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Lindsay Chapman
Fisheries Development Adviser
Marine Resources Division
Secretariat of the Pacific Community
Noumea, New Caledonia

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NEARSHORE DOMESTIC FISHERIES DEVELOPMENT IN PACIFIC ISLAND COUNTRIES AND TERRITORIES

by

Lindsay Chapman
Fisheries Development Adviser

Secretariat of the Pacific Community
BP D5
98848 Noumea Cedex
New Caledonia

Tel: (687) 26 20 00
Fax: (687) 26 38 18
e-mail: fishdev@spc.int
http://www.spc.int/coastfish

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SUMMARY

Pacific Islanders have traditionally harvested marine resources for their dietary needs, with inshore resources targeted in most cases. The tuna resource has also been targeted traditionally by Polynesian fishermen, who used poles with pearlshell lures from paddling or sailing outrigger canoes. Paddling canoes have also been used traditionally in Polynesian countries to catch flyingfish at night with light attraction (burning coconut fronds) and a scoop net.

Traditional fishermen in the Pacific were very skilled, and the methods they used had evolved over generations. Their methods were developed for specific fishing situations, and in some cases, species. From about the 1960s, the availability of modern fishing gears, aluminium dinghies and outboard motors started to erode traditional fishing methods. Using the modern equipment, more people also became involved in fishing. Some of the 'new' fishermen did not have the knowledge of traditional fishing techniques, so they were also open to learn fishing methods, both traditional and modern, that were being used elsewhere in the region.

In the 1960s and 1970s, many Pacific Island countries and territories (PICTs) started looking at developing their marine resources commercially. Initial focus was on harvesting inshore resources, such as and trochus for export and reef fish to sell locally. This was followed by the harvesting of nearshore resources, such as deep-water snapper and tunas, which in many cases had not been fished for traditionally. However, in order for this to happen, the fishermen and fisheries administrators in most PICTs needed guidance and training in the gears and fishing techniques needed.

Training programmes were implemented in many PICTS in the 1980s for the harvesting of deep-water snappers. Fish markets and ice machines were installed in support of this development, in both urban and rural areas. Fish aggregating device (FAD) programmes were also set up in many countries to assist local fishermen catch tunas using small-scale fishing methods. Mid-water fishing techniques for the larger, deeper-swimming tunas that aggregate around FADs were also introduced around the region.

In the late 1980s and early 1990s, domestic fisheries development changed dramatically, with some PICTs looking to commercially harvest the tuna resource using tuna longlining techniques. Private sector entrepreneurs could see the potential for the tuna longline industry, based on the foreign fishing activities in the region and the prices paid for high-quality fresh tunas in export markets such as Japan and Hawaii. Tuna longline development occurred in many PICTs through the 1990s and early 2000s, and remains the main focus of nearshore domestic fisheries development today.

This paper endeavours to benchmark domestic fisheries development as at the second half of 2003, as a reference against which to measure future development can be measured, in deep-water snapper fishing, and small-scale and medium-scale tuna fishing activities. To set the benchmarks, all Heads of Fisheries or their staff in the region were interviewed by the author in the second half of 2003. National Development Plans or Strategies were also reviewed, and the development objectives and strategies are recorded for each PICT where these were available. Fishery management plans were also reviewed in the same manner, with objectives and strategies recorded.

Finally, country profiles have been put together for the 22 PICTs in the region. The profiles provide some background on the development stages that each country or territory has gone through from the 1970s and 1980s to the second half of 2003.

RÉSUMÉ

Depuis toujours, les Océaniens exploitent les ressources marines pour répondre à leurs besoins alimentaires, en ciblant le plus souvent les ressources côtières. La pêche thonière était traditionnellement pratiquée par les Polynésiens, qui pêchaient au moyen de cannes et de leurres en coquille de nacre à bord de pirogues à balancier à voile ou à rames. En Polynésie, les pêcheurs sortaient également la nuit à bord de pirogues à rames pour capturer des poissons volants, en utilisant une source lumineuse pour les attirer (torche de feuilles de cocotier) et une épuisette.

Les pêcheurs traditionnels océaniens étaient extrêmement habiles : ayant évolué pendant des générations, leurs techniques étaient adaptées à des situations précises et, dans certains cas, à des espèces particulières. À partir des années 60 environ, les méthodes de pêche traditionnelles commencent à disparaître en raison de la disponibilité des engins de pêche modernes, des petites embarcations en aluminium et des moteurs hors-bord. Avec l'apparition de cet équipement, de plus en plus de personnes se mettent à pêcher. Certains de ces « nouveaux » pêcheurs ne connaissent pas les méthodes traditionnelles et sont donc disposés à apprendre les techniques de pêche, à la fois traditionnelles et modernes, utilisées ailleurs dans la région.

Au cours des années 60 et 70, de nombreux États et Territoires insulaires océaniens ont commencé à envisager l'exploitation commerciale de leurs ressources marines. Ils ont, tout d'abord, axé leurs efforts sur leurs ressources côtières, en pêchant le troca à des fins d'exportation et les poissons de récif pour les marchés locaux. Ils se sont ensuite tournés vers la pêche semi-hauturière, en ciblant des espèces telles que le thon et le vivaneau, qui, dans bien des cas, n'avaient pas fait l'objet d'une pêche traditionnelle. Toutefois, pour cela, les pêcheurs et les responsables des services des pêches, dans la plupart des États et Territoires océaniens, avaient besoin de conseils et de formations sur l'utilisation des engins et des techniques de pêche.

Des programmes de formation ont été mis en œuvre dans de nombreux États et Territoires insulaires océaniens au cours des années 80 pour la pêche du vivaneau. Des marchés de poisson et des machines à glace ont été mis en place pour assurer le développement de cette filière, tant dans les zones rurales qu'urbaines. Des campagnes de mouillage de dispositifs de concentration de poissons (DCP) ont été menées dans de nombreux pays pour aider les pêcheurs locaux à capturer des thons à l'aide de techniques de pêche artisanales. À l'échelle régionale, des techniques de pêche à mi-profondeur ont été introduites pour cibler des thons plus gros, évoluant à de plus grandes profondeurs, qui se concentrent autour des DCP.

À la fin des années 80 et au début des années 90, on assiste à de profonds changements dans le développement des pêcheries locales, certains États et Territoires envisageant l'exploitation commerciale des stocks de thonidés au moyen de techniques de pêche à la palangre. Des entrepreneurs privés voient le potentiel de cette forme de pêche, en se basant sur les activités des flottilles étrangères opérant dans la région et les prix payés pour le thon frais de qualité supérieure sur les marchés d'exportation, tels que le Japon et Hawaii. La pêche thonière à la palangre se développe dans de nombreux États et Territoires insulaires océaniens au cours des années 90 et au début des années 2000, et demeure aujourd'hui au cœur des efforts de développement des pêcheries côtières locales dans la région.

Le présent document vise à faire le point sur le développement des pêcheries locales au deuxième semestre 2003, et à établir des jalons qui pourront servir à mesurer les progrès futurs, qu'il s'agisse de la pêche du vivaneau, ou de la pêche thonière à petite et à moyenne échelle. Pour ce faire, l'auteur s'est entretenu avec tous les Directeurs des pêches de la région, ou des membres de leur personnel, au cours du deuxième semestre 2003. Il a également examiné les stratégies ou les plans de développement nationaux, et a pris en note les objectifs et stratégies de développement de chacun des États et Territoires insulaires océaniens, lorsque ceux-ci étaient disponibles. De plus, il a passé en revue les plans de gestion des pêches de manière similaire, en consignant les objectifs et stratégies qui s'y rapportent.

Enfin, des profils ont été établis pour chacun des 22 États et Territoires insulaires océaniens de la région. On y trouve des informations de base sur les stades de développement franchis par chacun d'entre eux, à partir des années 70 et 80 jusqu'à la deuxième moitié de 2003.

Contents

Introduction

This paper endeavours to benchmark the current status of nearshore domestic fisheries development in Pacific Island countries and territories (PICTs) in the latter half of 2003. For the purpose of this paper, nearshore is defined as the waters outside the 100 m depth contour to the extremities of each PICT's exclusive economic zone (EEZ). To benchmark the current status, information has been collected and the heads of fisheries departments in each country or territory interviewed to provide a snapshot of nearshore fisheries development from their perspective. The information provided by each head of fisheries has been sent to them for comment and verification.

The information collected on each PICT is compiled in a 'fisheries development country profile', which is provided in a series of annexes to this paper, one per PICT. Each country profile records the objectives for any national fisheries development plan or strategy as well as for development or management plans for nearshore fisheries in that country or territory. This information is provided verbatim from the 'Plans' from each country or territory. In addition, background material is provided on the development of domestic nearshore fisheries over the last 20 to 30 years under specific headings. The information contained in the country profiles is open to comment for inclusion in a future version of this document.

The information on current status has been summarised in a series of tables under the different fisheries or areas of nearshore domestic fisheries development in the paper. The five fisheries or areas chosen are: the deep-water snapper fishery; fish aggregating device (FAD) programmes; small-scale tuna fishing; medium-scale tuna fishing and processing facilities; and other nearshore fishing activities. This paper does not try to analyse the information collected from each PICT, as each country is at a different stage in their development process.

Background

The Pacific Region (Figure 1) is made up of 22 PICTs. The total population of the region is around 8.5 million (Table 1), with around 66 per cent of the total population in one country, Papua New Guinea.

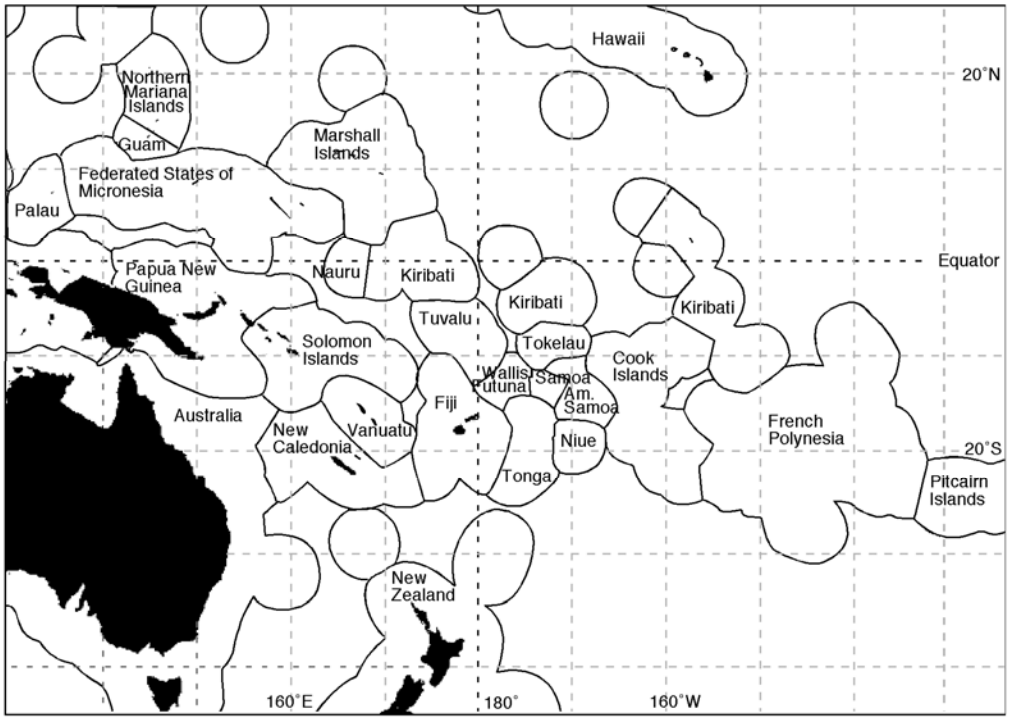

Figure 1: The Pacific region showing all 22 PICTs and their EEZs

The total land area of the 22 PICTs amounts to around 550,947 km^2 (Secretariat of the Pacific Community (SPC) 2003a, Table 1), with over 83 per cent of the land located in Papua New Guinea. In contrast, the total area of ocean under the jurisdiction of PICTs amounts to over 29 million km^2. The high ratio of ocean area to land area (roughly 53:1) highlights the importance of the ocean to PICTs.

Table 1: Summary of the population, approximate land area and approximate ocean area for each PICT

Country/territory	Population (2003 mid-year estimate — SPC 2003a)	Approximate land area (km^2 — SPC 2003a)	Approximate ocean or EEZ area (km^2)
American Samoa	61,400	200	390,000
Cook Islands	17,800	237	1,830,000
Federated States of Micronesia	112,600	701	2,780,000
Republic of the Fiji Islands	831,600	18,333	1,290,000
French Polynesia	250,000	3,521	5,030,000
Guam	162,500	541	218,000
Republic of Kiribati	88,100	811	3,550,000
Republic of the Marshall Islands	54,000	181	2,131,000
Republic of Nauru	12,100	21	320,000
New Caledonia	235,200	18,576	1,740,000
Niue	1,650	259	390,000
Commonwealth of the Northern Mariana Islands	75,400	471	777,000
Republic of Palau	20,300	488	629,000
Papua New Guinea	5,617,000	462,243	3,120,000
Pitcairn Islands	50	39	800,000
Samoa	178,800	2,935	120,000
Solomon Islands	450,000	28,370	1,340,000
Tokelau	1,500	12	290,000
Kingdom of Tonga	101,700	650	700,000
Republic of Tuvalu	10,200	26	900,000
Republic of Vanuatu	204,100	12,190	680,000
Wallis and Futuna	14,800	142	300,000
TOTAL	**8,500,800**	**550,947**	**29,325,000**

The PICTs have been developing their nearshore resources at different rates in line with their government policies and aspirations. In the 1970s and 1980s, the main focus was on the deep-water snapper resource (Dalzell and Preston 1992), although this resource was found to be more fragile in many locations than first thought.

During the 1990s, the focus of nearshore fisheries development moved to the harvesting of the regions tuna resource. Many countries had fishing access agreements in place with distant water fishing nations, and in 1999 the value of these were estimated at over USD$58 million (Gillett and Lightfoot 2001) to the 14 PICTs that are members of the Forum Fisheries Agency (Cook Islands, Federated States of Micronesia, Republic of the Fiji Islands, Republic of Kiribati, Marshall Islands, Republic of Nauru, Niue, Republic of Palau, Papua New Guinea, Samoa, Solomon Islands, Kingdom of Tonga, Republic of Tuvalu, and Republic of Vanuatu).

With access agreements in place, many PICTs looked at ways to develop their domestic tuna fishing capabilities, so they could harvest a larger portion of the region's tuna resource themselves. In many countries, the tuna resource is the only natural resource they have to harvest to generate economic wealth, create employment, and provide an ongoing protein source for the local population. Several approaches were taken, as governments looked at both small-scale and medium-scale tuna fishery development.

FAD programmes were developed in some countries to support small-scale tuna fishery development (Gillett in press). Some countries focused more on developing medium-scale tuna longlining, with both public and private sector participation. Development of domestic tuna fishing capacity continues to be the main focus of most PICTs today, with some countries looking at the processing sector as well as the harvesting sector.

Aims of domestic fisheries development and management

Many PICTs have national development policies or strategies, which include fisheries development and management. In fact, some PICTs have specific policies or strategies for fisheries development. In looking at the different documents, there are common themes that come though, especially in regard to development of domestic tuna fisheries. Coupled with this are management and/or development plans that have been, or are being, developed and implemented for specific fisheries, especially the tuna fishery. The aims and objectives of these documents can be summarised into the following broad areas:

- Transparent domestic management: Management arrangements are developed and implemented ensuring transparency at every stage, with good administration. The development of arrangements needs to include the participation of all stakeholders with information readily available and good communication channels open.

- Regional management requirements: Domestic legislation and management arrangements need to meet regional and international obligations and requirements.

- Domestic fisheries interactions: A balance needs to be maintained between all stakeholders with minimal interactions between the commercial and non-commercial sectors.

- Data provision and quality: The provision of quality data needs to be improved for adequate monitoring of fishing activities as well as increased surveillance and compliance to try to eliminate illegal and unregulated fishing activity.

- Sustainable harvesting of target species: Fishing of target species is conducted in a controlled and sustainable manner up to optimal yield while ensuring the protection of the stocks, and the avoidance of overfishing.

- Conservation and the environment: Fishing of target species should not have any negative impact on non-target species, especially protected or endangered species, or the marine environment.

- Employment: The generating of employment opportunities for locals in fisheries, both in the harvesting and processing sectors, with a focus on training to improve skills and employability so that local people can move into management positions.

- Maximise economic benefit: Increase income to the country and its people while maintaining a healthy lifestyle and ensuring food security; ensuring that customary, traditional and cultural values are preserved and that there are no negative social impacts.

- Investment: The need for infrastructure to create an enabling environment for investment by the private sector, or for local people, companies or even government, to attract foreign investment, possibly through joint venture arrangements.

Summary of domestic nearshore fisheries development and management

Domestic nearshore fisheries development has occurred in a range of areas throughout the Pacific. For this paper, five fisheries or areas have been chosen, being: the deep-water snapper fishery; fish aggregating device (FAD) programmes; small-scale tuna fishing; medium-scale tuna fishing and processing facilities; and other nearshore fishing activities.

Deep-water snapper fishing

The deep-water snapper fishery has been tested in basically all PICTs since the late 1970s. Table 2 summarises the current status of this type of fishery for each PICT. As can be seen from Table 2, very few PICTs have a target fishery for these species, with most fishing conducted on an ad hoc basis. Management plans are in place in five PICTs, and this probably reflects the level of fishing currently directed at these species.

Table 2: Summary of the fishing activity for deep-water snappers by PICT, and the status of development or management arrangements

Country/territory	Target fishery (vessel number if known)	Ad hoc fishery (vessel numbers if known)	Management/development plan for the fishery
American Samoa	No targeting.	At least 6 vessels.	Management plan in force since August 1986.
Cook Islands	2 small vessels.	Some small-scale vessels.	Nil – no plans to do one at present.
Federated States of Micronesia	No targeting.	Many small-scale vessels fishing subsistence and artisanal.	Nil – no plans to do one at present, as this is a non-commercial export fishery.
Fiji Islands	6 large vessels to fish the EEZ, outside 12 nm, plus some small-scale vessels.	Many small-scale vessels for subsistence and artisanal.	Management guidelines put in place in 1987. These have not been updated and there are no immediate plans to do so.
French Polynesia	No targeting.	Up to 300 small-scale vessels fishing ad hoc using handlines, handreels and electric reels.	Nil – process to draft a plan commenced with it hopefully completed by the end of 2004.
Guam	Up to 20 small-scale vessels target when weather permits.	Around 180 small-scale vessels fishing occasionally.	Management plan in force since August 1986
Kiribati	Many vessels working as part of rural fishing centres.	Many small-scale vessels fishing for subsistence and artisanal purposes.	Nil – no plans to develop one, however, the potential to expand this fishery is being explored.
Marshall Islands	No targeting at present but interest is there to start.	Some small-scale vessels fishing for subsistence and artisanal purposes.	Nil – no plans to develop one; however, there is interest to develop the fishery.
Nauru	No targeting.	Many small-scale vessels fishing for subsistence.	Nil – no plan to develop one at present.
New Caledonia	8–10 full-time vessels using handreels and short bottom	Another 10 part-time vessels.	Nil – study being considered, which may lead

	longlines.		to a plan being developed.
Niue	6 small-scale vessels target at times.	Up to 20 small-scale boats and 120 canoes fish ad hoc for subsistence and artisanal purposes.	Nil – an inshore fishery management plan being developed and this includes deep-water snappers.
Northern Mariana Islands	5 vessels over 15 m target these species.	Some small-scale vessels fish ad hoc.	Management plan in force since August 1986.
Palau	No targeting.	Small-scale vessels fishing subsistence and artisanal.	Nil – no plan to develop one at present.
Papua New Guinea	Very little targeting.	Many small-scale vessels fishing subsistence and artisanal.	Nil – being looked at and will be addressed in the future.
Pitcairn	No targeting.	A couple of small-scale vessels fishing subsistence and artisanal.	Nil – no plan to develop one at present.
Samoa	Small amounts of targeting.	Many small-scale vessels (some displaced alia longliners).	Nil – plan to be developed in early 2004 once the stock assessment is completed.
Solomon Islands	Targeting by small-scale vessels working to rural fishing centres.	Some small-scale vessel fishing for subsistence and artisanal.	Nil – no plan to develop one at present, although government is promoting expansion in this fishery.
Tokelau	No targeting.	Most small-scale vessels at all 3 atolls fish for subsistence.	Nil – no plan to develop one at present.
Tonga	24 vessels targeting deep-water snappers for export.	Some small-scale vessels fishing for subsistence and artisanal.	Final draft deep-water (bottomline fishery) management and development plan in place.
Tuvalu	Plan to target seamounts when larger vessels are available.	Some small-scale vessels fishing for subsistence and artisanal.	Management plan drafted and implemented in 1995, although minimal fishing has occurred to date.
Vanuatu	Over 100 small-scale vessels targeting these species. Three 9–10 m vessels fishing in same area. Also, 2 vessels over 10 m fishing outside 6 nm.	Some small-scale vessels also fishing for subsistence and artisanal.	Nil – no plan at present, although a plan will be developed in the near future with outside assistance.
Wallis and Futuna	No targeting.	Around 10 small-scale vessels on Wallis and another 10 vessels on Futuna fish subsistence and artisanal.	Nil – no plan to develop one at present.

Fish aggregating devices (FADs)

FADs have been widely used in the Pacific region since the end of the 1970s. Their use is based on the known fact that tuna schools and other pelagic species congregate or aggregate around floating objects in the water. There are many ideas as to why pelagic species do this, with the two most common being the ‘shelter and protection’ and the ‘orientation’ theories (Preston et al. 1998). The first theory suggests that the FAD buoy and mooring line offer protection from predators, while the second suggests that fish use the FAD as a physical reference point in an ocean generally devoid of such signals.

There are many different designs of FADs being used in the Pacific at present. When looking at FAD designs, they can be split into two groups, drifting and moored. The drifting FADs are just a buoy

system that is allowed to drift in the ocean currents, usually with a radio beacon attached so they can be easily located, while the moored FADs have a mooring line and anchor so they are positioned in a specific location.

Drifting FADs

Drifting FADs are used by the purse seine fleets in the Pacific to increase catches of surface-swimming tuna schools, primarily skipjack tuna (*Katsuwonus pelamis*) and juvenile yellowfin tuna (*Thunnus albacares*). Each purse seine vessel may have a dozen or more FADs that they set adrift with radio beacons. The boats then monitor the FADs and when a school of tuna is observed to be aggregated, the net is set around the FAD and school of tuna in the early hours of the morning. Once the net is set and pursed, the FAD is towed out of the net and allowed to continue drifting.

There has been quite a bit of publicity recently in regard to the catch of non-target species, small size target species, and small bigeye tuna by purse seiners. Most of this is associated with the catch taken from drifting FADs, and the proportions can be higher in different locations. This type of FAD use is for the industrial fishery, which is outside the scope of this paper, even though several PICTs have interest in purse seine vessels.

Moored (anchored) FADs

Moored FADs are an important part of small-scale fishing operations in many PICTs. Of the 22 countries and territories, 14 have active FAD programmes. Of these, most ongoing FAD programmes are funded by government for all stakeholders to use. In some countries, FADs are located close to shore for canoe fishermen, with others further offshore for outboard-powered skiffs to fish around. Table 3 summarises the current status of FAD programmes, number of FADs in the water and planned deployments where these are known.

Three countries, Papua New Guinea, Solomon Islands and to a lesser extent Palau, have industrial fishing operations that run their own FAD programmes for their fishing operations. In the case of Papua New Guinea, there are 600 to 700 FADs moored off the north coast for the 22 purse seiners working to the tuna cannery in Madang. In the Solomon Islands, the 100 or so FADs support the fishing operations of 12 pole-and-line boats working to the tuna cannery at Noro, and three purse seiners.

Table 3: Summary of FAD programmes and the current status in regard to FADs in the water and planned deployments

Country/territory	FAD programme in place including maintenance	Number of FADs in the water (Sept–Oct 2003)	Planned deployments in next 6 months
American Samoa	Ongoing programme.	4 at present.	1 deep and 7 shallow.
Cook Islands	Ongoing throughout the group.	7 off Rarotonga, 3 off Aitutaki and 7 in outer islands.	2 planned for outer islands plus replacements in other locations.
Federated States of Micronesia	No active programme.	Nil at present.	2 States have materials and may deploy FADs soon.
Fiji Islands	Ongoing programme, mainly around Suva.	Unspecified number of FADs at present.	Some FADs to be deployed, all in deep water.
French Polynesia	Ongoing government programme, which includes regular maintenance.	14 FADs around Tahiti, 3 in the northwest Society Islands and 4 in the Tuamotu Islands.	12 FADs around Tahiti, 8 for the northwest Society Islands and 5 for the Austral Islands.
Guam	Ongoing programme.	16 FADs maintained in set locations.	FADs replaced within 2 weeks of being lost.
Kiribati	FADs deployed on an ‘as	Several FADs in southern	None planned but will do if

	needs' basis.	reef islands.	requested and materials are available.
Marshall Islands	No ongoing programme – Billfish Club doing some maintenance work.	1 FAD off Majuro.	None planned as no materials available.
Nauru	FAD programme re-activated in 2003, with limited scope for regular maintenance.	3 FADs currently in the water.	None planned at this stage.
New Caledonia	Ongoing FAD programme.	4–5 FADs in the water around the country.	Possibly some deployments in early 2004.
Niue	Ongoing FAD programme including maintenance.	14 FADs in the water around the island.	At least 3 FADs to be deployed plus other replacements when needed.
Northern Mariana Islands	Ongoing programme.	3 at present.	4 in early 2004.
Palau	Government and 2 companies involved in separate FAD programmes. Companies maintain their own FADs.	Government has 4 FADs, pole-and-line company has 10–12 FADs and another company has 8–10 FADs for handline fishery.	Government planning to deploy several new FADs in late 2003, and companies expected to maintain their FAD numbers.
Papua New Guinea	Tuna purse seining companies have active FAD programmes, with the EU and a local company starting separate FAD programmes.	600–700 FADs currently in the water maintained by purse-seine companies.	Purse-seine companies to maintain FAD numbers. In late 2003 to early 2004, FADs to be deployed by EU project (several FADs) and small-scale tuna fishing company (12 FADs).
Pitcairn	Nil at present.	Nil at present.	Nil at present.
Samoa	Reactivated programme for FADs commenced in 2002.	3 FADs currently on station.	5 FADs to be deployed in early 2004 when materials arrive from overseas.
Solomon Islands	2 private sector companies have FAD programmes with maintenance for their pole-and-line and purse seine vessels.	Around 100 FADs maintained by the 2 companies.	Mainly replacement FADs when needed.
Tokelau	Currently no FAD programme, although one to commence in early 2004.	None at present.	6 planned for deployment in 2004, 2 at each atoll, funding permitting.
Tonga	Revitalised FAD programme started in 2002 including maintenance.	At least 18 FADs currently on station throughout the country.	Several deployments planned as well as replacements if needed.
Tuvalu	Nil at present.	Nil at present.	Nil at present and no funding available.
Vanuatu	Ad hoc programme at present, but new FAD funding in late 2003 to early 2004 will change this.	2 FADs currently off Port Vila.	Funding for at least 14 FADs to become available in late 2003 to early 2004, with FADs deployed soon after.
Wallis and Futuna	Limited capacity for a FAD programme at present.	1 FAD in the water off Futuna.	Funding available for materials and deployments in early 2004.

One of the problems being faced by many countries is the cost associated with FAD programmes, especially with many FADs breaking free in less than 12 months from deployment. The design of FAD moorings plus the actual cost of materials, and therefore the FAD system, is the focus of a research project currently being funded by New Zealand and implemented by SPC's Fisheries

Development Section in Niue and the Cook Islands. The results after two years are very encouraging, with several of the experimental designs having been in the water for around 20 months (at 1 November 2003), and the cost per unit for an FAD in 1000 m depth is around NZD$4500 (USD$2500 — Chapman et al. 2003).

Small-scale tuna fishing

There are thousands of small-scale boats and canoes trolling and mid-water handlining close to the reef or around FADs in their respective country or territory. It is impossible to put an accurate number together as many of these boats and canoes are used for subsistence and artisanal purposes, rather than commercial or semi-commercial, and many are in the outer islands within each country. Table 4 summarises the current information on small-scale tuna fishing activities by PICT, including charter fishing operations.

There is a large contrast between countries in regard to fishing activity, and this generally revolves around the availability of markets to sell the catch. In countries like Tokelau, there is basically no market to sell fish, so the catch is distributed amongst the community. A recent survey of around 65 per cent of the households in Tokelau recorded 38 canoes and 179 boats, not all operational, with many of these used for trolling, mid-water handlining and poling, with pearlshell lures for subsistence purposes (SPC 2003b). In contrast to Tokelau is the situation in Kiribati, where there are over 200 small-scale vessels fishing from South Tarawa to sell their catch on the local market.

Many small-scale operators rely on fishing around FADs, when these are available, as they increase catches, or at least the chance of getting a good catch, and cut operating costs as fishermen can go to set locations to fish. Another advantage of fishing around FADs is that they are in set locations, so if a fishermen's boat breaks down, there is a much better chance of being found.

Table 4: Summary of small-scale tuna fishing activity including charter fishing operations

Country/territory	Trolling and mid-water fishing	Small-scale tuna longlining	Gamefishing charter
American Samoa	At least 10 alias.	25 alias.	1 boat.
Cook Islands	Around 20 full time and 20–25 part time in Rarotonga; 5 full time and 10–15 part time in Aitutaki; over 200 in outer islands.	4 vessels fishing out of Rarotonga.	9 boats working from Rarotonga and 5 from Aitutaki.
Federated States of Micronesia	Pohnpei and Chuuk each have around 50–100 boats fishing, while Yap and Kosrae each have around 25–50 boats fishing.	Several boats but these are included in the total number of longline vessels for the country.	Several boats associated with tourist hotels.
Fiji Islands	Quite a few boats, mainly trolling around the Suva area and the FADs.	Several boats but these are included in the total number of longline vessels for the country.	Several charter boats, some associated with tourist hotels.
French Polynesia	Around 300 small-scale vessels trolling, vertical longlining and harpooning around the country.	Vessels in this category included in the total number of tuna longline vessels.	Around 15 charter boats, mainly in tourist areas.
Guam	Around 180 vessels involved in trolling with 20–30 of these full time.	Nil at present.	Around 25 vessels mainly catering to the needs of the tourist industry.
Kiribati	Over 200 open skiffs fish from south Tarawa plus 10–20 vessels associated with rural fishing centres.	2 vessels owned by CPP, one fishing off Tarawa and one from Kiritimati Island.	Nil at present.

Marshall Islands	10 full time and 25–30 part-time vessels trolling.	MIMRA has one small-scale longline vessel doing fishing trials.	Around 25 charter boats on Majuro plus 10 between Kwajalein and Arno.
Nauru	Around 100 boats mainly trolling and 50 canoes mid-water handlining.	Nil at present.	One private sector charter boat.
New Caledonia	Around 10 vessels trolling.	Nil at present.	Around 6 charter vessels, most in Noumea.
Niue	40–50 part time vessels mainly trolling, with 120 traditional outrigger canoes mainly mid-water fishing.	Nil at present.	1 charter vessel with another to start in late 2003.
Northern Mariana Islands	Around 50 full-time and 75 part-time vessels trolling.	Nil.	Around 12 vessels.
Palau	Around 10 full time and 10–15 part time vessels trolling the coast for tunas. Another 8 Filipino-design pug-boats mid-water handline fishing at FADs.	Nil at present.	Around 7 charter fishing vessels in Koror.
Papua New Guinea	Some vessels trolling for tunas and other pelagics. A new Filipino company starting up to mid-water handline around FADs.	Nil at present, all medium scale vessels.	Several charter boats around the country, especially at main centres such as Port Moresby, Lae and Madang.
Pitcairn	Small amounts of trolling by a couple of vessels when weather permits.	Nil at present.	Nil at present.
Samoa	30–50 alias mainly trolling the coast or around FADs, with limited mid-water fishing activity.	9 small-scale alia longliners currently working, which is a large downturn from previous years (around 80 alia vessels in 2002).	4 charter boats, 2 owned by one company.
Solomon Islands	Some small-scale vessels trolling coast and FADs	Nil at present.	Several charter boats at Gizo.
Tokelau	Many part-time boats and canoes trolling, mid-water handlining and poling with pearlshell lures for subsistence purposes.	6 alia-type longliners, although they are not in operation at present. Plans to start fishing in 2004.	Nil at present.
Tonga	20–30 part-time boats trolling the coast and FADs.	Several small-scale tuna longliners, but these are included under medium-scale vessels.	Around 8 charter vessels operation out of Vava'u.
Tuvalu	Around 10 full-time vessels and many part-time vessels trolling around the islands.	Nil at present.	Nil at present.
Vanuatu	Around 20 small-scale vessels trolling for tunas.	Nil at present.	Around 9 charter boats, 7 at Port Vila and 2 at Santo.
Wallis and Futuna	Around 10 vessels trolling the coast off Wallis and another 10 trolling the FAD off Futuna.	One vessel under construction and due to arrive in mid-2004.	Nil at present.

A few countries are involved in small-scale tuna longlining, and it was successful in several countries, Samoa and American Samoa, from 1997 to 2001. In more recent years though, the catch rates have dropped off in these countries, and the small-scale vessels do not have the range to fish further

offshore where the medium-scale longliners are fishing. Therefore the numbers of small-scale vessels in these countries has greatly reduced.

Charter fishing for pelagic species is an area that is slowly starting to pick up in the region, although this is generally tied in with tourism in the different PICTs. Five PICTs have no charter fishing vessels at present, and these are the countries with very little tourism, or are remote and difficult for people to get to. In the countries with charter boats, they are generally located in the main urban centres or tourist hotels, and, in some cases, they rely on FADs to produce fish for their paying customers.

Medium-scale tuna fishing and processing facilities

Medium-scale tuna fishing operations are the main focus of many countries in the region for economic development. PICTs are trying different approaches to promote development in this sector. Most PICTs are looking to promote private sector development, while a couple have opted for a mix of private and public sector development. Some countries have focused on pure domestic development with locals owning their own boats, while others have allowed local companies to bring in foreign vessels under charter, a joint venture arrangement, or have them flagged and based locally (locally based foreign vessels). Table 5 summarises the current status of medium-scale tuna fishery development, shore-based processing facilities, and domestic tuna fishery management arrangements.

Table 5: Summary of medium-scale tuna fishing activity, processing and packhouse facilities, and the current status of management and/or development arrangements

Country/territory	Domestic and locally based foreign vessels (as at Sept–Oct 2003)	Tuna processing and packhouse facilities	Management/development plan for the fishery
American Samoa	35 vessels.	2 tuna canneries plus 2 small fish markets.	Plan in force since March 1987.
Cook Islands	13 vessels working the northern Cooks and 20 vessels working out of Rarotonga.	3 large and 3 small facilities.	Draft plan with Cabinet for consideration.
Federated States of Micronesia	At least 85 private and public sector vessels (includes any small-scale longline vessels), some under charter arrangements.	At least 6 processing and packhouse facilities plus a tuna loining and steaking facility.	Management plan developed and implemented in 2002.
Fiji Islands	101 vessels fishing to 18 companies (includes all small-scale longline vessels). Also 1 pole-and-line vessel.	1 tuna cannery and 5 tuna processing and packhouse facilities. Also 1 tataki processing facility.	Plan in force since 2002. Plan also under review.
French Polynesia	50–55 tuna longline vessels fishing to around 35 companies. 16 of these vessels process and freeze their catch for export.	13 fish processors and packhouses in Papeete with 7 of these exporting product.	Nil – process to draft a plan started and hopefully completed by the end of 2004.
Guam	Nil – transhipment point for foreign vessels only.	Several transhipment facilities to handle catch from foreign vessels.	Plan in force since March 1987.
Kiribati	Nil at present.	2 processing and packhouse facilities plus plans for a small-scale tuna loining plant.	Draft plan developed and now under review.
Marshall Islands	28 tuna longliners working to one company plus 5 shark longliners working to a different company. Also 6	1 tuna packhouse, 1 tuna loining facility and 1 facility processing and handling sharks.	Plan being developed in late 2003 to early 2004.

	purse seiners flagged in the Marshalls.		
Nauru	2 longline vessels operated by the Nauru Fisheries Corporation.	1 government-run packhouse and fish market.	National Tuna Fisheries Strategy developed in 1998, and this will be revised in early- to mid-2004.
New Caledonia	29 active longliners working to 2 main companies plus 6 small companies.	3 tuna processing and packhouse facilities plus 1 vessel processing and freezing onboard for export.	No plan in place, but guidelines used to manage the fishery, with these to be reviewed in 2004.
Niue	No boats fishing at present, but up to 15 vessels to commence in early 2004.	Nil at present, although 1 under construction for completion in early 2004.	Development and management plan in place since 1998.
Northern Mariana Islands	2 vessels just starting.	Nil.	Plan in force since March 1987.
Palau	Around 94 tuna longliners working to 3 companies, plus 1 local pole-and-line vessel.	2 main packhouses plus 1 company that packs on the wharf.	Plan drafted in 1999 and implemented in 2001.
Papua New Guinea	31 tuna longline vessels working to 7 companies in Lae and Port Moresby. 22 purse-seine vessels working to 4 companies.	7 tuna processing and packhouse facilities, plus 1 tuna cannery at Madang. 3 new tuna loining plants to come on line in 2004.	Tuna management plan implemented in 1999. Also a FAD policy and shark management plan implemented in early 2000s.
Pitcairn	Nil at present.	Nil at present.	No plan at present.
Samoa	26 longline vessels working to around 15 companies (4 main ones) at present.	4 tuna processing and packhouses, all in Apia.	Tuna management plan in place since 2001.
Solomon Islands	8 tuna longliners working to one company. 10–15 shark longliners working to one company. 12 pole-and-line vessels working to Soltai tuna cannery. 3 purse seiners working to one company.	Processing and packhouses, 1 for tuna and 1 for shark. 1 tuna cannery with fishmeal plant and arabushi smoking facility.	Tuna fishery development and management plan developed and implemented in 1999.
Tokelau	1 small-scale vessel just starting.	2 freezer complexes but no real processing facilities at present.	No plan at present, although the process has commenced and a draft plan should be ready in early 2004.
Tonga	30 private sector longliners working to 9 companies plus 2 government vessels. Not all boats fishing at present.	4 processing and packhouses, although 1 not in operation at present due to financial difficulties.	National tuna plan in place since 2001.
Tuvalu	Nil at present, although 2 boats to arrive in early 2004 to commence tuna longlining.	1 facility on Funafuti that can be used if the boats work out of this port.	Draft tuna management and development plan (2002–2006) being finalised.
Vanuatu	Nil at present.	Nil at present – only packing deep-water snappers for export.	Plan in place since 2000 for the tuna fishery.
Wallis and Futuna	Nil at present.	Nil at present.	General Fishing Industry Development Policy drafted in 2003, and this includes the tuna fishery.

Figure 2 shows the effectiveness of domestic tuna fishery development through the numbers of fishing vessels currently tuna longlining. This includes all small-scale, medium-scale and large-scale vessels, the latter category mainly applying to the distant water fleets of Korea, Japan, Taiwan and mainland China. As can be seen in this figure, the numbers of domestic vessels have risen in the late 1990s to around 450, with the numbers levelling off from 1998 to 2000. Another increase in 2001 and 2002 has the number of domestic vessels up to almost 500.

By looking at these figures, we can see that the number of domestic vessels has increased in the past five years, although the figures do not show the change in fishing areas, in which fleets in some areas have decreased, while in other areas they have increased. The main area of decrease is in the number of small-scale tuna longliners operating out of Samoa and American Samoa, while the number of medium-scale longliners has increased in Fiji, French Polynesia and the Cook Islands.

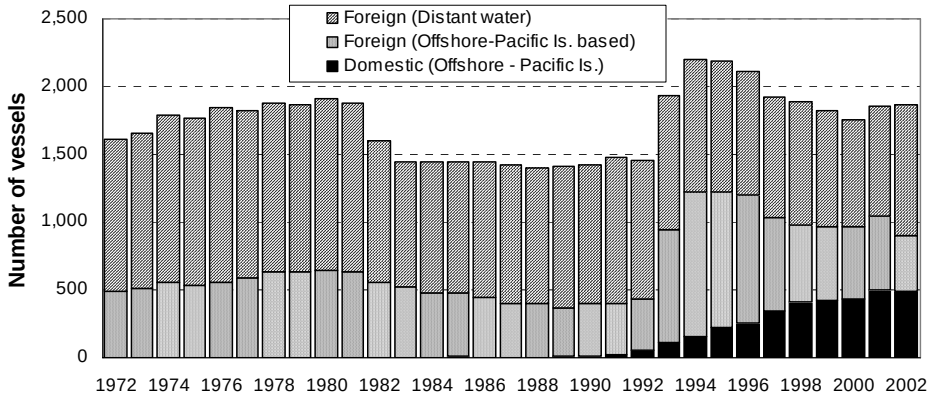

Figure 2: Longline vessels operating in the western and central Pacific Ocean

In line with the development of medium-scale tuna fishing operations, companies have established shore-based facilities to process, or in most cases pack, export-quality tunas and associated species into cartons for export to markets in Japan, Hawaii, the US mainland, Europe, and to a lesser extent, Australia and New Zealand.

In addition to packhouses, industrial processing facilities include two tuna canneries in American Samoa, one tuna cannery in Papua New Guinea, one tuna cannery in the Solomon Islands, one tuna cannery in Fiji, a tuna loining plant in the Marshall Islands, an *arabushi* (smoked tuna loins) plant in the Solomon Islands and a *tataki* (seared and frozen tuna loins) plant in Fiji. In addition, Papua New Guinea has plans to establish several new tuna loining facilities, and Kiribati is also looking into the feasibility of establishing a tuna loining plant.

For the management of the tuna resource, most PICTs have a plan in place, or are in the process of developing or finalising a plan. All PICTs are focused on management and sustainable harvesting of the tuna resource, while reducing impacts on non-target species. Some countries are also placing equal focus on developing local capacity so that a domestic medium-scale tuna fishery can develop.

Other domestic nearshore fishery development areas

PICTs continue to look to the ocean and its resources for future development. In Polynesia, fishermen have traditionally harvested flyingfish using scoop nets and light attraction. The gear has changed over time, but the basic method continues today. The flyingfish are used for bait and local consumption, and this is an important fishery in the countries where it is practised. Other deep-water resources have been explored, with Table 6 summarising the current status of development of these resources.

Table 6: Summary of other domestic nearshore fishery development areas currently being harvested or explored

Country/territory	Baitfishing activities	Crabs or shrimp trapping	Other methods
American Samoa	Nil at present.	Nil at present.	Nil at present.
Cook Islands	Nil at present, although several proposals are under consideration for milkfish aquaculture.	One vessel to commence trials for trapping deep-water crabs and possibly shrimp.	Night fishery for flyingfish using scoop nets and light attraction. Also same trap vessel will conduct longline trials for alfonsino.
Federated States of Micronesia	Nil at present.	Nil at present.	Nil at present.
Fiji Islands	Baitfishing in the lagoon by one pole-and-line vessel.	Nil at present.	Recent trawling trials for alfonsino and other deep-water species.
French Polynesia	Nil at present.	Nil at present.	Night fishery for flyingfish, using scoop nets and light attraction.
Guam	Milkfish aquaculture produces small amounts of bait for longline fishing.	Nil at present.	Nil at present.
Kiribati	Aquaculture of milkfish for bait, but no other baitfish fishery.	Nil at present.	Night fishery for flyingfish, mainly with scoop nets with some gill netting.
Marshall Islands	One proposal being considered for milkfish aquaculture. No other baitfishing.	Nil at present.	Nil at present.
Nauru	Nil at present.	Nil at present.	Nil at present.
New Caledonia	Nil at present.	Nil at present.	Nil at present.
Niue	Traditional baitfish fishery for ulihega plus some jigging for scad around FADs.	Nil at present.	Night fishery for flyingfish, using scoop nets and light attraction.
Northern Mariana Islands	Nil at present, although 1 person is planning to catch bigeye scad with lift nets in late 2003.	Nil at present.	Nil at present, although one proposal being considered for squid fishing for bait and human consumption.
Palau	1 pole-and-line vessel live baiting in lagoon.	1 vessels trapping deep-water crabs.	1 vessel fishing for large diamond-backed squid.
Papua New Guinea	Nil at present.	Nil at present.	Prawn trawl fishery in the Gulf of Papua and in the Torres Straight, plus 12 trial fishing permits are available for new fisheries.
Pitcairn	Nil at present.	Nil at present.	Nil at present.
Samoa	Nil at present.	Nil at present.	Nil at present, but a proposal for the mariculture of mahi mahi in ocean cages is being considered.
Solomon Islands	Live baiting conducted by pole-and-line vessel in lagoons.	Nil at present.	Nil at present.
Tokelau	Nil at present.	Nil at present.	Some boats and canoes involved in night fishery for flyingfish using scoop net and light attraction.

