00
	Solid	2,243		3.00	6,729.00
	Slap	126		3.00	378.00
	Live coral		2,062		8,188.50
Total					**231,480.00**
Grand total					**445,693.75**

Fish fences

A number of problems encountered in the registration and licensing of fish fences, as well as the decline in the highly valued species such as mullet and other coastal fish, resulted in a review of policy. Applicants for for the better fish locations argued the right for the positions. As the problems mounted, the Ministry decided that the current policy be reviewed. Factors such as mesh sizes, seasonal closure, distance from one fence to another, and total closure of breeding grounds were reviewed. Renewal of licenses was put on hold in 1997 pending the final outcome. So far, the problem only relates to Tongatapu.

Enforcement and prosecution

Enforcement activities were carried out by four staff appointed as authorised officers and fisheries inspectors to monitor compliance with the Fisheries Act and its Regulations. Cases of undersized sea cucumbers, lobsters and giant clams, as well as turtle fishing during the closed season from August to February were the types of offences that the section had to guard against. Three cases of undersized lobsters in Tongatapu were successfully prosecuted in the Supreme Court. Each offender was fined $100. More staff training is required in this important area, especially in surveillance and enforcement procedures.

Coastal management meeting

A meeting with the fish-fence holders and local fishermen was held at the Training Centre, Sopu to consider the serious drop in catch of inshore fish and to discuss various management strategies such as additional closed areas for fish fences, closed seasons, and the registration and licensing of net fishing. The meeting agreed that the Fanga'uta Lagoon be closed to all commercial fishing activities, and that a closed season for fish fences from June to August be introduced. The need for the registration and licensing of all net fishermen was agreed and the Ministry was to consider appropriate amendments to regulations. It is anticipated that the new management plans will be introduced in 1998.

3.3.2 Support Services Section

The Support Services consist of a Boatbuilding and an Engineering Section to support other sections within the ministry and to provide technical services for the private sector.

Boatbuilding Section

After successfully building 42 wooden fishing vessels mainly targeting bottom fish and seamount fishing, the scheme was suspended in order to monitor fishing effort. The Section continued to provide maintenance/renovation for Ministry's vessels and the private sector as well as carry out building repairs and renovations for the Ministry as required.

Staff consisted of five officers and four labourers as follows:

‘Aisea Tupou	Senior Fisheries Officer
Tevita Taulafo	Technical Officer Grade II
Toma Kauvaka	Technical Officer Grade II
Lupe Fakaleleu	Fisheries Assistant
Sekope Tiueti	Fisheries Trainee

During the last quarter of the year Toma Kauvaka, Technical Officer Grade II, went on vacation leave.

Repairs were carried out on the Ministry’s vessels MV *Ekiaki*, MV *Albacore*, MV *Ngutulei*, MV *Vete* and *Tangafa*. Building of new Fisheries accommodation in Ha’afeva as well as repair and maintenance of the Ministry’s residences in Pangai was completed.

Future Needs

- Repairs to the boatbuilding shed and boatyard store
- Training for personnel
- New tools and equipment

Engineering section

The Section undertook the overall maintenance of the Ministry’s fishing vessels (MFV *Albacore*, MFV *Ekiaki*, and *MFV Ngutulei*) refrigeration plants and vehicles. Services were also made available to private fishing vessels. Staff complement is eight officers. There are two vacant posts:

Siotame Vaipuna	Fisheries Officer
Vacant	*Fisheries Officer*
Lomio Tonga	Technical Officer Grade II
Siosifa Fisi’ipeau	Fisheries Assistant
Pala’a Ma’usia	Fisheries Assistant
‘Uluaki Vaipuna	Fisheries Trainee
Viliami Utumoengalu	Fisheries Trainee
Vacant	*Driver*

In August, Mr Kazuyuki Sakamoto, Electrical Engineer under JOCV commenced his two-year assignment. Mr Shinji Nagai, Outboard Engineer, from JOCV returned to Japan in October after completing a two year assignment with the engineering section at Ha’apai.

Annual dry dock for MFV *Ngutulei* and *Albacore* was completed in April and May respectively. Minor repairs were carried out to MFV *Vete* and other smaller fishing boats during the year.

In October the Head of Engineering Section, Siotame Vaipuna, Fisheries Officer went on special leave and Sioeli Pasikala, Chief Engineer, MFV *Ekiaki* was substituted as officer in charge. Pouvalu Blake, Fisheries Officer, resigned from the civil service. Additional staff are needed in the following areas:

- 1 Electrician
- 1 Refrigeration Engineer.

Transport

P1016, Toyota Hilux van was written off following a road accident. Some of the vehicles need to be replaced. Three new vehicles (1 Toyota double cab 4WD, (Vv); 2 Toyota double cabs for TBU and HP were purchased from Japan in mid December under the Project Development Fund administered by FFA

Table 19: Ministry's vehicles in 1997

Year	Registration No.	Types	Location	Standard	Aid/fund
1984	P. 1015	Toyota hilux van	Tuimatamoana market	fair	FAO
1987	P. 768	Izuzu truck	Sopu	fair	JICA
1990	P. 935	Toyota hilux van	Ha'apai	fair	Treaty Fund
1990	P. 936	Toyota hiace van	Sopu	fair	Treaty Fund
1992	P. 149	Toyota hilux van	Sopu	fair	JICA
1992	P. 3413	Toyota hiace van	Sopu	good	JICA
1992	P. 474	Toyota hilux van	Sopu	good	JICA
1992	P. 352	Toyota land cruiser van	Vava'u	fair	RDA
1994	P. 1026	Toyota van	Sopu	good	Treaty fund
1997	P. 39	Toyota hilux van	Vava'u	new	Treaty Fund
1997	P. 103	Toyota hilux van	Ha'apai	new	Treaty Fund
1997	P. 152	Toyota hilux van	Sopu	new	Treaty Fund

Ice plants

A number of the plants are not working or are in poor working order and need to be replaced.

Constraints

- Lack of spare parts for repairing of vessels, ice plants and other machineries;
- Lack of special tools for repairing and maintenance; and
- Lack of training for staff.

3.3.3 Marketing and Market Development Section

The management and operation of the fish market (Tuimatamoana) during 1997 are considered under the following headings: Personnel, Financial status, Magnitude of market services, Facilities and equipment, Upgrade of Tuimatamoana Market and Constraints.

Personnel

There were four established staff and five labourers. In July, Heleni K. Po'uhila (Clerk Class III) was transferred back to Fisheries Head office, Sopu. She had not been replaced at the end of the year. 'Isileli Ula (Senior Fisheries Assistant) took 108 days vacation on 21st August, and resumed duty on 8th December.

Name	Title	Responsibilities
Po'uha Hasiata	Technical Officer Grade II, Market Manager	Head of Market Section and OIC of Tuimatamoana Fish Market
'Isileli Ula	Senior Fisheries Assistant	Control fish landing and sales
Mafi Toutai Havea	Fisheries Trainee	Control of cold storage facilities
Vacant	Clerk Class III	Handle all financial aspects of the market

Financial status

Table 20 shows the working capital of the market for 1996/1997 financial year with balance of each vote as at 30/6/97. In the 1997/1998 FY the market operated under a provision from the revolving fund in the Development Estimates, Pilot Commercial Fishing Activities Tongatapu table (b). Revenue collected by the market for 1997 is shown in Table 21.

Table 20: Recurrent Estimate 1996–1997

Votes	Allocation provided	Balance at 30/6/97	CR or DR
Labour Wages	4,000.00	336.78	CR
Telecom Charges	1,500.00	72.21	CR
Market Maintenance	4,500.00	46.64	CR
Office Equipment Maintenance	800.00	78.39	CR
Machinery Maintenance	4,000.00	74.19	CR
Electricity Supply	20,000.00	340.45	CR
Water supply	2,500.00	86.28	CR

Table 21: Development Estimate 1996/1997 and 1997/1998

Votes	Allocation 96–97	Bal. at 30/6/97	Remarks
Upgrade T. Market	9,160.86	29,719.12	S/warrant T$30,018.19 in June for Phase III
Revolving Fund (Cooler)	11,643.65	7,855.08	Used for wages and repair boxes
Votes	**Allocation 97–98**	**Bal. at 31/12/97**	**Remarks**
Upgrade T. Market	9,500.00	9,500.00	Applied for revoting of the unused balance from 1996/97
Revolving Fund (Cooler)	28,142.00	28,595.11	All market operational costs were drawn from this fund since July, 97. All revenue collected paid into the same fund.