Tonga	Nil at present.	1 ex-Korean vessel trapping in deep water.	1 ex-Korean vessel bottom longlining in deep water.
Tuvalu	Nil at present.	Nil at present.	Nil at present.
Vanuatu	Nil at present.	1 vessel trapping deep-water crabs in 500 to 700 m depths.	Nil at present.
Wallis and Futuna	Nil at present.	Nil at present.	Nil at present.

Baitfishing in most cases is not a nearshore fishery, although the bait is necessary for other nearshore fishing activities, such as pole-and-line fishing. The aquaculture production of milkfish has been conducted in several PICTs, with others now becoming interested.

The trapping of deep-water shrimp was trialled in many PICTs in the 1980s, with generally low catch rates recorded. The high cost of gear and the potential for gear loss coupled with the low catch rates caused interest in this fishery to stop. However, there is now interest in deep-water crabs, with at least three PICTs having vessels trapping these species. Possibly deep-water shrimp will also be caught in the process.

Trial fishing is being conducted in a couple of PICTs to look at the potential of catching alfonsino with traps, bottom longlines and trawling. The trials have only just begun in the Cook Islands (traps and longlines), Fiji (trawling), and Tonga (bottom longlining) for alfonsino and other deep-water species.

Squid fishing trails have been undertaken in the past in quite a few PICTs. Today, only one boat fishes occasionally for the large diamond-backed squid in Palau.

Conclusions

Development of domestic nearshore fisheries in PICTs is an ongoing process, with the rate of development and its direction being different for each country or territory, based on their priorities and aspirations. When looking at the deep-water snapper fishery, there would appear to be a need for most PICTs to develop management arrangements before what is now in many countries an ad hoc fishery becoming a target fishery.

Trolling and mid-water fishing is a major fishery in most PICTs for small-scale subsistence, artisanal and commercial operators. Having FADs available for these small-scale operators greatly assists their fishing operation by increasing the chance of a good catch, decreasing operating costs and providing additional safety by fishing in known locations. Maintaining ongoing FAD programmes with regular maintenance of the devices can be a good approach to developing small-scale tuna fisheries.

Small-scale tuna longlining has been successful in the past in several countries in the region. However, these fisheries are changing, with medium-scale longliners with greater carrying capacity and fishing range starting to replace the small-scale longline vessels. Medium-scale vessels seem to be the preferred option for tuna longlining at present, although there is scope for limited numbers of small-scale vessels in the future.

Potential may exist in the deep water around some PICTs, especially those with seamounts or fishable areas that are not too steep or too deep, for developing new fisheries based on species such as deep-water crabs or alfonsino. However, the cost of trial fishing will be high and the resources are likely to be limited.

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American Samoa

General

American Samoa (Figure 1) is made up of five principal islands and two small atolls (Swains Island to the north is under dispute with Tokelau), between 11º and 14º S latitude, and 168º and 172º W longitude. The mid-year 2003 population estimate for American Samoan was 61,400 people (SPC 2003).

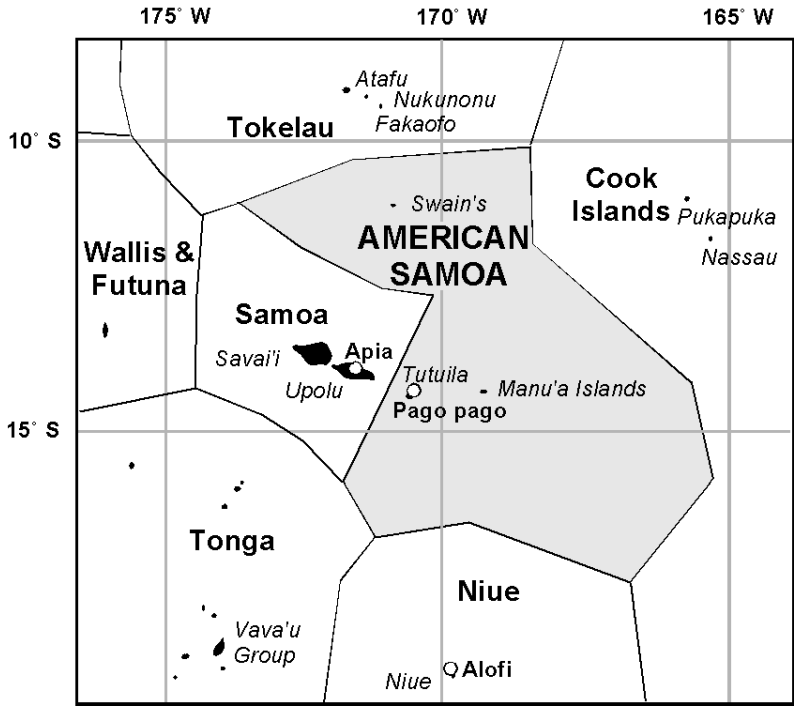

Figure 1: American Samoa, its EEZ and neighbouring countries

American Samoa has an EEZ of around 390,000 km^2, while having a land area of only around 200 km^2. American Samoa's EEZ shares borders with five countries, Tokelau to the north, the Cook Islands to the east, Niue to the south, the Kingdom of Tonga to the southwest, and Samoa to the west.

Fisheries development and management

The development and management of the marine resources within American Samoa's EEZ has been regulated by the US Government. Fisheries management is driven through the Western Pacific Regional Fisheries Management Council in response to the Magnusson-Stevens Fisheries Conservation and Management Act under the US Congress. However, in 1988 the Department of Marine and Wildlife Resources (DMWR) was established, amending Section 4.0301 ASCA; and sections under Chapter 03, Title 24 ASCA.

The policy as stated in the Statute that established DMWR is: '*It is the public policy of the Territory and purpose of the chapter to Preserve, protect, perpetuate and manage the marine and wildlife resources within the Territory. This chapter is to be construed so as to implement such policy and purpose to the fullest extent*'. Under this statute, DMWR has no mandate for development or developing of fisheries. DMWR is in the process of getting development added to its objectives, and it is hoped that this would occur in 2004.

Fisheries development and management is also reported to be covered under American Samoa's National Development Strategy; however, the document is being drafted by the Planning Office and is not available to the public at present.

Nearshore domestic fisheries development and/or management plans and strategies

Fisheries management of nearshore resources around American Samoa is conducted through the Western Pacific Regional Fisheries Management Council based in Honolulu, Hawaii. Through the Council, two fishery management plans have been implemented, one for the deep-water snapper resource and the other for pelagic species. These management plans cover Hawaii and the three US territories of American Samoa, the Commonwealth of the Northern Mariana Islands, and Guam.

Combined fishery management plan, environmental assessment and regulatory impact review for the bottomfish and seamount groundfish fishery management plan of the Western Pacific region

This plan was implemented in August 1986 (WPRFMC 1986) and has been amended nine times over the years to take account of changing circumstances in all or part of the fishery being covered. The plan has the following objectives:

1. Protect against overfishing and maintain the long-term productivity of bottomfish stocks;

2. Improve the database for future decisions through data reporting requirements and cooperative Federal/State/Territory data collection programmes;

3. Provide for consistency in Federal/State/Territory bottomfish management to ensure effective management across the range of the fisheries;

4. Protect bottomfish stocks and habitat from environmentally-destructive fishing activities and enhance habitat if possible;

5. Maintain existing opportunities for rewarding fishing experiences by small-scale commercial, recreational, and subsistence fishermen, including native Pacific islanders;

6. Maintain consistent availability of high quality products to consumers;

7. Maintain a balance between harvest capacity and harvestable fishery stocks to prevent over-capitalization;

8. Avoid the taking of protected species and minimise possible adverse modifications to their habitat;

9. Restore depleted groundfish stocks and to provide the opportunity for US fishermen to develop new domestic fisheries for seamount groundfish which will displace foreign fishing; and

10. Monitor stock recovery of depleted stocks in the Fisheries Conservation Zone so that any international plan of action for managing the common resource can be guided by experimental results.

The pelagic fishery management plan of the Western Pacific region

This plan was implemented in March 1987 and has been amended (WPRFMC 2003a). The current objectives of the plan are as follows:

1. To manage fisheries for management unit species in the Western Pacific region to achieve optimum yield;

2. To promote, within the limits of managing optimum yield, domestic harvest of the management unit species in the Western Pacific region EEZ and domestic fishery values associated with these species, for example, by enhancing the opportunities for:

   (a) satisfying recreational fishing experiences;

(b) continuation of traditional fishing practice for non-market personal consumption and cultural benefits; and

(c) domestic commercial fishermen, including charter boat operations, to engage in profitable fishing operations.

3. To diminish gear conflict in the EEZ, particularly in areas of concentrated domestic fishing.

4. To improve the statistical base for conducting better stock assessments and fishery evaluations, thus supporting fishery management and resource conservation in the EEZ and throughout the range of the management unit species.

5. To promote the formation of a regional or international arrangement for assessing and conserving the management unit species and tunas throughout their range.

6. To preclude waste of management unit species associates with longline, purse seine, pole-and-line or other fishing operations.

7. To promote, within the limits of managing at optimum yield, domestic marketing of the management unit species in American Samoa, the Commonwealth of the Northern Mariana Islands, Guam and Hawaii.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in American Samoa

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Ray Tulafono, Director, Department of Marine and Wildlife Resources (September 2003).	Currently around 6 small-scale alias fishing ad hoc for deep-water snappers. No boats or companies targeting these species.	2 private companies supplying ice to local fishermen. Small amounts of ice also sold by the Fisheries Division during office hours. 2 new private ice plants to be established next to the wharf, with construction to commence in late 2003. 2 main private fish markets with several other shops selling fish.	No boatbuilding facilities in American Samoa, although people have built one-off vessels, mainly in fibreglass, from time to time. Repairs can be done on steel, wood, fibreglass and aluminium vessels. 1 company has a slipway and can do maintenance on vessels from 10–50 m in length.
Background References: Dalzell and Preston 1992; Itano 1991; Mead, 1978; WPRFMC 2003b; WPRFMC 1996; WPRFMC 1991: WPRFMC 1988.	In 1978, SPC conducted deep-water fishing trials and training of local fishermen. In 1980 around 20 vessels fished for deep-water snapper species. In 1982, a development project targeting deep-water snappers for export was commenced. This led to increased vessel numbers, with around 47 in 1985	Government has encouraged private sector development, with several projects where assistance was provided in assisting fishermen increase fish quality (1982–84) of the deep-water snapper being exported. From 1985–87, assistance continued with phone contact with export markets. The government stayed away from providing infrastructure such as ice	Government subsidised boat building project 'Dory Project' commenced in 1972, with 24 x 7.3 m plywood monohull vessels constructed. In 1981, company established to construct 6.7–9.0 m plywood and fibreglass catamarans (Manta Cat), powered by 2 x 40 HP outboards. Small, 5 m aluminium

	before declining again. Catches were around 30 t in 1982 increasing to around 65 t in 1985. In 1985, Hawaiian fisherman conducted bottom longline trials using PVC droppers – the method was unsuccessful. Management plan implemented in August 1986 by the National Marine Fisheries Service, which covered Guam, Hawaii, American Samoa and the Commonwealth of the Northern Mariana Islands. During the late 1980s and 1990s, vessel numbers fluctuated from 15–30, with annual catches of 7–25 t. In the early 2000s, vessel numbers dropped as more alias converted to tuna longlining, resulting in smaller landings.	machines. DMWR has its own ice machine and does sell ice on infrequent occasions.	dinghies with outboards were imported and made up the majority of fishing vessels. In the mid 1980s, 8.5 and 9.5 m aluminium alia catamarans were imported from Samoa. Cyclones in 1987, 1990 and 1991 devastated boat numbers, with more alias bought in from Samoa. In the 1990s, alia catamarans from Samoa became the most common boat in American Samoa, with these being converted for tuna longlining in the late 1990s the same as in Samoa.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in American Samoa

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Ray Tulafono, Director, Department of Marine and Wildlife Resources (September 2003).	Ongoing FAD programme continues with 4 FADs currently in the water. 1 additional deployment planned for late 2003 when materials arrive. Implementing a more rigorous FAD maintenance programme for offshore FADs. Plans to deploy 7 shallow water FADs (30–60 m depth) in late 2003 or early 2004.	No public sector development work underway at present. Looking at running workshops on mid-water fishing techniques used in association with FADs in early 2004 to re-introduce these methods to local fishermen.	Up to 10 alias trolling FADs and free-swimming tuna schools, as well as bottom fishing. Around 25 small-scale alia longliners (9–12 m long), most doing day trips, with others doing 1–2 day trips and a couple doing 2–3 day trips.
Background References: Buckley et al. 1989; Itano and Buckley 1988; Moana and Chapman 1998; Russo unpublished; WPRFMC 2001; WPRFMC 1997; WPRFMC 1992; WPRFMC 1990.	First 10 FADs deployed in 1979 and 1980, with most lost after 3 months. From 1981–1983 another 15 FADs deployed with an average lifespan of 3–4 months. In 1985–86 another 10 FADs were deployed using a different design. Average lifespan of these FADs was 13 months, although 2 of these lasted almost 3 years. In 1988, 4 FADs were in the water and used for vertical longline fishing trials.	SPC provided assistance in 1988 with the introduction of vertical longlining used in association with FADs. In 1993–94, small-scale tuna longline trials conducted by an SPC consultant masterfisherman, with training of local people a high priority. Workshops held in early 2000 on handling sashimi-quality tuna for export markets.	Small-scale tuna fishing commenced in the early 1970s, with a couple of boats trolling for pelagic species. In 1982, around 22 boats trolled for pelagic species, landing around 12 t of fish. Management plan (pelagics) implemented in March 1987 by the National Marine Fisheries Service, which covered Guam, Hawaii, American Samoa and the Commonwealth of the Northern Mariana Islands. By 1988 vessel numbers grew

	FAD programme continued in the 1990s with varying numbers of FADs deployed.		to 44 with the landed catch increasing to over 100 t. Much of this trolling was done around FADs. Several longline sets also recorded by small-scale operators in 1988. Boat numbers fluctuated from 1990–1994 and ranged from 26–39, with most vessels trolling, some around the FADs. During these years the landed catch ranged from 40–125 t. In 1995, one local operator started longlining from his alia, using the same techniques as those used in neighbouring Samoa. From 1995–2001, trolling catch declined as tuna longlining expanded, although many of the alias were involved in both fisheries. In 1996, the trolling catch was 85 t while the longline catch was around 145 t.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in American Samoa

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint ventures tuna fishing operations
Current status Information provided by Ray Tulafono, Director, Department of Marine and Wildlife Resources (September 2003).	No public sector tuna fishing companies – government is promoting private sector development.	Up to 35 vessels, 15–30 m in length, longlining in American Samoa waters. Only longline vessels of less that 32 m (100 ft) in length are allowed to fish in the American Samoa EEZ. 50 nm from shore exclusion zone for vessels over 16 m (50 ft) in length.	At least 5 companies (3 US and 2 Korean) involved in joint venture operations with multiple vessels. Most of the medium-scale tuna longliners are fishing under joint venture arrangements.
Background References: WPRFMC 2002; WPRFMC 2001; WPRFMC 1997; WPRFMC 1992; WPRFMC 1990.	The government has not been involved in public sector tuna fishing companies at all, leaving this to the private sector.	First domestic longliner operates from 1983–1985 with limited success. Management plan (pelagics) implemented in March 1987 by the National Marine Fisheries Service, which covered Guam, Hawaii, American Samoa and the Commonwealth of the Northern Mariana Islands. In 1997 the first medium-scale longliner commences in the fishery, fishing offshore from the alias. In 2000 another 6 medium-scale longliners joined the fleet. The numbers increased	Joint venture arrangements between locals and overseas operators started in the mid to late 1990s and were associated with the larger vessels entering the tuna longline fishery.

		again in 2001 and reached 30 in early 2002 as the fishery expanded. In March 2002, new regulations imposed by NMFS, with a 50 nm exclusions zone declared to protect small-scale operators. Vessels over 16 m (50 ft) cannot fish within 50 nm of shore.	

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in American Samoa

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Ray Tulafono, Director, Department of Marine and Wildlife Resources (September 2003).	1 charter company with one vessel for gamefishing. At least 5 other sportfishing vessels around Pago. 4 fishing tournaments held annually through sportfishing club, with 20–30 vessels participating (some alias fish plus vessels from Samoa come over).	No baitfishing trials or activities under way at present.	No other nearshore fishing methods being used at present.
Background References: Itano 1991; Kearney and Hallier 1978; SPC 1984; Whitelaw 2001;	In 2001 there were no charter fishing vessels in American Samoa, so this is a new development area for the country.	Baiting and pole-and-line trials conducted from 1970–1972 by Hawaiian vessels. Tuna catches were good but bait was not found in adequate volume locally. In 1973, a baitfish culture project was established to culture mollies or top minnows for live bait; however, the culture techniques were not cost-effective. SPC conducted baiting and pole-and-line fishing trials in 1978 and in 1980. Baitfish catches were low.	Lobster trapping trials were conducted in 1975, but not successful. Ika shibi (night) and palu-ahi (day) fishing methods were tried around FADs and offshore banks to catch tunas in 1985, but with limited success. NOAA conducted research cruises in the mid-1980s to test the deep-eater shrimp resources in the area, which were found to be limited.

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Cook Islands

General

The Cook Islands (Figure 1) is made up of 14 islands and atolls that are divided into two distinct island groups, the northern and southern groups. The islands lie between 8º and 23º S latitude, and 156º and 167º W longitude. The 2003 mid-year population estimate for the Cook Islands is 17,800 people (SPC 2003).

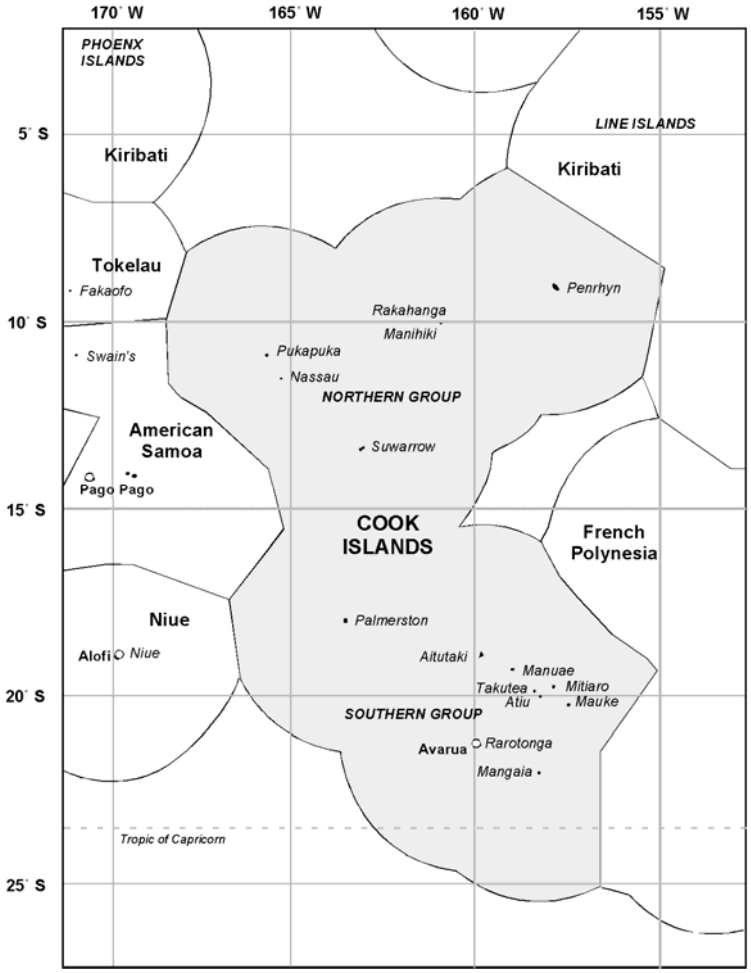

Figure 1: The Cook Islands, its EEZ and neighbouring countries

The Cook Islands has an EEZ of 1.83 million km^2, while having a land area of only 237 km^2. The Cook Islands EEZ borders five other countries (French Polynesia, Kiribati, Tokelau, American Samoa and Niue), although final delimitation agreements have been reached only in respect of the boundaries with the USA (for American Samoa) and France (for French Polynesia).

Fisheries development and management

The development and management of the marine resources within the Cook Islands falls under the jurisdiction of the Ministry of Marine Resources (MMR). The MMR was established by the *Ministry of Marine Resources Act 1984*. The MMR works under the *Marine Resources Act 1989* (GoCI 1989), which establishes a comprehensive framework for fisheries management. The Marine Resources Act is being reviewed to include conservation and social issues as well as ensuring that the Cook Islands

can meet international requirements as a result of future regional management of the tuna resource in the central and western Pacific.

Fisheries development and management is also covered under the Cook Islands National Development Strategy 2003. From this document the MMR has put together their budget estimates for 2003 to 2004 (GoCI 2003a) against the policy objective and the planned outputs under the national outcome of economic sustainability. The policy objective and outputs for 2003 to 2004 as stated in the budget estimates (GoCI 2003a) are as follows (results also presented for relevant areas):

Policy objective: Recognising the potential growth of the longline commercial fishing and aquaculture industries including the pearl industry, continued support will be provided through an environment of fiscal incentives and user-friendly regulatory regime to promote local business participation.

Output 1, International/Legal: To enhance the policy and legal capacity of the Ministry and ensure proactive participation in local, regional and international fisheries initiatives.

Results:

- A consolidated marine resources master plan completed;
- Sound legal advice provided within agreed time frame;
- New Marine Resources Act enforced;
- Review of Marine Resources Regulations completed;
- Provide assistance to develop Island/Vaka Councils Marine Management Plans;
- MMR well informed of regional and international offshore fisheries initiatives; and
- All fees received from multilateral treaties and bilateral agreements deposited into the public account within 24 hours of receipt.

Output 2, Inshore Fisheries: To facilitate the sustainable development of the pearl industry and the diversification, growth and sustainable management of the inshore fisheries resources.

Output 3, Offshore Fisheries: To promote a sustainable and regionally compatible fisheries management regime for the local offshore fisheries industry including monitoring, control and surveillance of the EEZ.

Results:

- Annual report of offshore catch statistics completed;
- Monthly reports of offshore catch statistics completed;
- Technical support provided to the industry within three months of request;
- Commercial fishing training courses conducted;
- Tuna management/strategic plan completed;
- Licensed vessel activities and movements in Cook Island EEZ known;
- EEZ maritime and aerial patrol reports completed; and
- Improved observer/compliance/port sampling coverage.

Output 4, Extension Services: To provide relevant fisheries related training to increase knowledge and skills of local fishermen and continue to maintain fish aggregating devices (FADs).

Results:

- Fish aggregating devices (FADs) deployed and well maintained;
- FADs deployed and well maintained at selected sister islands;
- Equipment stored at MMR well maintained; and
- International training received by private sector personnel.

Output 5, Corporate Services: To provide the Secretary with accurate financial information, efficient and effective managerial support.

Nearshore domestic fisheries development and/or management plans and strategies

The MMR is working towards the development and implementation of development and management plans for many of the domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the tuna fishery. At present there is no development and/or management plan in place for the deep-water snapper fishery, as there is little fishing of these at present.

Most nearshore fishery development has occurred in the tuna fishery, and the Ministry of Marine Resources has developed a draft 'Cook Islands Tuna and Large Pelagic Fishery Plan: 2003' (GoCI 2003b). The general objectives of this Fishery Plan are:

- to provide for the utilisation (including optimum economic returns) of the tuna and large pelagic fishery, for the benefit of the people of the Cook Islands;
- to ensure the long-term sustainability of the tuna and large pelagic fishery, and to assess the impact of fishing on target and bycatch species;
- to develop and maintain the economic viability of the tuna and large pelagic fishery and associated fishing industry, while ensuring the Cook Islands meets its international environmental, health and fisheries obligations;
- to protect traditional inshore fishers;
- to implement a comprehensive fisheries management regime incorporating SFRs as the principal management measure and transition the existing participants to the new management regime;
- to achieve effective cost recovery;
- to collect the best available scientific and other information on the tuna and large pelagic fishery;
- to fulfil the purposes and principles in the Act.

The fishery plan also allows for the formation and operation of a consultative advisory forum with six members appointed by the Secretary of Marine Resources. The consultative advisory forum is to inform the Secretary on any matter referred to it by the Secretary and, in particular the management and development of the designated fishery, the establishment and amendment of operational management procedures, recommendations on areas of research, the level of cost recovery, and any incidental matters. The Secretary will consider any advice proffered by the consultative advisory forum, but is not bound to act in accordance with it.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in the Cook Islands

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Navy Epati, Secretary of Marine Resources, and Ian Bertram, Director, Inshore Fisheries, MMR (September 2003).	Deep-water snapper fishing is conducted ad hoc by small-scale private sector fishermen. 2 fishermen target deep-water snapper when there are no tuna around. Some deep-water snapper fishing in Penrhyn and Aitutaki, with fish sold locally. Ad hoc subsistence fishing for these species in the outer islands.	Government-owned ice plant turned over to the Island Council on Aitutaki to operate. Government-assisted Island Council on Mangaia to locate funding, purchase and install ice plant. Palmerston Island group occasionally export shipments of parrotfish and other species to Rarotonga for marketing. 3 main tuna processing and packing facilities on Rarotonga, 2 to HACCP standards. 3 small processing facilities on Rarotonga as well.	There are 2 boat building facilities, 1 on Rarotonga and 1 on Aitutaki. Boats built in aluminium, plus repair work undertaken in steel and aluminium. Around 5 welding facilities on Rarotonga and 2 on Aitutaki. These places do repairs to boats. Several people build small-scale vessels in plywood and fibreglass to order in their backyard. One small company making fibreglass outrigger paddling canoes for recreational purposes.
Background References: Dalzell and Preston 1992; Hume 1976; Mead 1997; Taumaia and Preston 1985.	In 1975–76 and 1981–82, SPC introduced deep-water snapper fishing techniques and provided training to fishermen on Rarotonga, Aitutaki and Penrhyn. In 1983, SPC undertook additional survey work for deep-water snappers, and trained local fishermen on Rarotonga. Catches were small, and confirmed previous results that there was only a small deep-water snapper resource around Rarotonga. No further promotion of deep-water snapper fishing has occurred because of the limited stocks in many locations. In the early 2000s one operator conducted fishing trials for deep-water snappers on the seamounts and offshore areas from Aitutaki with limited success, and stopped the trials after one year.	Small fisheries centre established on Palmerston Island in early 1970s with fisheries providing a 2.5 t freezer. A collection system using the government fisheries vessel, F/V *Ravakai*, was used to transport the catch to Rarotonga for sale. In Rarotonga, the Fisheries Department had a blast freezer and holding freezer, 2 coldstores and an ice plant for freezing and selling local fish products. In 1982, UNDP established a freezer facility on Penrhyn Island with collection system. Centres were established with ice machines and freezers on Rakahanga and Manihiki in the early- to mid-1980s, under the government department of Outer Islands Affairs. Most centres were closed within a couple of years or by the end of the 1980s due to poor maintenance of machinery, low catches and transport problems to get the catch to market. The exception was the project on Palmerston, where most fishing occurred when the collection vessel arrived.	Outrigger canoes have been used traditionally in the Cook Islands, although these have been decreasing since the late 1970s in favour of outboard-powered craft. Plywood skiffs with outboards and forward steering (similar to the French Polynesian-style 'poti marara') were built locally for both trolling and scoop netting flyingfish. Carpenters still build plywood vessels although larger outboard engines are being used, including 4-stroke engines. Engineering shops can do repairs on steel and aluminium vessels. 2 companies have been build aluminium vessels for several years.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in the Cook Islands

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Navy Epati, Secretary of Marine Resources, and Ian Bertram, Director, Inshore Fisheries, MMR (September 2003).	FAD research project has 5 FADs on station, 3 off Rarotonga and 2 off Aitutaki. Active FAD programme around Rarotonga (7 FADs) and Aitutaki (3 FADs), including maintenance, implemented by the Fisheries Department. Fisheries Department also has FADs at some outer islands (2 at Atiu, and 1 each at Mauke, Mitiaro and Mangaia) although the maintenance is not regular. Manihiki fishermen and pearl farmers have paid for their own FAD materials (2 in the water), with the Fisheries Department assisting with material orders and the deployment of the FADs. Deployment of 1 FAD off Pukapuka and 1 off Penrhyn planned for late 2003.	There is currently no public sector development in tuna fishing in the Cook Islands apart from maintaining the FAD programme and the maintenance of the FADs in the water. The Fisheries Department has conduct training sessions with small-scale tuna fishing operators in the past.	Around 20 full-time and 20–25 part-time small-scale commercial operators fishing around Rarotonga mainly trolling and mid-water fishing around the FADs for tunas and other pelagics. Around 5 full-time and 10–15 part-time small-scale commercial operators fishing around Aitutaki, mainly trolling and mid-water fishing around the coast and FADs for tunas and other pelagics. Several hundred small-scale operators in the outer islands mainly trolling and mid-water fishing for tunas and other pelagics for subsistence purposes.
Background References: Beverly 1997; Chapman and Cusack 1997; Desurmont 1992; Gillett 2002; Taumaia and Preston 1985.	First FADs deployed off Rarotonga in 1981 by the Fisheries Department to assist small-scale tuna fishery development. During the 1980s, over 30 FADs were deployed in the Cook Islands. In 1991, 8 FADs were on station, 3 off Rarotonga and 5 in the outer islands, with an additional 5 FADs to be deployed that year. FADs continued to be deployed with around 30 units deployed during the 1990s, with most deployments around Rarotonga and Aitutaki. In 2001 a New Zealand-funded FAD research project was jointly implemented by SPC and the governments of Niue and the Cook Islands. In 2002, 7 project FADs were deployed (4 off Rarotonga and 3 off Aitutaki), with 2 more deployed in 2003 after several of the initial FADs were lost.	In November 1985, SPC introduced new mid-water fishing techniques to fisheries staff and local fishermen. These methods were the vertical longline and palu-ahi methods. Fisheries Department staff continued with mid-water fishing techniques and demonstrated these to local fishermen, although interest dropped off in the late 1980s. In 1997, SPC worked with the Fisheries Department's Fisheries Development Unit (FDU) to re-introduce FAD-associated mid-water fishing skills through workshops on Rarotonga and Aitutaki. In the late 1990s and early 2000s, the FDU held workshops on other outer islands to introduce mid-water fishing techniques, outboard motor repairs, boat repairs and maintenance, and sea safety.	Canoe fishermen mid-water handlined in traditional tuna holes, although this dropped off as fishermen changed from canoes to outboard-powered craft. Before FADs were introduced, local fishermen trolled around the reef edge, or moved further offshore if tuna schools were observed. With the deployment of FADs in 1980 and the introduction of mid-water fishing methods such as vertical longlines, fishermen started to use and rely on the FADs for better catches.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in the Cook Islands

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Navy Epati, Secretary of Marine Resources, and Ian Bertram, Director, Inshore Fisheries, MMR (September 2003).	There are no public sector tuna fishing companies in the Cook Islands, as the government policy is to promote private sector development.	In September 2003 there were 37 active private sector vessels tuna longlining in Cook Island waters. 13 of the vessels work in the northern Cook Islands, with 10 working from Samoa or American Samoa and 3 bringing their catch back to Rarotonga for marketing. Of the other 24 vessels working from Rarotonga, 2 do day trips, 2 do 3–4 day trips and the rest do 5–9 day trips. Fishing activities and unloading are dictated by flight schedules for export.	Each local company is allowed to bring in 3 vessels under demise charter arrangements. There are 12 local companies with 6 of these bringing in charter vessels (15 vessels in total). There is 1 locally based foreign vessel fishing under a joint venture arrangement. Several of the vessels working in the northern Cooks are also fishing under joint venture or demise charter arrangements.
Background References: Beverly 1997; Gillett 2002; Gillett in press; Mitchell 1996; Sokimi and Chapman 2003.	In the late 1980s, the Cook Island Fisheries Department purchased an 8.8 m vessel from Tonga to do some tuna longline trials. The boat was used for a short time, pulled out of the water for many years, and eventually sold to the private sector in 1996. The Cook Islands's Government has not been directly involved in any other tuna fishing operations, but has promoted the policy of private sector development of the tuna fishery.	In 1986, the first attempt at exporting sashimi-grade tuna by air was undertaken by a locally based vessel operating out of Penrhyn in the Northern Cooks. This venture was unsuccessful. In 1996, there were 2 small tuna longliners based in Rarotonga. Each was owned by a local business. In 1997, SPC provided assistance to the operators of these 2 vessels to try to improve the catch rates while training the crew. Unfortunately, 1 vessel went on the reef in 1998. The vessel on the reef was pulled off and sold to another local company, who refitted the vessel and started fishing in 1999–2000, selling the catch on the local market. In 2001 the company bought in a second vessel. 2001–2002 saw a large investment in tuna longlining in the country, not only with boats, but also the construction of processing and packhouse facilities in Rarotonga. The focus of these operations was fresh export. In 2002, SPC provided training to crews of new vessels and other people interested in tuna longlining.	In 1994, the joint venture company, Cook Islands Sealords Ltd, was established and 2 tuna longliners fished in the Southern Cooks for almost a year, landing their catch in Rarotonga. 2 other vessel arrived in 1996, but all departed by the end of 1996. Other joint venture operations were established in 2001 and 2002 as companies focused on the potential for developing the tuna longline fishery. Some of the joint ventures were associated with developing the domestic longline fishery out of Rarotonga, while others were to allow vessels to fish in the Northern Cooks, with the vessels operating out of, and landing their catch into, Samoa and American Samoa. Local companies were allowed to bring in up to 3 vessels under a demise charter arrangement.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in the Cook Islands

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Navy Epati, Secretary of Marine Resources, and Ian Bertram, Director, Inshore Fisheries, MMR (September 2003).	Around 9 charter vessel fish from Rarotonga and another 5 fish around Aitutaki, with most charters coming from tourists. One fishing tournament is held per month in Rarotonga with 15–32 boats participating. Aitutaki has 4 fishing tournaments per year with around 20 boats fishing per tournament.	There is currently no baitfishery in the Cook Islands. Several private sector proposals have been put to the Fisheries Department for farming milkfish in Aitutaki, Rakahanga and Mitiaro.	Catching flyingfish using outboard-powered boats and high-powered lights and a scoop net is a major fishery in the Cook Islands. There are currently no other domestic nearshore or offshore fisheries in the Cook Islands, although one company will conduct fishing trials for various deep-water species (crabs, shrimp) using traps and possibly bottom longlines in late 2003.
Background References: Chapman and Cusack 1997; Gillett 2002; OFP 1997; Whitelaw 2001.	Charter and sportfishing commenced in Rarotonga in the early 1980s with 1 operator, expanding to 3 by the mid-1980s. The number of charter operators remained constant at 3 on Rarotonga until 1998–99, when another 6 operators entered the charter fishing sector. On Aitutaki, there have been a constant number of charter operators from the early 1980s to the present, with these operators upgrading their boats from time to time.	Local fishermen have traditionally jigged for bigeye scad and blue mackerel from canoes, with these fish both used for bait or eaten. SPC's Skipjack Survey and Assessment Programme conducted baitfish surveys (for live bait for use in pole-and-line operations) from 1978–1980, with poor results. Baitfishing trials were conducted by SPC in 1985–86 using small-mesh gillnets in the harbour, passages and waters just outside the reef. The target species were bigeye scad and blue mackerel for use as bait on vertical longlines.	Traditionally, Cook Islanders have used coconut-frond torches and scoop nets to catch flyingfish outside the reef from canoes. In the 1980s and 90s, lights, run off batteries, were mounted on helmets to replace the coconut-frond torches. Outboard-powered boats have also replaced the canoes.

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Federated States of Micronesia

General

The Federated States of Micronesia (Figure 1) consists of over 600 islands in four states (Yap, Chuuk, Kosrae, and Pohnpei) between 1º and 10º N latitude and 138º to 163º E longitude. The mid-year 2003 population estimate for the Federated States of Micronesia is 112,600 people (SPC 2003).

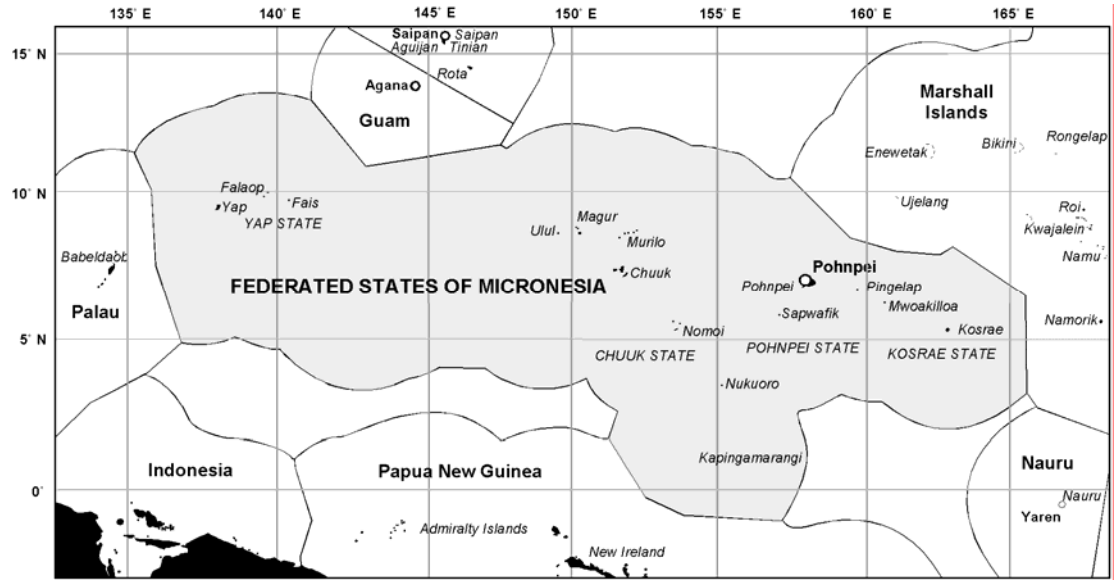

Figure 1: The Federated States of Micronesia, its EEZ and neighbouring countries

The Federated States of Micronesia has an EEZ of around 2,780,000 km^2, while having a land area of only around 701 km^2. The Federated States of Micronesia has around 50 per cent of its EEZ bordering on international waters, with the remaining EEZ bordering four Pacific Island nations, Papua New Guinea to the south, the Republic of Palau to the west, Guam to the north, and the Republic of the Marshall Islands to the east.

Fisheries development and management

The development and management of the marine resources within the Federated States of Micronesia (FSM) falls under the jurisdiction of the National Oceanic Resources Management Authority. The Authority works under *Title 24 — Fisheries Act 2002*, which establishes a comprehensive framework for fisheries management by the Authority from 12 to 200 nm in the FSM EEZ. The Marine Resources Department in each state has jurisdiction over the territorial sea, from high water mark to 12 nm.

Fisheries development and management is also covered under the FSM Planning Framework 1999–2002 (FSM 2000). In this document there is a strong focus on developing fisheries, especially the oceanic sector. The extracts form this document (FSM 2000) presented below cover the main areas of fisheries development objectives and strategies for the planning period.

The policy agenda and development strategies for inshore fisheries

In order to address the opportunities and constraints in FSM's inshore fisheries sector the policy agenda and development strategies focus on the following areas:

- Decreased dependence on the government and public finances for economic activity and in the sector
- Re-establishment of the responsibility of traditional leaders, resource owners, communities, and users in

the sustainable use and management of the resource using updated methods

- Clarification and rationalization of the role of public institutions supporting the management of inshore fisheries

- Resolution of potentially conflicting uses for FSM's limited inshore fisheries resources for subsistence, artisanal, commercial, tourism and public use

- Promote private and commercial investments that are strictly sustainable, environmentally and economically

- Improve value-added and trading opportunities for inshore fisheries and marine products that are sustainably harvested, through improved harvesting, culture, processing, quality control and better response to markets

- Improved human resources to support development of inshore fisheries, skills development for different resource users, and greater public awareness of sustainability and conservation in inshore marine areas

- Creation of a regulatory environment that favors private sector initiative, and investment encourages sustainable development that can be implemented through smaller, rationalized public agencies.

The policy agenda and development strategies for oceanic fisheries

The following policies were determined by the participants of the 1997 Fisheries Summit held in Palikir. The strategies are based on the conference recommendations.

Private sector to be responsible for all commercial fisheries investment and operations

- Commercial Fisheries Development should be in the hands of the private sector.

- Government's role is to facilitate fisheries development by the private sector by creating a business environment conducive to private enterprise development.

- Phase out subsidies to all government owned fisheries enterprises, with the intent to privatize these as soon as possible.

Strategies

1. Privatize publicly owned and operated domestic fishing, processing and transhipment activities;

2. Allow private sector to decide what to do with excess cold storage and fish processing facilities;

3. Promoting joint ventures with reputable foreign operators should be considered as an interim measure, to allow experienced international managers to begin to assist with development of full-scale FSM-based fishing and transhipment activities;

4. Government should develop a favorable business and cost environment to enable successful private sector ownership and management of fisheries operations in FSM waters and ports, and to ensure that they are more competitive than alternate locations and business environments in neighboring countries of the Western Central Pacific; and

5. Reform current FSM policies and programs governing immigration of managers and technical experts (see Policy Element 6).

Discussion: This is the paramount policy decision required to commence the turn around of the commercial fisheries of FSM, so that they may contribute strongly to the country's economy on a commercially sustainable basis. The turnover of the current nearly 100% public ownership and operation of domestic fishing, processing and transhipment activities to the private sector will need to be carefully handled. Joint ventures and other arrangements with reputable foreign operators should he considered as an interim measure, to allow experienced international managers to begin to assist with development of full-scale FSM-based fishing and transhipment.

Governments will need to turn their attention almost immediately to developing a favorable business and cost environment to enable the successful private sector ownership and management of fisheries operations in FSM waters and ports, and ensure that they are more competitive than alternate locations and business environments in neighboring countries of the Western Central Pacific. Reform of current FSM policies and programs governing foreign investment and immigration of managers and technical experts (see Policy Element 6) will be an urgent area for the government's attention in support of Policy Element I.

Implications for budgets and investment: While the government may still be required to provide some funds to maintain operations of loss-making enterprises in the short run while restructuring or reconstruction is in process, the long run implication of successful privatization will be to reduce the recurrent budget burden to the government. While this may appear to be a loss on government financed investments, additional appropriations for either operations or attempts to improve investment performance are likely to result in further accumulation of losses. It is better to view past investments as sunk costs and to make the adjustment as soon as possible, rather than at a time when public funding for such ventures is simply no longer available. This will also free-up funds for more productive uses at an earlier stage.

Promote Micronesian-Incorporated Enterprises

- Promote ownership of fishing vessels and shore facilities by Micronesian-incorporated enterprises (local and foreign capital).

- Make a portion (at least 50%) of access fees available to finance (through loans, or loan guarantees) private commercial fisheries development in FSM.

- Create other incentives to fisheries development, such as:

    - Tax breaks (on vessel fuel, for example),
    - Amend foreign investment rules (including immigration laws), and
    - Reform fisheries and maritime laws.