Table 22: Revenue income collected 1st January–31st December, 1997(pa'anga)

Revenue votes	Sources	1/1–30/6/97	1/7–31/12/97	Total 1997
	Cold storage fees	6,877.58	9,014.63	15,892.21
	Sale of ice	5,426.75	7,383.16	12,809.91
	Table rental fees	1,512.06	3,142.51	4,654.57
	Hire of weighing scale	570.00	1,007.50	1,577.5
	Hire and use of cooler boxes	-	2,642.50	2,898.00
	Sundries	1,032.60	4,013.61	5,046.21
4 : 2A	**Fisheries general revenue**	**15,418.99**	-	**15,418.99**
62 : E-9 (Rev. fund)	Sale of fish	10,160.34	21,107.13	31,267.47
62 : E-13 (Rev. fund)	Hire cooler boxes & other	255.50	27,353.91	27,609.41
	Total revenue	**25,834.83**	**48,461.04**	**74,295.87**

Magnitude of market services

Cold storage of goods

The following table shows the type and weight of products which were frozen and stored at the market cold store in 1997.

Table 23: Type and weight of products frozen and stored at the market cold store in 1997

Products	Weight in kg	Weight in metric ton
Seafood (fish, lobster etc.)	21,592.6	21.6
Fishing bait	8,391.0	8.4
Livestock meat	41,466.4	41.5
Agricultural products	55,474.5	55.5
Other (soft drink)	2,338.0	2.3
Total	**129,262.5**	**129.3**

Fish landing

The weight of marine food products landed at Tuimatamoana Market for export or local sales is given in Table 24.

Table 24: Weight of marine food products landed at Tuimatamoana Market in 1997

Products	Weight in kg	Weight in metric ton
Fish for export	35,147.37	35.15
Fish for local sales	108,387.18	108.38
Total	**143,534.55**	**143.55**

Ice production

More than 85.4 (metric tons) of ice were produced and sold to the public. The demand for ice remains high but production was low due to frequent breakdowns of the ice-machine and long waits for spare parts. The ice machine is too old and needs to be replaced.

Facilities and equipment

Refrigeration facilities

The following table shows the facilities and their working condition

Table 25: Facilities and their working condition

Items	Condition during the year	Condition at the end of the year
Air blast freezer No.1	Under repair, waiting for parts	Under repair, waiting for parts
Air blast freezer No.2	Worked well	Worked well
Freezer store No.1	Worked well	Worked well
Freezer store No.2	Worked well	Needs repair and service
Freezer/Chiller	Worked well	Worked well
Chiller room	Worked well	Worked well
Ice store	Worked well	Worked well
Ice making unit No.1	Worked but broken at times	Worked but in unsatisfactory condition
Ice making unit No.2	Same as No.1	Broken-down, needs to be replaced

Fish handling equipment :

Table 26 shows the equipment and its working condition.

Table 26: Equipment

	Items	Condition
6	Heavy duty trolley	All worked well but needed body repairs
1	Fish cutting bandsaw	Worked well after repairs in April
2	Manual pallet truck (load easier)	One worked well, one under repair since Oct.
150	Blue fish crates	All stored and used inside the market
31	Blue cooler ice-boxes	All in hiring pool and used inside the market
6	Hanging weighing scales	All worked well and used only inside the market
2	Platform weighing scales	One worked well and one broken since 1995

A new ice machine to complement the present one is required to increase ice production to cope with increased demand from the fishing community and the general public. A proper packing room with appropriate equipment could be built as an extension to the eastern end.

3.3.4 Post harvest and quality control section

One of the present critical issues relating to the development of the Fisheries sector is Fish Health Quality Management. The United States, one of the main destinations for Tonga's fresh fish export has already implemented *Hazard Analysis & Critical Control Point (HACCP)* requirement since December 1997. A Post Harvest and Quality Control section has been established to take responsibility for quality control management to meet international requirements. In order to ensure smooth management of HACCP and to assist exporters in this important area, a qualified member of staff has been assigned responsibility for the Post Harvest and Quality Control Section. An in-country training workshop on HACCP was conducted for the industry.