Strategies

1. Attract foreign direct investment in FSM based foreign owned and operated tuna longline vessels, which would conduct their fishing operations from these bases for the whole tuna fishing season (decisions based on the prospect for profitability of their operations compared to alternative locations);

2. Ensure that the registration requirements and procedures are transparent, rapid and simple for domestic incorporation of foreign-owned vessels;

3. Strengthen government and private sector capacity in proactive promotion of the potential of the FSM fishing industry and in international negotiations with foreign fishing companies;

4. Introduce multi-year allocations of tuna catch for domestic-based foreign fleets to promote profitability and increase the attractiveness of FSM basing;

5. Facilitate service industry development by providing access to financing of viable new and expanded businesses; and

6. Identify immediate short-term measures for improving the value added and profitability of the FSM tuna catch.

Discussion: Since such a tiny portion of the tuna longline fleet fishing in FSM waters is domestically owned and based (FSM owned vessels account for less than 1% of the current catch), the basing of foreign-owned and operated longline vessels in FSM ports is a fundamental aspect of this new FSM Fisheries Policy. FSM must attract foreign direct investment in the form of basing foreign tuna longline vessels in FSM ports, which would conduct their fishing operations from these bases for the whole tuna fishing season. The owners of these vessels will take such decisions based on the prospect for profitability of their operations as compared to alternative locations. This is where the FSM governments have a key role to play in creating the most favorable investment climate possible for such decisions. If there is a domestic incorporation requirement for foreign-owned vessels, the registration requirements and procedures will need to be transparent and simple,

otherwise such a policy will work against, rather than for, the expansion of transhipping businesses from FSM ports.

Multi-year allocations of tuna catch for domestic-based foreign fleets would be an added enticement. There is a concern among FSM Fisheries bureaucrats that foreign vessels may not respect the FSM basing commitments if their businesses become non-profitable. This is a legitimate concern, no matter who owns the vessels, which can only be addressed by ensuring that deficiencies in FSM policies are not the cause of these profitability problems. Tuna fishing is presently a very risky business, with very low or non-existent profit margins. If FSM tuna vessel home basing can help owners overcome their profitability problems, then FSM ports will be active transhipping bases.

The pay-off for FSM will be in the generation of new national income and employment from the increased tuna transshipping operations, which would provide opportunities for servicing and supplying the fishing fleet, and handling transhipment. Foreign investors would probably not need financing assistance, however, local businessmen, for example in the service industries which will need to be built up to handle the expected increase of shipments, could benefit from access to financing assistance.

Implications for budgets and investment: Activities required to implement this policy do not require additional government funding as the policy intends to shift the responsibility for investment and operations to the private sector. Investment capital is to come from successfully attracted foreign direct investment, domestic commercial sources, and access fees reserved for viable investments in the service sector. Time is needed to determine strategies, registration procedures and licensing arrangements. The exception is the budget requirement for proactive investment promotion (e.g. air fares, promotional material, promotional events etc.)

Manpower development

Develop a World-Class FSM Fisheries Manpower Development Program.

Strategies

1. Develop a plan of action covering all types of skills and professions required and include all facets of fishing, management, economics, biology, legal and vessel maintenance aspects of personnel development;

2. Support institutional and other forms of training; and

3. Develop school curricula that cover an understanding of the national fisheries resources, their importance to FSM and of the opportunities offered by this sector.

Discussion: This policy area will need thoughtful planning and investment by government to prepare FSM citizens for long-term employment opportunities based on the marine commercial fisheries. Many of the jobs will be ashore, and a comprehensive approach to planning the needs including skill gap analysis and training programs at different levels (e.g. vocational and professional) will be required. The time-frame for achievement of results will be fairly lengthy, which will make it even more important to begin planning on this aspect as soon as possible.

The restarting of the Micronesian Maritime and Fisheries Academy in Yap is an important step. It is likely that foreign-owned fishing vessels from more developed countries will want to recruit local fishermen for their vessels, if they are properly trained and willing to work according to the requirement. This could be an important factor in attracting foreign vessels to base in FSM ports, providing that a sufficient number of potential crew were available.

Implications for budgets and investment: This policy element represents an expansion in investment in human resources and will require an expanded budget for renovation and operation of the MMFA, regional course expenses, other domestic vocational courses and the resources required to develop and introduce fisheries related curricula in schools.

Ensure conservation of marine resources and preservation of the marine environment

Ensure conservation of tuna and other marine resources, and preservation of the marine environment through active participation in international and regional bodies and institutions.

Strategies

1. The conservation and management of the resource base of migratory tuna species and stocks which support the Central Pacific tuna fisheries to be an ongoing, fundamental responsibility of government;

2. Continue and expand participation in the work of the regional and sub-regional fisheries bodies and institutions;

3. Develop a more sophisticated data base on longline tuna exploitation, and take the lead in developing policies to enhance the availability of the more mature deep-running yellowfin and bigeye tuna stocks to the longline fishery; and

4. Place greater emphasis on the value of tuna catches rather than on their tonnage in devising future management strategies for FSM's economic development and employment objectives.

Discussion: The conservation and management of the resource base of the migratory tuna species and stocks, which support the Central Pacific tuna fisheries, is an ongoing fundamental responsibility of the FSM government. This will need to continue, and hopefully expand to its participation in the work of the regional and sub-regional fisheries bodies and institutions. FSM should acquire a much more sophisticated data base on longline tuna exploitation than presently exists, and could take the lead in international forums in developing policies which would enhance the availability of the more mature, deep-running yellowfin and bigeye tuna stocks to the longline fishery. A greater philosophical emphasis on the value of tuna catches rather than on their tonnage is important for devising future management strategies and would be beneficial to FSM's economic development and employment objectives.

Implications for budgets and investment: Apart from workshops and consultations, the development process itself of the fisheries management plan has no immediate budget implication but will ultimately affect most other aspects of the policy and strategy. ADB is to finance technical assistance for development of the plan. Operational budgets will be required for involvement in regional fisheries management efforts, the database system and fisheries surveillance.

Reform institutional management framework

1. Consolidation of responsibilities for fisheries policy development, management and enforcement under one well-financed, independent and autonomous body;

2. Increased cooperation and coordination among all jurisdictions (including private sector as well as government bodies); and

3. Develop the capability of MMA to:

- collect, analyze and disseminate comprehensive data — economic, biological and social — at all fishing vessel landing points within FSM, on the whole tuna fishery in the FSM exclusive economic zone (EEZ), and in adjacent zones.

- develop close ties with the fishing industry in analyzing information and examining new approaches and policies to improve operations and profits.

- maximize the contribution of the tuna resources to FSM's economy for the public good.

- develop and recommend a body of sensible regulations governing the fishery and the protection of the aquatic environment upon which the fishery depends.

- handle surveillance and enforcement within the FSM EEZ both as an intelligence information gathering activity, as well as to prevent transgressions of conservation and other rules by the fishing fleet.

Discussion: The current fragmentation of responsibilities for the marine fisheries of FSM is a serious deterrent to progress in revitalizing the sector. This recommendation is considered to be an essential component of the strategies to support the overall objective of having growing, profitable tuna fisheries in FSM which will generate substantial growth in GDP and create economic and employment opportunities at FSM's fishing ports. Such an agency needs to have the capability to: collect, analyze and disseminate comprehensive data — economic, biological and social — at all fishing vessel landing points within FSM, on the whole tuna fishery in the FSM exclusive economic zone (EEZ), and in adjacent zones; to develop close ties with the fishing industry in analyzing such information and examining new approaches and policies to improve operations and profits, and maximize the contribution of the tuna resources to FSM's economy for the public good; to develop and recommend sensible regulations governing the fishery and the protection of the aquatic environment upon which the fishery depends; and to handle surveillance and enforcement within the FSM EEZ both as an intelligence information gathering activity, as well as to prevent transgressions of conservation and other rules by the fishing fleet. Technical assistance is being provided for this area.

Implications for budgets and investment: As indicated in Policy 4 the budget required for fulfilling a reformed MMA will depend on the nature of the institutional reform of MMA.

Reform of laws and regulations inhibiting fisheries development

- Tax Laws (including incentives)
- Duties and Levies
- Regulation of foreign investments
- Labor laws
- Immigration laws and permits
- Maritime Code and relevant Conventions
- Fisheries Laws and relevant Conventions
- Land tenure laws

Strategies

1. Review each of the above laws and regulations for their purpose, appropriateness, and the need for modification in order to promote foreign and domestic investment, private sector development and competitiveness; and

2. Place high priority on foreign investment, labor and immigration laws.

Discussion: This policy element is fundamental to all the productive sectors, and private sector development in general. It addresses the many areas where present policies, legislation and programs hinder, rather than help the encouragement of development in the fisheries and other sectors of FSM. Together with divesting of government ownership of the principal means of production in FSM fisheries, the current constraints are the most important factors to overcome in preparing a favorable and attractive investment environment for the development of FSM's fisheries sector. Ownership and operation of tuna fishing vessels is one of the financially riskiest commitments an investor can choose in these times, and currently profits are very slim to non-existent for vessel owners in the tuna industry. So, owners and investors are easily frightened away from locating their business in any jurisdiction, which has as an unfriendly business environment to alternative locations. FSM is well located in relation to tuna fishing areas, but by no means has any exclusivity. In this respect each of the laws and regulations listed needs to be reviewed from the point of view of ease and cost of doing business in the sector. Foreign investment, labor and immigration laws are among the most urgent of these to be reviewed and amended with respect to fisheries.

Implications for budgets and investment: The intention of regulatory and legal reforms is to create a business environment conducive to private sector development and investment. This requires developing a legal framework that permits: ease of access to land for necessary shore facilities; a supply of labor with the necessary management and technical skills for fisheries including foreign sources if it is not available locally; a competitive cost environment; combined with a commercial code that builds investor confidence in the long-term security of their investments and future profits. Without this environment, the assumption that

government development and aid capital can be successfully replaced with private investor and commercial capital will be difficult to realize. The costs of developing legislation will be borne by the National and State AG offices, possible TA support, and legislator time.

Promotion of value added investments

Strategies

1. Promote value added investments in:

- Fish and Fish Product Processing
- Manufacturing
- Marketing
- Quality Control

2. Where possible, make local products available in local markets to reduce the dependence on imports;

3. Identify immediate short-term measures for improving the quality and profitability of the FSM tuna catch; and

4. Increase awareness of market opportunities for tuna 'rejected' for shipment to the Japanese sashimi market to FSM plants and encourage entrepreneurs to take advantage of new markets (e.g. transformation into tuna loins and steaks for both domestic as well as export markets).

Discussion: Once national policies have taken hold and have attracted foreign tuna longliners to be based in FSM and tranship their catches to market through FSM ports and airports in quantity, the economic opportunities of policy Element 7 become important. Beginning with the diversion of tuna 'rejected' for shipment to the Japanese sashimi market to FSM plants for transformation into tuna loins and steaks for both domestic as well as export markets, business could develop transforming high quality yellowfin tuna into fresh and frozen product for export. The market for high quality tuna steaks is rapidly developing in North America — and tuna processing plants near to the source of supply of high quality fresh raw material, which meet the highest international standards of quality control, could have a good chance of exploiting that market if efficient infrastructure is developed or available. The loining of seiner catches is another possibility .
The government of FSM need to be aware of these possibilities, and provide encouragement to domestic and foreign entrepreneurs who wish to pursue this development direction. Every one of the current fishing ports in the four states has an opportunity of developing such a processing industry if they can attract sufficient vessels to land and transship their catch through their port, thus providing a supply of "reject" fish, and the seiner catch.

Implications for budgets and investment: Management and technical improvements for the above items lie with individual enterprises. The government's role is to facilitate access to information and where necessary technical and management expertise with minimal direct cost to the government. Market monitoring and provision of market information for enterprises without access to such information may be a government function in the short run with staff and operational budget implications. In the medium and long term the function will be assumed by the private sector directly.

Controlling fisheries access

- All longline vessels (delivering chilled tuna) must be FSM-based to be licensed.
- The need for uniform governing rules within each class of vessels based in FSM (and fishing in FSM waters).
- Long-term access arrangements should be used to encourage FSM basing of foreign owned vessels.

Strategies

1. Continued review and modification of access fee arrangements to promote home basing and investment.

Discussion: Policy Element 8 reinforces the point that incentives are needed to encourage tuna longline vessel owners to base their vessels in FSM ports. Long-term access arrangements, such as allocation of multiyear quotas of tuna resources to a given fleet or group of vessels for periods of up to four or more years, could provide a strong incentive for local basing of foreign owned vessels.

Implications for budgets and investment: The objective of simplified and longer-term access fee arrangements is to provide investors in FSM based vessels with a greater choice of investment options and longer period for their investments to perform. It complements the policy for the reform of laws and regulations to make investment in FSM fisheries more attractive, thereby increasing flows of private and commercial capital.

Promoting public awareness

Strategies

1. A public awareness program should be established, with careful thought to key audiences and how best to reach them; and

2. Stimulate FSM citizens' interest in fisheries through information programs.

Discussion: The contents under Policy Element 9 are based on the concerns expressed at the National Fisheries Summit by those close to the fisheries sector that most citizens in FSM have little or no knowledge of the importance of the marine resources of FSM to their economy. It is important that citizens and residents of FSM alike have an appreciation of the natural resources of the nation, and their importance to their economy. The basic workings of the industry and the fish upon which the industry depends are relatively unknown except to those who work in fishing occupations. Public awareness can be tackled in a number of ways, such as including knowledge of these national resources in school curricula, and through government and industry sponsored public awareness programs.

Implications for budgets and investment: Costs for developing professional media and presentations, and inclusion in school curricula.

Note: the FSM Government has held an Economic Summit in early 2004 to revise the current planning framework and set the development directions and goals for the next four-year period.

Nearshore domestic fisheries development and/or management plans and strategies

The Fisheries Department is working towards the development and implementation of development and management plans for many of the domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the tuna fishery. At present there is no development and/or management plan in place for the deep-water snapper fishery in the FSM, and there are no immediate plans to develop one.

Most nearshore fishery development has occurred in the tuna fishery, and the FSM Government, with ADB assistance, has finalised a National Tuna Management Plan for the country (FSM 2002). The objectives, goals and guiding principles as set out in the Plan for the Management of Tuna in FSM (FSM 2002) are:

Overall Objectives of Tuna Fisheries Management in FSM

'The resources of the sea around the Federated States of Micronesia are a finite but renewable part of the physical heritage of our people. As the Federated States of Micronesia has only limited land-based resources, the sea provides the primary means for the development of economic viability, which is necessary to provide the foundation for political stability. The resources of the sea must be managed, conserved, and developed for the benefit of the people living today and for the generations of citizens to come.'

The statement of purpose above, given as a preamble to Title 24, describes the importance of tuna resources to FSM. Consistent with this statement, MFA has adopted three overall objectives of tuna fisheries management in line with national expectations of the benefits that tuna resources can provide**.**

- to ensure that the nation's tuna resources are used in a sustainable way
- to obtain maximum, sustainable economic benefits from the nation's tuna resources
- to promote economic security for the nation through the use of tuna resources

These overall objectives are logical, supported by the law, and considered to have wide national support. They describe the essential aims that MFA pursues when exercising its mandate under the law to safeguard the nation's tuna resources.

The overall objectives also establish the benefits that the nation expects to derive from its tuna resources, and guide MFA in defining the role it will take in obtaining those benefits.
MFA's role is ultimately determined by the identification of specific goals of tuna management that it will pursue. In the following sections, those goals are described and paired with appropriate guiding principles. These principles will be kept in mind when identifying and implementing the strategies considered likely to be compatible with achieving the goals.

The diagram on the next page shows the relationship between overall objectives, specific goals and expected benefits. The following section details the specific goals of the Plan.

Specific goals of tuna fisheries management in FSM and their guiding principles

In pursuit of the overall objectives of tuna fisheries management outlined in the Plan, MFA has adopted six specific management goals formulated through national consultation. These goals provide MFA with practical, achievable management targets and represent how MFA may contribute, in whole or in part, to realizing national expectations of the benefits that FSM's tuna resources can provide.

Specific goals:

- Ensure that the tuna catch does not exceed sustainable levels
- Obtain national revenue from foreign fishing access agreements
- Support development of FSM-owned and/or foreign FSM-based fishing enterprises
- Encourage investment in enterprises related to tuna fisheries
- Promote employment opportunities
- Enhance international relationships beneficial to FSM

Each of these specific goals has a clear and deliberate purpose and the achievement of each will contribute directly to the overall objectives of tuna management as set out in the Plan. The essential purpose of each specific goal is outlined below. (*Note the guiding principles for each specific goal have been added from another section of the Plan*).

Ensure that the tuna catch does not exceed sustainable levels:

To safeguard FSM's tuna stocks against over-exploitation and the risk of biological decline, so that FSM may continue to benefit from its tuna resources in perpetuity. Guiding principles:

- The tuna resource is shared with other countries in the region and is finite.
- The precautionary approach to fisheries management is most appropriate.
- Management measures will promote the objective of optimum utilization.
- Effective management requires participation in, and compliance with, regional and international measures.
- Surveillance and enforcement are important tools of management.
- Surveillance of state waters is important to resource management and should be supported.
- Tuna stock assessment is not exact and there may be differing scientific opinions on the status of resources.

- Special attention should be given to bigeye resources.
- Principles guiding tuna fisheries management are generally applicable to non-target species affected by tuna fishing.

Obtain national revenue from foreign fishing access agreements:

To produce revenue that will contribute to meeting the cost of national government and generate national cash reserves, by selling the opportunity to fish in FSM waters to external interests. Guiding principles:

- Global events affect the economics of FSM tuna fisheries.
- MFA should be a discriminating seller of a valuable commodity.
- Maximum national revenue from access fees comes from a well-managed fishery and an economically efficient fishing industry.
- Collaborating with other Forum Fisheries Agency members and Parties to the Nauru Agreement (PNA), and acting jointly where justified increased bargaining strength.
- Any surveillance or enforcement program must be cost effective.
- Net benefits received by the country must be greater than any access fee concessions granted for the purpose of encouraging local development.

Support development of FSM-owned and/or foreign FSM-based fishing enterprises:

To assist in developing local capacities to participate effectively in FSM's tuna fisheries and in so doing, direct an increasing share of the wider benefits that flow from fishing activities in FSM's EEZ to the local economy. Guiding principles:

- The transition from direct government involvement in the development of the domestic fishing industry to primarily private sector leadership should be supported.
- Active and ongoing consultation with domestic industry will enhance decision-making.
- Optimum utilization of FSM's fisheries infrastructure and facilities is of national economic and social benefit.
- Any negative impacts of foreign fleets on domestic fishing must be minimized.
- The adverse environmental and social impacts of activities relating to tuna fishing must be minimized.
- The interests of artisanal and subsistence fishers must be taken into account.
- MFA has a role in ensuring FSM domestic vessels comply with all FSM laws, international laws, and the laws of nations in which they are fishing

Encourage investment in enterprises related to tuna fisheries:

To help in identifying the means of establishing the capital assets, facilities and systems that will enable growth and increased economic output in all components of the domestic tuna fisheries sector. Guiding principles:

- Foreign investment is needed to support development of the domestic industry.
- Optimum utilization of FSM's fisheries infrastructure and facilities is of national economic and social benefit.

Promote employment opportunities:

To assist in directing a greater part of the benefits that flow from tuna resources to FSM citizens through wages and salaries. Guiding principles:

- Employment of FSM citizens on overseas vessels contributes to the national economy.
- Domestic employment through local basing contributes to national economic development.

- FSM labour must be productive, well trained, and competitively priced to take advantage of employment opportunities.

Enhance international relationships beneficial to FSM:

To take advantage of the global significance of FSM's tuna resources for national benefit. Guiding principles:

- There should be no direct linkage between fisheries access and foreign aid.
- Relationships facilitated by MFA must result in clear and sustained net benefits to FSM.
- The global significance of FSM's tuna resources provides an opportunity to obtain national benefits in sectors other than fisheries.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in the FSM

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Bernard Thoulag, Executive Director, National Oceanic Resource Management Authority, Pohnpei, (September 2003).	Ad hoc fishery mainly for subsistence and artisanal fishermen with catches sold locally but not exported.	Some ice plants in rural areas with 3 in Chuuk, 2 in Yap and 1 in Pohnpei. National Fisheries Corporation in Pohnpei with transhipment points in Chuuk (CFTI) and Yap (YFTI), all with ice, freezer and processing facilities. Pohnpei Fisheries Corporation involved in loining and steaking tuna for export markets. Several other private sector processing or packing facilities for tuna.	One company in Chuuk building fibreglass boats from 6 to 9 m in length. Kosrae and Yap have slipways for doing repairs and maintenance work, mainly on steel and wood vessels. Several small repair shops for fibreglass boats, and some people do repairs in their backyard.
Background References: Beverly and Chapman 1997; Chapman 1999; Chapman and Cusack 1997; Dalzell and Preston, 1992; Diplock and Dalzell 1991; Hood 1991; Kent 1978; Lambeth 2000; McCoy 1990; Mead and Crossland 1979; Moana and Cusack 1997; NFS 1997; OFCF 1992; Smith 1992; SPC 1984; Taumaia and Crossland 1980.	SPC conducted fishing trials and training in fishing methods to catch deep-water snappers in Kosrae (1979) and Chuuk (1980). From 1983–1986, deep-water snapper fishing trials were undertaken by a private operator who fished around Pohnpei as well as Ant and Pakin Atolls. Further fishing trials and training were undertaken by SPC for deep-water snappers in Yap (1984–85), Kosrae (1987), and Chuuk (1988).	Small tuna cannery operated in Chuuk in the 1930s plus many (up to 23) katsuobushi (hard smoked and dried tuna loins) throughout the FSM. Kosrae Fishing Cooperative Association operated a processing facility in the mid-1980s, with 2 ice machines, a blast freezer and an 18 t coldstore. Government fish processing facility established in Chuuk in the mid 1980s, with 2 ice machines (6 t/day) and coldstorage and freezer	Traditionally, outrigger canoes have been built in many locations around FSM. Some have been paddling canoes, while others were sailing canoes. These were used for ocean travel as well as tuna fishing. In the early 1970s a 7.5 m dory was built by the Pohnpei Community Action Agency and fitted with baitwells for pole-and-line fishing trials. In Kosrae, 75 x 7.5 m fibreglass catamaran fishing vessels were donated by

	From 1989–1991, NFC and OFCF of Japan conducted surveys of seamounts from Yap to Chuuk State for deep-water snappers using bottom longlines and droplines, with low catch rates recorded.	rooms. New coldstore and ice plane set up on Dublon, Chuuk, in 1986. The National Fisheries Corporation (NFC) set up processing facilities in 3 states (Yap, Chuuk and Pohnpei) in the early- to mid-1990s to process tunas from longline vessels for fresh export. All were equipped with ice plants, chillers and freezers. They also had 2 charter aircraft to transport the fish to Guam for on-freighting. Kosrae had its own transhipment facility in the mid 1990s — Pacific Tuna Industries. Pohnpei Fisheries Corporation (PFC), a state-owned company established in 1993, purchased fish from local longline vessels and processed it into steaks and loins and exported it to the US. Tuna and swordfish jerky was also produced and exported by PFC.	Japan in the late 1980s, to promote small-scale tuna fishery development. The US also financed small-scale fishing vessels for Chuuk in the late 1980s, leasing or giving them to private individuals and municipalities.

Table 2: Current status, with background information on FAD programmes and public and private sector small-scale tuna fishing projects in the FSM

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Bernard Thoulag, Executive Director, National Oceanic Resource Management Authority, Pohnpei, (September 2003).	There are no government FADs or moored FADs in the waters of the FSM at present. Two states have materials for FADs.	Training provided through the maritime and fisheries colleges in FSM. Yap Fishing Authority has several small-scale vessels trolling and deep-water snapper fishing.	Subsistence and artisanal trolling outside the reef for tunas and other pelagics is conducted part-time by many private sector operators, with 50–100 boats at both Pohnpei and Chuuk, and 25–50 boats at both Yap and Kosrae.
Background References: Beverly 2001a; Beverly 2001b; Beverly 2000; Chapman and Cusack 1997; Moana and Cusack 1997; SPC 1984.	SPC assisted in deploying the first FADs off Yap in 1984. 4 FADs were deployed with another 2 in 1985. Several other FADs were deployed in the following years. The Pacific Tuna Development Foundation (PTDF) conducted an FAD programme in Pohnpei in 1984–1985, with several FADs deployed, although they were lost soon after. In 1987 there were 2 FADs off Kosrae. In the late 1980s, around 100 FADs were deployed in	Trolling survey by PTDF in 1977 around Chuuk produced a catch rate of 11.5 kg of fish per hour. In 1978, PTDF conducted night-fishing handline trials (ika-shibi) for tunas around Chuuk. Vertical longline trials conducted in Yap in 1984–85 around the FADs, with limited results. One vertical longline set for tuna around an FAD was undertaken off Kosrae in 1987 to demonstrate the method to local fishermen.	Traditionally, canoes were used in some locations throughout the four states of FSM for poling tuna using pearlshell lures. Fishermen from Kosrae and Yap trolled for tunas off the coast from outboard-powered skiffs in the late 1970s and 1980s. Trolling is the main tuna fishing method used by small-scale fishermen in the 4 states of FSM in the 1990s and early 2000s, with trolling activity concentrated around the coastal areas outside the reef, offshore tuna school and

	Pohnpei waters by the Philippine purse-seine company, Mar Fishing Company. In 1991, Kosrae received a shipment of FAD materials under Japanese aid, but these were not used until Japan provided electronic equipment in 1997. 2 FADs were deployed in 1998, with one on station in early 2000. SPC provided FAD assistance to Yap in 2000 to conduct site surveys to identify suitable FAD deployment sites, Kosrae in 2000 with site surveys conducted and 3 FADs deployed, and Pohnpei in 2000 with site surveys in three areas and 1 FAD deployed.	SPC conducted 2 FAD fishing skills workshops in 2000, which include vertical longline trials as well as mid-water handlining for tunas.	around FADs when these are available.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in the FSM

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint ventures tuna fishing operations
Current status Information provided by Bernard Thoulag, Executive Director, National Oceanic Resource Management Authority, Pohnpei, (September 2003).	Micronesian Longline Fishing Company has 12 longliners with foreign crew. State fishing authorities have 6 or 7 longliners between them. NFC and affiliated companies in the states have around 10 tuna longline vessels between them. Other government companies have around 6–8 tuna longliners and 3 purse seine vessels.	MFV has 10–12 tuna longline vessels. PFS has 6 tuna longline vessels, but also acts as an agent for 27 charter boats. Two other companies have vessels under charter or joint venture arrangements.	3 of the private sector companies have tuna longline vessels that have come in under charter or joint venture arrangements.
Background References: Beverly and Chapman 1997; Chapman 1999; Friberg 1995; Gillett 2002; Gillett in press; Hood 1991; Lambeth 2000.	In the early 1980s there were 3 pole-and-line vessels operated by the government in Chuuk. The National Fisheries Corporation (NFC) was established in 1989, and by 1992 had 4 tuna longline vessels and its processing facilities to develop fresh tuna exports from the FSM. NFC managed 11 tuna longline vessels in 1995, and it co-managed 3 vessels through a joint venture arrangement with Kosrae. NFC also obtained a B-727 air freighter and operated this in the mid 1990s.	In the early 1980s there were 3 pole-and-line vessels operated by the private sector in Chuuk. Pacific Foods and Services Incorporated (4 boats) and Pacific Longlining and Supplies (3 boats) operated out of Pohnpei in the late 1990s exporting fresh, longline-caught tunas. Other private sector tuna companies include Micronesian Fishing Venture, 2 vessels chartered from China in 2002; and Clearwater Incorporated with 4 FSM-flagged vessels in 2002. These vessels were,	In the early 1970s, Japanese firms entered into joint venture arrangement for pole-and-line fishing in Pohnpei and Chuuk. NFC had 8 tuna longline vessels under a joint venture arrangement in the mid 1990s, and 3 of these were with the Kosrae Sea Ventures Incorporated (KSVI). NFC entered into a joint venture with the Japanese Okinawan Tuna Fisheries Cooperative Association in the early 1990s. The Caroline Fishing Company (CFC), a joint venture between NFC, an

	SPC assisted NFC with their tuna fishing operation in 1996 with training provided to crew of one of their vessels. In 1991 the Micronesian Longline Fishing Company (MLFC) incorporated (95% owned by NFC) with its first tuna longline vessels purchased in 1995. By 2001, MLFC was operating 7 longline vessels. Other public sector tuna fishing companies in 2002 include Chuuk Public Fishing Corporation operating an ex-US purse-seine vessel; Diving Seagull Incorporated in Yap operating 1 purse seiner; Tri Marine (FSM) Incorporated operating 4 purse seiners; and the Southwest Pacific Venture Corporation based in Yap operated up to 15 tuna longline vessels.	however, working out of Majuro in the Marshall Islands.	Australian company and Pohnpei State, was created in 1990 and by 1995 operated 3 purse seiners. Most of the tuna fishing companies in the FSM have at least some of their vessels fishing under a joint venture arrangement, although in some cases, the vessels are chartered.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in the FSM

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Bernard Thoulag, Executive Director, National Oceanic Resource Management Authority, Pohnpei, (September 2003).	Several charter boats available in FSM, mainly associates with hotels. Pohnpei Gamefishing Club has at least one tournament each month with around 20 vessels competing.	No baitfishing trials or activities at present.	No other fishing methods conducted in nearshore waters at present.
Background References: Paulo 1989; Saunders 1988; Saunders 1987; SPC 1984; Whitelaw 2001.	Several charter vessels in Pohnpei although some fishermen will take out paying passengers. Pohnpei Gamefishing Club has several tournaments per year. Around 100 sportsfishing vessels throughout the 4 states in the late 1990s and early 2000s.	During the late 1960s and early 1970s, Japanese and US-sponsored surveys were undertaken to assess the baitfish potential of FSM. Japanese baiting trials in 1975 yielded 90 kg/night in Pohnpei and 100 kg/night in Chuuk over 20 and 24 days fishing respectively. Further baitfishing trials were conducted in the late 1970s and early 1980s by US and Japanese operations. During late 1978, November 1979, and July and August 1980, SPC conducted baiting trials in FSM over 56 days, with good catches of suitable bait for pole-and-line fishing. Exploratory, decapterus (opelu) fishing in Pohnpei using a Hawaiian-style lift net	Traditional catching of flyingfish using light attraction at night and a scoop net used in some locations around FSM. Trapping trials conducted in the mid- to late-1980s in Yap and Kosrae States for deep-water shrimp with low catch rates recorded. OFCF squid fishing trials were conducted in 1991 outside Chuuk Lagoon with poor results.

		conducted in 1989.	

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Republic of the Fiji Islands

General

The Republic of the Fiji Islands (Figure 1) is made up of over 300 islands and atolls between 12º and 20º S latitude, and 177º E and 177º W longitude. The mid-year 2003 population estimate for the Republic of the Fiji Islands was 831,600 people (SPC 2003).

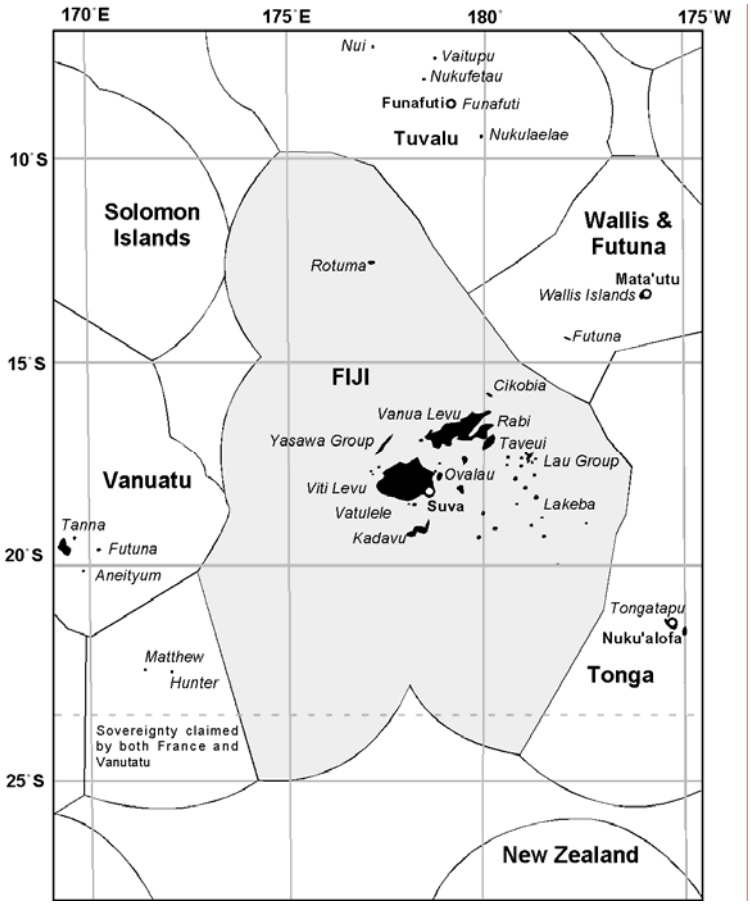

Figure 1: The Republic of the Fiji Islands, its EEZ and neighbouring countries

The Republic of the Fiji Islands has an EEZ of around 1,290,000 km^2, while having a land area of around 18,333 km^2. The EEZ of the Republic of the Fiji Islands borders five Pacific Island nations, the Republic of Vanuatu to the west, the Solomon Islands to the northwest, the Republic of Tuvalu to the north, Wallis and Futuna to the northeast, and the Kingdom of Tonga to the southeast, with around 40 per cent of the EEZ bordering international waters. In addition, New Caledonia may also share a border through the waters around Mathew and Hunter Islands (disputed between France (New Caledonia) and the Republic of Vanuatu).

Fisheries development and management

The development and management of the marine resources within the Republic of the Fiji Islands falls under the jurisdiction of the Fisheries Department of the Ministry of Fisheries and Forests. The Fisheries Department works under the *Fisheries Act 1972* (revised), and the associated fisheries regulations, and there are also areas under the *Marine Species Act 1978* that the department needs to work within. A new draft Fisheries Management (Bill) Act has been developed as a collaborative project with the Forum Fisheries Agency, with full national consultation complete. Once the draft Act has been approved by the Fiji Cabinet, the legislation will allow the formation of a National Fisheries

Authority (regulatory) and a National Fisheries Corporation (commercial activities) as statutory bodies, with the Fisheries Department charged with the drafting and implementing of fisheries policy and management plans.

The development of fisheries is also covered in the 'Strategic Development Plan 2003–2005 for Fiji — Rebuilding confidence for stability and growth for a peaceful and prosperous Fiji' (GoF 2002a). The Mission, Guiding Principles and Marine Resources specific objectives and indicators as stated in the Strategic Development Plan 2003–2005 are:

Mission and Guiding Principles

Government's **Mission** is to develop and implement the best political, social and economic policies to advance the goals of Peace and Prosperity. To this end, Government has consulted widely with the private sector and with non-government organisations to identify the right mix of policies given the current social and economic situation in Fiji.

In pursuing its Mission, Government will abide by a number of **Guiding Principles.** These are:

- Good governance including the need for consistent and credible policies;
- Environmental sustainability;
- Respect for the Vanua and the cultures and traditions of the Indigenous Fijians and Rotumans;
- Respect for the cultures and traditions of other communities in Fiji;
- Recognition of the paramountcy of indigenous Fijian and Rotuman interests as proclaimed in the Constitution;
- Respect for legal authority and law and order;
- Respect for human and group rights; and
- Honesty in public life and general standards of conduct, which reflect our fundamental beliefs.

International Commitments

Fiji is part of the global community and has made commitments to global bodies such as the United Nations, the World Trade Organisation and the European Union as well as to regional bodies such as the Pacific Islands Forum. Government will pursue these commitments in the interest of Fiji and its citizens. Of particular importance is the commitment of Government to the United Nations Millennium Declaration that was adopted by the UN General Assembly in 2000. The Declaration establishes eight goals to which the international community will commit its resources. The Millennium Development Goals are:

1. Eradicate extreme poverty and hunger;
2. Achieve universal primary education;
3. Promote gender equality and empower women;
4. Reduce child mortality;
5. Improve maternal health;
6. Combat HIV/AIDS, malaria and other diseases;
7. Ensure environmental sustainability; and
8. Develop a Global Partnership for Development.

Government is committed to achieving these Goals and gives assurance that the policies in this Plan are consistent with the Millennium Development Goals (MDGs) as well as the Plan of Implementation on Sustainable Development adopted in Johannesburg in 2002. Targets and Indicators for the achievement of the MDGs, which have been developed by the various UN agencies, the World Bank, the International Monetary Fund (IMF), and the Organisation for Economic Cooperation and Development (OECD), are contained in the Appendix.

Consistent and Credible Policies

Government believes that consistent and credible policies that are vigorously implemented are essential for the successful achievement of the Vision. Credible policies are ones that are well thought out, contribute effectively to overcoming social and economic problems, and are widely supported.

The following chart [removed] shows how Government's policies and plans are linked back to the Vision of a Peaceful and Prosperous Fiji. The Vision is at the top and represents the long-term goal of all Government policies. Moving down the pyramid, the focus changes to the medium term (up to three years). This Strategic Plan covers the planning pyramid down to the sector policy level. Below that level, indicated in the Policy Implementation box below the pyramid, Ministries have their own sector plans and corporate plans to guide annual budget allocations.

The Vision, Mission and Guiding Principles provide the long-term direction and the method Government will adopt to move the country towards the Vision. The Review of social and economic development progress pinpoints the main issues that Government needs to address in the medium term. The Medium Term Strategy, which can be summarized as Rebuilding Confidence for Stability and Growth, is a set of Strategic Priorities that Government needs to address to steer the country forward to the Vision. Policies at a sector level, and policies for critical cross-sector issues, then follow. These detailed policies are consistent with the Strategic Priorities in the Medium Term Strategy.

Marine Resources (section 7.4 of document)

Goal: Sustainable utilisation and development of fisheries and marine resources

Fisheries are now the third largest export industry. With an EEZ covering 1.3 million square miles of ocean, Fiji has a rich resource for commercial exploitation and to meet the subsistence needs of 90 percent of villages located on the coast. The sector accounts for 1.5 percent of GDP and has considerable potential for expansion.

The tuna industry dominates the sector. Pacific Fishing Company (PAFCO) cans tuna using yellowfin, skipjack and albacore, and processes tuna loins for Bumble Bee. Most tuna is sold duty free to the United Kingdom. However, as with sugar, a steady erosion of the preferential prices is expected. Large tuna (albacore, yellowfin, skipjack, and bigeye) are also exported to the Japanese sashimi market and the US.

PAFCO operations are constrained by supply problems, even though the tuna resource is fished at levels well below the maximum sustainable biological yield. The company recently entered into a strategic alliance with an international company, Bumble Bee. However, the EU rules of origin requirements have acted as a significant barrier to the development of commercial fleets.

There is scope for expansion in the longline tuna fishery, which exports to the high quality sashimi market in Japan and the US. However, methods used by tuna longliners are reported to be having an adverse impact on the resource of other pelagic species.

Consistent with international and regional obligations, such as the Monitoring: Control and Surveillance (MCS) Treaty, a total allowable catch (TAC) limit of 15,000 tonnes has been set for targeted species such as yellowfin, albacore, and bigeye tuna and bycatch such as marlin, wahoo and ogo. The Ministry of Fisheries and Forests monitors the TAC through visual monitoring systems and 'catch-log' submissions by fishing companies.

The unsustainable use of resources in artisanal fishery, such as mangroves harvesting, and selling undersized fish and crustaceans, is now becoming a concern. As a result of inadequate education and short-term monetary gain, abuse of marine resources and its environment continues to increase.

The crustacean, mollusc and beche-de-mer resources are now under considerable management pressure due to reclamation of mangrove areas and conversion to other uses — sugarcane, tourism and urbanisation. Similarly, some of the coral reefs are under threat from pollution, erosion and mining.

Opportunities offered by other potential industries need to be developed further. The possibility of expanding tilapia and prawn farming, carrangeenan seaweed industry, and the pearl industry should be explored fully.

Policy Objective / Key Performance Indicators

To ensure sustainable development of fisheries and marine resources.

- Sustainable Development Bill provisions relating to fisheries resources enacted and implemented by 2005;
- Regular surveillance of EEZ undertaken and catches monitored;
- A moratorium on reef mining implemented by 2003;
- Mangrove Management Plan reviewed by 2003; and
- TAC and licensing reviewed by 2004.

To promote production and export of value added fisheries products.

- Fisheries product export earnings increase by 10 per cent by 2005;
- New markets for existing products and new products for existing markets identified;
- Seaweed and pearl industries expanded; and
- Increased air cargo capacity to facilitate exports.

To increase community participation through ownership in fish and fish processing companies.

- 10 community-owned companies established by 2005;
- Offshore fishing licenses offered to indigenous Fijians full utilized by 2005; and
- Formulation of an acceptable structure that will facilitate the active participation and involvement of resource owners in the mainstream activities of the industry by 2003.

To provide appropriate institutional and physical infrastructure to support development in the sector.

- Port handling facilities improved by 2004;
- National, regional and international legislation consistent and compatibly favourable to the expansion of the sector;
- Tuna Development and Management Plan implemented by 2003;
- Rents from distant nation vessels increased to economic levels by 2003;
- Self-managed Industry Councils operational by 2004;
- Management Plan for customary fishing rights developed by 2005; and
- Management Information System (MIS) in place to monitor and manage the quantity and quality of coastal and fisheries resources.

Nearshore domestic fisheries development and/or management plans and strategies

The Fisheries Department is working towards drafting and implementing development and management plans for the domestic fisheries in the Fiji Islands. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the tuna fishery. The deep-water snapper fishery had management arrangement or guidelines put in place in 1987 (Lewis et al. 1988), while management arrangements for the tuna fishery were implemented in 2002.

Management guidelines for the deep-water snapper fishery

In 1987 the Government of Fiji accepted a management plan for the deep-water snapper fishery as a working guideline, to be able to control the development of the fishery given the approaches of foreign interests at the time to develop this fishery. The management guidelines (Lewis et al. 1988) had no specific objectives, but they did cover the following:

- a maximum permitted catch of 1000 t for the years 1987 and 1988, or until such time as a more accurate yield estimate is available (the figure was based on the estimated initial yield (for the first few years of the fishery) of 1400 t for the whole of the Fiji EEZ, including undiscovered seamounts;

- limitations of effort with provisions to:
  - recognise the pioneering role of local vessels and protect their future requirements;
  - safeguard the interests of small vessel local fishermen with a limited operating radius from the main population centres;
  - commitment by the Fisheries Division to further refine scientific yield assessments; and

- vessel limits of eight in the 15 to 20 m range, no limit on smaller vessels (<15 m), and no vessels over 20 m in length permitted in the fishery.

It should be noted that there are no records of any changes to the above management guidelines and it is unclear whether these are still in place. There are also no plans at present to develop a management plan for this fishery.

Tuna management arrangements

The management of the tuna resource in the waters of the Fiji Islands is very important to the government. At present tuna fishing is mainly conducted by locally based private sector tuna fishing companies. To manage the tuna fishery, the Fisheries Department drafted and implemented the Fiji Tuna Development and Management Plan (GoF 2002b) in 2002. The Fisheries Department is about to commence a revision of this plan, with assistance from the Forum Fisheries Agency and SPC, to meet the current circumstances in the local tuna fishery. The purpose, national objectives and development strategies as stated in the current plan (GoF 2002b) are:

Purpose

The purpose of this plan is, in recognition of regional and global international fisheries agreements, to create the appropriate conditions such that all Fijians derive the maximum benefit from the nation's tuna resources over the long term. This statement implies the government will create:

- a catch limit at a level that is sustainable;
- a limit on the number of licenses issued to maximize return to each license;
- a set of criteria for distribution of licenses according to government objectives;
- a set of license fees to support the management of the fishery and provide some benefit for all Fijians;
- a development programme addressing shortcomings in port facilities, legislation, training, social and gender issues, and coordination with other government agencies.

National objectives

- Address the conservation and management of tuna resources within Fiji waters.
- Highlight development policies for maximum utilisation of the tuna resources without compromising the long-term economic, political and resource sustainability.
- Determine the level of sustainable fishing effort, distribution of licenses as well as total allowable catch within Fiji's EEZ.
- Provide policy direction to government towards new areas for development that would increase the economic gains from tuna fishing.
- Make recommendations on institutional changes that would ensure transparency, accountability and efficiency within the Fisheries Department.
- Determine changes to fees paid to government in terms of licensing fees, export permits and processing permits.

Development strategies

Infrastructure: The Ministry has made a series of decisions in support of the plan. In the areas of infrastructure, the Ministry is committed to:

- Repairing the fisheries Jetty in Lami;
- Developing a Fisheries Port at Lami; and
- Maintaining a multi-year Fish Aggregation Device (FAD) Programme in rural areas.

Training: The tuna fishing industry is expanding, and there is a growing demand for trained people to work in the industry, both on the fishing vessels and in the processing and packing facilities. This Plan provides for the establishment of a Fisheries Training School to meet the challenge of this growing industry to provide a comprehensive programme for existing fishermen and those who want to enter the industry.

Social awareness: This Plan provides some innovation in recognition of the Ministry's social responsibilities. Not only will the Ministry introduce a training module for seafarers and their families to reduce the risks to communities associated with the social problems created by the presence of the tuna fishery, but also it will create a Social Impacts Fund from a portion of the access fees charged the industry. The Ministry will work with other agencies to create a Social Consultative Committee to examine the impacts of the industry and distribute the Social Impacts Funds on an annual basis.

In addition, the Ministry recognizes the need for more public awareness of fisheries in the school system and, with assistance of other Ministries, will ensure fisheries is included in vocational training for secondary schools, and to promote the inclusion of fisheries into school curricula.

Small-scale fisheries training: At the same time there is also a requirement to meet the training needs of small-scale fisheries and the Ministry is committed to provide such instruction in the form of hands-on workshops conducted in a village setting.

Staff development: The Ministry recognizes the training requirements of the Fisheries Department staff and the need to develop university and technical programmes to meet the needs of the Ministry in the future.

Seed capital revolving fund: The government of Fiji supports its fishing industry, particularly new entrants and will make financing available through a Seed Capital Revolving Fund to support the entry of Indigenous Fijians into the Fishery as owners of businesses.

Air cargo space: The tuna companies have been successfully exporting fresh tuna from Fiji for many years, and the facilities themselves seem adequate at present. The problem that the tuna industry is facing is the declining number of flights and destinations, as the tourist industry has declined. Without dedicated cargo space departing from Nadi, expansion of the tuna industry will be dependent on the level of passenger service to Fiji Asia and North America. The Ministry recognizes this to be one of the greatest impediments to growth in this sector and will commission a study to provide some options for overcoming this obstacle.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in the Fiji Islands

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Maciu Lugibalavu, Director of Fisheries, and Apolosi Turaganivalu, Principal Fisheries Officer, Management and Technical Services, Fisheries Department (September 2003).	Some targeting of this species by tuna longline vessels due to low catch rates in the tuna fishery. Subsistence and artisanal fishing of these species by small-scale operators mainly ad hoc at present. 6 vessels have been licensed to fish deep-water snapper in the Fiji EEZ outside 12 nm.	Government has 14 ice plants in rural areas. 8 of these are in good order with processing facilities while 6 need to be upgraded. 2 new fishing centres with ice, freezers, and processing, 1 funded by the Fiji Government and 1 by Japan. 5 processing and packing facilities as part of the tuna longline fishery. 1 tuna cannery and loining plant plus a tuna tetaki plant. 4 new fishing centres to be established in 2004. Government is looking at a fish collection system for rural areas.	Government shipyard and slip makes steel fishing vessels to order plus does repair work. 2 other slipways that do repair work on steel and wood boats. Several companies making fibreglass skiffs. Several companies making timber and plywood punts. Several companies making larger vessels in fibreglass and aluminium. Most all companies do repair work on boats.
Background References: Anon 1998; Chapman 2002; Chapman et al. 1984; Dalzell and Preston 1992; Fisheries Division 2002; Fisheries Division 1993; Fisheries Division 1989; Fisheries Division 1987; Fisheries Division 1986; Fisheries Division 1985; Fisheries Division 1981; Fisheries Division 1980; Fisheries Division 1979; Gulbrandsen and Savins 1987; Lewis et al. 1988; Mead 1980; Mead 1997; Mead in press.	Deep-water snapper fishing gear and techniques were introduced to Fiji in 1979–80 by SPC. 6 Fisheries officers and 5 local fishermen were trained, with good catches of deep-water snapper recorded. Fiji Fisheries also conducted initial deep-water snapper fishing trials in 1980–81. In 1981–82, SPC conducted training in deep-water fishing techniques in the Lau group, with 60 local fishermen trained. Again, good catches were recorded, although only half of the catch was saleable. In 1983, SPC assisted the Fiji Fisheries Division with cyclone rehabilitation work after 2 cyclones devastated parts of the country. This was through training fishermen in deep-water snapper fishing techniques. In 1984, SPC conducted additional deep-water fishing trials and training in the Labasa area in northern Fiji, with 18 fishermen trained. In the mid-1980s, a Japanese survey demonstrated the catchability of deep-water snappers by bottom longline gear. As a result, a deep slope commercial fishery commenced in 1985, and by	The Pacific Fishing Company Limited (PAFCO) was established in 1963, with a freezing plant and 2,400 t capacity coldstore built in 1964. In 1970, a pilot cannery was constructed as part of PAFCO to process 10 t of tuna/day. The facility produced frozen loins for export and tuna flakes for the local market. PAFCO continued its transhipment role as well as tuna processing in the early 1970s, although the number of foreign vessels landing fish to PAFCO dropped from over 60 in 1972, to 22 by the end of 1974. Fiji Government established 4 fisheries bases in the mid-1970s at Lami, Lautoka, Labasa and Savusavu. These bases produced and sold ice and a range of fishing gear to fishermen. In 1974, PAFCO commenced the construction of a new 15,000 t/year tuna cannery. The cannery was completed and ready for operation in 1976. Rural fishing centres established during the 1980s, with 3 ice machines installed in rural areas in 1986. Also in	Fisheries Division commenced a small boat construction project in 1978, with 2 x 8.5 m diesel-powered plywood vessels and 4 x 8.5 m plywood catamarans (outboard-powered) built for commercial fishermen. By August 1980, the boatyard had completed 28 x 8.5 m diesel boats, with most of these supplied to rural fishermen and fishing groups. The purchase of these vessels is subsidised by government. In 1984 the boatyard constructed 37 x 8.5 m vessels, 16 for fishermen under the village training programme and 21 for commercial fishermen. From 1984–1986, FAO assisted the Fiji boatyard with designs for 2 vessels, a 6 m flat-bottom punt and a 6.4 m diesel-powered cabin dory. FAO also provided the design for the8.5 m plywood vessel constructed at the boatyard since 1978. In the mid-1980s, a private sector boatyard was established, making 7 m fibreglass planing hull boats under licence to Yamaha in Japan.

	1987 the fishery was focused on 9 coastal slope areas and 8 seamounts around Fiji. In 1987, Fiji Fisheries Division put forward some management guidelines which were accepted by government and implemented for the deep-water snapper fishery. By 1989, catches had fallen in the deep-water snapper fishery and boats moved out of the fishery. During the early 1990s, the deep-water snapper fishery became an ad hoc fishery with boats sometimes fishing for these species. In 1997, interest in fishing deep-water snapper increased with the setting up of TPSL. 3 vessels were targeting these species with TPSL handling 19 t of deep-water snappers in 1998, and 22 t in the first 8 months of 1999.	1996, new slipway, office complex and 10 t/day ice plant installed at Labasa. First tuna longline processing and packing facility established in 1989. By 1997 there were 5 companies handling fish for a range of operators. New facilities including coldstores were constructed for PAFCO by the Australian Government, with the facilities operational in 1992. This supported the cannery side of the PAFCO operation. Trans Pacific Seafoods Limited (TPSL) was established in 1997, with processing facilities for deep-water snappers. In 2000, Tosa Bussan established a tataki processing facility and commenced operation. Fisheries, with donor funding support, commenced the construction of a new rural fishing centre in 2002. It has a 3 t ice plant, 20 t coldstore, processing facility, slipway, jetty, offices, trucks and a collection vessel. 2 similar rural fishing centres are planned for construction in coming years.	Fisheries boatyard continued to make the 8.5 m diesel boats, with 29 made in 1986 and 18 in 1987. At the end of 1987, 272 of these vessels had been constructed since the start of the boatbuilding project. In 1988 the fisheries boatyard started to wind down as the cost of vessels went up and the availability of engines became scarce. Only 3 boats were built plus maintenance undertaken on older boats. This trend continued until July 1993, when the boatyard closed as the donor stopped supplying engines and financial support.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in the Fiji Islands

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Maciu Lugibalavu, Director of Fisheries, and Apolosi Turaganivalu, Principal Fisheries Officer, Management and Technical Services, Fisheries Department (September 2003).	Major FAD programme with several FADs in the water. It is planned that several FADs will be deployed with each of the new fishing centres.	Training is provided to local fishermen through the Fisheries Department in trolling and mid-water fishing techniques used in association with FADs. Government boat subsidy scheme in place where fishermen pay 33% of the value of the boat, outboard and gear and government pays the rest. Many boats issued through this scheme.	Promotion of the small-scale tuna fishery with the boat subsidy scheme and FAD programme. Many boats trolling and mid-water fishing for tunas.
Background References: Beverly and Chapman 1998; Chapman 2002; Chapman and Lewis 1982; Fisheries Division 2002; Fisheries Division	Ika Corporation and the Fisheries Division started to deploy FADs in 1980–81, mainly for the 12 pole-and-line vessels working for Ika. 2 New Zealand purse-seine	In 1981, a trolling survey for coastal pelagics was conducted on the northern side of Fiji with good catches recorded. This survey was extended to the Lau group in	Trolling for tunas was carried out in Fiji in the 1970s and early 1980s from a variety of paddling canoes, sailing canoes, and small outboard-powered runabouts and punts,

1999; Fisheries Division 1995; Fisheries Division 1993; Fisheries Division 1989; Fisheries Division 1987; Fisheries Division 1986; Fisheries Division 1981; Gillett 2002; Gillett in press; Mead 1997; Mead in press;	vessels fishing in Fiji under a survey permit deployed 39 FADs in 1981, with half of these lost by the end of the year. In 1984, fisheries deployed 22 FADs, with one-third of these lost before the end of the year. Fisheries FAD programme continued through the 1980s, with 9 units deployed in 1986 and 6 deployed in 1987. In 1987, a levy on Ika's tuna catch was imposed to cover the cost of 'offshore' FADs for the industrial fishing sector, with Ika assisting with deployments. Fisheries would continue with their 'nearshore' FAD programme for local fishermen. Fisheries continued their FAD programme with assistance from the Ika Corporation in the 1990s, with 10 FADs deployed in 1991. SPC helped in 1992 by training fisheries staff in conducting site surveys and deploying FADs, with 2 units deployed off Suva. In 1993, fisheries deployed 11 units with between 8 and 12 units deployed annually from 1994 to 1999. With the pole-and-line fishery for skipjack winding down in the late 1990s, few FADs were deployed until the CDF project was implemented. In 2002, 6 FADs were deployed in the Suva area in support of the CDF fishermen.	1982 with encouraging results. In 1982, a fisherman from Samoa was brought to Fiji to conduct trolling trials around FADs using artificial lures from an alia catamaran, and to train local fisheries staff in this method. In 1984–85, SPC conducted vertical longline fishing trials around FADs in Fiji. This was to develop the gear and train fisheries staff and interested fishermen. From 1984–86, the Japan International Cooperation Agency (JICA), conducted fishing surveys throughout Fiji, trialling pole-and-line, trolling, surface gillnetting and trolling for tunas, sometimes in association with FADs. Poling was the most successful method. Fisheries has run training courses for fishermen over the years to help promote small-scale development of the tuna fishery. Fisheries implemented a new project in 1999 under their Commodity Development Framework (CDF). 30 local fishermen in the Suva area were subsidised into skiffs for tuna fishing, with each fisherman paying 33% and government 67% of the value of the boat, motor and fishing gear in 2002. FADs were also deployed for the vessels to fish around, and local export companies would buy export-quality tuna.	3.6–6.0 m in length. In the 1980s and 1990s, more small-scale fishermen started to troll around FADs and sell their tuna on the local market. As the tuna became more accepted by locals, fishermen increased their effort. Although mid-water fishing methods had been introduced in the 1980s, this method was not practised. With the start of the CDF project, more emphasis was placed on mid-water fishing for tunas. More fishermen started tying to the FADs, using vertical longlines and mid-water handlines, which target the larger, deeper-swimming tunas.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in the Fiji Islands

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Maciu Lugibalavu, Director of Fisheries, and Apolosi Turaganivalu, Principal Fisheries Officer, Management and Technical Services, Fisheries Department (September 2003).	PAFCO cannery and loining facility have Taiwanese vessels unloading to them under a contract. Government has completed a feasibility study to establish a government commercial fishing entity, the National Fisheries Corporation, as soon as the new legislation is passed by government.	There are currently 18 tuna longline companies with 101 vessels licensed to fish in Fiji waters. Some of these vessels also fish in neighbouring EEZs, but land their catch back in Fiji. There are 5 processing or packhouses associated with the tuna longline fleet. There is one company with a pole-and-line vessel catching	It is estimated that 60–70% of the tuna longline vessels in Fiji are under charter arrangements or joint venture arrangements between local people or companies and overseas fishing companies.

		tuna and processing it into tataki.	
Background References: Anon 1998; Chapman 2002; Gillett 2002; Gillett in press; Smith and Tamate 1999.	The Pacific Fishing Company Limited (PAFCO) was established in 1963 and acted as a transhipment point for longline vessels from Taiwan, Japan and Korea. A national fishing company, Ika Corporation, was established in 1975 to catch skipjack tuna using the pole-and-line method, with the catch sold to PAFCO for canning. In 1980, Ika had 5 of its own pole-and-line vessels, plus it had 6 under charter from Japan and 1 under charter from a local company. Ika Corporation ran into financial difficulty in 1994, and the Fiji Government forced PAFCO to take over the operation of this company. Ika Corporation went bankrupt in 1997.	Stone Fish Company established in the early 1980s, and commenced pole-and-line fishing with 1 vessel in 1984. The company added another pole-and-line vessel in 1987. The catch from this company was sold to PAFCO. Fiji Fish, a private sector tuna longline company, was established in 1988–89, and operated one vessel on a trial fishing basis, which proved successful. Several other tuna longline companies set up in the early 1990s as the fresh tuna export trade stared to expand in Fiji, and by 1992 there were 21 longline vessels operating. In 1997 there were 5 tuna longline companies, with 34 vessels operating. In the late 1990s and early 2000s, 6 shark-fishing companies started up in Fiji. In 2000 a new company, Tosa Bussan, was established with 1 pole-and-line vessel, with another purchased in 2001. In 2001, there were 19 tuna longline fishing companies in Fiji with 90 vessels licensed to fish, and in 2002 this increased to 28 companies with 96 tuna longliners.	PAFCO was a joint venture between two Japanese companies and the Government of Fiji. Ika Corporation chartered pole-and-line vessels from Japan and a local company for its fishing operation. Several of the tuna longline companies in the early 1990s brought in vessels under joint venture or charter arrangements, and this practice has continued into the early 2000s.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in the Fiji Islands

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Maciu Lugibalavu, Director of Fisheries, and Apolosi Turaganivalu, Principal Fisheries Officer, Management and Technical Services, Fisheries Department (September 2003).	There are quite a few gamefish charter boats operating around Fiji, some in association with tourist hotels. There is a series of fishing tournaments held around Fiji where fishing clubs exist.	One pole-and-line vessel baits at night in the lagoons around Fiji.	Some recent trials by a bottom trawler looking for alfonsino in deep water.
Background References: Brown and King 1979; Chapman 2002; Fisheries Division 1999; Fisheries Division 1993; Fisheries Division 1981; Kearney 1984;	In 2002 it was estimated that there were around 20–30 charter fishing vessels in Fiji, with most of these associated with tourist hotels. The number of boats seemed to	UNDP funded a survey of the baitfish resources needed for pole-and-line fishing operations in Fiji in 1969, with positive results. In 1974 a baitfish and pole-	Fiji Fisheries Division conducted sporadic deep-water shrimp-trapping trials in 1977, although data on the trials were not kept. In late 1978, further deep-

Whitelaw 2001.	fluctuate with the number of tourists, as Fijians did not charter vessels themselves. Many fishing tournaments held each year by the different gamefishing clubs around the country. The main tournament is the Pacific harbour International, held in July each year. It is also estimated that there are more than 50 suitable private sportsfishing and gamefishing vessels around Fiji.	and-line survey was undertaken which led to the commencement of a tuna pole-and-line fishery, with the formation of the government Ika Corporation in 1975. In 1978 and 1980 the SPC conducted tuna tagging operations in Fiji, which included baitfishing at night. The results of baitfishing were very good. Fisheries and the University of the South Pacific commenced research into the baitfish species in Fiji in the late 1970s. From 1991–93, fisheries in collaboration with CSIRO (Commonwealth Scientific and Industrial Research Organisation) of Australia, conducted a baitfish survey in Fiji waters and found the level of baitfishing undertaken by the pole-and-line boats was sustainable. In 1998, Fisheries assisted with the construction of 20 ponds, 5 hectares each, for rearing milkfish, both as bait for tuna longlining and as food fish. In 1999, an additional 22 pond sites were identified.	water shrimp-fishing trials were commenced to test 3 different trap designs. Fishing was conducted in depths to 575 m (310 fa), with little difference in catch rates between trap designs. Squid fishing trials were conducted in the waters around Fiji from 1979–1981, with poor results and a catch rate of 0.3 kg/line-hour for the jigging machines.

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French Polynesia

General

French Polynesia is made up of five main island groups, Marquesas, Tuamotu, Society, Gambier, and Austral, with a mix of high and low basaltic islands, and raised and low coral atolls. The islands and atolls are located between 8º and 28º S latitude, and 134º and 155º W longitude. The mid-year 2003 population estimate for French Polynesia is 250,000 people (SPC 2003).

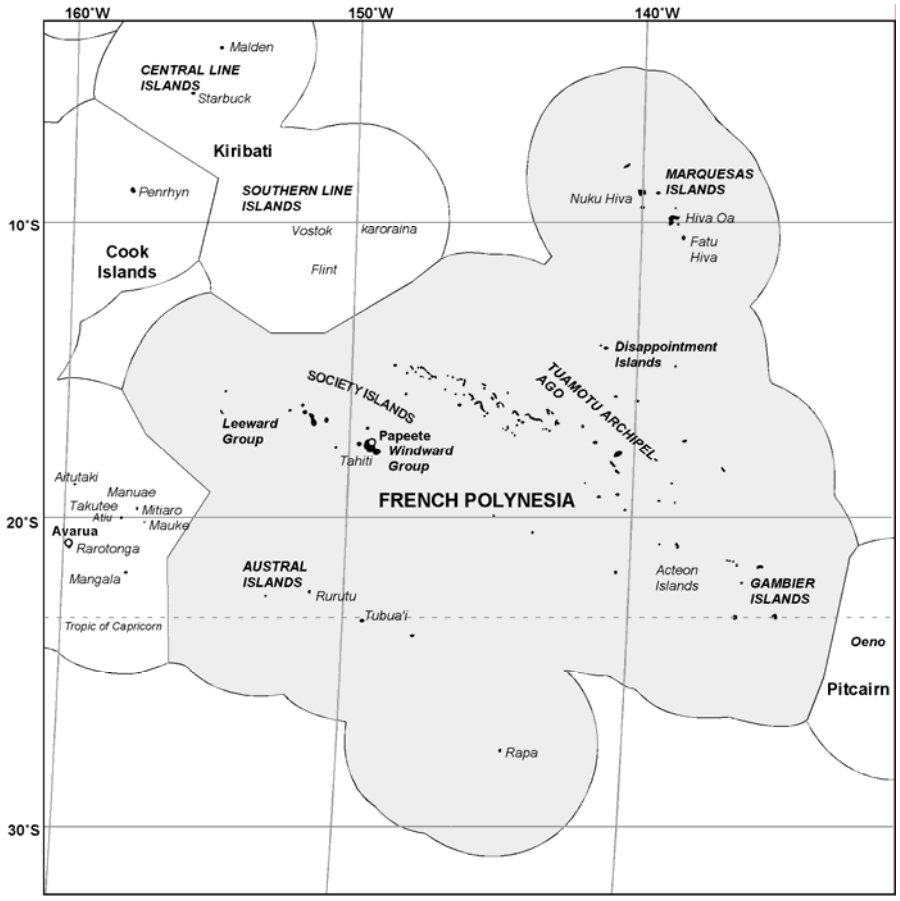

Figure 1: French Polynesia, its EEZ and neighbouring countries

French Polynesia has an EEZ of around 5,030,000 km^2, while having a land area of only around 3521 km^2. French Polynesia has around 70 per cent of its EEZ bordering on international waters, with the remaining EEZ bordering three Pacific countries, the Cook Islands to the west, the Republic of Kiribati to the northwest, and Pitcairn Islands to the southeast.

Fisheries development and management

The development and management of the marine resources within French Polynesia falls under the jurisdiction of the Service de la pêche (SPE) of the Ministère de la pêche, de l'industrie et des PME. There is no specific fisheries legislation for the Service de la pêche (SPE) to work under. However, a 'Development Contract' (French Government — French Polynesia 2000–2003) or 'Contrat de Développement (État — Polynésie Française 2000–2003) has been agreed for national development initiatives in French Polynesia. The following extracts from the 'Development Contract' (GoFP undated) outline the background and objectives for development projects in the area of oceanic fisheries covered under the contract in article 2, Marine Resources.

English translation (of GoFP undated):

Oceanic longline fisheries also appear to be a promising vector for economic expansion in French Polynesia: since 1997, fishery products exports have reached a significant level (1) following modernisation of the oceanic fleet and rationalisation of trade, (2) combined with the implementation of HACCP and European quality standards for products sold on the export market. The increase in the capacity of longline fisheries, diversification of outside markets, improvement in qualifications and, in particular, consolidation of the new semi-industrial fishing experience will be the bases for building up this new industry.

Sector data and identifying the problems to be resolved (oceanic fisheries)

Given the scope of its maritime territory, French Polynesia has significant potential for developing its fisheries activities. It has an exclusive economic zone of about 5 million sq. km. and privileged access to international fishing areas with high tuna concentrations.

However, semi-industrial oceanic fisheries are just beginning and development efforts must be continued. Although fish exports have increased sharply since the early 1990s as a local commercial oceanic fisheries fleet developed, very significant potential for growth still exists. In fact, the local market absorbs a large part of production. The limited number of boats (54 working boats in 1998, 57 in 1999) is a hindrance to exports getting off the ground, something which will also come about through strengthening productivity in the local fleet.

Developing fisheries in the Marquesas Islands requires that techniques to store or process fish (yellowfin or bigeye) before shipping need to be refined. The 'burnt meat' phenomenon, which makes the meat turn from bright red to brown, brings about trade problems on outside markets. Studies should be conducted to both find out the causes of this phenomenon and identify storage or processing techniques to prevent it from happening.

Objectives and expected results (oceanic fisheries)

The objective set in terms of production is 11,000 t of fish, including 7000 t for export, as of 2003 (4500 tons of frozen fish and 2500 tons of fresh fish). In this way, the percentage of fishing in French Polynesia's self-generated resources should then go from nearly 0% in 1993 to nearly 3% as of 2003, i.e. nearly XPF 3 billion as compared to XPF 351 million in 1998. To do this, the local fleet's fishing capacity and productivity must be increased through better use of information about the resource, improved levels of professional qualifications, and improved fishing strategies; the development of trade structures should be continued and better technical assistance provided to commercial fishers. In particular, such assistance is related to transferring research results (ECOTAP, ZEPOLYF and POREMA programmes) to commercial fishers so they better understand fisheries resources, providing training in mastering export quality procedures and requirements (HACCP and European standards) and market research, adding value to products, and reducing costs.

Building a fish port in Faratea (background and objectives)

The Government's policy for the fishery section has been set out in the 'Strategic Programme to Strengthen French Polynesia's Economic Self-Sufficiency'. The goal of the basic strategy is to reorient French Polynesia's economy in order to increase its self-generated resources through implementation of a balanced development process which will cement social cohesion while at the same time allowing implementation of a policy to integrate disadvantaged populations so as to reduce the social divide created by the CEP (French Polynesia Nuclear Testing Centre). This process of converting French Polynesia's economy involves, in particular, developing production sectors (sea, agriculture, industries). Between 1990 and 1995, the coverage rate for all transfers by self-generated resources went from 24% to 32%. It is vital to continue this significant level of growth and to intensify it. In the sea production sector, the "oceanic fisheries" aspect is one of the major components of this development.

The overall goals initially set for this sector for 2003 were:

- a production level of 11,000 tons of fish, including 7000 for export.

These objectives were revised upwards for 2006–2008:

- a production level of 30,000 to 40,000 tons of fish;
- exports of 22,000 to 30,000 tons for a turnover of about XPF 6 to 8 billion;

- a total of 3000 jobs in the fisheries sector.

The Papeete fishing port will certain arrive at its overload point when production reaches 20,000 tons, i.e. about 100 tuna boats. A study on delocalising part of the fleet needs to be undertaken now.

Main objective: Delocalising part of Papeete's semi-industrial fishing activities; this delocalisation will mainly affect frozen fish activities.

The main objective of the Faratea port complex is to delocalise part of the Papeete port's semi-industrial oceanic fisheries activities. Although new infrastructures are planned to increase the Papeete port's accommodation capacities, it will undoubtedly reach a breaking point. For that reason, the Faratea port offers a new alternative while at the same time providing, over the long-term, adequate working conditions for semi-industrial or even industrial activities. This delocalisation would mainly affect frozen fish exports, as fresh fish is mostly sold directly in Papeete because it must transit, within very short deadlines, Faa'a Airport. Frozen fish is mainly transported by sea and at the end of the second phase of the Faratea complex, it will be possible to load it directly onto container ships in the zone. In the meantime, the containers will be transported by road to Papeete port under customs bond.

Secondary objective: Creating an attractive port for the South and East Pacific

Given the scope of the Faratea port project and its economic ambitions, it would be a good opportunity to create an attractive logistical base for foreign fishing fleets working in the central and southern Pacific. French Polynesia has the advantage of being located at the heart of the Pacific, at the centre of many international fishing zones, and, if only due to its geographic position, French Polynesia does interest many foreign fleets for off-loading and transhipment, provisioning, refuelling and repair operations. However, the obstacle to this type of development is purely economic, since the port services proposed by the Territory are among the most expensive in the Pacific (COFREPECHE study on the feasibility of a logistical base for purse seiners). The Faratea project will have to take this into account and offer competitive services if the authorities want this to be an attractive port.

Taiohae (Marquesas Islands) fish trade centre (background and objectives)

Great progress will have to be made in the area of oceanic fisheries over the next few years as the Government plans to triple current production by 2008. This development will not be made at the expense of the outlying island groups, which, through implementation of appropriate land infrastructures, are supposed to play a central role in this development scheme.

In this regard, the Marquesas Islands have very abundant red tuna resources when compared to the other French Polynesian island groups. For that reason, these islands must be integrated into this development through creation of semi-industrial-type oceanic tuna fisheries based in Nuka Hiva (site favoured by several studies).

Due to their great distance from Tahiti, in order to develop this type of fishing, the Marquesas Islands must base themselves on creating the logistical resources to make it possible to arrange trade circuits for Marquesian fisheries products.

The expected results are an increase in production (up to 1500 tons per year), regulation of the Marquesian local market and development of exports to Tahiti (1100 tons per year in fresh fish shipped by air and 120 tons per year of frozen fish shipped by boat). The other effects of this project will be:

- delocalising part of the semi-industrial activities;
- optimising exploitation of the red tuna resources that are particularly found in this part of the Territory;
- creating 60 jobs in the marketing sector, in a geographic area where opportunities are rare.

Improving fisheries product quality

The main problem for coastal fishers is marketing (often conducted on the side of the road). Competition from tuna boats is fierce and new health requirements will soon go into effect in the Territory, probably forcing coastal fisheries to begin a quality approach and, in order to be profitable, use circuits similar to those used by tuna boats, i.e. direct sales to fish traders, auctions or shops.

The actions begun to assist them with this approach are providing fishing cooperatives with refrigerating equipment and training their members.

1. Refrigeration programme

Refrigerating equipment makes it possible to store fishers' production and improve the quality of the fish sold. In this regard, French Polynesia purchased, from 1987 to 1998, 23 cold storage units, two refrigerated containers and 29 ice makers. At the present time, more than half of this equipment needs to be taken out of service.

In 2002, the grant procedure was revised in order to ensure better on-going maintenance of this equipment. During 2003, using a CD2 (Development Contract 2) budget (XPF 25 million, 100% Territory), eight ice makers that can produce one ton of ice every 24 hours each were set up at those sites where coastal fisheries are currently being developed, i.e. Tautira, Hitia'a, Pueu, Faaone, Teahupoo, Punaauia, Papetoai, and Taiohae. A ninth machine has been installed in Paea using a FIM (Sea Investment Fund) budget.

To date, three justifiable requests for ice makers have not been met on Tahiti (in Mahina, Papara and Arue). A budget of XPF 10,000,000 would make it possible to meet the needs of these groups of fishers.

2. Training

Funded out of the CD2 budget (XPF 17 million, 100% Territory), this training is provided when the new ice makers are installed. CEFOR, the training department of CCISM, is in charge of this training, as per the 12 December 2001 framework agreement signed with the Territorial Government. The main training topics are:

- fish processing, storage and packaging;
- hygiene measures;
- marketing;
- management and accounting;
- safety at sea.

This training is open to commercial fishers, fisher group members, spouses in charge of managing fishing companies and young people over the age of 16 interested in the trade of commercial fisher.

It began in June at the various sites that were designated for new ice machines and is continuing at the request of other fisher groups. The expected objective is to integrate coastal fisheries production into the oceanic longline fisheries trade circuits through this quality approach.

Reclaiming fish waste

Fish processing generates 45% in wastes, i.e. 500 tons in 2002, which, for the moment, are discarded at sea at a cost to fish traders of XPF 8.5/kg. Projections for increasing fish production led the Fisheries Service to begin a study, with the IDMER company, on possibilities for processing and reclaiming wastes, whose quantities could reach some 1500 tons (CD2 budget). The objective sought is zero cost to fish traders.

The solution consisting of producing fish meal was excluded due to the tonnages to be processed, given energy costs and the markets targeted. Other solutions were proposed over the short, medium and long terms.

Over the short term: in order to process the quantities of waste, manufacturing organic compost seems to be very well adapted to the local situation. In fact, given the poor quality of soil of volcanic origin, such soil must be fortified by nutrients (mainly for the flower, fruit and market crops). The French Polynesia compost market is between 600 and 1800 tons per year, and so is quite a bit higher than what it is possible to produce using fisheries by-products. It should also be noted that the composting process is very well understood in French Polynesia (Technical Company).

The proposed plan of action is, then, to conduct pilot composting operations and agricultural tests and, finally, to begin a promotion campaign with users and key points of influence. The Territory would take part in the testing phase and through assistance with marketing and investment, while the private sector would be in charge of the technology and investments.

The Fisheries Service is already working with the Rural Development Service and Technical Society in order to begin agricultural tests in February 2004.

Over the medium term: it is possible to plan for more efficient waste reclamation methods:

- flower fertilizers, for gardening, flower crops and nurseries, could be a way of diversifying organic compost production. This would involve 30 tons of fish wastes;
- tuna pulp taken from black tuna muscle or recovered from the central fins can be used in 2nd generation products (delicatessen/smoked products). The Territory could then participate through financial aid and setting up appropriate infrastructures.

Over the long-term: Very high-added-value products could be planned. The most notable is oil from tunas' eyes, which is rich in Omega 3 (or DHA). It is one of the most sought-after and expensive fish oils on the market. It is used in human nutrition for its cardioprotective qualities and its effect on the development of children's brains. The oil's value is determined by its concentration in Omega 3. The actions to be taken are:

- set up procedures for recovering the raw material;
- confirm extraction yields and DHA concentrations;
- conduct initial production runs;
- test the markets (export).

The first two points are the subject of a funding request to the Ministry for Overseas Affairs as a research project in partnership with Ifremer. However, the intellectual property rights on this 'research/development' part will have to be clearly defined.

Exploratory fishing campaigns in the Southern Ocean (30° – 35° S — background)

Since oceanic fisheries began in the late 1980s in French Polynesia, they have continued to increase in scope. In 2002, the tuna fleet comprised nearly 60 tuna boats, including 16 tuna freezers. At the same time, fishing techniques and strategies have improved, particularly due to the contributions of the ECOTAP research programme, which made it possible to gain an overview of oceanographic conditions and species distribution in the northern part of French Polynesia's EEZ. The sector's current challenges are now directed to exporting. Albacore tuna, which in 2002 accounted for nearly 70% of marketable catches, is also the flagship product of French Polynesian exports, which, for the large part, still consist of frozen fish.

Late 2002 and early 2003 were marked by a sizeable drop in yields for most species. While this situation is obviously related to the ENSO climatic phenomenon, it is, nevertheless, worrisome. According to scientific analyses, resource abundance has not, however, been put into question. Despite the drop in yields, most of the fleet did remain in the North-Tuamotu and South-Marquesas zone. Expeditions south of the 20th parallel were extremely rare and only a small percentage of French Polynesia's EEZ (5 million sq. km) is exploited.

Yet the southern area of the EEZ (30–35° S) is potentially host to significant albacore resources. Given its distance from Papeete and the lack of any provisioning or fuelling points in the Austral Islands, this zone is practically inaccessible to fresh fish tuna boats. However, it could offer a new significant fishing area for tuna freezers equipped for greater autonomy that mainly target albacore tuna. However, as uncertainties about species distribution in this zone are still strong and weather conditions there are often unfavourable, the risks of loss in income are high.

The objective of this project is to launch an exploratory fishing campaign in this zone so as to prospect species abundance and distribution and test the profitability of such expeditions.

Creating a fishing assistance website (background and objectives)

Given the production objectives set for 2007, the Ministry of Fishing and the Fisheries Service have decided to implement technical and scientific assistance for commercial fishers with a view to optimising their operations. This technical assistance to oceanic fishers is a relatively vast programme which includes a section that is supposed to make satellite maps of surface temperatures available to fishers. Recently it has become easy to get copies of these maps from the NOAA website (resolution to 50 km) and distribute them to fishers who request them. Distribution of these surface temperature maps, even if their resolutions are far

from optimal, will have a significant impact on the profession, most particularly on young captains, who will find in them information they consider vital for selecting their fishing zones and who will become aware of the importance of these new technologies that they consider to be of real benefit.

The various oceanic fisheries trades increasingly use satellite information to locate the most favourable fishing areas. The oceanographic measures made by satellite are processed by agencies and universities for scientific purposes. These data are sometimes made available to the public through the Internet. Access to these data may be free or paid depending on the processing they have undergone and the degree of precision desired.

The project's main objective is to create a website that will make it possible to distribute satellite maps to French Polynesian fishers showing surface temperatures and sea level or surface current altimetries. These maps will have to be precise because longlines are deployed over dozens of kilometres, and this implies purchasing the data from specialised agencies. Distribution of these maps will be an invaluable assistance to oceanic fishers in selecting fishing zones. These maps will be accompanied by advice, in the form of text and footnotes, that will help fishers better interpret depictions of the various oceanographic variables.

This site will have to be upgradeable as the information shared will not be limited and static. Commercial fishers may express a desire to have additional information of a different nature or information that is more precise than that given. The site administrator will be in charge of studying the timeliness of such requests and the possibilities for sharing this information.

Regulations on marketing, holding and transhipping shark fins in French Polynesia (background)

Due to the characteristics of their lifecycles (low reproduction, slow growth and long life spans), sharks are species that are very vulnerable to exploitation. Current scientific knowledge based on capture rates indicate that many shark stocks in the world are threatened and information to analyse the situation is still too sparse to formulate well-thought out management plans. Only a small number of shark species are sold as food. However, as shark fins get very high prices on the Asian markets, the rest of the animal is thrown back into the sea.

Given this alarming observation and under growing pressure from environmental protection organisations, many countries have implemented, over the past few years, regulations banning the capture of these species and trade in shark fins or in any other part of the animal.

Although the available data are still too sparse to make a ruling on the state of the stocks in French Polynesia, the current world situation must incite a great deal of prudence. In addition to the ecological impact, the lack of such measures is likely to quickly have a negative effect on the Territory's tourist activities and image. Some countries, including, in particular, the United States, which is the main market for the fish exported by our fishing industry, could boycott, over the short-term, those countries that have not adopted measures to protect these species.

Original French version (GoFP undated) :

La pêche hauturière palangrière apparaît aussi comme un vecteur prometteur de l'expansion économique polynésienne : les exportations de produits de la pêche atteignent, depuis 1997, un niveau significatif (1) à la suite d'une modernisation de la flottille hauturière et d'une rationalisation de la commercialisation (2) conjuguée à la mise en œuvre des plans de qualité HACCP et européen des produits vendus à l'export. L'augmentation de la capacité de pêche palangrière, la diversification des marchés extérieurs, l'amélioration des qualifications et surtout la conso1idation de la nouvelle expérience de pêche semi-industrielle seront les bases d'une montée en puissance de cette nouvelle industrie.

Données du secteur et identification des problèmes à résoudre (pêche hauturière)

Compte tenu de 1'étendue de son territoire maritime, la Polynésie française détient un potentiel important pour le développement de son activité de pêche. Elle dispose d'une zone économique exclusive d'environ 5 millions de km^2 et d'un accès privilégié aux zones de pêche internationales bénéficiant d'une forte concentration en thons.

Toutefois, l'activité de pêche hauturière semi-industrielle est encore naissante et il s'avère nécessaire de poursuivre les efforts le développement. Bien que les exportations de poissons aient fortement augmenté

depuis le début des années 90, parallèlement à la mise en place d'une flottille hauturière professionnelle locale, leur potentiel de croissance reste encore très important. De fait, le marché local absorbe une part conséquente de la production. Le manque de bateaux (54 bateaux actifs en 1998, 57 en 1999) freine le décollage des exportations, qui passe également par le renforcement de la productivité de la flottille locale.

Le développement de la pêche aux Marquises nécessite de préciser les techniques de conservation ou de traitement du poison (yellow fin ou big eye) avant expédition. Le phénomène de "burnt meat", qui fait évoluer la couleur de la chair du rouge vif au marron pose des problèmes de commercialisation sur les marchés extérieurs. Des études sont menées pour définir d'une part les causes du phénomène et d'autre part les méthodes de conservation ou de traitement pour le prévenir.

Objectifs et résultats attendus (pêche hauturière)

L'objectif retenu en termes de production s'établit à 11,000 T de poissons dont 7,000 T à l'exportation à l'horizon de 2003 4,500 T en congelé et 2,500 T en frais). La part de la pêche doit ainsi passer de quasiment 0% en 1993 à près de 3% des ressources propres de la Polynésie française en 2003 (soit environ 3 milliards de F CFP contre 351 millions de F CFP en 1998). Sur ce faire, il convient d'augmenter la capacité de pêche et la productivité de la flottille locale grâce à une meilleure utilisation des connaissances de la ressource, à l'accroissement, du niveau des qualifications professionnelles et à l'amélioration des stratégies x pêche, de poursuivre le développement des équipements de commercialisation, de fournir une meilleure assistance technique administrative aux professionnels. Cette assistance porte notamment sur le transfert aux professionnels des acquis de la cherche (programmes ECOTAP, ZEPOLYF et POREMA) pour une meilleure connaissance des ressources halieutiques, leur formation afin de maîtriser les procédures et des exigences de qualité à l'exportation (normes HACCP et européennes) et la cherche des marchés, la valorisation des produits, la réduction des coûts.

AMENAGEMENT DU PORT DE PÊCHE DE FARATEA (contexte et objectifs)

La politique du gouvernement pour le secteur de la pêche a été définie dans le "programme stratégique pour le renforcement de l'autonomie économique de la Polynésie française". La stratégie de base a pour objectif de reconvertir l'économie de la Polynésie française afin d'augmenter ses ressources propres grâce à la mise en place d'un processus de développement équilibré qui cimente la cohésion sociale tout en permettant de mener une politique d'insertion en direction des populations défavorisées afin de réduire la fracture sociale créée par le CEP. Ce processus de reconversion de l'économie polynésienne concerne notamment le développement des secteurs productifs (mer, agriculture, industries). Entre 1990 et 1995, le taux de couverture de l'ensemble des transferts par les ressources propres est passé de 24 à 32%. Il est indispensable de poursuivre et intensifier cette croissance significative. Dans le secteur productif du secteur de la mer, la filière "pêche hauturière" est l'une des composantes majeures de ce développement.

Les objectifs globaux initialement fixés pour ce secteur à l'horizon 2003 étaient:

- une production de 11,000 tonnes de poissons dont 7,000 destinées à l'exportation.

Ces objectifs ont été revus à la hausse avec, à l'horizon 2006 – 2008 :

- une production de 30 à 40,000 tonnes de poissons,
- des exportations à hauteur de 22 à 30,000 tonnes pour un chiffre d'affaires de l'ordre de 6 à 8 milliards de F CFP.
- un total de 3,000 emplois pour la filière pêche.

Le port de pêche de Papeete arrivera certainement à saturation lorsque la production atteindra 20,000 tonnes, c'est-à-dire pour à peu près une 100^{aine} de thoniers. Il est d'ores et déjà nécessaire d'étudier la délocalisation d'une partie de la flottille.

<u>*Objectif principal*</u> : *Délocalisation d'une partie des activités de pêche semi industrielle de Papeete : cette délocalisation toucherait essentiellement l'activité de pêche congelé.*

L'objectif principal du complexe portuaire de Faratea est de délocaliser une partie de l'activité de pêche hauturière semi-industrielle du port de Papeete. Le port de Papeete, bien que de nouvelles infrastructures soient prévues pour augmenter sa capacité d'accueil, arrivera sans doute à saturation. Le port de Faratea

propose donc une nouvelle alternative tout en offrant, à terme, des conditions de travail adéquates pour une activité semi-industrielle voir industrielle. Cette délocalisation toucherait essentiellement l'activité de pêche en congelé pour l'export, le frais étant en grande partie directement vendu sur Papeete car devant transiter, dans des temps très courts, par l'aéroport de Faa'a. Le congelé transite essentiellement par voie maritime et au terme de la deuxième phase du complexe de Faratea, pourra directement être embarqué sur les porte containers présents dans la zone. En attendant, les containers transiteront par voie routière jusqu'au port de Papeete sous douanes.

Objectif secondaire : Création d'un pôle portuaire attractif dans le Pacifiq1ue Sud et Est.

Etant donné l'envergure du projet portuaire de Faratea et ses ambitions économiques, il serait opportun de constituer une base logistique attractive pour les flottilles de pêche étrangères exerçant leurs activités dans le Pacifique Centre et Sud. La Polynésie française a l'avantage d'être située au cœur du Pacifique, au centre de nombreuses zones de pêche internationales, et ne serait-ce que part sa position géographique intéresse de nombreuses flottilles étrangères pour des opérations de débarquement ou de transbordement, d'avitaillement et de réparations. Cependant, le frein à ce genre de développement est purement économique, puisque les prestations portuaires proposées par le Territoire sont parmi les plus chères du Pacifique (étude COFREPECHE, sur la faisabilité d'une base logistique pour les senneurs). Le projet de Faratea devra tenir compte de cette donnée et offrir des services compétitifs si les autorités souhaitent que ce pôle portuaire soit attractif.

CENTRE DE MAREYAGE DE TAIOHAE (MARQUISES — contexte et objectifs)

La pêche hauturière est appelée à fortement progresser dans les prochaines années puisque le gouvernement envisage de tripler la production actuelle d'ici 2008. Ce développement ne sera pas fait au détriment des archipels qui, par la mise en place d'infrastructures adaptées à terre, devrait jouer un rôle central dans ce schéma de développement.

A ce titre, les Marquises disposent d'une ressource en thons rouges très abondante en comparaison des autres archipels de Polynésie. Elles doivent donc être intégrées à ce développement par la mise en place d'une activité de pêche thonière hauturière de type semi-industriel basée à Nuku Hiva (lieu privilégié par plusieurs études).