Due to staff shortages, the Head of the Management, Surveillance, and Extension sections, Viliami A. Petelo, Fisheries Officer has also taken over responsibility for Post Harvest and Quality Control .

3.3.5 Extension

Introduction

Shortage of properly trained staff affected the section's performance. Extension staff were also involved in Management and Licensing work including surveillance, enforcement, legal matters, and quality control.

In July the mapping of fish fence sites in Tongatapu was completed.

The extension section fully participated in the preparation for the 1997 Royal Agricultural and Industrial Show which was held in Vava'u, Ha'apai, 'Eua, and Tongatapu.

The Ministry wishes to thank all the sponsors for their generous support towards prizes in the 1997 Agricultural and Industrial Show.

All FADs deployed in Tongatapu and 'Eua were lost due to damage by cyclone Hina. One FAD in Tongatapu was replaced in mid August. The position of the existing FAD is 21°00.39'S & 175°20.14'W, site depth is 1105 m and the location is 3.5 miles north west of Niu'aunofo point.

Constraints

- Shortage of staff;
- Head of extension on overseas study and need for a designated replacement; and
- Lack of a consistent work plan.

'Eua Fisheries sub-station

No staff are deployed in 'Eua but during the preparation for the Eua Royal Agricultural and Industrial Show staff occupied office space at the Ministry of Agriculture and Forestry offices.

Steve Beverly the SPC Master Fisherman, Mr Taniela Koloa PFO, Sione Kolo TO1, Tevita 'Ahoafi TO 11 and Silika Ngahe TO 11, visited 'Eua to assist the Fisheries preparation for the 1997 Royal Show.

Niuatoputapu Fisheries sub-station

Introduction

The Niuatoputapu Fisheries sub-station (NFS) is part of the Nuku'alofa Extension Section and is staffed by one officer. The ice-making plant was overhauled during the year and is in good working condition. The remoteness of the island makes the proper servicing of machinery and equipment from Sopu difficult.

Equipment and accommodation

Electric generators: Two electric generators were both working, one for the cooler and the second for the ice machine.

Outboard-motor: The fibreglass boat needs to be repaired and the outboard engine requires a new propeller and fuel tank.

Accommodation: A new staff quarters was approved to be funded from the Project Development Fund administered by FFA. This project will commence in 1998. Additional equipment needed includes a lawn mower, an electric fan, a computer and new curtains for the office building.

3.3.6 Vava'u Fisheries Section

The VFS has six (6) sub-sections: Administration, Aquaculture and Research, Extension and Management, Fish Marketing, Boatyard, and Engineering. Main areas of activity were aquaculture including cultivation of oysters for mabe pearl experiments, extension duties to assist local fishermen and monitoring and control related to enforcement of Fisheries Regulations for conservation.

Administration

Administration consists of personnel and finance units. The sub-section is responsible for implementing policy and management in Vava'u. There are ten (10) established and five (5) non-established personnel working in Vava'u.

Vea Kava, Fisheries Assistant was transferred from Nuku'alofa to Vava'u in August to work in aquaculture and research. In September 'Aisea Vailea, Fisheries Assistant was transferred from Vava'u Fisheries as officer in charge of the Niuatoputapu station. Fotu Tu'i'onetoa was appointed Fisheries Trainee. Staff working in Vava'u Fisheries Section are as follows:

'Aisea Tu'ipulotu	Technical Officer Grade I
'Otinili Fisi'ikava	Technical Officer Grade II
Siola'a Malimali	Technical Officer Grade II
Sio 'Ofanoa	Senior Fisheries Assistant
'Epalahame Taufalele	Senior Fisheries Assistant
Vea Kava	Fisheries Assistant
Sione Fine	Fisheries Assistant
Emeline Tonga	Fisheries Trainee
Fotu Tu'i'onetoa	Fisheries Trainee
Koliniasi Hafoka	Fisheries Trainee
'Alamoti Fa'uvao	Fisheries Trainee
Vacant	Typist Clerk Grade 11

Aid personnel

One aid personnel from JOCV, Mr. Masakazu Takahashi, worked for Research & Aquaculture in Vava'u.

Travel

The Secretary for Fisheries accompanied by Dr A.D Lewis and Mr Keith Bigelow, SPC, visited Vava'u in April to discuss with local fishermen the report on the tuna fish stocks likely to be in Tonga's EEZ.