De part leur éloignement de Tahiti, les Marquises doivent, pour développer ce type de pêche, s'appuyer sur la mise en place d'une logistique permettant d'organiser les circuits de commercialisation des produits de la pêche marquisienne.

Les résultats à atteindre sont l'augmentation de la production (jusqu'à 1500 T/an), la régulation du marché local marquisien et le développement de l'export sur Tahiti (1100 T/an en frais par avion et 120 T/an eu congelé par bateau). Le présent projet aura pour autres répercussions:

- la délocalisation d'une partie des activités semi-industrielles ;
- l'optimisation de l'exploitation de la ressource en thons rouges surtout présente dans cette région du Territoire;
- la création de 60 emplois dans le secteur marchand, dans une zone géographique où les opportunités sont peu fréquentes.

AMELIORATION DE LA QUALITE DES PRODUITS DE LA PECHE

Le principal problème des pêcheurs côtiers est la commercialisation (souvent réalisée en bord de route). La concurrence des thoniers est sévère et de nouvelles exigences sanitaires vont prochainement entrer en vigueur sur le Territoire, obligeant probablement la pêche côtière à entamer une démarche qualité et, pour être rentable, à utiliser des circuits similaires à ceux empruntés par les thoniers (à savoir vente directe aux mareyeurs, à la criée ou aux poissonneries).

Les actions lancées pour les accompagner dans cette démarche sont l'équipement des coopératives de pêche en matériels frigorifiques et la formation de leurs membres.

1. Le programme froid

Les équipements frigorifiques permettent de conserver les productions des pêcheurs et d'améliorer la qualité

des poissons commercialisés. Dans ce cadre, la Polynésie française a acquis, de 1987 à 1998, 23 chambres froides, 2 containers frigorifiques et 29 machines à glaces. A ce jour, plus de la moitié de cet équipement est à réformer.

En 2002, la procédure d'attribution a été revue pour assurer un meilleur suivi de l'entretien de ces équipements. Courant 2003, sur un budget CD2 (25 M CFP, 100% Territoire), 8 machines à glace d'1 tonne/24h ont été installées dans les sites où l'activité de pêche côtière est en développement : Tau tira, Hitia'a, Pueu, Faaone, Teahupoo, Punaauia, Papetoai et Taiohae. Une neuvième machine est installée à Paea sur un budget FIM.

A ce jour, 3 demandes justifiées de machines à glace restent insatisfaites à Tahiti (à Mahina, Papara et Arue). Un budget de 10 000 000 F CFP permettrait de répondre aux attentes de ces groupements de pêcheurs.

2. La formation

Financée sur un budget CD2 (17 M CFP, 100% Territoire), cette formation est couplée, dans le temps, à l'installation des nouvelles machines à glace. Elle a été confiée au CEFOR, service de formation de la CCISM, en application de la convention-cadre du 12 déc. 2001 signée avec le Gouvernement du Territoire. Cette formation a pour principaux thèmes :

- le traitement, la conservation et le conditionnement du poisson;
- les mesures d'hygiène;
- la commercialisation;
- la gestion et la comptabilité;
- et la sécurité en mer.

Cette formation a été ouverte au profit des pêcheurs professionnels, aux membres des groupements de pêcheurs, aux épouses chargées de la gestion d'entreprises de pêche et aux jeunes de plus de 16 ans intéressés par le métier de pêcheur professionnel.

Elle a débuté au mois de juin dans les différents sites attributaires d'une machine à glace et se poursuit actuellement à la demande d'autres groupements de pêcheurs. L'objectif recherché est, par cette démarche qualité, d'intégrer la. production de la pêche côtière dans les circuits de commercialisation de la pêche palangrière hauturière.

VALORISATION DES DECHETS DE POISSONS

La transformation de poisson génère 45% de déchets (soit 500 T en 2002) qui sont, pour le moment, évacués en mer à un coût de 8,5 F/kg pour les mareyeurs. Les prévisions d'augmentation de la production de poisson ont conduit le Service de la Pêche à lancer, auprès de la société IDMER, une étude des possibilités de traiter et valoriser ces déchets, dont les quantités pourraient atteindre 1500 T (budget CD2). L'objectif recherché est un coût nul pour les mareyeurs.

La solution consistant à produire de la farine de poisson a été écartée au regard des tonnages à traiter, du tarif de l'énergie et des marchés visés. D'autres solutions sont proposées à court, moyen et long termes :

A court terme, afin de traiter la quantité de déchets, la fabrication de compost organique semble très adaptée au contexte local. En effet, du fait de la nature pauvre des sols d'origine volcanique, il est nécessaire de renforcer ces sols en éléments nutritifs (essentiellement pour les productions florales, fruitières et maraîchères). Le marché polynésien du compost est compris entre 600 et 1800 T / an, il est donc largement supérieur à ce qu'il est possible de produire avec les sous-produits de la pêche. On peut ajouter que le procédé de compostage est largement maîtrisé en Polynésie française (société Technival).

Le plan d'action proposé est donc de réaliser des opérations pilote de compostage et des tests agronomiques et enfin d'engager un programme de promotion auprès des utilisateurs et prescripteurs. Le Territoire aurait à intervenir dans la phase de tests ainsi qu'au travers de l'aide à la commercialisation et à l'investissement, le privé se chargeant de la technologie et des investissements.

Le Service de la Pêche est d'ores et déjà en relation avec le Service de Développement Rural et la Société

Technival afin de débuter des tests agronomiques à compter de février 2004.

A moyen terme, il est possible d'envisager des pistes de valorisation des déchets plus efficaces:

- les engrais foliaires, à destination de la jardinerie et des productions florales et pépinières, pourraient être une diversification de la production de compost organique. Ils concernent 30 T de déchets de poissons,
- la pulpe de thon, à partir du muscle noir du thon ou récupérée sur les arêtes centrales de poisson, peut être utilisée en produit de 2ème génération (charcuterie-saurisserie). Le Territoire peut donc intervenir par des aides financières et la mise en place d'infrastructures adaptées.

A long terme, les produits à forte valeur ajoutée peuvent être envisagés. Le plus remarquable est l'huile des yeux de thon, riche en oméga 3 (ou DHA). C'est une des huiles de poisson les plus recherchées et les plus chères du marché. Elle est utilisée en nutrition humaine pour ses propriétés cardio-protectrices et son action sur le développement du cerveau des enfants. La valeur de cette huile est définie par sa concentration en oméga 3. Les actions à mener sont :

- fixer les procédures de récupération de là matière brute,
- confirmer les rendements d'extraction et de titrage en DHA,
- réaliser les premiers lots de fabrication,
- tester les marchés (à l'export).

Les deux premiers points font l'objet d'une demande de financement en tant que projet de recherche auprès du Ministère de l'Outre-Mer, en partenariat avec l'IFREMER. Il faudra cependant définir clairement la propriété industrielle des résultats de cette partie « recherche/développement ».

CAMPAGNES DE PECHE EXPLORATOIRE DANS LA ZONE SUD (30–35° S — contexte)

Depuis ses débuts à la fin des années 1980, la pêche hauturière polynésienne n'a cessé d'augmenter en puissance. La flottille thonière comptait en 2002 près de 60 thoniers dont 16 thoniers congélateurs. Parallèlement, la technique et les stratégies de pêche se sont perfectionnées, notamment grâce aux apports du programme de recherche ECOT AP qui a permis de dresser un bilan des conditions océanographiques et de la distribution des espèces dans la partie nord de la ZEE polynésienne. Les enjeux actuels de la filière se tournent désormais vers l'export. Le thon germon, qui représentait en 2002 près de 70% des captures commercialisables, est également le produit phare des exports polynésiens qui sont encore majoritairement réalisés en congelés.

La fin de l'année 2002 et le début de l'année 2003 furent marqués par une chute considérable des rendements pour la plupart des espèces. Si cette situation est à l'évidence liée au phénomène climatique ENSO, elle n'en demeure pas moins inquiétante. Selon les diagnostics scientifiques, l'abondance de la ressource n'est cependant pas en cause. Malgré la chute des rendements, l'essentiel de la flottille est pourtant resté dans la zone nord-Tuamotu et sud-Marquises. Les incursions au sud du 20ème parallèle sont quasiment inexistantes et seule une faible partie de la ZEE polynésienne (5 millions de km^2) est exploitée.

Or la zone sud de la ZEE (30–35° S) abrite potentiellement une importante ressource germonière. Compte tenu de la distance par rapport à Papeete et l'absence de point de ravitaillement aux Australes, cette zone est pratiquement inaccessible aux thoniers de pêche fraîche. Elle pourrait en revanche offrir une nouvelle zone de pêche considérable aux thoniers congélateurs dotés d'une plus grande autonomie et ciblant majoritairement le germon. Les incertitudes étant cependant fortes sur la distribution des espèces dans cette zone et les conditions climatiques y étant souvent défavorables, les risques de manque à gagner sont élevés.

L'objectif de ce projet est de lancer une campagne de pêche exploratoire dans cette zone afin de prospecter l'abondance et la distribution des espèces et tester la rentabilité de ces campagnes.

CREATION D'UN SITE INTERNET D'AIDE A LA PECHE (contexte et objectifs)

Etant donné les objectifs de production fixés pour 2007, le Ministère de la Pêche et le Service de la Pêche ont décidé de mettre en œuvre une assistance technique et scientifique au service des professionnels avec pour objectif l'optimisation de leur exploitation. Cette assistance technique aux pêcheurs hauturiers est un programme relativement vaste dont un des volets prévoit de mettre à leur disposition des cartes satellitaires

de températures de surface. Ces cartes sont, depuis quelques temps, simplement récupérées sur un site de la NOAA (résolution à 50 km) et distribuées aux pêcheurs qui en font la demande. La diffusion des cartes de températures de surface, même si la résolution est loin d'être optimale, aura eu un impact important sur la profession et plus particulièrement sur les jeunes capitaines qui d'une part y trouvent des informations qu'ils jugent essentielles pour le choix de leurs zones de pêche et qui d'autre part prennent conscience de l'importance de ces nouvelles technologies qu'ils considèrent comme une véritable aide.

Les différents métiers de la pêche hauturière utilisent de plus en plus l'information satellitaire pour repérer les zones de pêche les plus favorables. Les mesures océanographiques des satellites sont traitées par des organismes et universités à des fins scientifiques. Ces données sont mises quelques fois à la disposition du public sur le réseau Internet. L'accessibilité à ces données peut être gratuite ou payante en fonction des traitements qu'elles ont subit et du degré de précision que l'on souhaite obtenir.

L'objectif principal du projet est de créer un site Internet qui permette de diffuser aux pêcheurs polynésiens des cartes satellites de températures de surface et d'altimétrie du niveau de la mer ou de courants de surface. Les cartes devront être précises car les palangres sont posées sur quelques dizaines de km, ce qui implique donc l'achat des données auprès d'organismes spécialisés. La diffusion de ces cartes constituera une aide précieuse pour les pêcheurs hauturiers dans leurs choix des zones de pêche. Ces cartes seront accompagnées de conseils, sous forme de textes et d'annotations, qui aideront les pêcheurs à mieux interpréter les représentations des différentes variables océanographiques.

Ce site devra être évolutif dans le sens où les informations à diffuser ne seront pas limitées et figées. Les professionnels pourront émettre le souhait d'obtenir des informations supplémentaires de nature différente ou plus précises que celles diffusées. Le gestionnaire du site sera chargé d'étudier la pertinence des requêtes et étudiera les possibilités de diffusion.

REGLEMENTATION RELATIVE A LA COMMERCIALISATION, LA DETENTION ET LE TRANSBORDEMENT DES AILERONS DE REQUINS EN POLYNESIE FRANÇAISE (contexte)

De par les caractéristiques de leur cycle de vie (reproduction faible, croissance lente et longue durée de vIe), les requins sont des espèces très vulnérables à l'exploitation. Les connaissances scientifiques actuelles qui se fondent généralement sur des taux de capture indiquent que de nombreux stocks de requins sont menacés dans le nm0nde et les éléments de diagnostic sont encore trop faibles pour élaborer des plans de gestion raisonnés. Seul un petit nombre d'espèces de requins est commercialisé pour la consommation. Les ailerons se vendent cependant très chers, en particulier sur les marchés asiatiques, le reste de l'animal étant alors le plus souvent rejeté à la mer.

Face à ce constat alarmant et sous la pression grandissante des organisations de protection de l'environnement, de nombreux pays ont mis en place depuis quelques années des réglementations interdisant la capture de ces espèces et la commercialisation des ailerons ou toute autre partie de l'animal.

Bien que les données disponibles soient encore trop faibles pour statuer sur l'état des stocks à Polynésie française, la situation mondiale actuelle doit inciter à la plus grande prudence. Outre l'impact écologique, l'incidence d'une absence de mesures risque d'être rapidement préjudiciable aux activités touristiques et à l'image du territoire. Certains pays, dont notamment les Etats-Unis qui représentent le principal marché pour les poissons exportés par la filière pêche, pourraient boycotter à brève échéance les pays n'ayant pas adopté de mesures de protection de ces espèces.

Nearshore domestic fisheries development and/or management plans and strategies

The Service de la pêche (SPE) is working towards the drafting and implementation of development and management plans for some of the domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the tuna fishery. There is no development and/or management plan currently in place for the deep-water snapper fishery, although the process to draft one has commenced and it is hoped the plan will be completed by the end of 2004.

Management of the tuna resource in the waters of French Polynesia is very important to the government. At present tuna fishing is mainly conducted by private sector tuna longlining operations. To manage the tuna fishery, the Service de la pêche (SPE) is taking steps to develop a tuna management and development plan for this fishery, with the aim of completing it by the end of 2004.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in French Polynesia

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Bruno Ugolini, Chef de service, Service de la Pêche (SPE), (November 2003).	No specific targeting of deep-water snapper species. Mainly an ad hoc fishery with around 300 boats throughout the country using handlines, handreels and electric reels.	13 fish processing and packhouses in Papeete with 7 of these exporting product. Around 30 fish markets in Papeete and another 15 in the outer islands. Government has installed many ice plants, 12 around Tahiti and 10 in outer islands, with these managed by local fishermen's associations or cooperatives.	6 private sector boat building facilities. 1 building poti marara boats from 4.9–9.2 m in wood. 1 building 11 m wooden bonitiers. 4 building 13.5–30 m longliners in aluminium and steel – 1 of these companies to start using fibreglass soon. 1 slipway with workshop facilities. Many places to get repairs done on steel, fibreglass, aluminium and wooden boats.
Background References: Chapman and Cusack 1998; Dalzell and Preston 1992; Misselis 2003; SPE 1996; SPE 1979; Wrobel 1988.	Fishing for deep-water snappers has been conducted by people in French Polynesia for decades, although mainly by recreational fishermen using electric reels. In 1985, some commercial fishing for deep-water snappers commenced with fishermen using handlines. In 1987, SPC demonstrated the gear being used in the Pacific to fish for deep-water snappers. Many local fishermen already fished for these species, although the wooden handreels used by SPC made the fishing operation easier. The introduction of this gear was conducted at 4 locations with catch rates ranging from 2.3 kg/line-hour at Rurutu to 6.7 kg/reel-hour at Ua Pou. The deep-water snapper fishery remained an ad hoc fishery during the 1990s as the resource was found to be fragile. Many local fishermen catch these species infrequently when the	In 1973 the Government of French Polynesia set up a fish receiving and processing facility in Apataki. This facility had freezer and coldstore capacity as well as making ice for local fishermen. Also in 1973, government established a similar facility in Papeete. This facility also received product from Apataki and sold it locally. During the 1980s and 1990s, other rural fishing centres were established to assist in the overall development of fisheries in the country. With the development of the tuna longline fishery, at least 8 private sector processing facilities were established in Papeete in the 1990s. The main port infrastructure in Papeete has been upgraded to keep up with the expansion of the tuna longline fishery and in 2002 consisted of a 450 m wharf with floating pontoons (can service 100 vessels), 2 ice towers	Construction of Tahitian-style pole-troll boats (bonitier), started in 1946 at local boatyards. These vessels are 10 m in length and originally had 8–18 HP engines. These vessels became popular by 1970, with 132 of them constructed and fishing by 1979. All boats were constructed locally. The engine size was greatly increased, though, to 200–250 HP. Also in the 1950s, local boatyards started constructing 4.5–6 m plywood vessels that were powered by 1 or 2 outboard motors. These 'poti marara' vessels are used for a range of fishing activities. Two larger 'superbonitier' vessels were constructed locally for sea trials in 1980. These vessels were 16 m long with a 385 HP diesel engine. Local boatbuilders continued to make both bonitiers and poti marara vessels during the 1990s, although in the mid-1990s, some bonitiers were

	weather permits.	producing 50 t/24 hours, 2 fresh fish market buildings (1 for local market and 1 for export), and 1 frozen tuna loin packing plant. New fish market centre established in 2001–2002 in the Leeward Islands.	converted to tuna longlining. In the mid- to late-1990s, several boatyards started building tuna longline vessels, especially larger vessels in steel.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in French Polynesia

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Bruno Ugolini, Chef de service, Service de la Pêche (SPE), (November 2003).	Government has an ongoing FAD programme, which includes regular maintenance of the FADs. Currently there are 14 FADs around Tahiti, 3 in the northwest Society islands and 4 in the Tuamotu Islands. In 2004, deployments are scheduled for 12 FADs around Tahiti, 8 in the northwest Society islands and 5 in the Australes group.	Government is promoting private sector development. Government provides training for local fishermen in small business management and so on, on-board handling and processing techniques and fish quality.	About 300 small-scale vessels around the country involved in trolling, vertical longlining and harpooning of tunas and other coastal pelagics, fishing the coast, tuna schools and around FADs.
Background References: Chapman and Cusack 1998; Leproux 1999; Misselis 2003; Nordhoff 1930; Gillett and Kearney 1983; SPE 1996; SPE 1979.	3 FADs were deployed in the Marquesas in 1978–79 by the Inter-American Tropical Tuna Commission. Fisheries commenced a FAD programme in 1981, with the deployment of 3 devices. The FAD programme expanded in the following years, with 5 FADs deployed in 1982 and 7 in 1984. From 1981 to 1999, fisheries deployed a total of 251 FADs throughout the 5 island groups in French Polynesia. Over this time, 8 different designs have been tried, with no single model being adopted as better or more suitable than others. In 2002 Fisheries was maintaining 30 FADs around the Windward group and 10 FADs in the Leeward group, with plans to deploy FADs in the more distant island groups.	Ika-shibi fishing trials (night fishing for tunas with light attraction) conducted in the Leeward Islands by a Hawaiian fisherman in 1981–82. Local fishermen were given training in this gear and fishing technique. SPC provided training on the construction and use of vertical longlines to fisheries staff and interested fishermen in 1987. Fisheries have provided training in a range of fishing methods to fishermen around the country.	Traditionally tuna have been caught from a range of large double-hull canoes using live bait (as bait and as chum to attract fish). The use of live bait seems to have died out in the 1920s, with traditional pearlshell lures used from a paddled canoe in its place. Another traditional tuna fishing method is the drop-stone, mid-water handlining technique which was practiced from 1-person outrigger canoes. Pole-trolling from bonitier vessels using bamboo poles and pearlshell lures took over from the canoes in the 1940s and 1950s, and continues today. From 1991–1996, 30 bonitiers were converted to tuna longlining. In 1996 there were about 100 bonitier vessels pole-trolling for skipjack and 200 poti marara vessels, fishing for tuna and mahi mahi in the day and flyingfish at night. In 2002 there were 55 bonitiers still pole-trolling and 237 poti marara undertaking a range of fishing

			activities including trolling, vertical longlining, mid-water handlining and harpooning.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in French Polynesia

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Bruno Ugolini, Chef de service, Service de la Pêche (SPE), (November 2003).	There are no public sector tuna fishing companies as the government is promoting private sector development.	50–55 tuna longline vessels fishing to around 35 companies. 16 of these vessels process and freeze their catch on board ready for export.	There are no joint venture tuna fishing operations in French Polynesia.
Background References: Misselis 2003; SPE 2001; SPE 1996.	There is no record of the public sector being involved in tuna fishing operations in French Polynesia.	Domestic vessels started tuna longlining in the early 1990s in French Polynesia. By 1996 there were 43 vessels, 13 purpose-built longliners and 30 bonitiers that had been converted from pole-troll vessels to longlining. In 2000 the domestic tuna longline fleet consisted of 11 bonitier-type vessels (10–12 m long), 30 fresh tuna longliners (13–20 m long), and 15 steel freezer vessels (25–26 m long). Most freezer vessels have HACCP plans so they can process and freeze the catch to export requirements while at sea. In 2002 the tuna longline fleet structure had changed, with 6 bonitiers, 30 fresh tuna boats, 2 x 21 m 'mixed' longliners, and 16 freezer longliners, giving 54 vessels in total.	There are no records of any joint venture fishing operations in French Polynesia.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in French Polynesia

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Bruno Ugolini, Chef de service, Service de la Pêche (SPE), (November 2003).	Around 15 charter vessels, mainly in tourist areas. 10 fishing clubs with about 30 tournaments held each year around the country. Tournaments attract from 10–120 boats depending on location and type of tournament. Professional fishermen are allowed to compete in some tournaments.	No baitfishing trials or activities undertaken at present.	Many small-scale vessels throughout the country catching flyingfish at night using scoop nets and light attraction. No other nearshore fishing methods trialled or used at present.

Background References: Chapman and Cusack 1998; Gillett and Kearney 1983; SPE 1978; Whitelaw 2001.	Sportsfishing and gamefishing has been practised in French Polynesia for some time, mainly centred around the tourist areas of Tahiti and Moorea in the Windward Islands and Taiatea and Bora Bora in the Leeward Islands. In 2000 there were around 15 charter vessels that were members of gamefishing clubs. There were also around 450 suitable private sector vessels in the 6–8 m range and 50 in the 8–13 m range.	During the 1950s and 1960s, trips were undertaken by research vessels to the Marquesas to test the baitfish and pole-and-line potential, with the fish taken to Hawaii for marketing. French research institutes conducted baitfishing surveys and research from 1974–1979, with several species (mollie and chanos) recommended for aquaculture production. SPC conducted baiting and pole-and-line fishing in 1978–79 and 1979–80 (2–3 month periods); with good bait catches recorded in the Marquesas.	The catching of flyingfish using a scoop net and light attraction is a traditional method used throughout French Polynesia. From the 1950s, a specific design of boat, the poti marara, has been used for catching flyingfish. These vessels have a forward cockpit fitted with tiller steering, with a scoop net and light attraction still used. In 1996 there were around 200 poti mararas catching flyingfish at light.

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Guam

General

Guam (Figure 1) is a single high island located at the end of the Mariana Archipelago at 13º 26' N latitude, and 144º 43' E longitude. The mid-year 2003 population estimate for Guam was 162,500 people (SPC 2003).

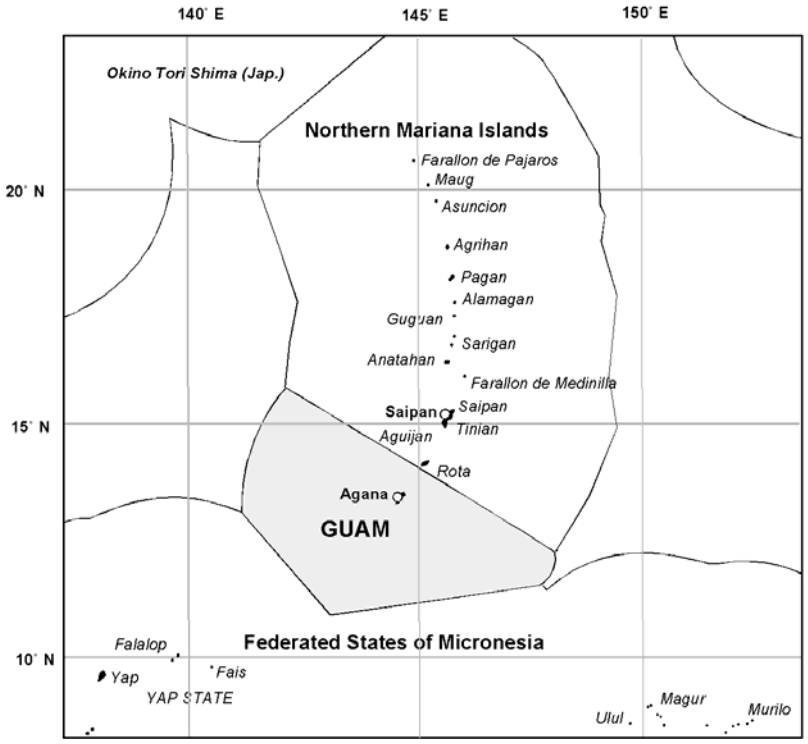

Figure 1: Guam, its EEZ and neighbouring countries

Guam has an EEZ of around 218,000 km^2, while having a land area of around 541 km^2. Guam's EEZ borders two Pacific nations, the Federated States of Micronesia to the south and the Commonwealth of the Northern Mariana Islands to the north, with around 25 per cent of the EEZ bordering international waters.

Fisheries development and management

The development and management of the marine resources within Guam's EEZ has been regulated by the US Government over the last 50 years. Fisheries management is handled through the Western Pacific Regional Fisheries Management Council in response to the *Magnusson-Stevens Fisheries Conservation and Management Act* under the US Congress. However, the Government of Guam also claims legal jurisdiction under 1 Guam Code Annotated. The local government has also been working with US Federal partners in developing a management plan that will allow the transfer of oversight of the natural resources and any revenue generated from activities within the EEZ to the Government of Guam.

Nearshore domestic fisheries development and/or management plans and strategies

Fisheries management of nearshore resources around Guam is conducted through the Western Pacific Regional Fisheries Management Council based in Honolulu, Hawaii. Through the Council, two fishery management plans have been implemented, one for the deep-water snapper resource and the other for

pelagic species. These management plans cover Hawaii, and the three US territories of American Samoa, the Commonwealth of the Northern Mariana Islands and Guam.

Combined fishery management plan, environmental assessment and regulatory impact review for the bottomfish and seamount groundfish fishery management plan of the Western Pacific region

This plan was implemented in August 1986 (WPRFMC 1986) and has been amended nine times over the years to take account of changing circumstances in all or part of the fishery being covered. The plan has the following objectives:

1. Protect against overfishing and maintain the long-term productivity of bottomfish stocks;

2. Improve the database for future decisions through data reporting requirements and cooperative Federal/State/Territory data collection programmes;

3. Provide for consistency in Federal/State/Territory bottomfish management to ensure effective management across the range of the fisheries;

4. Protect bottomfish stocks and habitat from environmentally destructive fishing activities and enhance habitat if possible;

5. Maintain existing opportunities for rewarding fishing experiences by small-scale commercial, recreational, and subsistence fishermen, including native Pacific islanders;

6. Maintain consistent availability of high quality products to consumers;

7. Maintain a balance between harvest capacity and harvestable fishery stocks to prevent over-capitalization;

8. Avoid the taking of protected species and minimise possible adverse modifications to their habitat;

9. Restore depleted groundfish stocks and to provide the opportunity for US fishermen to develop new domestic fisheries for seamount groundfish which will displace foreign fishing; and

10. Monitor stock recovery of depleted stocks in the Fisheries Conservation Zone so that any international plan of action for managing the common resource can be guided by experimental results.

The pelagic fishery management plan of the Western Pacific region

This plan was implemented in March 1987 and has been amended (WPRFMC 2003a). The current objectives of the plan are as follows:

1. To manage fisheries for management unit species in the Western Pacific region to achieve optimum yield;

2. To promote, within the limits of managing optimum yield, domestic harvest of the management unit species in the Western Pacific region EEZ and domestic fishery values associated with these species, for example, by enhancing the opportunities for:
   (a) satisfying recreational fishing experiences;
   (b) continuation of traditional fishing practice for non-market personal consumption and cultural benefits; and
   (c) domestic commercial fishermen, including charter boat operations, to engage in profitable fishing operations.

3. To diminish gear conflict in the EEZ, particularly in areas of concentrated domestic fishing.

4. To improve the statistical base for conducting better stock assessments and fishery evaluations, thus supporting fishery management and resource conservation in the EEZ and throughout the range of the management unit species.

5. To promote the formation of a regional or international arrangement for assessing and conserving the management unit species and tunas throughout their range.

6. To preclude waste of management unit species associated with longline, purse seine, pole-and-line or other fishing operations.

7. To promote, within the limits of managing at optimum yield, domestic marketing of the management unit species in American Samoa, the Commonwealth of the Northern Mariana Islands, Guam, and Hawaii.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in Guam

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Gerry Davis, Chief, Division of Aquatic and Wildlife Resources, Guam (October 2003).	Deep-water snapper fishing is conducted ad hoc by about 180 small-scale vessels fishing around Guam. Less that 20 small-scale vessels would target deep-water snapper when the weather permits.	Main centre is the Guam Fishermen's Cooperative, to which most fishermen sell their fish. Several other small fish vendors around Guam. 4 private sector ice-making facilities, 2 main ones where fishermen collect their ice and 2 smaller ones that deliver ice to the boat.	1 small boatyard building fibreglass vessels less than 7 m in length. Drydocking facilities available but very expensive. Local fishermen hire a crane to lift their vessels out to work on them. Facilities available for repairs on all types of boats: wood, fibreglass, aluminium and steel.
Background References: FitzGerald 1996; WPRFMC 2003b; WPRFMC 1996; WPRFMC 1991; WPRFMC 1988.	Deep-water snapper data is available from 1979, when around 2 t of fish was recorded. Fishery expanded in 1983 with 32 vessels reporting landings of around 14 t. Fleet expanded to 47 vessels in 1985, although the landings dropped to around 10 t. Further declines in 1986, with 38 vessels landing around 6 t. Note that these vessels only fished part-time for deep-water snappers. Management plan implemented in August 1986 by the National Marine Fisheries Service, which covered Guam, Hawaii, American Samoa and the Commonwealth of the Northern Mariana Islands. In the late 1980s, catches went up to around 15 t	Small-scale fish buyers in the private sector established in the 1980s and 1990s. No details on hand as to the size of these operations. In 1996 there were 12 agents servicing the foreign tuna longline vessels that were transhipping fresh tuna through Guam to Japan and US markets.	No information found on background to boatbuilding ventures or facilities on Guam.

	annually, with about 110 boats fishing During the early- to mid-1990s the landed catch of deep-water species increased to 30–40 t with vessel numbers increasing to 167 in 1992, 266 in 1993 and 346 in 1995. Catches continued to increase in the late 1990s and early 2000s to 50–60 t, with vessel numbers fluctuating from a high of 411 in 1999 to 337 in 2001.		

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in Guam

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Gerry Davis, Chief, Division of Aquatic and Wildlife Resources, Guam (October 2003).	Currently 16 FADs on station around Guam up to 20 nm offshore in set locations approved by the Coastguard. Regular maintenance carried out on the FADs and lost FADs are generally replaced within 2 weeks.	No public sector small-scale tuna fishing activities.	As for deep-water snapper fishing, about 180 local small-scale vessel troll around the FADs and open water for tunas and other pelagics. A few boats would also mid-water handline for tunas around FADs or off the corners of banks. About 20–30 boats full-time fishing, with trolling making up around 90% of their fishing time.
Background References: AWR 1999; AWR 1998; AWR 1997; AWR 1996; AWR 1995; AWR 1994; AWR 1992; AWR 1990; AWR 1987; AWR 1983; AWR 1982; AWR 1981; AWR 1979; SPC 1999; SPC 1984; WPRFMC 2001; WPRFMC 1997; WPRFMC 1996; WPRFMC 1992; WPRFMC 1990.	First 3 FADs constructed in 1979 using 3 x 55 gal drums. Environmental impact assessment made with 9 possible sites identified. 2 FADs deployed in around 1100 m (600 fa) and one kept as a spare. In 1979 and 1980, 4 FADs were deployed and all were lost in less than 5 months. 5 FADs deployed in 1981 and 2 in 1982, with all FADs lost by April 1983. This first FAD programme concluded in 1984. FAD programme reactivated in 1987, with materials purchased and sites selected during 1988 and 1989. 5 FADs deployed in 1990, with 1 lost after 5 months and another 3 lost in 1991 in a cyclone. 4 replacement FADs deployed in 1992, 2 lost after 5 months and replaced late in	Hawaiian sampan used for a trolling survey around Guam from 1967–69. Method was assessed as being not economically viable. Pacific Tuna Development Foundation (PTDF) conducted a trolling survey around Guam from 1978–1979, with low catch rates. PTDF conducted ika-shibi fishing trials around Guam from December 1978 to April 1979. 46 people trained over 39 night fishing trips, but catches were low. Tuna longline trials undertaken with financial assistance in the mid-1980s, although no results available.	Trolling for tunas and other pelagics goes back a long way off Guam. In 1980 there were around 115 small-scale vessels operating, landing around 240 t of pelagics. Duding the 1980s, vessel numbers fluctuated and reached a high of 282 vessels in 1989. The landings also fluctuated during this time (190–350 t). Management plan (pelagics) implemented in March 1987 by the National Marine Fisheries Service, which covered Guam, Hawaii, American Samoa and the Commonwealth of the Northern Mariana Islands. In 1991, commercial longlining was prohibited within 50 nm of the 180 m (100 fa) isobath, which included FADs and offshore banks. This exclusion zone

	1992. 2 FADs lost in 1994 after 25 and 26 months on station. These FADs were replaced in the same year. 5 new FADs deployed in 1995 and 3 in 1996, which brought the total to 12 FADs in the waters around Guam. 1997 saw the start of a FAD maintenance programme. 5 FADs lost, 4 replaced and 13 FADs serviced in 1997. FAD programme expanded in 1998 to 16 FADs, with 4 new deployments. In addition, 5 FADs lost and replaced. In 1999, 7 FADs were lost with 6 replaced.		was applied to foreign purse-seine and pole-and-line vessels in 1992. This exclusion zone was to protect the interests of local small-scale operators. During the 1990s vessel numbers fluctuated from 332–469, with the landed catch fluctuating from 240 t (1992) to 430 t (1996). The 1999 landing was 287 t. Nearly all of the catch was taken by trolling and includes charter boat operations.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in Guam

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Gerry Davis, Chief, Division of Aquatic and Wildlife Resources, Guam (October 2003).	No public sector tuna fishing companies.	No domestic medium-scale tuna fishing operations partly because there is a 50 nm exclusion zone around Guam, and there is no export of domestically caught tunas. Foreign vessels tranship their catch through Guam, but the fish is not taken in the Guam EEZ.	No joint venture tuna fishing operations in Guam.
Background References: FFA 1989; WPRFMC 2001; WPRFMC 1997; WPRFMC 1992; WPRFMC 1990.	No record of any public sector tuna fishing companies having been established on Guam. Focus has been on private sector development.	Transhipment of frozen tuna from foreign purse-seine and carrier vessels into reefer containers was conducted in the late 1970s and early 1980s. This changed in the later 1980s to transhipment of the frozen catch from purse seiners to carrier vessels. Management plan (pelagics) implemented in March 1987 by the National Marine Fisheries Service, which covered Guam, Hawaii, American Samoa and the Commonwealth of the Northern Mariana Islands. Transhipment of fresh tuna from foreign longline vessels by air freight to Japan commenced in 1986. 2 US tuna longliners were licensed to fish Guam's EEZ in 1991, although neither vessel actually fished.	No records of any joint venture fishing operations having been set up on Guam.

		No other records of domestic tuna longlining activity have been located.	

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in Guam

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Gerry Davis, Chief, Division of Aquatic and Wildlife Resources, Guam (October 2003).	Around 25 charter boats operating out of Guam, mainly to cater to the tourist trade, with trolling making up 90% of their charter activities. No actual gamefishing club, although there is an annual international tournament plus 2–3 local derbies annually.	No baitfishing trials or activities undertaken at present. The aquaculture of milkfish for live tuna longline bait has greatly reduced with only small quantities currently produced.	No other nearshore fishing methods being trialled or used at present.
Background References: FitzGerald; 1996; Kent 1978; SPC 1984; Whitelaw 2001; Wilder 1977; WPRFMC 2001; WPRFMC 1997; WPRFMC 1992; WPRFMC 1990.	Charter operations have operated on Guam since the 1970s, mainly to cater to the needs of Japanese tourists. In 1977 there were 5 charter vessels operating from Guam. During the 1980s and 1990s it was estimated that around 7% of the troll fleet were charter vessels. This equated to around 8 vessels in 1980 increasing to around 34 charter boats in 1996. In 2001 there were about 25 charter boats and another 100 private sportsfishing boats, with numerous gamefishing tournaments held each year.	In the late 1960s a Hawaiian sampan conducted day and night baiting trials with poor results. Japanese pole-and-line vessels fishing in the waters around Guam brought their bait from Japan, as baiting was poor in this area. Cultivation of milkfish commenced in the mid 1970s, although this was for food rather than bait at the time. From about 1978, some baiting trials were conducted by a US troll vessel, with poor results. SPC conducted some baitfishing trials around Guam in 1978 and 1980 as part of the regional tuna tagging programme. Bait catches around Guam were lower than in other locations. In early 1995, a 15 ha aquaculture farm converted from shrimp to milkfish production, with the milkfish being used as live bait for foreign tuna longlining vessels. In late 1995 and early 1996, 2 other small farms, 1 and 2 ha, were established for rearing bait-size (12–15 cm long) milkfish for foreign tuna longline vessels.	Study undertaken in the mid-1970s in the waters around Guam for deep-water shrimp. Trials indicated a potential annual yield of 2–3 t of 2 deep-water shrimp species.

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Republic of Kiribati

General

Kiribati is made up of 33 islands with a total land area of 811 km^2. The islands are divided into three widely spread groups, the Gilbert Group, the Phoenix Group and the Line Group (Figure 1). Although the land area is small, the EEZ that surrounds the islands is large at around 3.55 million km^2 (Gillett 2002). The capital of Kiribati is Tarawa in the Gilbert Group.

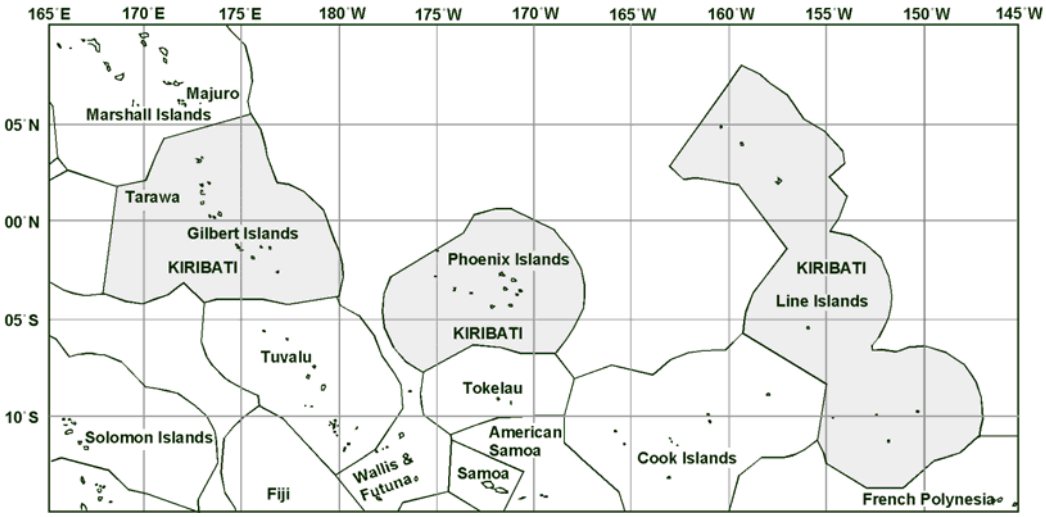

Figure 1: the Republic of Kiribati and its EEZ

The mid-year 2003 population estimate for the Republic of Kiribati was 88,100 people (SPC 2003). Marine resources are very important to the people of Kiribati, as it is their main protein source. Subsistence and small-scale fishing operations are carried out throughout the islands with fishing activities focused both within lagoons for reef fish and shellfish, and nearshore for tunas and other pelagic species.

Fisheries development and management

The development and management of the marine resources within Kiribati falls under the jurisdiction of the Fisheries Division of the Ministry of Fisheries and Marine Resources Development. The Fisheries Division works under two pieces of fisheries-related legislation: The *Fisheries Ordinance* (CAP 33) and the *Fisheries (Pacific Island States' Treaty with the United States of America) Act 1988*. The Fisheries Ordinance has been amended by the *Fisheries (Amendment) Act 1992*; the *Fisheries (Amendment) Act 1995* and the *Fisheries (Amendment) Act 1997*. In addition to these two pieces of legislation, the Republic of Kiribati has a National Development Strategy that also covers marine resources.

In the National Development Strategy 2000–2003 (RoK. 2000a) the policies and strategies (2000–2003) for marine resources are to:

- Promote private sector production and marketing of marine products;
- Identify specific marine commodities having highest commercial feasibility, and target a small number of these for development support;
- Accord high priority to selected commodities that can be produced and marketed by smallholders in the outer islands;
- Formulate strategy for promoting fish transhipment by foreign vessels and for achieving greater utilisation of onshore facilities by these vessels;

- Complete development plan for the cultured pearl industry; and
- Complete development plan for the milkfish industry.

Nearshore domestic fisheries development and/or management plans and strategies

The Fisheries Department is working towards the development and implementation of development and management plans for many of the domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the tuna fishery. At present there is no development and/or management plan in place for the deep-water snapper fishery, but the Fisheries Department is looking at the potential to further develop this fishery.

Most nearshore fishery development has occurred in the tuna fishery, and the Government of Kiribati is yet to finalise their National Tuna Development and Management Plan for the country (GoK 2003), which needs a lot of changes, especially to reflect the policies of the new government. The Kiribati Government has had a Tuna Task Force working on this project, and the development of the tuna fishery since 1999. The draft plan deals with the development and management issues for the period 2003 to 2006, noting the following objectives (GoK 2003):

- Promoting longline development;
- Maximizing government revenues;
- Securing more jobs and more business from foreign vessels;
- Developing large-scale servicing capacity for fleets operating in the region; and
- Promoting industrial scale tuna fishing and processing.

In achieving the above objectives, the plan recognizing the need to address the following constraints:

- Sustainability of the stocks;
- Conflicts between users of fish stocks;
- Adverse social impacts of tuna industry development;
- Infrastructure requirements to support the fishing and the service industry;
- High costs of supplies and transport for development;
- Limited institutional capacity;
- Limited private sector capacity;
- Investment environment; and
- Regional management pressures.

In the draft plan there is a three-phased strategy for developing the tuna fishery, which the Tuna Task Force, in consultation with the Management Advisory Committee, is responsible for implementing as follows (GoK 2003):

- Short term: the priority will be on the small-scale longline development activities described below; promoting larger scale longlining development; securing employment of I-Kiribati on foreign fishing vessels; and finalizing decisions on the infrastructure needs and other long term development initiatives so feasibility studies can be commenced in preparation for such activities, e.g., fishing port complexes, etc.;
- Medium term: the priority will be on improving transhipment and servicing facilities, and operations, coupled with the above noted studies; final decisions on infrastructure sites; and securing of funding for these enterprises; and
- Longer term: there will be greater scope to promote increased Kiribati participation in purse seining and industrial scale fish processing, training and the development of new large-scale vessel servicing which will include the construction of the required infrastructure and its operations.

Small-scale longline development: The immediate priority for tuna development is to follow through with the test fishing already being conducted by the F/V *Tekokona III* and other complementary proposals for trials of smaller scale longline development to include small businesses to step up into modern, export-oriented commercial tuna fishing. Depending on the results of these trials, support will be provided as necessary for additional trials, training, development of shore facilities and services, the private sector demand for export transport services, and other measures to promote investment in small-scale longlining.