A courtesy call was made on the Governor of Vava'u who was briefed on the report and the nature of the mission. Discussions were also held with Vava'u Development Office on fisheries wharf facilities in Neiafu.

The Secretary for Fisheries accompanied by Mr Owa of Horiuchi Co. visited Vava'u to inspect sites for *limu tanga'u*. Po'uha Hasiata, Tu'imatamoana Market Manager, visited Vava'u in November to investigate the possibility of putting up fish market facilities.

The Secretary for Fisheries, 'Akau'ola; Steve Beverly, the SPC Master Fisherman; Taniela Koloa, PFO; and Silika Ngahe, TO II; visited Vava'u to assist with the preparation for the 1997 Royal Agricultural and Industrial Show.

Vacation leave

Three officers went on vacation leave during the year: 'Aisea Tu'ipulotu, TO II, 'Ofa Moala, TO II, and Koli Hafoka. 'Ofa Moala was transferred to Ha'apai as officer in charge at the completion of his leave. Siola'a Malimali, T.O.II, substituted as officer in charge during the period of A. Tu'ipulotu's leave.

Aquaculture and research

A number of projects involving the propagation and/or growing of marine organisms were being implemented but the main focus of activity was the Pearl Oyster Project which continued to show good results.

The pearl oyster experimental sites in Vava'u are: Hunga, 'Olo'ua, Vaipua, Mo'unga Talau, and Neiafu Bay (2 sites).

Management, licensing & extension

The Management and Licensing Unit were active in apprehending fishermen involved in breaches of the Fishing Regulations. The use of the same staff for Extension and Management as well as licensing has created some problems in how fisheries officers are perceived by the fishing community. It was recommended that additional staff be allocated to this division.

Fish market

The facilities and equipment which had been rented to the Friendly Islands Marketing Co-operative (FIMCO) were returned to the Ministry of Fisheries at the completion of the agreed rental period. Facilities and equipment status are shown in the following table.

Number	Refrigeration facilities	Condition
1	Freezer Store	Not working & in need of repair
2	Freezer Store	"
3	Chiller Room	"
4	Freezer Store	"
5	Blast Freezer	"
6	Blast Freezer	"
7	Freezer Store	"
1	Ice Plant	"
2	Ice Plant	"
3	Ice Plant (Japanese Aid)	"

Boatyard

One staff member was involved in repairing fishing vessels. By the end of the year rebuilding and conversion of the Hunga Methodist church vessel (35 feet) as a fishing vessel was nearing completion. The vessel is to be used for deep sea bottom fishing.

Engineering

The Engineering sub-section was responsible for the maintenance of machines and equipment. Most of the work was co-ordinated from the Tongatapu Engineering Section. List of equipment is as follows:

Vehicles	Condition
Van - L352	fair condition
Forklift	not working
Bike	not working

Boats

Boat	Subsection responsible	Condition
20 ft fibreglass boat	Management & Licensing	Good condition
Engine 30 Hp Mariner	Management & Licensing	Good condition
30 ft fibreglass	Pearl Oyster Project	Good condition
Engine 60 Hp Mariner	Pearl Oyster Project	Good condition

3.3.7 Ha'apai Fisheries Section

Fisheries development in Ha'apai posed special problems because of the scattered nature of the islands. Revenue collected was from three sources: the sale of ice; boat building materials & engine repair; and miscellaneous sources. The Boatyard and Engineering Sub-sections played a useful role in repairing fishing boats and carrying out engine repairs. Nomuka and Ha'afeva Sub-stations operated their own ice machines.

Personnel

There were eight established posts at Ha'apai Fisheries. Seven local staff were employed in the main office in Pangai and one each in Nomuka & Ha'afeva sub-stations. One labourer Mr Talia'uli Napa'a was appointed to the vacant post of Fisheries Trainee during the year.

Pangai:	Tevita F. Latu	Senior Fisheries Officer
	'Ofa Moala	Technical Officer Grade II
	Sosefina Vili	Typist Clerk Grade II
	Tevita 'Atana	Fisheries Assistant
	Sailosi 'Alofi	Fisheries Assistant
	Anatapu Latu	Fisheries Trainee
	Talia'uli Napa'a	Fisheries Trainee
Ha'afeva:	Tevita Tonga'onevai	Fisheries Assistant
Nomuka:	Tu'iniua Tupou	Fisheries Assistant

Ongoing projects

Giant clam circle

The clam circles established in 1995 were inspected and found to be in a satisfactory condition. Most of the circles were well protected by the communities but there was some evidence of predators or theft.

Flying fishing project

Exploratory surveys for catching flying fish (*malolo*), an excellent bait for trolling, had already identified the coast of Ha'ano as excellent fishing grounds. In November, nine sets of flying-fish fishing gear were distributed to fishermen who were interested in this type of fishing operation. Financial assistance was provided by the Australian Government.

Dried fish survey and beche-de-mer processing handbook

The above project had been identified but had not been implemented. Funds were available from the Australian Government. The purpose of the dried fish survey was to establish a market, either locally or overseas for the dried fish products processed by the people of the central Ha'apai Group.

Translation of the beche-de-mer handbook produced by SPC into the Tongan language, was aimed at developing a quality product. Such a value-added approach would ensure better prices and would promote sustainable harvesting, an important concept for a resource that is increasingly under threat from over fishing. Following the ban of all exports of this product however, implementation of the project is no longer a priority.

Revenue

Table 27: Total revenue collected by the Ha'apai Fisheries Section in 1997 (pa'anga)

Month	Pilot commercial activities	Boatbuilding & engineering	Government General Revenue
January	1,400.00	7.00	24.00
February	768.00	35.00	12.00
March	1,287.00	20.00	21.00
April	1,395.50	37.00	3.00
May	2,087.00	50.00	42.00
June	2,103.50	100.00	21.00
July	1,191.60	65.00	3.00
August	2,054.10	105.00	21.00
September	1,335.95	65.00	39.00
October	2,064.90	155.00	24.00
November	1,735.30	5.00	9.00
December	1,086.10	-	9.00
Total revenue for 1997	**18,508.95**	**644.00**	**228.00**

The ice machine was not in good condition due to mechanical problems for the first three months.

Enforcement of fisheries regulation

Eight fishermen were successfully prosecuted for the illegal use of hookah and scuba diving gear.

Royal Agricultural and Industrial Show

The 1997 Royal Agricultural and Industrial Show was successfully held in Pangai in the presence of His Majesty. The Ministry participated and several senior staff from headquarters visited Pangai to assist with the preparations.

Constraints

The main constraint continues to be lack of properly trained staff who possess competency in fisheries related matters, especially fisheries extension skills. This will need to be addressed if staff are going to be more effective.

In addition, the lack of appropriate work boats in Pangai, Ha'afeva and Nomuka resulted in transport problems, which were difficult to overcome. This needs to be addressed if the officers are to fulfil their duties properly. Funds were earmarked for vessels for Ha'afeva and Nomuka in 1998. One of the Ministry's vessels in Nuku'alofa is to be permanently transferred to Pangai in the new year.

4. Miscellaneous

4.1 USA treaty on fisheries

Since the implementation of the Treaty, Tonga received the following amounts under the 15% shares in each licensing period. These funds were paid directly to general revenue each year.

Licensing period	6th	7th	8th	9th	10th
Amount (US$)	148,866.85	147,630.33	149,824.76	149,722.98	148,652.83

Project Development Fund (PDF)

Tonga has so far received a total of US$868,109.62. These funds are administered by the Forum Fisheries Agency for Fisheries projects.

Percentage shares

Tonga has not benefited under this provision because there has been no US fishing activity in the region. All fishing operations are confined to 10 degrees North/South of the equator.

4.2 Conclusions

The FAO/AusAID fisheries sector study was basically completed by the end of the year. This has been a major undertaking despite of the fact that the Ministry has not been short of studies in the past few years. The senior staff were given every opportunity to comment on the body of issue papers developed in the course of the study so there are no major areas of disagreement in terms of the action that needs to be taken and the policies that need to be considered and adopted.

An analysis of the report and further consultations with Ministries that will be working together during the implementation phase will be completed in the new year prior to the submission of the report to Cabinet.

The Ministry is confident that the report will be a sound basis for much needed reform within the Ministry as well as a solid platform for the development of the fishing industry in the Kingdom.