New development direction

Since the National Tuna Development and Management Plan was developed, the new Government of Kiribati has added a new development direction, focusing on establishing a tuna loining plant. The immediate plan is to ensure that a tuna loining plant is established for the sole purpose of purchasing and processing fish from the already flooded local fresh or frozen tuna markets. By adding value locally, the price paid to local fishermen will increase and more employment will be generated through the various processing activities needed in the loining plant.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres, and boatbuilding activities in Kiribati

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Maruia Kamatie, Director of Fisheries, Ministry of Fisheries and Marine Resources Development (September 2003).	Deep-water snapper fishing is conducted ad hoc by small-scale private sector fishermen. Deep-water species caught by the rural fishing centres sold to Central Pacific Producers (CPP) limited for marketing in Tarawa.	CPP has 2 major facilities with ice plants, freezers and processing areas, 1 on Tarawa and 1 on Christmas Island. There are 6 islands with rural fishing centres. 2 of these centres sell their catch locally of airfreight small amounts of fillets to CPP for marketing. CPP has a small collection vessel to service the other 4 centres that are closer to Tarawa.	Government company, Betio shipyard, builds boats in wood as well as assembling and welding aluminium skiff kits from Fiji. Repair work also undertaken. 4 private sector companies building boats in wood plus another 10 or more part-time boatbuilders; all do repair work. Fisheries Department to start a new fibreglass boatbuilding and repair facility in late 2003 or early 2004.
Background References: Chapman 2003; Dalzell and Preston 1992; Gillett in press; GoK 1996; Gulbrandsen and Savins 1987; RoK 1998; Taumaia and Cusack 1997; Taumaia and Gentle 1983; Tinga 1993; Wellington unpublished.	1980 saw the first deep-water snapper fishing trials and training conducted by SPC in the area around Tarawa. Training of a government deep-water snapper fishing demonstration team and local fishermen in the southern Gilbert Islands by SPC in 1984. Ongoing training of local fishermen by the government	Outer Islands Fisheries Project (OIFP) was established in 1988, under UK funding. 2 centres set up initially with ice plants, ice store, coldstores, blast freezers and generators. These centres closed in 1992, while 4 other centres were opened in the same year under UK funding. In March 2000, Japan provided funding	In 1983, new fishing canoes designed along traditional lines, with a UN volunteer boatbuilder appointed to Tarawa to build the two new prototype canoes with sails. Government assisted several local boatbuilders to take on the new designs in the mid-1980s, with additional designs evolving from the initial ones.

	demonstration team in the latter half of the 1980s to introduce deep-water snapper fishing throughout the country.	for the OIFP centres for 3 years. The operation of the centres passed to CPP in 2003.	Government and private sector boatbuilders continued to build these canoes, with over 550 constructed in the first 8 years to 1992. Both government and private sector boatbuilders continue to make canoes and small plywood craft for trolling. The government-run Betio Shipyard started importing aluminium skiffs (up to 7.5 m in length) in kit-form from Fiji in the early 2000s and assembled and welded them for sale on the local market.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in Kiribati

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Maruia Kamatie, Director of Fisheries, Ministry of Fisheries and Marine Resources Development (September 2003).	There are currently a few shallow-water FADs deployed in the southern reef islands. The Fisheries Division will rig and deploy FADs as soon as materials have been secured by the islands needing a FAD. Maintenance of the FADs is done by fisheries when a need is identified.	The government Fisheries Training Centre trains men for work on Japanese foreign fishing vessels and they have a tuna longline vessel for training purposes. CPP has a 12 m twin-hull longliner at Christmas Island and they are conducting tuna longline trials and test export trials. CPP also has several smaller boats trolling, bottom fishing etc. at Christmas Island. CPP and the Fisheries Division provide training in small-scale tuna fishing methods when the need is identified.	Over 200 open skiffs in the south Tarawa area trolling, poling (using pearlshell lures) and mid-water handlining for tunas. Some of these operators sell their catch to CPP. Around 10–20 boats associated with the rural fishing centres, depending on the size of the island.
Background References: Chapman 2003; FFA 1995; Gillett in press; Gillett 2002; RoK 1998; SPC 1993; Sokimi et al. 2001; Tinga 2002.	12 FADs deployed around Tarawa and adjacent islands in 1988, with another 6 in 1989 and 1990. Half of the FADs lost within 12 months with the other half lasting 2 years. No maintenance undertaken with these FADs. 8 FADs deployed in the Line Islands from 1989–1993. All but one lost in less than a month. No maintenance undertaken with these FADs. 20 FADs deployed during 1994 around 10 outer islands. 14 of these lost within 1 week and the remainder lost soon after. Several FADs deployed off Tarawa in 1995, but these	In 1988, small-scale tuna longlining trials undertaken using a 150-hook horizontal line, sometimes with one end of line attached to a FAD. In 1989–90, additional small-scale horizontal tuna longlining trials undertaken with SPC assistance, but not in association with FADs. Results were inconclusive. Vertical longline trials undertaken from 1996–1998, although these were undertaken in open water outside the reef as no FADs available. In 2000, horizontal tuna longline trials undertaken from new prototype twin-hull	Large traditional tuna troll-and-pole (using pearlshell lures) fishery operation out of South Tarawa since the late 1970s, with catch sold on local market. Local fishermen trolled and poled around FADs when these were available, but continued with fishing in traditional areas when no FADs available. Mid-water tuna fishing techniques were introduced to small-scale fishermen, but with no FADs to fish around, these methods were not readily accepted.

	were lost before mid-water fishing trials could be conducted in 1996.	vessel built locally. Trials were successful, so a second vessel was constructed in 2002. Second vessel to be moved to Christmas Island for tuna longline fishing trials in 2003.	

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in Kiribati

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Maruia Kamatie, Director of Fisheries, Ministry of Fisheries and Marine Resources Development (September 2003).	CPP established in 2001 and is responsible for developing tuna fisheries in Kiribati, plus manage the rural fishing centres. CPP has processing and storage facilities on both Tarawa and Christmas Island, plus 4 boats working at Christmas Island.	There are currently 2 longline vessels owned locally (purchased from Hawaii), working around Christmas Island.	KAO purse-seine fishing company set up as a joint venture operation with the government and one fishing company from Japan. 1 purse-seine vessel flying the Kiribati flag is fishing under this joint venture.
Background References: Chapman 2003; FFA 1995; Gillett in press; Gillett 2002; RoK 1998; SPC 1993; Sokimi et al. 2001.	In February 1981, Te Mautari Ltd (TML) was established to develop the tuna fishery using pole-and-line vessels. TML was taken over by CPP in 2001. Marine Exports Division was established on Christmas Island in 1979, and later became Kiritimati Marine Exports Limited (KMEL). This company mainly focused on buying and selling lagoon species and crayfish, but was also involved in handling tunas and deep-water snappers. KMEL was taken over by CPP in 2001. CPP was incorporated in May 2001 and took over the operations of TML, KMEL and the Outer Island Fisheries projects (OIFP).	In 1995, Teikabuti Fishing Company (TFC) acted as agent for 3 US tuna longliners to fish and export fresh sashimi-grade tuna to Hawaii and Japan. Catches were reasonable but the trials lasted only a short time because of the many problems encountered. TFC equipped a twin-hull vessel with hand-hauled small-scale horizontal longline gear in 2000–2001, but the trials were unsuccessful with very low catch rates. Since the initial trials by TFC, there has been no domestic private sector medium-scale development in the Kiribati tuna fishery.	Kiribati entered into a joint venture arrangement with Kao Fishing Company of Japan in 1994, with one purse seiner flagged in Kiribati. This arrangement is still in place.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in Kiribati

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Maruia Kamatie, Director of Fisheries, Ministry of Fisheries and Marine Resources Development (September 2003).	No charter boats for gamefishing in Kiribati waters. Around 8 gamefishing craft (all private sector) in Tarawa with a fishing competition each month.	Milkfish farming on both Tarawa and Christmas Island for food fish. Plans to grow milkfish for tuna longline bait, but only small amounts produced to date.	Local fishermen catch flying fish at night using scoop nets and light attraction. Netting of flying fish also occurs in the early evening (before dark) when the flying fish school up.

	Well-developed sportsfishery on Christmas Island (both public and private sector), based on flyfishing for bonefish and other species.		No other nearshore fishing methods or trials being conducted at present.
Background References: Chapman 2003; Gillett in press; RoK 1998; SPC 1993; Tebano and Tabe 1993; Whitelaw 2001.	Gamefishing is in its infancy in Kiribati, although fishing competitions are held out of Tarawa several times per year with up to 8 boats competing. This is all done by the private sector with no government involvement. On Christmas Island there is a well-developed sportsfishery in the lagoon based on flyfishing for bonefish. Both the public and private sectors are involved in this activity.	From the 1970s to the end of the 1990s, baitfishing has been conducted around islands in Kiribati for live bait in tuna pole-and-line fishing operations. This has now ceased as there are no industrial pole-fishing activities. Baitfish (milkfish) has also been produced in ponds on Tarawa since 1975 to meet the needs of the pole-and-line vessels in the 1980s and 1990s. The ponds are government run, with funding initially from the UK, then the EC, and then by the Kiribati Government and Japan Tuna Corporation. Milkfish has been grown to a suitable size for tuna longline bait and used during some of CPP's longline trials. Milkfish is also grown as food fish.	Traditionally, a neatly bundled dry coconut frond was set alight and used as light for the night time catching of flying fish using a scoop net. In the 1970s and 1980s, light was provided by lanterns for this fishing method. In the 1980s, 20–25 mm gillnets were introduced to catch flying fish outside the reef in the late afternoon and early evening (4–7 pm). There are no records of other domestic fisheries development projects outside the reef in Kiribati.

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Republic of the Marshall Islands

General

The Republic of the Marshall Islands (Figure 1) is made up of 29 coral atolls and five single islands in the equatorial and tropical Pacific Ocean between 5° and 15° N latitude, and 162° and 173° E longitude. The mid-year 2003 population estimate for the Republic of the Marshall Islands was 54,000 people (SPC 2003).

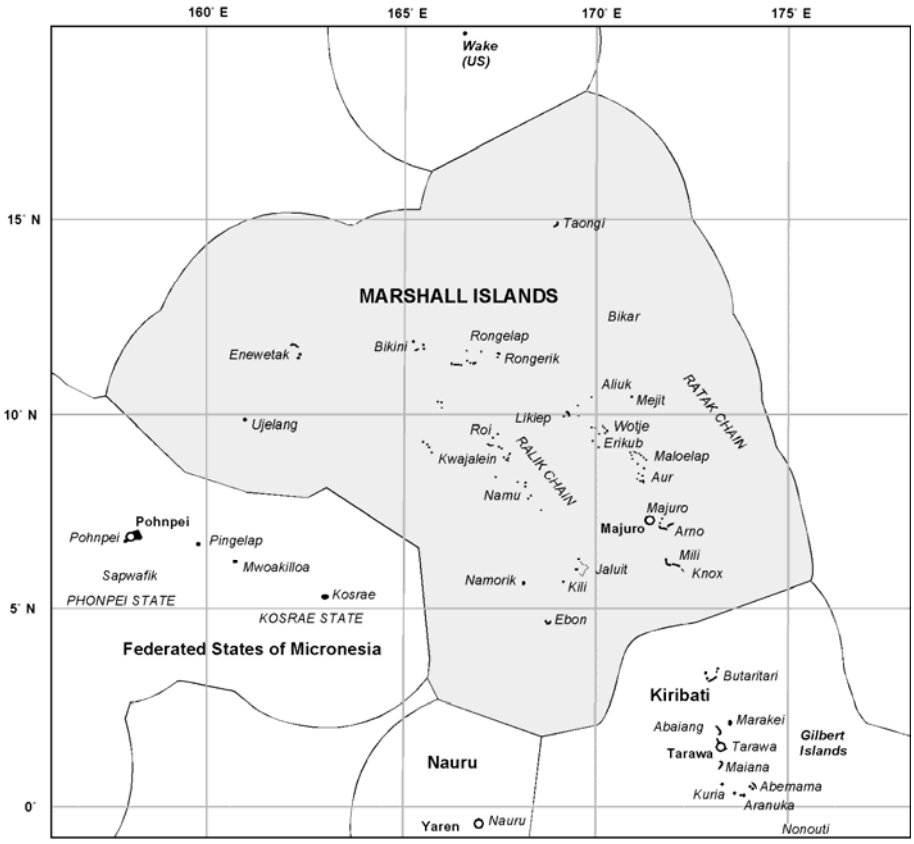

Figure 1: The Republic of the Marshall Islands, its EEZ and neighbouring countries

The Republic of the Marshall Islands has an EEZ of around 2,131,000 km^2, while having a land area of only around 181 km^2. The Republic of the Marshall Islands has around 50 per cent of is EEZ bordering international waters, with the remaining EEZ bordering three Pacific Island nations (the Federated States of Micronesia, Nauru and Kiribati) to the south, and the US territory of Wake Island in the north.

Fisheries development and management

The development and management of the marine resources within the Republic of Marshall Islands falls under the jurisdiction of the Marshall Islands Marine Resources Authority (MIMRA). MIMRA was established in 1988 under the *Marshall Islands Marine Resources Authority Act 1988*. The Act was revised in 1997 (MIMRA Act 1997, also called the Marine Resources Act 1997), to give MIMRA more autonomy and flexibility in carrying out such responsibilities, and to ensure that MIMRA's overall function as provided for in the Act, could be carried out more effectively. The objectives of the MIMRA Act 1997 and the Fisheries Policy (MIMRA 1997) are to:

- improve economic benefit from the fisheries sector within sustainable limits;
- promote responsible and sustainable private sector led fisheries developments; and

- strengthen institutional capacity to facilitate the responsible development and management of the Nation's fisheries resources.

The Fisheries Policy is guided by the need for clarity, consistency and transparency in Government activities in the sector. Government policies will support:

- legitimate, responsible, private sector enterprise as the primary vehicle for commercial-scale fisheries development;
- a facilitatory, regulatory and oversight role for the public sector designed to support responsible, sustainable fisheries development; and
- the preservation of coastal, reef and lagoon resources primarily for nutrition, food security and small-scale sustainable income earning opportunities for the community.

The development of fisheries is also covered in the Government's document 'The strategic development plan framework 2003 to 2018 — vision 2018' (RoMI 2001). In this document the specific objectives for fisheries are:

- to maximise rents from fisheries resources within sustainable limits;
- development of income opportunities in sustainable coastal fishing activities for fishers;
- to develop sustainable management plans based on stock assessments of fisheries resources prior to any development activities;
- to strengthen the Fisheries and Nautical Training Centre (FNTC) and diversify the employment opportunities for graduates; and
- enhance the capacity of the sector to increase production, processing, trade, and exports in a sustainable manner.

Nearshore domestic fisheries development and/or management plans and strategies

MIMRA is working towards drafting and implementing of development and management plans for some of the domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the tuna fishery, although in the case of the Marshall Islands, there is a pelagic shark fishery as well. There is no development and/or management plan in place for the deep-water snapper fishery at present, and there is no immediate plan to develop one as there is very little fishing of these species at present, although there is private sector interest to develop this fishery.

The management of the tuna resource in the waters of the Marshall Islands is very important to the government. At present tuna fishing is mainly conducted by locally based foreign longline vessels. To manage and develop the tuna fishery, MIMRA is taking a two-pronged approach. Firstly, MIMRA is working closely with the Forum Fisheries Agency (FFA) to draft a specific tuna management plan for the country.

On the tuna fishery development side, MIMRA has commenced a consultative process with the assistance of the FFA and the Secretariat of the Pacific Community. The aim is to draft a domestic tuna fishery development strategy or plan for the Marshall Islands. Work commenced on this project in October 2003.

In addition to the tuna fishery, MIMRA has started drafting a shark fishery management plan. Drafting commenced in October 2003.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in the Marshall Islands

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Danny Wase, Director, Marshall Islands Marine Resources Authority (September 2003).	Currently an ad hoc fishery using small local boats, with the catch sold locally. Increasing interest in deep-water snapper fishing, and this fishery could be targeted in the future.	7 fishing centres altogether, 5 have ice plants and 2 have freezers to make ice. All have been established under Japanese aid. Around 30 boats associated with the fishing centres, mainly under a 'rent with the option to buy' system. Tuna loining plant in operation with the cooked loins sent for canning. Foreign company operating the government fishbase (Marshall Islands Fishing Venture), fish processing and packing facility. Company operating government facility as a shark fishing company (Edgewater Fisheries).	One boatyard building traditional outrigger sailing canoes from tree trunks or plywood sheathed in fibreglass. Small operator building boats in backyard plus doing repairs in plywood and fibreglass. Drydock for small cargo boats with repairs done in steel, wood, fibreglass and aluminium.
Background References: ADB 1991; Alessio 1991; Dalzell and Preston 1992; Gillett 2002; Mead unpublished; MIMRA 2002; MIMRA 1999; OFCF 1993; Smith 1992; Sokimi and Chapman 2003.	Preliminary assessment and training in deep-water snapper fishing conducted by SPC in 1985. Catch rates were not high with many species not considered saleable. Some fishing for deep-water snappers undertaken as part of rural fishing centre activities on Arno in the early 1990s. OFCF did some deep-water snapper fishing trials around Jaluit and Aur from 1999–2001.	Tuna fishery fishbase was constructed under Japanese aid in 1985. First company to manage the fishbase was the Hawaiian Mehau Group. No benefits accrued to the Marshalls, so the management contract was terminated around 1994. First rural fishing centre established on Arno in 1989 with boats and gear provided under Japanese aid. Freezers, an ice plant and other infrastructure also provided from 1990–1993. Fish purchased by centre a transported to Majuro for resale. MIMRA dock and processing facility established in the late 1980s under Japanese aid for coastal fisheries development. 6 other outer island rural fishing centres established, 5 from 1991–1999, and the last	Marshallese have a long history of constructing traditional outrigger sailing canoes from local materials. Ministry of Transport and Communication with assistance from UNDP set up a boatbuilding and training programme in the early- to mid-1980s. Around 20 fibreglass vessels, most around 10 m in length, were constructed and maintained. In 1991, traditional outrigger sailing canoes constructed on Namdik Atoll using both traditional and modern materials.

		in 2002. All gear, machinery and work provided under Japanese aid. Private sector live reef fish company, Marshall Islands Ocean Development (MIOD) set up a facility in Majuro with freezers and ice plan. Company operated from 1994–95 to 1998–99 with little success. Taiwanese company Ting Hong took over the management contract of the fishbase in 1994 and operated the base until the end of 1998. At this time the base was completely run down as Ting Hong did not fulfil their contract agreements. Tuna loining plant constructed and commenced operation in November 1999. Initial employment was for 300 people. This has increased to 500 employees in 2003 (2 shifts of 250 staff, 80% women). In 2001–02 Marshall Islands Fishing Venture (MIFV) took over management of the fishbase. MIFV is a subsidiary of Luen Thai Holdings Ltd, based in Hong Kong. In 2001, Edgewater Fisheries purchased the old MIOD facility and refurbished it for their shark fishing venture.	

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in the Marshall Islands

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Danny Wase, Director, Marshall Islands Marine Resources Authority (September 2003).	1 FAD in the water put out by the gamefishing club in July 2003 with funding assistance from the Visitors Authority. MIMRA looking at FADs in the future.	MIMRA has conducted a tuna longline workshop and training to promote or stimulate interest in this area. Trial fishing was also carried out as part of this project. MIMRA now looking at suitable fishing vessels for different fishing methods such as tuna fishing.	Around Majuro, 10 full-time and 25–30 part-time vessels trolling for tunas and other pelagics around the FAD, the coast and bird patches. Some of the vessels in the outer islands troll along the reef and around bird patches.
Background References: MIMRA 1999; OFCF 1993; OFP 1998; Smith 1992.	2 FADs deployed off Arno in 1989 as part of the rural fishing project. FADs lost within 3 months. Another 4 deployed in 1991. 3 lost in a cyclone after 6 months with	Some tuna trolling (around FADs and coastal) by the Arno rural fishing centre vessels during the first few years of the project. In 1993 the vessels were sold off to	Traditionally, trolling for tunas occurred from outrigger sailing canoes as local fishermen looked for offshore tuna schools. In the 1980s and 1990s

	the last unit lasting 18 months. 4 FADs deployed from 2000–2003 off Majuro (one at a time), with the last 2 of these funded by the Visitors Authority.	the private sector. FNTC/MIMRA vessel used for tuna longline trials and training local people interested in tuna longlining in 2003 with the fish sold to partially cover the cost of the project.	traditional canoes gave way to modern outboard-powered skiffs (fibreglass and aluminium), with trolling the main method used to catch tunas and other coastal pelagics. Commercially made boats and outboards are mainly used now for trolling tunas and other pelagics around the FAD, around the coast and around tuna schools.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in the Marshall Islands

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Danny Wase, Director, Marshall Islands Marine Resources Authority (September 2003).	There are no public sector fishing companies, but the tuna loining plant is government owned.	There are 6 local purse-seine vessels fishing under the FSM arrangement — foreign vessels flagged in the Marshall Islands. Shark fishing company has 5 vessels fishing. MIFV has around 28 vessels (locally based foreign vessels) that operate from the fishbase. There are no locally owned tuna longline vessels at present.	All of the tuna longline and purse-seine vessels are under a charter or joint venture arrangement.
Background References: Gillett 2002; Gillett in press; MIMRA 1999; OFP 1998; Smith 1992; Sokimi and Chapman 2003;	Marshall Islands Development Authority (MIDA) involved in joint venture tuna purse-seining operations starting in 1989.	MIDA involved in bringing in 5 tuna longline vessels in the early 1990s, with the vessels operated by private sector operators with some government assistance. From 1991–1995 there were 8 active domestic or locally based foreign longline vessels. From 1994–95 to 1998–99 MIOD had several company longline vessels working to them. Companies operating the fishbase during the 1990s were bringing in locally based foreign vessels to fish to them.	RMI government entered a joint venture with a US purse-seine company to own and operate a seiner in 1989. RMI entered a second joint venture with a different US seiner company in 1991.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in the Marshall Islands

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Danny Wase, Director, Marshall Islands Marine Resources Authority (September 2003).	Around 25 charter vessels on Majuro with another 10 between Kwajalein and Arno. 2 annual tournaments in Majuro, All Micronesian (around 15 boats fish) and Majuro Billfish Tournament (around 20 boats compete). Billfish Club in Majuro holds club tournament every month. 2 other tournaments held on other islands.	No bait trials or baitfishing activities at present. MIMRA has received 1 proposal to farm milkfish, and this is being assessed at present.	No other nearshore fishing activities being used at present.
Background References: FJTFCA 1983; Hampton 1991; MIVA undated; OFP 1998; Smith 1992; SPC 1984; Whitelaw 2001.	The Billfish Club has been the biggest proponent of sportfishing and gamefishing in the Marshall Islands since 1983. In recent years, around 10–12 tournaments have been held annually, mostly in Majuro.	Baitfishing for pole-and-line fishing operation in the Marshalls waters goes back to the 1920s for Japanese vessels. 7 atolls surveyed in 1977 for their baitfish potential by JAMARC, with 11 atolls surveyed in 1978. SPC conducted tuna tagging and bait fishing trials in the Marshalls in 1978, with baiting at Majuro and Jaluit atolls. Results were highly variable. In 1983, bait fishing trials undertaken in Majuro lagoon and Arno lagoon to assess catch rates and species composition.	Fishing trials undertaken in 1984 for deep-water shrimp using a range of different traps. 2 boats fished for a year, but lost a lot of gear and did not have good catches. Some deep-water crabs were caught as well.

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Republic of Nauru

General

The Republic of Nauru (Figure 1) is made up of a single landmass of raised limestone with a 50–300 m wide coral 'belt' surrounding the 19 km circumference of the island. The island lies between 0º 30' and 0º 34' S latitude, and 166º 54' and 166º 58' E longitude. The 2003 mid-year population estimate for the Republic of Nauru is 12,100 people (SPC 2003).

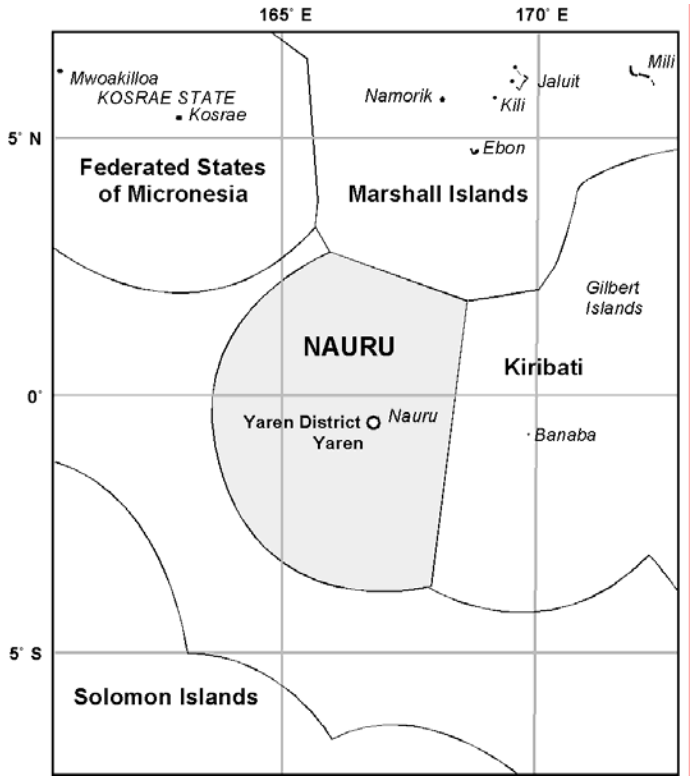

Figure 1: The Republic of Nauru, its EEZ and neighbouring countries

The Republic of Nauru has an EEZ of 320,000 km^2, while having a land area of only 21 km^2. The Republic of Nauru's EEZ shares borders with two countries, the Republic of the Marshall Islands and the Republic of Kiribati, with around 50 per cent of the EEZ bordering international waters.

Fisheries development and management

The development and management of the marine resources within the Republic of Nauru falls under the jurisdiction of the Nauru Fisheries and Marine Resources Authority (NFMRA), which was established by an act of Parliament through the *Nauru Fisheries and Marine Resources Act 1997*. The NFMRA carries out regulatory functions under the *Fisheries Act 1997*, the Fisheries Regulations 1998, and the Sea *Boundaries Act 1997*.

The development of fisheries is also covered in the National Fisheries Development Strategy 1996 to 2001 (RoN 1997), and this strategy is currently being reviewed. The aims and objectives of the National Fisheries Development Strategy (RoN 1997) are:

Aim

To promote the sustainable development and exploitation of the fisheries resources of Nauru as well as to promote the effective management and conservation of the fisheries resources and the marine environment.

Objectives

The objectives of the National Fisheries Development Strategy are:

- to earn revenue for the country;
- to provide employment;
- to provide training in all aspects of fisheries;
- to establish a local fish processing/fishmarket whereby ample supply, good quality and reasonably priced fish and fish products are readily available for local consumption;
- to promote improvement in nutritional standards to establish effective conservation measures of the fisheries resources;
- to promote aquaculture and mariculture development;
- to establish Nauru's participation in regional fisheries activities and to take advantage of regional resources and arrangements for the harvesting, processing and marketing of fish and fish products, for the local and export markets; and
- to promote the development of other activities related to fisheries and the marine environment.

Nearshore domestic fisheries development and/or management plans and strategies

The NFMRA is working towards drafting and implementing development and management plans for some of the domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the tuna fishery. There is no development and/or management plan in place for the deep-water snapper fishery and there is no immediate plan to develop one.

The management of the tuna resource in the waters of Nauru is very important to the government. At present tuna fishing is mainly conducted by the Authority's two longline vessels. To manage the tuna fishery, the NFMRA drafted a National Tuna Fishery Strategy (NFMRA 1998) in 1998, and a revision of this strategy is about to be commenced with the assistance of the Forum Fisheries Agency and SPC, and should be ready for government consideration in early- to mid-2004. The objectives for local tuna fishery development as stated in the current National Tuna Fishery Strategy (NFMRA 1998) are:

To give effect to the fisheries management principles stated in section 4 of the *Fisheries Act* 1997: and specifically;

1. ensure that the utilisation of the tuna stocks in the fisheries waters of Nauru is consistent with the sustainable utilisation of these stocks throughout their range;

2. eliminate illegal fishing activity in the fisheries waters of Nauru;

3. maximise economic benefits to Nauru through the sustainable utilisation of its tuna resources, particularly through the development of a domestic industry, with reduced reliance on foreign access fees and harvesting of the resource by foreign boats;

4. maximise the participation of Nauruan people in the tuna fishery and all activities associated with tuna fishing, including the catching sector, marketing, processing and scientific research;

5. improve the nutritional standards of the Nauruan people through increased availability of fish, including tuna and bycatch species taken during tuna fishing, as a source of food in Nauru;

6. minimise any adverse impacts of tuna fishing and related activities on non-tuna species and the marine environment;

7. satisfy Nauru's regional and international obligations in regard to the management and conservation of tuna resources, including the Wellington Convention, Palau Arrangement, Federated States of Micronesia Arrangement, the Niue Treaty and the Nauru Agreement;

8. minimise any adverse impacts of commercial tuna fishing on the non-commercial sectors, including recreational, game fishing and subsistence fishing; and

9. ensure that all activities undertaken as part of this National Tuna Fishery Strategy are implemented and administered efficiently and cost-effectively.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in Nauru

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Anton Jimwereiy, Acting Chief Executive Officer, and Peter Jacob, Research and Development Manager, Nauru Fisheries and Marine Resources Authority — NFMRA (August 2003).	Ad hoc fishing for deep-water snappers conducted by small-scale local boats. This is mainly for home consumption.	NFMRA has a fish market plus training and office facilities at the new Anibare Community Boat Harbour on the other side of the island.	There is no boatbuilding capacity on Nauru. NFMRA and the Nauru Phosphate Corporation (NPC) Workshops can do repair work on aluminium and steel boats. Some repairs can also be undertaken by private sector people in their backyard, mainly on wood and fibreglass boats.
Background References: Cusack 1987; Dalzell and Preston 1992; Dalzell and Debao 1994; Kent 1978; Sokimi and Chapman 2001.	No commercial fishing or trial fishing has been conducted on the deep-water snapper resource around Nauru. A rough stock assessment was made of the resource in 1992 with the maximum sustainable yield calculated at 250 to 750 kg.	Freezer plant and katsuobushi plant built in 1977 on Nauru by the Nauru Fishing Corporation. NFMRA established a new fish market and freezer complex in 1999 under the NFC. The complex was to cater to the local market in the first instance, with export to follow when fish throughput increased.	No boatbuilding projects have been conducted in Nauru. Some I-Kiribati and Tuvaluan fishermen, employed by the phosphate mine have built their own traditional outrigger canoes. Nauruans tend to bring in powered skiffs from overseas, as do some of the migrant workers at the phosphate mine.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in Nauru

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Anton Jimwereiy, Acting Chief Executive Officer, and Peter Jacob, Research and Development Manager, Nauru Fisheries and Marine Resources	FAD programme re-activated in mid 2003 with 3 FADs deployed and materials on hand for 1 more when needed. Limited capacity to do ongoing maintenance of the	Nauru Fisheries Corporation (NFC) vessels fish and sell the catch to the fish market, with fishing now conducted around the FADs. NFMRA planning to conduct training with private sector	Around 50 canoe fishermen (mainly I-Kiribati and Tuvaluan) mid-water handlining for tunas around the phosphate vessels mooring buoys. Around 100 local outboard-

Authority — NFMRA (August 2003).	FADs.	operators in vertical longlining and other mid-water fishing methods used in association with FADs.	powered skiffs and runabouts used mainly for trolling for tunas and coastal pelagics, with some vertical longlining.
Background References: Chapman et al 1998; Cusack 1987; Dalzell and Debao 1994; Gillett 2000; Sokimi and Chapman 2001; Sokimi and Chapman 2002.	Phosphate mooring buoys first deployed off Nauru in 1930, with these aggregating tunas and other species. These were moored out to 350 m from the reef with up to 16 buoys in the water and acting as FADs. First series of FADs deployed in the mid-1980s based on the Philippines *payao* style for the domestic purse seiners. In 1990, SPC assisted Nauru with FAD site surveys. Further SPC assistance was provided in 1991 with 3 FADs constructed and deployed in depths of around 1000 m. In 1993 Nauru requested assistance from SPC for additional FAD site surveys further offshore, as the previous 3 FADs were not aggregating fish. The surveys were completed as requested. Offshore FAD deployments were undertaken in 1997 with 3 FADs deployed in depths of 1450 and 2450 m. One attempt was made to deploy a FAD in 2000, but this failed. Three FADs were deployed in mid-2003 with assistance from SPC.	Mid-water fishing techniques, including vertical longlining and mid-water handlining, introduced to Nauruan fishermen in the mid-1990s as part of FAD assistance provided by SPC. NFMRA received two 4.5 m and two 7.5 m vessel from Japan in 1996–97. These vessels were used for small-scale tuna fishing (mainly trolling), training, and search and rescue activities. Vertical longlining and mid-water handlining re-introduced to Nauruan fishermen and NFMRA staff through technical assistance provided by SPC in 2002.	In 1992 there were 128 canoes and 88 powered skiffs owned by the migrant workers, with the canoes used for mid-water jigging for scads and handlining of tunas around the phosphate mooring buoys, and the skiffs used for trolling for tunas and other pelagic species. Also in 1992 there were 130 powered skiffs owned by Nauruans who mainly trolled for tunas and other pelagic species plus a little bottomfishing, mainly in shallow water.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in Nauru

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Anton Jimwereiy, Acting Chief Executive Officer, and Peter Jacob, Research and Development Manager, Nauru Fisheries and Marine Resources Authority — NFMRA (August 2003).	NFC is the fishing or commercial part of the NFMRA. NFC operates the fish market, and has freezers and a packhouse for exporting product. NFC has two tuna longline vessels, 15 and 18 m in length, plus 2 x 7.5 m aluminium and 2 x 5 m fibreglass vessels for fishing around the FADs.	There is currently no medium-scale tuna fishery development in the private sector.	A trial joint venture in longline fishing is being negotiated with a private operator from New Zealand to commence operations before the end of 2003.
Background References: Chapman	Government formed the NFC	There have been no private	In 1975, Hassui of Japan

1998; Chapman et al 1998; Gillett 2002; Gillett in press; Kent 1978.	in 1976 and brought in 4 vessels in 1978 to catch tuna for a katsuobushi plant built on the island in 1977. In the early 1980s, NFC purchased 2 purse seiners from Peru. The venture was unsuccessful, with 1 vessel sinking off Nauru in a storm around 1986/87 and 1 sold around 1989. NFMRA was established in the mid-1990s. Under NFMRA, the NFC was established as the commercial arm of this development and management authority. NFC purchased an 18 m tuna longliner in 2000 and a 15 m longliner in 2002 to fish for both the local market and for export. SPC provided training for the crew of these vessels in 2000.	sector initiatives to develop medium-scale tuna fishing activities in Nauru. To date, all development has been initiated and conducted by the public sector.	planned a joint venture with the Government of Nauru to conduct tuna fishing. No other joint venture operations were considered in the past.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in Nauru

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Anton Jimwereiy, Acting Chief Executive Officer, and Peter Jacob, Research and Development Manager, Nauru Fisheries and Marine Resources Authority — NFMRA (August 2003).	There is 1 private sector charter fishing vessel around 15 m in length. There is no organised sportsfishing or gamefishing on Nauru.	There are currently no baitfishing trials or activities underway around Nauru.	There are currently no other nearshore fishing activities or trials underway around Nauru.
Background References: Cusack 1987; Gillett 2002; SPC 1984; Whitelaw 2001.	Around 50 vessels capable of gamefishing or sportsfishing on the island. Nauru Fishermen's club meets 1–2 times a year to discuss gamefishing and sportsfishing issues. Regular fishing tournaments at Easter and Constitution Day, with other ad hoc competitions organised privately.	Japan Marine Fishery Resource Research Centre conducted baitfish surveys around Nauru from 1971 to 1974 with poor results. Although pole-and-line and trolling survey work was conducted around Nauru by SPC in mid 1980, no baitfishing was attempted because of the lack of suitable fishing locations and baitfish.	Canoe fishermen fish around phosphate buoys conducting mid-water jigging for scads (used for bait for tunas) and rainbow runner, which is sold to local buyers. Migrant workers fish for flyingfish using scoop nets and light attraction at night, mainly from powered skiffs.

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New Caledonia

General

New Caledonia (Figure 1) is a French territory and is made up of the main island of New Caledonia (or Grande Terre) and many small islands that lie within its lagoon, the Loyalty Islands to the east (Ouvea Atoll, Lifou, Mare and Tiga), and the Chesterfield Islands group to the northwest, bounded between 15º and 25º S latitude, and 156º and 170º E longitude. The 2003 mid-year population estimate for New Caledonia is 235,200 people (SPC 2003).

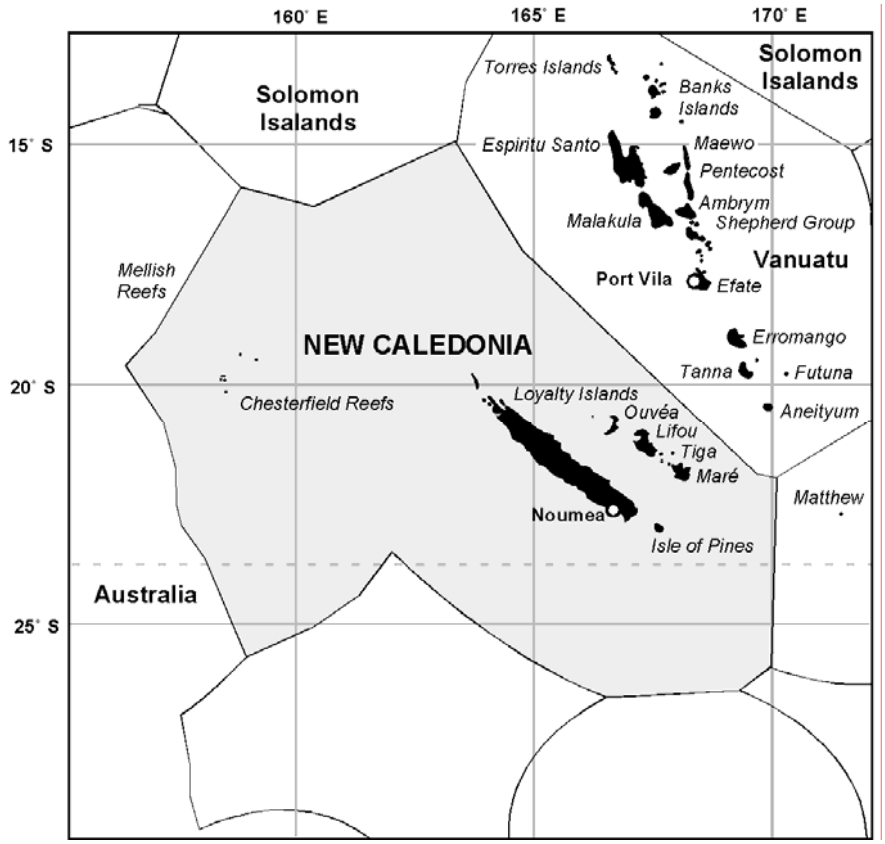

Figure 1: New Caledonia, its EEZ and neighbouring countries

New Caledonia has an EEZ of around 1,740,000 km^2, while having a total land area of 18,576 km^2. The New Caledonia EEZ shares borders with three other countries, Australia to the west, the Solomon Islands to the north, and the Republic of Vanuatu to the northeast, with around one quarter of the EEZ bordering international waters to the south. The ownership of the islands of Matthew and Hunter to the southeast, and the waters around them, are disputed between the Republic of Vanuatu and France (New Caledonia).

Fisheries development and management

The management of the marine resources within New Caledonia's EEZ falls under the jurisdiction of the Service de la Marine Marchande et des Pêches Maritimes. The development of the fisheries, wherever they fish, is a competency undertaken by the three Provinces of New Caledonia. There is no specific fisheries legislation at present for the Service de la Marine Marchande et des Pêches Maritimes to work under. However, a general policy has been developed: 'Resolution No. 237 dated 1 August 2001 concerning the implementation of a fisheries policy in New Caledonia' (Délibération no. 237 du 1 août 2001 relative à l'instauration d'une politique des pêches en Nouvelle-Calédonie (GoNC 2001)) to allow the local government to implement technical measures to manage fisheries in the

territory's EEZ and to issue licences etc. The strategies and definitions as stated in the current policy document (GoNC 2001) are as follows:

English translation:

In order to ensure immediate preservation of the fisheries resources in the Exclusive Economic Zone and sustainable economic development of the fishing sector in New Caledonia and its economic and social conditions, biological and non-biological natural resources must be conserved and oceanic resources must be exploited in a rational and responsible manner that preserves the interests of coastal and oceanic fishers.

Article 1: For the purposes of this Resolution, the following terms mean:

"exclusive economic zone": the zone off the coasts of the territory of the French Republic defined by Law no. 76-655 dated 16 July 1976 mentioned above, which, offshore of New Caledonia, extends from the outside boundary of the territorial waters to 188 miles beyond this boundary, subject to border agreements with neighbouring countries;

'resource': fish, crustaceans, shellfish and other marine animals, including coral;

'fishing': the capture, destruction, collection or harvesting of marine resources, by any procedure whatsoever;

'fishing vessel': any vessel used or designed for fishing, including support ships, transport vessels and any other vessel directly participating in these fishing operations;

'fishing effort': for a vessel, the product of its capacity and its activity during a set time period and, for a fleet or group of vessels, the sum of the fishing efforts of all the vessels in question.

Article 2: The provisions of this Resolution apply to fishing vessels flying the French flag and operating in New Caledonia's exclusive economic zone.

Article 3: As at 1 October 2001, all the vessels referred to in Article 2 must hold a fishing permit issued by the Government of New Caledonia after examination of their request by the Maritime Fisheries and Merchant Marine Service.

Article 4: The terms and conditions for issue, validity and renewal of such permits shall be provided for by the Government of New Caledonia.

Article 5: In order to achieve the objectives set out by the Congress in the preamble of this Resolution, the Government of New Caledonia is empowered, after receiving the opinion of the Marine Resources Commission, to take measures targeted, among other things, at:

- setting total allowable catches (TAC), surpluses and quotas;
- setting the fishing effort level;
- establishing prohibited or limited fishing zones and periods;
- setting quantitative limits for catches;
- setting the number and type of vessels authorised to fish;
- setting technical measures concerning fishing gear and how it is used; and
- setting minimum sizes or weights for fish likely to be caught.

Article 6: All previous provisions contrary to those of this Resolution are hereby abrogated.

Article 7: This Resolution shall be transmitted to the Government Delegate, High Commissioner of France, and to the Government of New Caledonia and shall be published in the Official Gazette of New Caledonia.

Original French version:

Afin d'assurer une préservation immédiate des ressources halieutiques de la Zone Economique Exclusive et de permettre un développement économique durable du secteur de la pêche en Nouvelle-Calédonie et ses

conditions économiques et sociales, il est nécessaire d'assurer la conservation des ressources naturelles biologiques et non biologiques, et une exploitation rationnelle et responsable des ressources halieutiques conforme aux intérêts des pêcheurs côtiers et hauturiers.

Article 1 : Aux fins de la présente délibération, on entend par :

- « zone économique exclusive », la zone définie au large des côtes du territoire de la République par la loi n° 76-655 du 16 juillet 1976 sus-visée et qui s'étend, au large de la Nouvelle-Calédonie, depuis la limite extérieure des eaux territoriales jusqu'à 188 miles au-delà de cette limite, sous réserve d'accords de délimitation avec les Etats voisins ;

- « ressource », les poissons, crustacés, coquillages et autres animaux marins y compris les coraux ;

- « pêche », la capture, la destruction, le ramassage ou la cueillette des ressources marines, par quelque procédé que ce soit ;

- « navire de pêche », tout navire utilisé ou destiné à la pêche, y compris les bâtiments de soutien, les navires transporteurs et tout autre navire participant directement à ces opérations de pêche ;

- « effort de pêche », pour un navire, le produit de sa capacité et de son activité pendant un intervalle de temps déterminé et, pour une flotte ou un groupe de navires, la somme de l'effort de pêche de chacun des navires en question.

Article 2 : Les dispositions de la présente délibération s'appliquent aux navires de pêche, battant pavillon français et opérant dans la zone économique exclusive de la Nouvelle-Calédonie.

Article 3 : A compter du 1er octobre 2001, tous les navires visés à l'article 2 doivent être titulaires d'une licence de pêche délivrée par le gouvernement de la Nouvelle-Calédonie après instruction par le service de la marine marchande et des pêches maritimes.

Article 4 : Les conditions et les modalités de délivrance, de validité et de renouvellement de la licence sont arrêtées par le gouvernement de la Nouvelle-Calédonie.

Article 5 : Afin d'atteindre les objectifs énoncés par le congrès au préambule de la présente délibération, le gouvernement de la Nouvelle-Calédonie, après avis de la commission des ressources marines, est habilité à prendre des mesures visant, entre autres, à :

- fixer des Totaux Admissibles de Capture (T.A.C.), les reliquats et des quotas,
- fixer le niveau de l'effort de pêche,
- établir des zones et des périodes d'interdiction ou de limitation de pêche,
- fixer des limites quantitatives pour les captures,
- fixer le nombre et le type de navires autorisés à pêcher,
- fixer des mesures techniques concernant les engins de pêche et leur mode d'utilisation,
- fixer une taille ou un poids minimal des poissons susceptibles d'être capturés.

Article 6 : Sont abrogées toutes dispositions antérieures contraires à celles de la présente délibération.

Article 7 : La présente délibération sera transmise au délégué du Gouvernement, haut-commissaire de la République et au gouvernement de la Nouvelle-Calédonie et publiée au Journal Officiel de la Nouvelle-Calédonie.

Nearshore domestic fisheries development and/or management plans and strategies

Together with the Service de la Marine Marchande et des Pêches Maritimes, the fisheries departments in the provinces (Loyalty Islands, Southern Province and Northern Province) are working towards drafting and implementing development and management plans for some of the domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery

and the tuna fishery. There are no development and/or management plans currently in place for the deep-water snapper fishery.

The management of the tuna resource in the waters of New Caledonia is very important to the government. At present tuna fishing is conducted mainly by private sector tuna longlining operations. To manage the tuna fishery, the Service de la Marine Marchande et des Pêches Maritimes is regularly proposing technical measures under 'Resolution No. 237' to licence and monitor the catch and effort in the tuna fishery. This is a start to the process that may lead to the development of a tuna management plan for the fishery in the future.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in New Caledonia

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Régis Etaix-Bonnin, Ingénieur chargé des pêches, Service de la Marine Marchande et des Pêches Maritimes (October 2003).	8–10 full time vessels targeting deep-water snapper around the country using handreels and short bottom longlines. Around 10 vessels fishing for these species on infrequent occasions.	There are no government facilities in the country. 3 tuna processing and packhouse facilities in the country. One 30 m vessel licensed to process and freeze catch to export standards (now operating). Project proposal to establish provincial port facilities in 3 locations in the Loyalty Islands.	At least 3 private sector boatbuilding companies building small vessels up to 12 m long in plywood, fibreglass and aluminium. Several companies do repair work on plywood, steel, fibreglass and aluminium boats. 1 travel lift in Noumea for lifting mainly pleasure craft out of the water. At least 3 small slipways able to pull vessel up to 12 m long out of the water. Some repair work can be done. 1 larger slipway in Noumea to take vessels to 40 m, with repair work possible on all materials.
Background References: Beverly and Chapman 1997; Chapman and Cusack 1998a; Chapman and Cusack 1998b; Dalzell and Preston 1992; Fourmanoir 1979; Fusimalohi and Chapman 1999; Fusimalohi and Grandperrin 1979; RTMF 1992; RTMF 1985.	In the late 1970s, fishing for deep-water snappers was conducted by some recreational fishermen and 2–3 commercial fishermen. In 1979, ORSTOM conducted some experimental fishing trials for deep-water snappers using a bottom-set trotline system (800 m long with 30 trots or droppers, each with 5 hooks (150 hooks/line). Catches were encouraging. Also in 1979, SPC conducted deep-water snapper fishing	Government established 9 village fishing cooperatives around the country in the early 1980s, with fishermen trained in different fishing methods. Tuna processing and packhouse established in the mid-1980s to handle fish form the new tuna longline fishery. In the early 1990s, Navimon set up its fish processing and packhouse facility in Noumea to handle the catch from its	Traditionally, locally made outrigger sailing canoes were used to fish around New Caledonia, although most fishing activity was conducted in the shelter of the lagoon. In 1975, FADIL was used to establish a government boatbuilding project. The boatyard was at Nouvelle (Noumea) and the boats were built for fishermen outside Noumea to promote rural development. The boats were

	trials and training in 3 locations around New Caledonia, Noumea, Lifou and Isle of Pines. Training was conducted on fishermen's boats, most of which were constructed under the Fund d'Aide pour le Developpment de l'Interieur et des Iles (FADIL) project. SPC conducted a second training programme in deep-water snapper fishing techniques in 1981, with local fishermen trained in Noumea, Lifou and Mare. Again, Fishermen's FADIL boats were used for fishing at Lifou and Mare. 3 local Noumea fishermen targeted deep-water snappers from 1982–84, with poor market demand for these species affecting their viability. In 1985, SPC conducted additional training in deep-water snapper fishing, as part of a larger project in New Caledonia. 43 fishermen from 2 tribes in the Oundjo and Gatope areas were trained. Also in 1985, a local commercial fisherman conducted trapping trials for deep-water snappers with moderate success.	tuna fishing operation. Government of New Caledonia opened a new city fish market in 1991 for local fishermen to sell their catch from. Belep cooperative received a new freezer complex in 1986 to assist the local fishermen store their catch. From 1999–2002, 2 new processing and packhouse facilities were established in support of the tuna longline fishery. 1 facility was set up in Noumea and 1 in Koumac in the north.	5–8 m in length with either diesel inboard or petrol outboard engines. Many boats were built in the late 1970s and early 1980s and provided to fishermen involved in the village fishing cooperatives. In the 1990s, 2 private sector boatyards were established in Noumea, 1 specialising in the construction of aluminium boats.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in New Caledonia

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Régis Etaix-Bonnin, Ingénieur chargé des pêches, Service de la Marine Marchande et des Pêches Maritimes (October 2003).	Currently 4–5 FADs around the country. No plans for deployments for the rest of 2003, although possibly some may be deployed in 2004.	The local fisheries and maritime college provides short-term training for skippers and crew, especially for tuna longlining operations.	About 10 vessels do some commercial trolling for tunas as part of their general fishing activities.
Background References: Beverly 2002; Chapman and Cusack 1998a; Chapman and Cusack 1998b; SPC 1985.	3 FADs were deployed in early 1984 by the Transpêche pole-and-line fishing company for their fishing operations. 2 were lost within the first 8 months. Fisheries retrieved the remaining FAD and redeployed it off Noumea in early 1985. In 1985–86, fisheries received	SPC conducted experimental fishing trials around FADs in 1985 using methods including vertical longlining, mid-water handlining (palu-ahi) and using a gillnet tied to the FAD. All methods produced poor results, although very little time was spent on each method. Training of local fishermen in the Belep Islands was	In the 1960s, several fishermen used Tahitian-style pole-troll boats (bonitiers) to fish for skipjack out of Noumea and the southwest coast. By the early 1980s there were only 2 vessels still fishing part of the year. Some local operators trolling around the FADs installed off Noumea and the Loyalty Islands from both diesel-

	funding and purchased materials for 10 FAD. Several of these were deployed in 1986. The FAD programme has been ongoing with fisheries trying to maintain 3–5 FADs around New Caledonia, mainly near Noumea. SPC has deployed 1 FAD per year in 1999, 2000, 2001, 2002, and 2004 as part of the practical fishing module for the Pacific Island Fisheries Officers Course.	conducted in 1986 to introduce different trolling techniques for Spanish mackerel. 27 fishermen received training. The local Maritime College, L'École des Métiers de la Mer (EMM), implemented a training programme, both theory and practical, for tuna longline fishermen in 2001, with SPC providing assistance to EMM in setting up and running the first course.	powered and outboard-powered vessels from 5–13 m in length. Recreational fishermen also troll around the FADs.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in New Caledonia

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Régis Etaix-Bonnin, Ingénieur chargé des pêches, Service de la Marine Marchande et des Pêches Maritimes (October 2003).	There is no public sector tuna fishing company, as the government is promoting private sector development.	There are currently 29 active tuna longline vessels operated by 8 companies, with most boats owned and operated by 2 of these companies.	1 of the tuna longline companies is a joint venture with shareholders from New Zealand. Another company is in a joint venture arrangement with the Loyalty Islands province.
Background References: Beverly and Chapman 1997; Chapman and Cusack 1998a; SPC 1985.	Navimon became a public sector tuna longline company in 1995, when 51% of the shares were taken over by the Loyalty Islands Province. In December 1996, Navimon had 5 tuna longliners in operation. Navimon has suffered financial difficulty during the late 1990s and early 2000s, with additional funding being injected into the company by the Loyalty Islands Province to keep the company going.	Private company Transpêche established in 1981 to conduct pole-and-line fishing operations. The company operated from 1981–1984 with several vessels, but the catches were insufficient to make the operation viable, so the company folded. Domestic tuna longline operations commenced in 1983, with a single boat catching 60 t. This expanded to 7 boats in 1990. Navimon was established as a private sector company in 1989, but fishing did not commence until 1994 when their first boats arrived. In 1995, Navimon was taken over by the Loyalty Islands Province. In 1996 there were 3 longline companies, Navimon with 5 boats, Toho Caledonie with 2 boats and Megu Caledonie with 1 boat. In the late 1990s and early 2000s, several new tuna longline companies were established, and in 1999 there were 13 longliners increasing to 25 vessels in 2002.	Several of the early tuna longline companies were joint venture operations with Japanese interests. Navimon became a joint venture company when it was taken over by the Loyalty Islands Province. During the late 1990s, several of the tuna longline companies were joint ventures with either Japanese or New Zealand companies.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in New Caledonia

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Régis Etaix-Bonnin, Ingénieur chargé des pêches, Service de la Marine Marchande et des Pêches Maritimes (October 2003).	Up to 6 charter gamefishing boats in the country, mainly in Noumea. Perhaps more than 100 gamefishing vessels that fish occasionally. Many gamefishing tournaments held during the year in different locations around the country.	There are currently no baitfishing trials or activities in the country.	There are no other deep-water fishing methods being trialled or used at the present.
Background References: Barro 1981; Boely and Conand 1980; Chapman and Cusack 1998a; RTMF 1985; SPC 1985; Whitelaw 2001.	In 2000 it was reported that there were 7 charter operations working out of Noumea, plus a company with 'pilot-your-own' charter boats. There were also charter fishing operations at the Isle of Pines, and in Lifou and Mare in the Loyalty Islands. Over 500 suitable sportsfishing vessels in New Caledonia in 2000. Clubs hold monthly tournaments with 1–2 international tournaments annually. Also, inter-club tournaments are held with other Pacific countries.	Baitfishing trials were conducted in the early 1970s by Japanese pole-and-line vessels, with positive results. SPC conducted baitfish surveys around New Caledonia in 1977–78 as part of their tuna tagging project using a chartered pole-and-line vessel. Good baitfish concentrations were located at numerous locations, although the areas surveyed were limited in number. From 1980–1981, ORSTOM conducted baitfishing research in New Caledonia, with good results which led to the start of a pole-and-line fishing company in 1981. In 1985, baitfishing trials were conducted to ringnet garfish to be used as trolling bait. Also a bouki-ami net was used once to try to catch bait for other fishing activities.	Survey conducted for deep-water shrimp in the late 1970s by ORSTOM researchers. Deep-water trawl survey in depths to 690 m undertaken by a Japanese research vessel in 1981 in the area south of the Isle of Pines and the offshore banks from the Chesterfields. Deep-water snapper trap fishing trials conducted by a commercial fisherman in 1985. When the traps were set at depths of around 400 m, an average catch of 38 nautilus were recorded per trap per set.

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Niue

General

Niue (Figure 1) consists of a single uplifted coral island located at 19º S latitude and 169º W longitude. The mid-year 2003 population estimate for Niue was 1,650 people (SPC 2003).

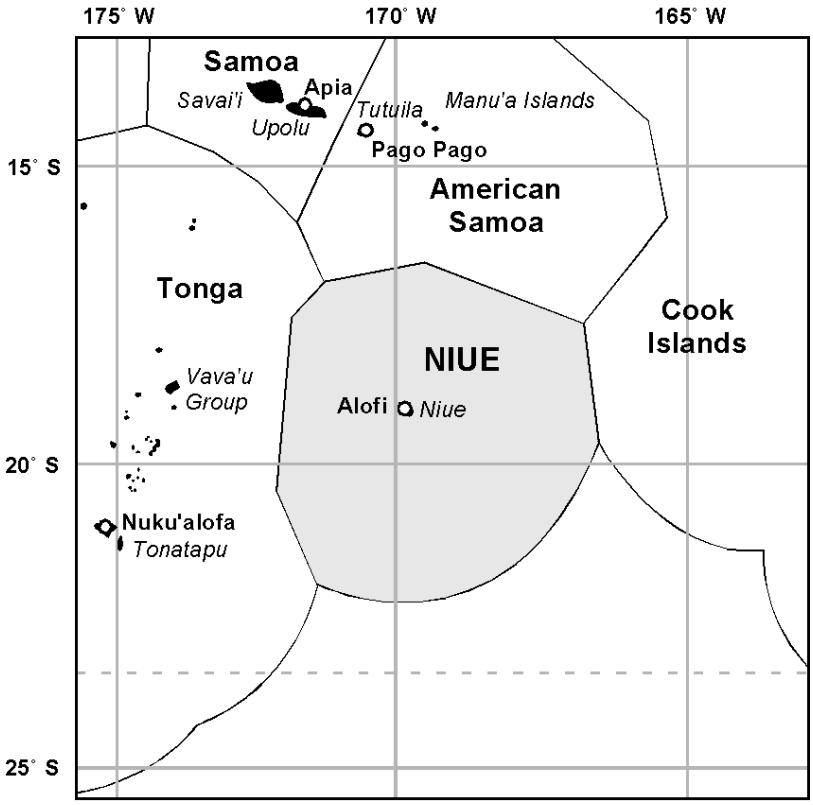

Figure 1: Niue, its EEZ and neighbouring countries

Niue has an EEZ of around 470,000 km^2, while having a land area of only around 259 km^2. Niue's EEZ borders on three Pacific nations, the Kingdom of Tonga to the west, American Samoa to the north, and the Cook Islands to the east, with around 35 per cent of the EEZ bordering international waters to the south.

Fisheries development and management

The development and management of the marine resources within Niue falls under the jurisdiction of the Fisheries Division of the Ministry of Agriculture, Forestry and Fisheries. The Fisheries Department works under the *Domestic Fishing Act 1995*, the Domestic Fishing Regulations 1996, and the *Territorial Sea and Exclusive Economic Zone Act 1996*, which establish a comprehensive framework for fisheries management. The fisheries legislation is currently being reviewed to improve its application, especially in regard to Niue's responsibility under international conventions to which it is a signatory.

Fisheries development and management is also covered under the Niue Integrated Strategic Plan — 2003 to 2008 (GoN undated). The strategic objectives, guiding principles and strategy for economic development and the environment as presented in the document (GoN undated) are:

Strategic objectives

1) *Financial Stability*: Ensure there are sufficient financial resources to manage and develop the country in a responsible and sustainable manner.

2) *Governance*: Provide governance that is stable, transparent and accountable.

3) *Economic Development*: Maximise benefits from Niue's resources in a sustainable manner.

4) *Social*: Enjoying a lifestyle of a thriving, educated and healthy community that has access to a wide range of quality social infrastructure, services and development opportunities.

5) *Environment*: Sustainable management of Niue's natural resources for future generations.

Guiding principles

- Sustainable development
- A strategic focus and alliances with key stakeholders
- Collaboration, communication and consultation
- Accountability, responsibility and transparency
- Cohesive and coordinated implementation of the strategic objectives
- Action focused and mindful of cultural and spiritual values
- Relevant to Niue ke Monuina – A Prosperous Niue
- Constant monitoring and review

Economic development

Strategic objective: Maximise benefits from Niue's resources in a sustainable manner.

Background

Niue has access to a range of quality infrastructure services and has the capacity to maximise returns from its natural resource. To ensure this happens a more strategic approach is being taken to target assistance and support to areas with maximum potential.

This new economic strategy is based on the development of primary products that enjoy a unique and comparative advantage. In particular Niue's clean environmental image offers a marketing advantage that can be used to promote vanilla production and eco tourism.

It is seen that the private sector will play a vital role in development of the new products or support will be provided to them to do so.

Aim: To nurture economic development by:

1) targeting assistance to areas in the private sector with maximum potential,
2) maximising use of Niue's resources in a sustainable manner,
3) encouraging foreign direct investment and trade, and
4) developing and maintaining key infrastructure.

Strategies

Private Sector:	1) Promote, assist and support a vibrant private sector.
	2) Form and foster partnerships with non-government organisations.
Agriculture:	Facilitate agricultural development of products with proven commercial merits, particularly vanilla, through research and product and market development.

Fisheries:	Increase the returns from the fisheries resource in a sustainable and responsible manner.
Tourism:	Increase tourism in a responsible and sustainable manner taking advantage of our clean, green environment and cultural and social values.
Trade and Marketing:	Promote and secure markets for our products.
Investment:	Seek and encourage venture capital investment and skills and technology transfer.

Environment

Strategic Objective: Sustainable management of Niue's natural resources for future generations.

Background

As a small isolated land mass Niue has a unique unspoilt environment typified by its pristine water, abundant vegetation and clean air.

These attributes can be used to commercial advantage in marketing the country and its products through organic farming, eco tourism and whale watching.

Valuing the environment in this manner will ensure that it is protected and preserved for future generations.

Niue is an active participant in international environmental initiatives and signatory to international treaties.

Aim: Utilise the abundant natural resources in a way that not only maximises the economic benefit but also ensures that future generations will be able to enjoy them to the full.

Strategies

Management of Resources:	Prepare and implement management plans for the sustainable use and ongoing monitoring of our natural resources.
Global Responsibilities:	1) Participate in international environment programmes to assist Niue in meeting its global environmental responsibilities.
	2) Seek international assistance in implementing sound environmental policy.

Nearshore domestic fisheries development and/or management plans and strategies

The Fisheries Division is working towards the drafting and implementation of development and management plans for many of the domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the pelagic fishery. At present there is no specific development and/or management plan in place for the deep-water snapper fishery. However, the Fisheries Department has included this fishery in the Niuean National Management Plan for the Coastal Fishery (Fisheries Department 2003) that is in draft form.

The management of the tuna resource in the waters of Niue is very important to the government. At present tuna fishing is mainly conducted by foreign fishing vessels, licensed to fish under access agreements. To manage the tuna fishery, the Fisheries Department drafted and implemented a Niuean National Management and Development Plan for the Tuna and Billfish Fishery (Fisheries Department 1998) in 1998.

Niuean National Management Plan for the Coastal Fishery

Goal and objectives as stated in the Niuean National Management Plan for the Coastal Fishery (Fisheries Department 2003) are:

Goal: to maintain the productivity, and maximise the overall sustainable benefit to Niue, of Coastal Fisheries in all areas permitted to fishing.

Objectives of the Plan

1. Ensure that the utilisation of coastal fishery resources is consistent with obtaining the maximum long-term benefit for the people of Niue, according to social development goals defined by the Government and/or Village Councils from time to time;
2. Ensure that the utilisation of coastal fishery resources is consistent with maintaining the integrity of coastal marine ecosystems, particularly coral reef ecosystems, taking into account seasonal, annual, decadal, and other natural environmental cycles;
3. Effectively integrate National and Village coastal fisheries governance systems;
4. Ensure that there is a balance in perceived equity in the right to use or enjoy coastal fishery resources by all relevant groups and stakeholders, in each Village Council area across the nation as a whole;
5. Provide early warnings for potential or actual crises in coastal fisheries and their supporting ecosystems;
6. Contribute to minimising the impact of non-fishing human impacts on coastal fishery resources;
7. Assist in fulfilling any regional and international obligations of Niue regarding the identification, conservation and management of coastal fishery species and their habitats;
8. Ensure that all activities undertaken as part of this Plan are implemented and administered efficiently and cost-effectively;
9. Ensure that Niue has sufficient capacity to implement the Plan; and
10. Review the progress of this Plan against objectives 1 to 7 after a period not exceeding five years from each implementation, and make any amendments necessary to better achieve the overarching Goal of the Plan or of its parent legislation.

Tuna and Billfish Fishery Plan

The objectives as stated in the Tuna and Billfish Fishery Plan are to (Fisheries Department 1998):

1. Ensure that the utilisation of the tuna, billfish and wahoo stocks in the fishery waters of Niue is consistent with the sustainable utilisation of these stocks in their entirety;
2. Eliminate illegal fishing activity in the fishery waters of Niue;
3. Maximise benefits to Niue, including economic and social, from the long-term sustainable utilisation of its tuna and billfish resources;
4. Minimise any adverse interactions between fisheries, in particular, between the large-scale commercial industry and the small-scale commercial, subsistence, charter or recreational fishers;
5. Minimise the impact of target fishing on both the marine environment and bycatch species;
6. Identify and secure funding to support the development and implementation of management measures to pursue the objectives of the Plan;
7. Assist to fulfil regional and international obligations regarding the conservation and management of highly migratory fish stocks in Niue's fishery waters; and
8. Ensure that all activities undertaken as part of this Tuna and Billfish Fishery Plan are implemented and administered efficiently and cost-effectively.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in Niue

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Brendon Pasisi, Principal Fisheries Officer, Ministry of Agriculture, Forestry and Fisheries (September 2003).	Mainly an ad hoc fishery with around 20–30 boats and 120 canoes fishing occasionally. 6 small boats target deep-water snappers more regularly at times.	Ice plant at fisheries plus ice storage freezers in two locations (ice from fisheries is stored for fishermen's use). One fish shop plus a couple of shops that sell fish as well as other items. New processing and freezer complex being established and should be operational in early 2004.	Canoe building project for traditional outrigger canoes. Several locations to have boat repairs done, mainly on aluminium dinghies. Public Works does repairs on their steel workboat and barges.
Background References: Coffen-Smout 1992; Dalzell et al 1991; Dalzell and Preston 1992; Fusimalohi 1978; Mead 1997; Mead 1980.	Traditionally, local canoe fishermen would fish in depths to 200 m using handlines. SPC first conducted deep-water snapper fishing trials in Niue in 1978, with a low catch rate of 2.8 kg/line-hour recorded. SPC worked with staff of the Fisheries Department in 1979, with a catch rate of 7.0 kg/line-hour recorded for deep-water snapper fishing. 1979 also saw the first trip to Beveridge Reef, under a joint Niue Government and FAO/ UNDP project, using a Tongan vessel. Fishing was in depths less than 150 m with a catch rate of 5.6 kg/line-hour. Catch records for 1 Niuean fisherman from 1988–1990 gave an average catch rate of 5.5 kg/line-hour, although very few people fish for deep-water snappers.	In the late 1970s, fish was sold at the local market.	Outrigger canoes have been built traditionally, although the art was being lost in the 1980s and 1990s with fishermen moving to powered skiffs. This changed in the late 1990s to early 2000s with the canoe building project being introduced. There has not been any boatbuilding conducted commercially, although a few people have built their own boats in plywood in their backyards. All boats are small on Niue as there is no harbour and the only way to get boats in and out of the water is with a crane, or to use the small boat ramp at Avatele.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in Niue

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Brendon Pasisi, Principal Fisheries Officer, Ministry of Agriculture, Forestry and Fisheries (September 2003).	Total of 14 government and FAD research project FADs around Niue. 3 FADs ready for deployment when weather permits.	Training provided on mid-water fishing techniques used in association with FADs. Looking to fit out suitable local vessels as part of a new longline development project.	Around 40–50 active part-time aluminium dinghies (3.5–8 m) trolling the FADs and coast plus a little mid-water fishing around the FADs. Around 120 traditional outrigger paddling canoes mainly mid-water fishing for

			tunas in tuna holes or the inshore FADs, with a little trolling done.
Background References: Fisheries Department 1999; Fisheries Department 1994; Fisheries Department 1993; Fisheries Department 1992; Fisheries Department 1990; Cartwright et al 2003; Gillett in press; Gillett 2002; Mead 1997; Mead 1980.	First FAD deployed in mid-1982 by SPC, with 3 others deployed by SPC in the latter half of that year. FAD programme implemented by the Fisheries Department to follow on from the initial SPC work, with several FADs deployed in the mid-1980s. In 1989–90, 6 FADs were deployed, with 3 lost, 2 to vandalism. In July 1991 there were 7 FADs on station around Niue. 1 was lost in early 1992, 4 new ones were deployed in early 1993, and 1 lost soon after. 1 FAD was deployed in early 1994, with materials ordered for several others. In 1998–99, 8 FADs were on station around Niue, with funding for several others.	Mid-water fishing trials conducted by SPC and the Fisheries Department in 1982–83, using vertical longlines around the FADs. Local fishermen were also trained in the construction and use of this gear. Ika-shibi fishing trials also conducted in 1982–83 by SPC and the Fisheries Department. In the mid- to late-1980s, fisheries started hiring their aluminium catamarans to locals to promote fishing outside the reef. SPC assisted the Fisheries Department in 1999, with workshops for local fishermen on mid-water fishing techniques used in association with FADs (vertical longline and palu-ahi).	Traditionally, outrigger canoes used for mid-water handlining of tunas, with some trolling. In the 1970s, fishermen used 3–4 m wooden or aluminium, outboard-powered dinghies to troll for tunas and other pelagics, as well as some mid-water handlining. Traditional canoes also used. Trolling for tunas and other coastal pelagics, especially wahoo, continued during the 1990s, with a focus on fishing the FADs. In the early 2000s several fishermen were using mid-water fishing techniques around the FADs.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in Niue

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Brendon Pasisi, Principal Fisheries Officer, Ministry of Agriculture, Forestry and Fisheries (September 2003).	Government has entered a joint venture partnership to develop the tuna fishery in Niue.	Up to 20 medium-scale tuna longliners will fish in Niue waters to supply or service the joint venture processing facility being built at present.	Government joint venture for processing to encourage development of the tuna fishery.
Background References: Cartwright et al 2003; Gillett in press; Gillett 2002; OFP 2000.	There have been no public sector tuna fishing companies in Niue in the past	There has been no private-sector medium-scale tuna fishing development or trials in the past.	There have been no joint venture tuna fishing operations or ventures in the past.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in Niue

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Brendon Pasisi, Principal Fisheries Officer, Ministry of Agriculture, Forestry and Fisheries (September 2003).	1 charter boat with a second starting in late 2003. 2–3 sportsfishing vessels also used for charter work occasionally. Annual fishing tournament	Fishermen jig for bigeye scad around the FADs. Canoe fishermen fish traditionally for ulihega (decapterus spp) outside the reef.	Catching flyingfish using scoop nets a traditional fishery that continues today, with fish used for bait as well as food. There are currently no other

	with 15–20 boats and 15–20 canoes competing. Several smaller tournaments at the village level.		nearshore fishing activities or trials underway off Niue
Background References: Dalzell et al 1991; Gillett 1987; Mead 1997; OFP 2000; SPC 1984; Whitelaw 2001.	Government hired out its alia catamarans on charter in the mid- to late-1980s. Also in the 1980s, some fishermen chartered their boats for fishing, mainly when fish were needed for local community or social activities. In the early 1990s, the first tourist charters were undertaken. By the mid-1990s there were 4–5 boats available for charter, and this number has remained constant into the early 2000s.	Traditional canoe fishery for ulihega outside the reef. In early 1980 a baitfish assessment for pole-and-line fishing was conducted by SPC with virtually no habitat suitable for baitfish located. With the introduction of FADs in the early 1980s, fish traps were trialled, and tied under the buoy system to catch bait such as scad and ulihega. In 1987, FAO/UNDP fishing trials undertaken using a Hawaiian-style hoop lift net for ulihega. Catches averaged 7.0 kg/haul, although the trials were for research only, as fishing for ulihega with nets is forbidden by law.	Trials were conducted in 1977 and 1978 using bottom-set longlines, bottom-set and surface-set gillnets, crayfish pots and prawn/shrimp pots, with none of these methods found to be viable.

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Commonwealth of the Northern Mariana Islands

General

The Commonwealth of the Northern Mariana Islands is made up of a string of 14 islands lying in a north and south direction, with many of the smaller islands uninhabited. The islands lie between 14º and 21º N latitude, and 144º 30' and 146º E longitude. The 2003 mid-year population estimate for the Commonwealth of the Northern Mariana Islands is 75,400 people (SPC 2003).

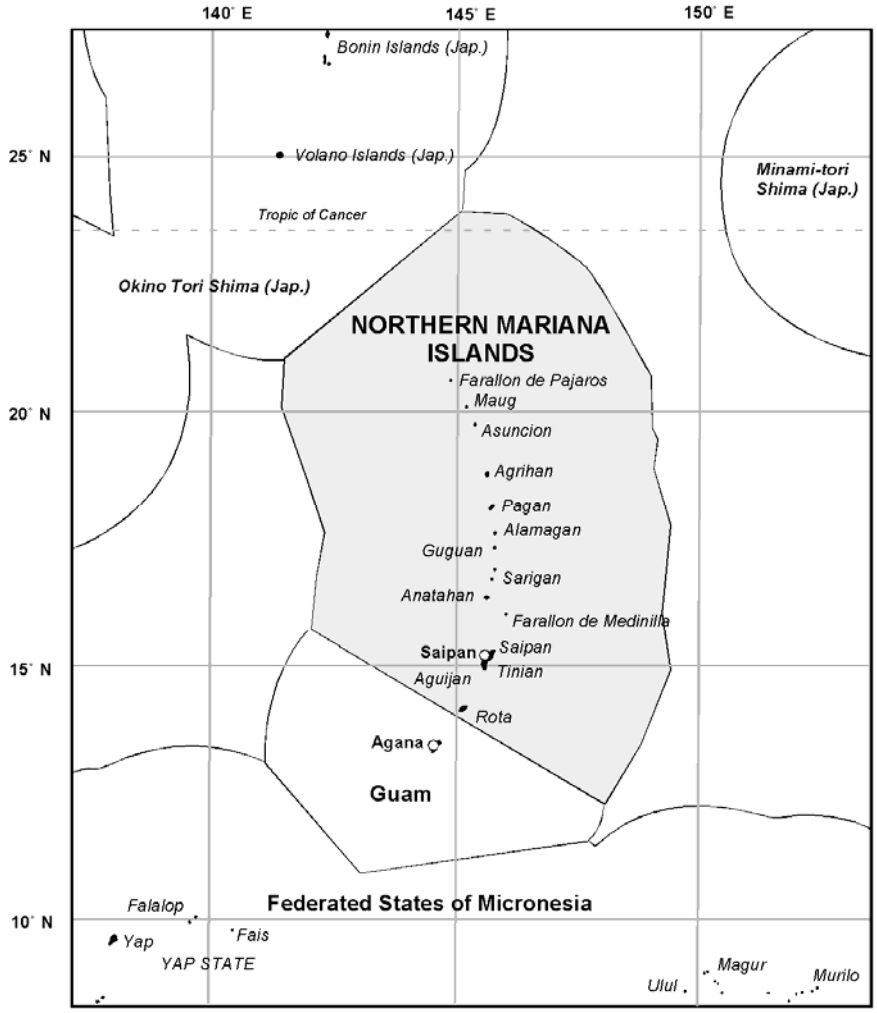

Figure 1: The Commonwealth of the Northern Mariana Islands, its EEZ and neighbouring countries

The Commonwealth of the Northern Mariana Islands has an EEZ of 777,000 km^2, while having a land area of only 471 km^2. The Commonwealth of the Northern Mariana Islands' EEZ borders two countries, Japan to the north and Guam to the south, although around 60 per cent of the EEZ borders international waters.

Fisheries development and management

The development and management of the marine resources within the Commonwealth of the Northern Mariana's (CNMI's) EEZ has been regulated by the US Government over the last 50 years. Fisheries management is handled through the Western Pacific Regional Fisheries Management Council in response to the *Magnusson-Stevens Fisheries Conservation and Management Act* under the US Congress. In 1980, through the CNMI *Marine Sovereignty Act*, the people of the Northern Mariana

Islands, through their constitutional processes, affirmed the Commonwealth's jurisdiction to explore, exploit, conserve, and manage living and nonliving resources, including fisheries resources, in the EEZ and other waters surrounding the islands.

The local government has also been working with US Federal partners in developing a management plan that will allow the transfer of oversight of the natural resources and any revenue generated from activities within the EEZ to the Government of CNMI as provided in the Magnusson-Stevens Re-authorization Act, which allows for the establishment of a Pacific Insular Area Fisheries Agreement (PIAFA) with foreign countries. This does not, however, include mineral rights.

Nearshore domestic fisheries development and/or management plans and strategies

Fisheries management of nearshore resources around American Samoa is conducted through the Western Pacific Regional Fisheries Management Council based in Honolulu, Hawaii. Through the Council, two fishery management plans have been implemented, one for the deep-water snapper resource and the other for pelagic species. These management plans cover Hawaii, and the three US territories of American Samoa, the Commonwealth of the Northern Mariana Islands, and Guam.

Combined fishery management plan, environmental assessment and regulatory impact review for the bottomfish and seamount groundfish fishery management plan of the Western Pacific region

This plan was implemented in August 1986 (WPRFMC 1986) and has been amended nine times over the years to take account of changing circumstances in all or part of the fishery being covered. The plan has the following objectives:

1. Protect against overfishing and maintain the long-term productivity of bottomfish stocks;
2. Improve the database for future decisions through data reporting requirements and cooperative Federal/State/Territory data collection programmes;
3. Provide for consistency in Federal/State/Territory bottomfish management to ensure effective management across the range of the fisheries;
4. Protect bottomfish stocks and habitat from environmentally destructive fishing activities and enhance habitat if possible;
5. Maintain existing opportunities for rewarding fishing experiences by small-scale commercial, recreational, and subsistence fishermen, including native Pacific islanders;
6. Maintain consistent availability of high quality products to consumers;
7. Maintain a balance between harvest capacity and harvestable fishery stocks to prevent over-capitalization;
8. Avoid the taking of protected species and minimise possible adverse modifications to their habitat;
9. Restore depleted groundfish stocks and to provide the opportunity for US fishermen to develop new domestic fisheries for seamount groundfish which will displace foreign fishing; and
10. Monitor stock recovery of depleted stocks in the Fisheries Conservation Zone so that any international plan of action for managing the common resource can be guided by experimental results.

The pelagic fishery management plan of the Western Pacific region

This plan was implemented in March 1987 and has been amended (WPRFMC 2003a). The current objectives of the plan are as follows:

1. To manage fisheries for management unit species in the Western Pacific region to achieve optimum yield;

2. To promote, within the limits of managing optimum yield, domestic harvest of the management unit species in the Western Pacific region EEZ and domestic fishery values associated with these species, for example, by enhancing the opportunities for:
   (a) satisfying recreational fishing experiences;
   (b) continuation of traditional fishing practice for non-market personal consumption and cultural benefits; and
   (c) domestic commercial fishermen, including charter boat operations, to engage in profitable fishing operations.

3. To diminish gear conflict in the EEZ, particularly in areas of concentrated domestic fishing.

4. To improve the statistical base for conducting better stock assessments and fishery evaluations, thus supporting fishery management and resource conservation in the EEZ and throughout the range of the management unit species.

5. To promote the formation of a regional or international arrangement for assessing and conserving the management unit species and tunas throughout their range.

6. To preclude waste of management unit species associated with longline, purse seine, pole-and-line or other fishing operations.

7. To promote, within the limits of managing at optimum yield, domestic marketing of the management unit species in American Samoa, the Commonwealth of the Northern Mariana Islands, Guam and Hawaii.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in the CNMI

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Richard Seman, Director, Division of Fish and Wildlife (August 2003).	There are currently 5 vessels over 15 m in length primarily fishing for deep-water snappers at present. Small-scale fishermen fish occasionally for these species ad hoc.	Currently there are 4 private companies on Saipan fishing with large vessels, selling their catch on the local market, with one of these companies exporting as well. Government has a pilot fish market project in the pipeline for Saipan, with land identified for part of the project. Northern Island Mayor's Department has a proposal to set up 2–4 fishing centres in the outer islands with a collection vessel arrangement to bring the fish to Saipan for marketing.	1 company can build boats up to 25 m in length, mainly in wood and fibreglass to confirmed order. 3 private companies can do repair work on wood, steel, aluminium and fibreglass boats to 25 m in length.
Background References: Dalzell and Preston 1992; Miller	In 1973 and 1974, a private sector company brought in an	Fishing cooperative established on Saipan in the	No information found on background to boatbuilding

2001; Trianni 1998; Watt and Chapman 1998; WPRFMC 2003b; WPRFMC 1996; WPRFMC 1991; WPRFMC 1988.	Okinawan fisherman to conduct deep-water snapper fishing, with reasonable success. In 1979 very little deep-water snapper fishing took place, with landings of 1–2 t. From May 1982 to June 1984, a US research vessel conducted 6 x 40-day cruises to survey deep-water bottomfish around 22 islands and banks in the Mariana Islands. Vessel numbers increased to around 102 in 1984, before declining to around 54 in 1986. Landings in 1984 were around 15 t, dropping to around 10 t in 1986. Management plan implemented in August 1986 by the National Marine Fisheries Service, which covered Guam, Hawaii, American Samoa and the Commonwealth of the Northern Mariana Islands. From 1987–1995 the vessel numbers fluctuated between 20 and 42, with annual landing fluctuation between 3 and 18 t. In 1988 and 1990, SPC conducted training in Saipan, Tinian and Rota in deep-water snapper fishing using handreels and bottom longlines. In 1994 two larger vessels entered the fishery and fished around the northern islands. Another large vessel joined the operation in 1995–96. 1996 saw a large increase in the deep-water snapper fishery with vessel numbers increasing to 70 and the landed catch to 24 t. Vessel numbers decreased in the late 1990s to 50 before increasing back to 71 in 2001. Landing followed the same trend, declining to 18 t before increasing to 26 t in 2001.	early 1990s, but had failed by 1995 due to management difficulties.	ventures or facilities in the Northern Mariana Islands.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in the CNMI

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Richard Seman, Director, Division of Fish and Wildlife (August 2003).	Current and ongoing FAD programme with 3 FADs left from the 10 deployed in 2000–2001. Materials on-island for, another 4 FADs, to be deployed in 2004. Contract has been let to a private operator to maintain the FADs.	Training programme is being organised for the private sector to encourage the use of mid-water fishing techniques, especially in association with FADs.	Around 50 small-scale commercial vessels trolling for tuna with another 75 part-time operators.
Background References: Beverly 2001; CNMI 1996; SPC 1999; SPC 1984; WPRFMC 2001; WPRFMC 1997; WPRFMC 1992; WPRFMC 1990.	The Pacific Tuna Development Foundation funded the construction and deployment of 5 FADs around the Northern Mariana Islands in 1980. 4 of the FADs were lost in less than 6 months. From 1991–1993, 8 FADs were deployed around Saipan, Tinian and Rota, although there is no record of how long these FADs stayed on station. 2 FADs were deployed in 1997, but both were lost within 2 months due to a typhoon. 10 FADs were deployed around Saipan, Tinian and Rota from March–July 2000. By April 2001, all but 2 of these FADs were lost.	In 1978–79 a US troll vessel conducted some survey work around the CNMI, with the method assessed as not productive for tropical tunas in the area. In 1989 the Fisheries Department had a consultant do some ika-shibi fishing trials; however, this method was not formally introduced to local fishermen. In 2001, SPC provided training in mid-water tuna fishing techniques used in association with FADs. 50 fishermen were trained during 4 workshops and practical fishing trials in the use of vertical longlines and mid-water handlines (palu-ahi).	Trolling is the main method used to catch pelagic species, with records going back to the 1970s. In 1982 there were 92 small-scale vessels trolling, with around 90 t of pelagics landed that year. From 1983–1986 the vessels numbers remained basically the same, although the catch fluctuated between 75–110 t annually. Management plan (pelagics) implemented in March 1987 by the National Marine Fisheries Service, which covered Guam, Hawaii, American Samoa and the Commonwealth of the Northern Mariana Islands. From 1988–1994, trolling vessel numbers fluctuated between 54–114, with 80–90 boats in operation most years. Landings during these years also fluctuated between 55–120 t. In 1995, there were 87 full-time and 69 part-time commercial fishing boats.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in the CNMI

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Richard Seman, Director, Division of Fish and Wildlife (August 2003).	There is no public sector fishing company in CNMI. Government has a proposal to do tuna longline fishing trials either using the Fisheries Department boat or chartering a longliner from Hawaii.	There is 1 company with 2 boats that have just been licensed to tuna longline in the CNMI EEZ. The skipper and crew first need to undergo NMFS training on bycatch handling, catch	There are 2 joint venture fishing operations in CNMI using larger vessels. 1 joint venture is with a Japanese company, trolling for tunas and deep-water snapper fishing, with the

		reporting and federal compliance issues.	catch sold locally. 1 joint venture is with a Korean company, trolling for tunas, shark fishing, and deep-water snapper fishing, with some catch exported to Korea and the rest sold locally.
Background References: FFA 1989; WPRFMC 2001; WPRFMC 1997; WPRFMC 1992; WPRFMC 1990.	No record of any public sector tuna fishing companies having been established in The Northern Mariana Islands. Focus has been on private sector development.	Transhipment of frozen tuna from foreign purse seiners and carriers to reefer containers conducted in late 1970s and early 1980s. This changed in the late 1980s to foreign purse seiners unloading to carrier vessels, both in port and at sea. Management plan (pelagics) implemented in March 1987 by the National Marine Fisheries Service, covering Guam, Hawaii, American Samoa and the Commonwealth of the Northern Mariana Islands. In 1990 a US tuna longliner operated for 6 months, but was not successful and only 12 trips were made. No other domestic longlining activity has been recorded.	Larger vessels entered the bottomfish fishery as early as 1992, with these vessels coming in under joint venture arrangements. From 1994–1999, 3 or 4 larger vessels operated each year under joint venture arrangements with local companies.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in the CNMI

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Richard Seman, Director, Division of Fish and Wildlife (August 2003).	There are about 12 charter fishing vessels, mainly on Saipan. There are another 30 or more sportsfishing vessels with regular gamefishing tournaments.	There are currently no baitfishing activities in CNMI waters. 1 person is planning to start lift netting for bigeye scad in late 2003. 1 person has made a proposal to fish for squid in the CNMI zone for bait and human consumption.	No other nearshore fishing methods are being trialled in the CNMI zone at present.
Background References: CNMI 1996; Miller 2001; Moffitt and Polovina 1985; Ostazeski 1997; SPC 1984; Watt and Chapman 1998; Whitelaw 2001; WPRFMC 2001; WPRFMC 1997; WPRFMC 1992.	Charter boats have operated in CNMI since the 1980s, mainly to cater to the tourist industry. By 1991, 27 charter vessels were registered, with 3 of these being new larger vessels to cater to Japanese tourists. By 1996 charter vessel numbers increased to 33 before declining again to 27 in 1999. Many of these	During the 1960s and 1970s there were several pole-and-line and baitfish surveys sponsored by Japan and the US. No results of these surveys are available. Japanese pole-and-line vessels fishing in the waters of the Mariana Islands brought their bait from Japan as baiting was poor in this area.	From 1982–1984, eight trips were undertaken to test the deep-water shrimp resource in depths from 300–800 m. Yields of 102–218 t were estimated, although no commercial fishing has occurred. In May 1994, 2 private firms commenced trapping deep-water shrimp in a small-scale venture. From the start to

	vessels fish commercially to supplement their charter fishing activities. In 2001 there were about 10 charter fishing vessels and another 60–80 private sportsfishing vessels. Saipan International Fishing Tournament usually held in August.	SPC conducted baiting trials in CNMI as part of their regional tagging project in 1978 and 1980. Catch rates averaged 110 kg/haul. Baitfishing trials conducted in 1982 by US research vessel, with poor catches reported.	March 1996, fishing activities were intermittent with a total catch of 12,160 kg recorded for 193 nights fishing.

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Republic of Palau

General

The Republic of Palau (Figure 1) is made up of some 586 islets and islands, which are divided between 16 states. The islands lie between 2º and 8º N latitude, and 131º and 135º E longitude. The 2003 mid-year population estimate for Palau is 20,300 people (SPC 2003).

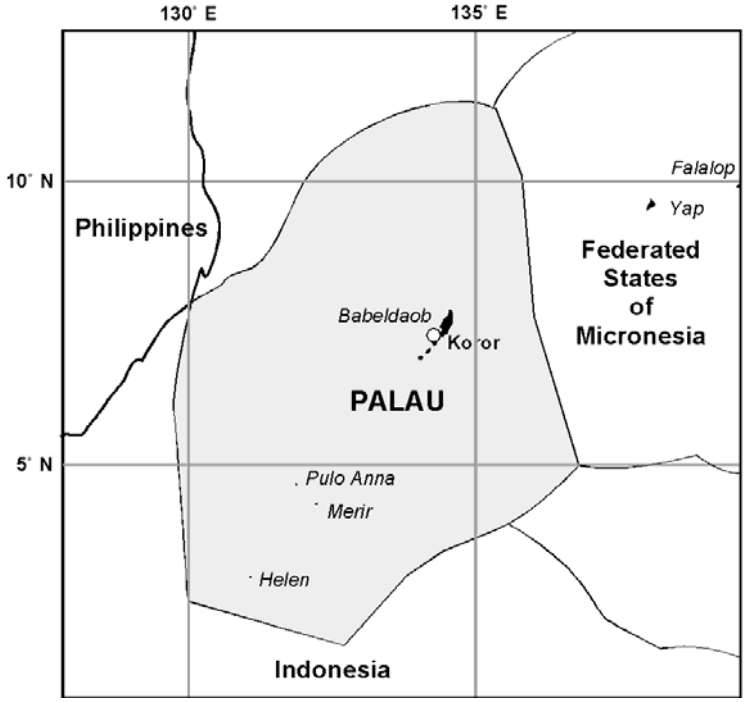

Figure 1: The Republic of Palau, its EEZ and neighbouring countries

The Republic of Palau has an EEZ of 629,000 km^2, while having a land area of only 488 km^2. Palau borders two other countries, the Federated States of Micronesia and Indonesia, with the EEZ also touching that of the Philippines. Around one-quarter of the Palau EEZ borders international waters.

Fisheries development and management

The development and management of the marine resources within the Republic of Palau falls under the jurisdiction of the Bureau of Oceanic Fishery Management of the Ministry of Resources and Development. The Bureau of Oceanic Fishery Management works under the *Fisheries Act 1975* and its supporting regulations, which fall under the Palau National Code, Title 27.

The development of fisheries is also covered in the document *Sustainable Human Development in Palau: Progressing with the past* (PNC and UN 1997). This document does not look at specific sectors, such as fisheries, but rather focuses on sustainable human development and ways this can be achieved across different sectors. The following extracts on fisheries and fisheries development strategies are taken form the document.

> ***Issues in sustainability: Marine resources***
>
> Fisheries is Palau's largest private economic sector valued in recent years at between 15% and 28% of GDP. Fluctuations result from variable income derived from licenses issued to off-shore fishing fleets. Rather than a unitary industry, fisheries is comprised of three distinct sub-industries, each with unique characteristics and specific development issues. The three are: (i) aquaculture; (ii) coral reef (in-shore) fisheries; and (iii) pelagic fisheries (deep water, off-shore fishing primarily for tuna and other highly migratory species).

Aquaculture

Palau has developed a world-class mariculture center which has pioneered the cultivation of three commercially valuable clam species. The technology for cultivating these clams from seeds is now well established and government extension agents are available to assist individuals or groups wishing to embark on production. The center has also developed trochus cultivation techniques although these have not yet proven commercially viable. Techniques for cultivating certain species of coral are also being developed.

The NMDP identifies a number of potentially viable aquaculture products including: milkfish; sponges; seaweeds (edible and non-edible); pearls; oysters; crocodiles; and certain salt-water fish species. There is considerable interest from prospective entrepreneurs in utilizing aquaculture technologies. The developmental significance of aquaculture is two-fold: (i) it will provide additional opportunities for small-scale Palauan entrepreneurs to develop a sustainable livelihood base (see Panel 12); and (ii) successful development would help to relieve some of the pressure on inshore reef resources.

"The people of Palau must be brought to realize that the days of inshore fishery development and export must end. The days of reef resource management and conservation must begin immediately."

Dr. Paul Callaghan, Palau, 1994

Responsibility for aquaculture development rests with the Marine Resources Division of the Ministry of Natural Resources. Assistance is also available through the Palau Community College which has recently been granted 'Sea Grant' status by the U.S. Government. This status will enable the Cooperative Research Extension branch of the College to hire aquaculture experts, apply for development grants, and draw upon the expertise of a U.S. national network of Sea Grant institutions. With close cooperation between the College and the Government, it should be possible to accelerate research in support of potentially viable products. However, in any aquaculture research significant obstacles must be expected which will require time and money to resolve. Clam research began in 1983 and required more than ten years to produce a commercially viable product. No one should be misled into believing that future developments will come rapidly. Most important, potential advances in aquaculture will not replace the urgent need for Palau to implement a Sustainable Fisheries Management Program.

In-shore (coral reef) fisheries

In-shore (or coral reef) fisheries refers to exploitation of marine resources from the shore to twelve nautical miles off-shore, the area reserved under the Palau Constitution for state government management. In-shore fisheries are controlled by Palauans engaged in a combination of subsistence and commercial fisheries supplying their homes and extended families, the Koror market, and the nearby Saipan and Guam markets.

Analysis of coral reef fisheries is hampered by the absence of a uniform monitoring and surveillance network from which continuous estimates of yield and market value can be derived. Estimates vary widely, but it is uncertain the extent to which these differences reflect real variations and the extent to which they reflect differences in data collection methods. Table 2 shows some recent estimates of coral reef fisheries yields. The total value of production derived from each source is similar if the effect of inflation is ignored. Nevertheless, each source undoubtedly underestimates the value of total extraction because none of the methods account for the occasional recreational fishing as well as for food, and all excepting the 1991 HIES estimate, are biased toward marketed products. The HIES estimate is biased toward home-consumed products.

In addressing the in-shore component of the fishing industry, the main issue in sustainability is that modern technology allows resource exploitation to reach unprecedented extraction levels. As a consequence, in-shore fish resources are declining at an alarming rate. Closely related to over-fishing is the abrogation of traditional conservation practices and ineffectual management of fishery resources by traditional, state, and national leaders whose responsibilities vis-a-vis one another are not clearly defined.

Over-fishing is a major part of the problem although habitat destruction due to mangrove removal, seagrass destruction, and sedimentation are undoubtedly contributing factors, especially in localized depletion. Habitat destruction will become a more significant cause of depletion unless future development can be managed in a way which protects seagrass beds (fish maternity units), mangroves (fish nurseries), and coral reefs (fish apartment houses) from destruction and sedimentation. A related issue is competing for use of the same resources. Divers come to Palau primarily because of the quantity and variety of marine life; the same fish

that support subsistence and commercial fishing also support diving and tourism.

No single strategy will halt the decline in in-shore fishery resources. A multi-faceted approach to sustainable in-shore fisheries will require each of the following strategies:

Table 2: Various estimates of in-shore fishery production

	Source	# Producers	Market value
1991	HIES	Not avail.	$2,400.000
1992	OPS	770	$2,100.000
1996	IESL	888	$2,356,568

'The best thing a fisherman can do with his catch is to feed his family. If he sells his fish, most of the proceeds go to support marketing, transportation, and processing. This is why canned fish costs many times more than the same amount of fresh fish. If we eat our own fish rather than selling if and then buying canned fish, we will not use up so much fish.'

A strategy for in-shore fisheries

'The following strategy has been recommended as a basis for in-shore fisheries management: 'first we eat them; second we play with them; third we let visitors eat and play with them, and fourth, we export them.' In other words, give first priority to fish consumption by Palauans resident in Palau; second priority to sports fisheries and recreation by Palauans; third priority to meeting the food and recreational needs of tourists; and finally fourth (only if the resource reserves permit) do we export them.'

Dr. Paul Callaghan, Palau, 1994

Education

Everyone in Palau must recognize that in-shore fish resources are increasingly scarce. It is only this knowledge which will facilitate voluntary compliance with conservation measures. Each person must become more aware of the small but important contributions he or she can make toward conservation, ranging from the use of biodegradable cleaning products to protecting the mangroves located on their own lands.

Conservation

Respect for and compliance with traditional conservation measures must be reinstated. The most basic of these measures is 'take only what you need.'

Ban commercial export

Palau's limited reef resources cannot support the demands of the virtually insatiable Saipan and Guam markets. As a scarce resource, in-shore fish should be retained in Palau for use by Palauans their visitors.

Zone the reefs

Just as land is zoned to allow for uses most compatible with ecological conditions, the reef ultimately must be zoned to balance competing and sometimes incompatible demands for diving surface recreation, food fishing, recreational 'catch and release' fishing, and aquaculture.

Prohibit use of foreign labor in in-shore fisheries

Reserve the in-shore fishing industry for Palauan entrepreneurs using Palauan labor.

Establish alternative livelihoods

Because the preceding strategies will undermine the livelihoods of some Palauans, it is important to establish alternatives which are environmentally sustainable. Alternatives include: deep sea fishing, sportsfishing ('catch and release'), value-added processing of marine products, and more extensive involvement by Palauans in marine-based tourism.

Revise marine legislation

Among the revisions needed are: expansion of the range of species protected by law; cessation of commercial export of in-shore marine products; improved enforcement; and deputization of state officials to enforce both state and national conservation laws.

Off-shore (pelagic) fisheries

The Western Pacific Region comprises one of the world's richest tuna fishing grounds — tuna, a renewable resource once termed Palau's 'pelagic gold'. Currently, Palau generates economic benefits from its substantial tuna resource through: (i) access licenses paid by foreign vessels fishing in Palau's two hundred mile exclusive economic zone (ii) gross revenue taxes paid on the commissions generated by shore-based fish handling companies; (iii) a kilo tax on exported fish; and (iv) the indirect revenues derived from shore expenditures by Palau-based fleets. The combined value of these inputs comprises about 90% of the fisheries component of the national economy. There are no Palauan-owned fishing vessels at present engaged in the commercial harvest of tuna for export. There are few Palauan crew aboard the Palau-licensed vessels.

Stage two: Shore facilities

Shore service facilities can bring big economic benefits to Palau but will require government support for infrastructure development and creation of a favorable economic enabling environment. In Guam, it has been reported that a single purse seiner will spend an average of $475,000 per fishing trip and will average five trips per year. A longliner will spend about $22,000 per trip and make some ten trips per year. A fleet of ten purse seiners and sixty longliners using shore-based facilities in Palau could generate up to $24 million and $13 million per annum respectively in addition to access license fees and taxes on export values. These additional revenues, assuming upward adjustment over time in pace with inflation, are in excess of the value of recurrent Compact revenues for 1997–1999 before the first step-down. The environmental impact, however, would have to be assessed including research to determine the sustainable harvest level for the resource, not solely in Palauan waters but throughout the Western Pacific.

Tuna: A development continuum

Off-shore fisheries development can be seen as a continuum.

First, we *generate revenues from access licensure of foreign fishing fleets.*
Second, we *develop optimal conditions for local companies or genuine joint ventures to provide shore-based services for foreign fleets.*
Third, we *develop our own domestic fleets.*

While some Pacific Island countries, such as PNG and Fiji, are already at step three, most countries are planning now to make the transition from step one to step two. Essential to this successful transition is regional cooperation and development of domestic management expertise by providing opportunities for island businessmen and women to work alongside experienced, international experts who know the tuna industry. Tuna is big business; a *successful, internationally competitive industry cannot be managed by amateurs.*

From the perspective of sustainable human development, there are two main issues arising from off-shore fisheries: (i) effective management of the resource to ensure long-term sustainability of harvests; and (ii) increased involvement of Palauans in the industry thereby increasing the economic benefits accruing to Palau.

At the outset it must be recognized that tuna are highly migratory species; effective management of tuna resources cannot be undertaken by any single Pacific Island nation acting alone, for large multinational fishing corporations can simply play one nation against the other, thus forcing each toward the lowest common denominator. It was this recognition that led to creation of the Regional Forum Fisheries Agency (FFA). While region-wide cooperation is important, in the case of Palau, sub-regional cooperation, especially with the FSM and Papua New Guinea as well as with maritime adjacent nations in Asia, is equally important because of their vast ocean areas bordering Palau.

Under current arrangements, Pacific Island nations, including Palau, receive only about two cents from every dollar generated by their fish in the overseas markets. For a country with alternative financial resources, as Palau enjoys under the Compact, some people may legitimately question the wisdom of selling off valuable fish stocks for such minimal gain. The fact is that Palau is one of the few Pacific Island nations that enjoys the luxury of being able to debate this point. For most other nations, even two cents in the dollar represents a vital contribution to their national income.

Tuna: Two viewpoints

Fact: Pacific Island tuna has been variously estimated as worth $1.5 — $4.0 billion (1995) when sold in Japan. Of this sum, Pacific Island nations receive approximately two percent. This two percent represents a substantial proportion of the national income (GDP) of many island nations but only a fraction of the market value of the resource.

One point of view: 'Experience has demonstrated that foreign fishing has not reaped large financial benefits or employment opportunities for the Pacific people and has resulted in serious degradation of Palau's environment and fisheries.'

Senator Joshua Koshiba, Senator Harry Fritz, Palau, OEK, April, 1996

An alternate point of view: 'Those who make money from the tuna fishing industry are those who own the boats and those who catch the fish, because they take the most risk… If you want to measure the value of fish when sold on the Japanese market, the value of tuna is very high. But that takes a lot of money, manpower, and time to bring that fish to Japan.'

Johnson Toribiong
Palau Lawyer

In considering the off-shore fishery industry, it must be recognized that access licensing was never intended, in Palau or elsewhere in the region, to be the long-term strategy of choice for developing off-shore fisheries. Licensure is simply an interim measure to allow island nations, especially those whose financial situation is precarious, to generate some revenues from their resource while pursuing longer-term, higher revenue strategies.

For Palau, the second step is to develop the infrastructure which will encourage Palauan businesses or joint ventures to develop shore-based service centers for vessels fishing the waters of Palau, western FSM, and northern PNG; these vessels are now purchasing the bulk of their supplies, fuel, and repair services from other Pacific Rim destinations. Full service centers, ship and net repair facilities, bait farming, and other industries could be established. The revenues generated for Palau from such operations, if well managed, might be five-to-ten times the revenue generated from the current access licensing arrangements. This is an area where government's role in infrastructure development and creation of a favorable enabling environment for successful private entrepreneurship is critical.

Finally, there is a third level of development: Palauan owned and operated companies taking control of actual fishing operations. There is a lengthy list from around the region in which island-owned companies have attempted to do just this. Most of these ventures have failed, thus underscoring that this third option is high-risk. Movement into this third development level will require a great deal of capital, careful study, professional expertise, and Palauans with solid industry experience gained through participation in and management of shore-based value-added industries. For these reasons, this third option is far into the future. Exercising the second option — control of shore-based support industries — has potential, however, of becoming a reality prior to expiration of the Compact.

Environment: Marine Resources

Palau's marine environment is one of the most biologically diverse in the world. Subsistence fisheries and domestic commercial marketing play an important role in household and national food security having been called the 'refrigerator', 'social security', and 'unemployment compensation' for low income Palauan families. These resources also provide the direct (through commercial fisheries) and indirect (through tourism) base for much of Palau's economic development.

To dredge or not to dredge is one of the most long-lasting issues facing Palau as it embarks on construction of the Compact Road in Babeldaob. The 53 mile long road will require immense quantities of fill materials of varying grades. On the one hand, there is strong pressure on designers to use local products to enhance the economic impact of construction while minimizing costs; on the other hand there are strong environmental pressures to avoid dredging corals while recognizing that land-based extraction also has environmental implications for both terrestrial and marine resources. After weighing the various options, the (draft) Environmental Impact Statement for the Compact Road concludes, 'coral dredging is the least desirable alternative for sources of materials…' Unfortunately, the Compact road is just the beginning of increasing demand for construction materials as secondary roads and commercial development will follow the Compact Road.

Due primarily to over-exploitation and secondarily to habitat disruption, in-shore marine fisheries are under considerable threat today. The urgent need for conservation measures has been widely recognized. In 1994 a landmark Marine Protection Act was enacted. This Act represents a renewed national commitment toward more stringent conservation. Through this act, Palau adopted a host of new restrictions on the harvest, sale and export of marine resources including: giant clams, lobsters, mangrove crabs, coconut crabs, sea cucumbers, napoleon wrasse, humphead parrotfish, groupers, aquarium fish, and hard corals. Scuba, compressed air and small mesh nets were outlawed for fishing. While additional protections are required, of greater urgency is the need for public education and awareness about existing marine laws and development of effective enforcement mechanisms.

The marine environment and in-shore subsistence fishing and reef gleaning are an important part of the safety net for low income Palauan families.

A customary conservation practice in some parts of Palau was to limit one's catch at any one time to the number of fish that one's family could consume and to not return to a fishing spot for at least seven days.

In-shore marine resources are under serious threat. The decline in fish numbers and species has become obvious to even the 'weekend fisherman'. The landmark Marine Resources Act (1994) signaled a move in public policy away from 'in-shore fishery development' toward 'in-shore fishery conservation.' More stringent restrictions will undoubtedly follow. Proposals now being studied of the chiefs over communal resources; and (ii) developing 'mirror' legislation which embeds into codified law the intent of various traditional practices, established periods during which harvest is restricted, established reef zones, and bans exports of in-shore marine products. Key to effective conservation of in-shore fisheries is a holistic approach that reflects the linkage between terrestrial resources and marine resources and inter-linkage of the various states. At present each state controls its own in-shore fisheries, but this is increasingly recognized as ineffective since the fish spawned in Peleliu may be harvested in Ngarchelong and vice versa.

Although off-shore fisheries are not generally perceived as under threat, there is increasing awareness that multi-national cooperation is needed to conduct basic research which will establish sustainable harvest levels and to manage the resource in accordance with these research findings.

Equity of gender and age: Agriculture and Fishing

Regional objective. To support women's participation in agriculture and fishing and to recognize women's role in food security.

Women are Palau's traditional agriculturists with agriculture a source of pride, power, and income in addition to food security. Women are likewise active in Palau's marine sector although that role is of lesser customary

importance, is less highly celebrated, and receives less support today from the government extension services. Revitalizing agriculture extension services in a way which recognizes and supports women's role in agriculture is an important component of a sustainable human development strategy for Palau. Women themselves will need to devise strategies for transferring their traditional skills to their daughters and granddaughters and determine the appropriate role for foreign farm laborers in Palau's future agriculture development.

Strategies for sustainable human development: Develop Palau's marine industry to provide a sustainable source of food and income for future generations

Fisheries is not a single industry but three industries: aquaculture; in-shore ('coral reef') fisheries; and off-shore fisheries. In-shore fisheries provide the basis for subsistence, local commercial sales, limited export, and indirectly for tourism (since divers come to Palau first and foremost to view the vast array of marine life found here). The most pressing issue confronting Palau in the fisheries sector is depletion of in-shore resources. For sustainable fisheries development, CoPopChi recommends:

- The Ministry of Natural Resources, the Palau Community College, the soon-to-be established Coral Reef Research Center, and other institutions with the requisite technical expertise, accelerate research and demonstration to identify viable aquaculture technologies which can help to reduce pressures on in-shore resources.

- Develop alternative livelihoods for Palauans currently dependent on commercial extraction of in-shore resources (e.g. sportsfishing 'catch and release', intensified value-added processing of marine products, exploitation of off-shore resources which are not being fully exploited, and increased involvement of Palauans in marine-based tourism).

- Revise marine protection legislation by expanding the range of species protected under the law, halting commercial export of in-shore marine products, establishing a system of 'reef zoning', improving enforcement of existing laws, and deputizing state officials to enforce state and national conservation laws.

- Through education and advocacy, increase public awareness about the problem of in-shore resource depletion and re-establish respect for and compliance with traditional conservation practices.

- Strengthen the enabling environment, including infrastructure, which will encourage Palauan businesses to further develop shore-based industries serving offshore fishing fleets.

- Reassess the costs and benefits of licensing foreign fishing fleets; develop mechanisms to increase revenues for Palau from sale of off-shore marine products.

- Continue active participation in regional and sub-regional initiatives to monitor and manage off-shore fishery resources for sustainable harvest.

Nearshore domestic fisheries development and/or management plans and strategies

The Bureau of Oceanic Fishery Management is working towards drafting and implementing development and management plans for some of the domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the tuna fishery. There is no development and/or management plan in place for the deep-water snapper fishery at present, and there is no immediate plan to develop one.

The management of the tuna resource in the waters of Palau is very important to the government. At present tuna fishing is mainly conducted by locally based foreign longline vessels. To manage the tuna fishery, the Bureau of Oceanic Fishery Management drafted the Palau National Tuna Management Plan (GoP 1999) although the plan has not been fully implemented. The aims, objectives, and the strategies for development of, and employment in, the local tuna fishery as stated in the plan are:

Broad aims

- Establish concise agreed objectives of the plan;
- Enhance national fisheries management practices through transparent consultations with all stakeholders;
- Create guidelines and strategies to maintain the continuity of established policies through consultations and compliant administration of management practices;
- Balance conservation, environmental, social and economic priorities;
- Formulate a series of performance indicators for evaluating changes in policies and strategies; and
- Promote Palauan fisheries development opportunities.

Objectives

- Conserve fishery resources by controlling harvesting within international and regiona1 recognized sustainable limits.
- Establish an efficient government framework to harmonize the application of fisheries management policies and practices.
- Minimize detrimental impacts of fishing on coastal and inshore environment.
- Attain an optimum balance in relation to access to the resource between all stakeholders.
- Enhance the overall economic balance between:
  a) the necessity for government to generate revenue
  b) financial expectations of the commercial tuna fishery interests
  c) the interest of other users of the resource.
- Promote Palauans in professional, administrative, research and development positions in the fishery and related industries and government agencies.
- Adherence by Palau to regional and international marine resources agreements.

Many of the objectives in the Plan have components that cover domestic development of the tuna fishery. However, objective six is the one most focused on domestic development, so it is presented below.

Development and employment

Objective 6: Promote the employment of Palauans in professional administrative research and development positions in both the tuna industry and related government agencies.

Palauans can redress their current lack of knowledge of commercial tuna longline fishing techniques through training. As a consequence it is recommended that the tuna longline training vessel at the Bureau of Marine Resources currently being re-equipped under a Japanese aid program be utilized to introduce and train Palauans for tuna longline fishing.

It is recommended that consideration be undertaken to introduce value-added products as a means to enhance opportunities for Palauans into the tuna fishery. Value adding can be split into two categories:

1) Small-scale (focusing on domestic markets and limited export). This could be in the form of tuna jerky, smoked fish, salted and dried tuna etc. These products should focus on utilizing rejected tunas and by-catch from the locally based longline fleet.
2) Large-scale production (focusing on exports). Large-scale value adding processes include tuna canneries, fishmeal production, tuna farming, and possibly transhipment of foreign catches through Palau.

It is suggested that small-scale value-added opportunities receive immediate consideration because of the following elements:

1) the need for only limited demand for financial investment
2) requires minimal technical skills

3) low labour requirements
4) close proximity of markets decrease complexity and costs of delivery

In view of the fact:

1) that there are few skilled Palauan trades and technical support services:
2) that expected demands for maintenance and support services are expected to coincide with an increase in a domestic tuna fishery.

It is suggested that Palauans become involved in these activities through existing training programs of the Palau Community College. In addition, external education agencies combined with the Palau Community College could be utilized to train Palauans in research fisheries management, surveillance and compliance, captains, engineers for fishing vessels and business management.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information on domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in Palau

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Silas Orrukem, Director, Bureau of Oceanic Fishery Management (September 2003).	Ad hoc fishery with no vessels or companies targeting these species. Catch is mainly sold on the local market.	6 government iceplants in the rural areas plus one in Koror, these are run by the fishing cooperatives in the states. Cooperative fish market and several other fish retail and wholesale outlets around Koror. 2 processing or packhouses facilities used for exporting tunas.	1 private sector company building fibreglass vessels up to 7 m. Repairs also undertaken. 1 fibreglass repairs shop plus some people do repairs to fibreglass boats in their back yard. 1 slipway that does repairs on steel, wood and fibreglass vessels.
Background References: Chapman 2000; Chapman 1997; Dalzell and Preston 1992; MRD 1996; MRD 1989; Nichols 1991; Taumaia and Crossland 1980; Taumaia and Cusack 1997; Wilson 1966.	Deep-water snapper fishing trials and training undertaken by SPC in 1979–80 with 30 fishermen trained in the fishing gear and technique. Further deep-water snapper fishing trials and training undertaken by SPC in 1983. Fishing activities were conducted in 12 states, with 56 fishermen trained. SPC conducted deep-water snapper fishing trials in 1987–88 as part of a project to look for offshore seamounts using deep-water echo-sounding equipment. Deep-water fishing activities were practised by some fishermen in Palau during the	Tuna transhipment facility established by the Van Camp Company in 1964, with ice and freezer capacity plus a Katsuobushi plant. The Palau Federation of Fishing Associations (PFFA) established in 1975, although it ran into financial problems in 1982 and was taken over in 1983 by the Palau Fishing Authority, a semi-government agency. PFFA operated a fish market, providing ice to fishermen and buying their catch to sell locally and export. Facility had flake and block ice makers, freezers and coldstores (200 t capacity).	Boatyard and drydock established in Palau in 1965, with the Hawaiian 'sampan' fishing vessel design chosen for construction. Japan donated 10 x 11 m (36') displacement hull diesel craft in 1983 to Palau. These vessels were controlled by PFFA, and leased to the state cooperatives at USD $150/month. In 1988, a new 8 m (25') cabin cruiser with 2 x 86 HP outboards and a range of safety equipment was donated to Palau by Japan under its goods and services aid. During the 1980s and 1990s, the private sector has

	1990s, but this did not become a target fishery.	State-run fishing cooperatives set up around Palau in the early 1980s with ice facilities for local fishermen In 1985 the Van Camp facility was taken over by a Palauan–Taiwanese company (Palau International Trades Incorporated — PITI) and renovated over a 2-year period, opening in late 1987 as a fresh tuna exporting facility with a 1000 t holding freezer, 10 t blast freezer and 55–60 t/day block ice. Palau Marine Industries Corporation (PMIC) was established and operational in 1990 with 50 t/day block ice machines, 2 x 500 t and 1 x 450 t holding freezers and 2 blast freezers with a capacity of 12 t/12 hours. Kuniyoshi Fishing Company (KFC) was established in 1993 with a 10 t/day ice plant and 5 refrigerated reefer containers.	developed the skills to do repair work on fishing vessels, especially wood and steel boats. The 3 tuna fishing companies have their own tradespeople to do repairs on vessels that are under charter to them. In 1999, the boatyard and drydock (slipway) was in poor repair and there were few people using the facility due to the high costs being charged.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in Palau

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Silas Orrukem, Director, Bureau of Oceanic Fishery Management (September 2003).	Currently 4 government FADs in the water with another couple planned for deployment in late 2003. Kuniyoshi Fishing Company has 10–12 FADs deployed for their pole-and-line vessel. Another fishing company has 8–10 FADs deployed for its tuna handline vessels (using Filipino handline and jigging methods).	No public sector activities except the provision of training in different tuna fishing methods and the FAD programme being implementing by fisheries.	Around 10 full-time vessels trolling the FADs and coast for tunas and other pelagic species, with another 10–15 part-time vessels doing the same. Around 8 Filipino-design pug-boats (6–9 m trimarans) working with a mothership around the FADs.
Background References: Beverly 2003; Chapman 2000; Gillett in press; Johannes 1981; MRD 1991; PCS 1999; Watt and Chapman 1998.	The Palau Marine Resources Division (MRD) initiated the first FAD programme in Palau in 1980, with 6 deep-water FADs deployed. There are no records of catch or longevity of the FADs. A second FAD programme was initiated by MRD and the Palau Community Action Association in 1990, with 8 FADs deployed between 1990 and 1991. All FADs were lost within 2–12 months of their deployment.	MRD requested technical assistance from SPC in 1991 to introduce mid-water fishing techniques to Palau fishermen. Vertical longlining trials were undertaken, training MRD staff and local fishermen in the gear and its use around FADs. A sub-regional workshop on FAD designs, construction and the method of conducting site surveys, was held in Palau in 1994. Participants were from several countries	Traditionally some areas of Palau used sailing canoes and feather lures to troll for tunas and other pelagics outside the reef. Canoes gave way to outboard-powered skiffs in the 1960s, as well as artificial or synthetic lures being introduced for tuna trolling. In 1999 it was reported that there were 20–30 boats that occasionally trolled for tunas and other pelagics outside the reef.

	In 1992, SPC assisted MRD conduct site surveys in 10 locations around Palau, with 6 suitable offshore FAD deployment sites identified. 2 offshore FADs were then deployed. In addition, 1 shallow-water FAD was deployed in a depth of 180 m. During the mid- to late-1990s, FAD materials were obtained from Japan through goods and services grants. Several FADs were deployed during this period, but the lifespan of each was less than 12 months. 2 FADs were deployed in 1998, but were lost within 3 months of deployment. MRD had materials on hand for another 3 FADs, with plans to deploy these in 1999. The owners of the locally owned pole-and-line vessel also deployed several FADs off Palau in the late 1990s and early 2000s to assist its fishing operation.	in the region plus MRD staff. MRD staff conducted some small-scale tuna longline trials in the mid- to late-1990s using the research vessel donated by Japan. FAD fishing skills workshop and a horizontal longline workshop were held in 2002 by SPC at the request of MRD, with 17 local fishermen and MRD staff trained in these gears and techniques.	

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in Palau

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Silas Orrukem, Director, Bureau of Oceanic Fishery Management (September 2003).	There is no public sector tuna fishing company in Palau.	1 locally owned pole-and-line vessel operating with the catch sold on the local market. Three tuna longline companies, PITI (about 60 vessels), PMIC (about 27 vessels), and KFC (about 7 vessels). PITI and PMIC also have packhouses and freezer complexes for their fishing and exporting operations.	KFC is a joint venture company with their vessels brought in under this arrangement. PITI and PMIC bring their boats in under a charter arrangement, with the companies holding the licences.
Background References: Beverly 2003; Chapman 2000; Gillett 2002; Gillett in press; PCS 1999; SPC 1995; SPC 1984; Taumaia and Cusack 1997.	There have been no public sector tuna fishing companies in Palau, as the government policy has been to promote private sector development. The Palau Fishing Authority (PFA) and PFFA oversees all cooperatives in Palau, although these do not specifically target tunas.	Van Camp Company of San Diego operated foreign pole-and-line vessels in Palau from 1964–1982. One local vessel also worked to the company. After 1982, the locally-owned pole-and-line vessel sold its catch on the local market. PITI commenced fishing in 1987, followed by PMIC in 1990 and KFC in 1993. All three companies have strong financial backing from overseas and charter vessels	PITI commenced tuna longline operations in 1987 by chartering vessels from the Peoples Republic of China (PRC). By 1993, PITI had around 100 tuna longline vessels on charter. In 1999 PITI had 30–40 vessels from PRC under charter. In 2001, PITI had 42 vessels under charter, 24 from Taiwan and 18 PRC. PMIC started fishing in 1990, and from 1991–1995 had from 40–60 PRC tuna

		for their tuna longline fishing activities. All 3 companies were still operational in the early 2000s.	longline vessels under charter. From 1996 this changed, with PMIC chartering Taiwanese vessels in preference to PRC vessels. By 1999, PMIC was chartering 40–60 Taiwanese tuna longliners annually. In 2001, vessel numbers had dropped to 22 vessels under charter, 21 Taiwanese and 1 local vessel. Kuniyoshi Fishing Company (KFC) was established in 1993 and chartered vessels from Taiwan for its tuna fishing operations. In 2001, KFC had 7 Taiwanese longliners under charter.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in Palau

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Silas Orrukem, Director, Bureau of Oceanic Fishery Management (September 2003).	There are around 7 charter boats in Koror for sport or gamefishing. Many sportsfishing vessels, some used as dive boats in the tourist industry. 4 tournaments held per year with 35–40 boats competing.	Baiting conducted in the lagoon by the pole-and-line vessel. No other baiting activities or trials in Palau.	One vessel is doing a small amount of trapping for deep-water crabs and deep squid jigging for the large diamond-back squid.
Background References: Chapman 2000; Gillett 1999; Johannes 1981; MRD 1989; Nichols 1991; PFDF 1987; SPC 1984; Whitelaw 2001.	MRD conducted a study on sportsfishing/gamefishing from 1994–1996, which generated a lot of interest in this activity and a sportsfishing association was established. In the late 1990s there were 3 charter fishing vessels, and some of the dive boats provided this activity as well. 2 main fishing tournaments held annually. In 1999 there were 20–30 vessels involved in some form of sportsfishing or gamefishing, although fewer than 10 of these would occasionally participate in commercial sportsfishing.	Initial baitfish surveys were conducted in Palau by the Japanese in 1925–26. From 1964–1982, foreign pole-and-line vessels fishing to the Van Camp facility, conducted live baiting activities in the Palau lagoon. From 1971–1973, the Trust Territory Administration and Van Camp conducted research into the population and biology of the anchovy caught in the Palau lagoon. Results showed that the baitfishery in the Palau lagoon was operating near its optimal level. A Japan-sponsored baitfish and pole-and-line survey was carried out in Palau over 7 days in 1975. Bait catches averaged 163 kg/night over 7 nights. A similar survey was conducted by a Japanese pole-and-line vessel in 1976, with bait catches averaging	Flyingfish have been caught outside the reef traditionally, using canoes, coconut-frond torches and a scoop net. Deep-water shrimp and crab survey conducted from 1987–1988 by the Pacific Fisheries Development Foundation. Results were encouraging, but only as a secondary fishery. In the late 1990s, fishing trials for diamond-back squid were conducted on the MRD training vessels around Palau under the direction of a Japanese fisherman.

		159 kg/night over 35 nights. SPC conducted some baiting in the Palau lagoon in 1978 and 1980, with batfish catches averaging 131 kg/haul and 87 kg/haul respectively. The 1 private sector pole-and-line vessel still operating in Palau continues to catch its baitfish in the lagoon.	

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Papua New Guinea

General

Papua New Guinea (Figure 1) is made up of a mix of large islands, small islands and coral atolls between the equator and 12º S latitude, and 141º and 160º E longitude. The mid-year 2003 population estimate for Papua New Guinea was 5,617,000 people (SPC 2003).

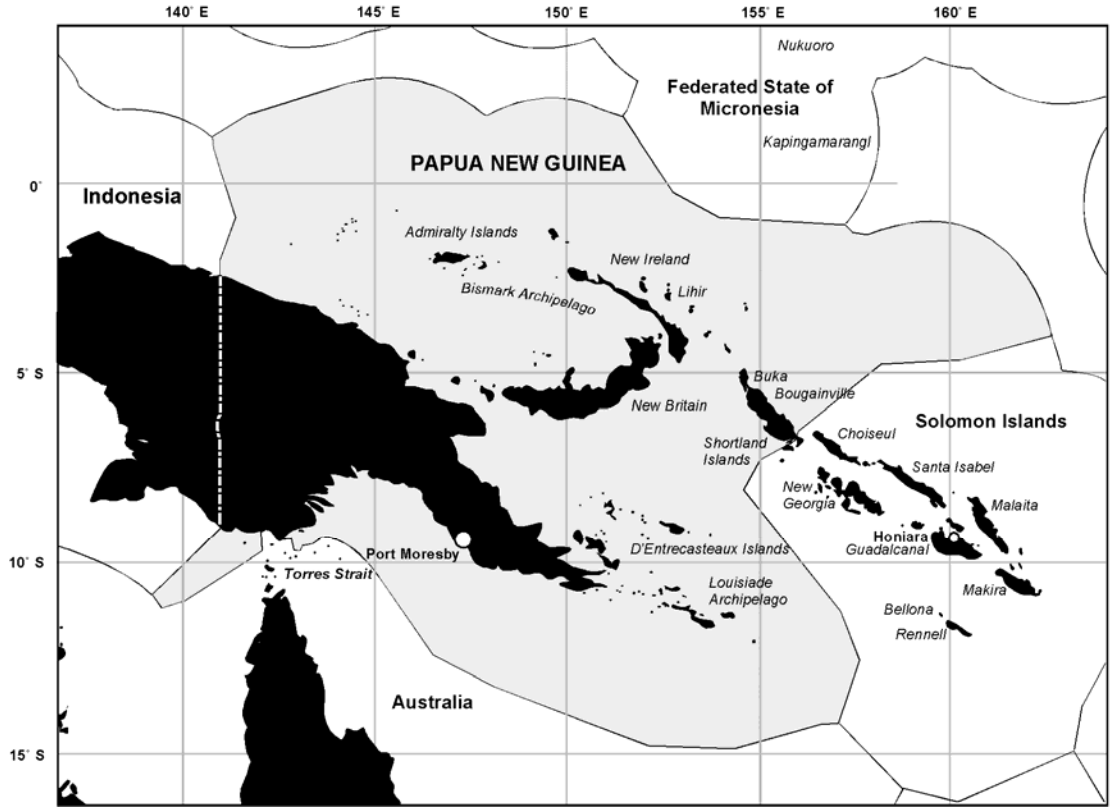

Figure 1: Papua New Guinea, its EEZ and neighbouring countries

Papua New Guinea has an EEZ of around 3,120,000 km^2, with a land area of around 462,243 km^2. Around 20 per cent of Papua New Guinea's EEZ borders on international waters, with the rest bordering four Pacific nations, Indonesia to the west, the Federated States of Micronesia to the north, the Solomon Islands to the east, and Australia to the south.

Fisheries development and management

The development and management of the marine resources within Papua New Guinea falls under the jurisdiction of the National Fisheries Authority, a non-commercial statutory authority that is self-funding and self-accounting, with excess income going to government. The National Fisheries Authority works under the *Fisheries Management Act 1998* and related fisheries regulations, and there are also parts of the *Torres Strait Protected Zone Act 1984* that the Authority needs to work within. The Fisheries Management Act is being revised, and the new Act is expected to be implemented in 2004.

Given the importance of fisheries development and management in Papua New Guinea, the National Fisheries Authority (NFA) has drawn up a Corporate Plan for the period 2002 to 2004 (NFA 2002a) to guide its operation and set a blueprint for the future. The goals and programmes as set out in the National Fisheries Authority Corporate Plan 2002 to 2004 are:

1. To facilitate the development of PNG's fisheries and maximise the sustainable benefits.

   NFA programmes to achieve this are:

   - Developing and implementing management plans for all major fisheries;
   - Improving the economic returns from the commercial fisheries sector;
   - Encouraging and facilitating funding and investment for coordinated development of the domestic fisheries sector; and
   - Providing practical training and education to the fisheries sector.

2. To have policies that enable the development and management of PNG's fisheries compatible with conservation of the resource and promoting the national interest.

   NFA programmes to achieve this are:

   - Revising the legislative framework; and
   - Representing PNG interests in regional and international fisheries forums.

3. To ensure a high level of compliance with fisheries legislation, regulation, access terms and licence conditions.

   NFA programmes to achieve this are:

   - Effective surveillance and enforcement based on the compulsory use of Vessel Monitoring System technology; targeted deployment of resources and cooperation with neighbouring countries;
   - Providing education and information to licence holders so they fully understand the terms and conditions of their licence; and
   - Successfully prosecuting those who do not comply with the law.

4. To promote and facilitate development of provincial and community fisheries and meet NFA's obligations under the organic law.

   NFA programmes to achieve this are:

   - Improving the effectiveness of joint Provincial Governments and NFA fisheries management and development efforts;
   - Encouraging the development of community-based fisheries;
   - Facilitating the Coastal Fisheries Development and Management Project; and
   - Facilitating the Rural Fisheries Development Program.

5. To operate NFA as a streamlined, efficient and responsive statutory authority.

   NFA programmes to achieve this are:

   - Providing effective governance and strategic management for the organisation;
   - Developing and maintaining positive working relationships with industry and other key stakeholders;
   - Streamlining the issue of domestic and foreign licences;
   - Ensuring that effective financial and internal controls are in place so that cash and other assets are secured and only authorised financial commitments and liabilities are incurred;
   - Encouraging and providing targeted staff training and development;
   - Rationalising and effectively utilising property and infrastructural assets; and
   - Completing the Fisheries Development Project.

Nearshore domestic fisheries development and/or management plans and strategies

The National Fisheries Authority is working towards the drafting and implementing of development and management plans for domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the tuna fishery, although Papua New Guinea has a shark fishery as well. There is no development and/or management plan in place for the deep-water snapper fishery at present, although this fishery will be looked at by the NFA, with a plan developed.

The management of the tuna resource in the waters of Papua New Guinea is very important to the government. At present tuna fishing is conducted by a range of local, locally based foreign, and foreign vessels, both using purse-seining gear and longline or mid-water gear. To manage the tuna fishery, the NFA drafted and implemented the National Tuna Fishery Management Plan (NFA 1999a) in 1998–1999. In addition to this plan, the NFA has drafted and implements several other plans that cover nearshore fisheries. These plans are the National Shark Longline Management Plan (NFA 2002b), the Gulf of Papua Prawn Fishery Management Plan (NFA 1998), plus the National Fish Aggregating Device Management Policy (NFA 2002c) for the waters around Papua New Guinea. The management and/or development objectives and strategies as stated in each of these plans and policies are:

The National Tuna Fishery Management Plan (NFA 1999a)

The broad **objectives** of the National Tuna Fishery Management Plan aspire to give effect to the fisheries management principles contained in the Fisheries Management Act, and specifically to:

(a) Maximise benefits to Papua New Guinea from sustainable use of its tuna resource;

(b) Satisfy Papua New Guinea's regional and international obligations to the management and conservation of tuna resources, while ensuring the national interest comes first and foremost;

(c) Minimise any adverse impacts of tuna fishing and related activities on the marine environment;

(d) Minimise any adverse impacts on the artisanal and traditional fishing sectors;

(e) Improve decision-making in relation to management of the tuna fishery through effective information and communications networks; and

(f) Ensure that the provisions of this Plan are developed, implemented, administered and monitored in an efficient and cost-effective manner.

Management and Development of the Tuna Fishery

The following management **strategies** are adopted for the tuna fishery:

(a) Establish a national Total Allowable Catch (TAC) for each relevant fishery, or by licence category;

(b) Implement the limits set on fishing effort for tuna species, consistent with national TAC levels;

(c) Encourage and facilitate sustainable development of Papua New Guinea's domestic tuna industry;

(d) Develop and apply criteria for licensing which give preference to PNG operators;

(e) Regulate the deployment and utilisation of artificial fish attractants, including anchored fish aggregation devices (FADs or payaos), that may cause gear conflict and fishery interaction, or have adverse biological impact on the tuna stocks;

(f) Support fiscal and developmental incentives to invest in the domestic tuna industry;

(g) Implement zoning where necessary to prevent localized tuna stock depletion, or gear conflict, to enhance the long term viability of locally based industries;

(h) Collect and validate scientific data on the status of tuna stocks towards national and regional stock assessments through use of regional log books, port sampling, scientific observers, and other reporting methods;

(i) Promote industry involvement in research, including active use of industry vessels and knowledge towards improving stock assessment processes and providing data on their operations for the purpose of reviewing this Plan;

(j) Develop and implement a policy to recover costs of management being incurred by NFA;

(k) Monitor tuna fishing impact on associated or dependent species and, as necessary, adopt measures to ensure sustainable management;

(l) Monitor licensed tuna fishery interactions with other users of the resource, and where necessary, implement measures to address adverse impacts;

(m) Monitor the economic performance of the tuna fishery, including information on catches, sales, processing and other relevant information;

(n) Implement a strategy to ensure responsible fishing, as required under international and regional conventions to which PNG is a party;

(o) Facilitate active involvement in consultations on fishery management arrangements.

National Shark Longline Management Plan (NFA 2002b)

Objectives

a) To apply a precautionary approach to the management of the shark fishery, ensuring the harvest of shark resources is sustainable and that shark fishing has minimal impact on the marine ecosystem.

b) To ensure that there are benefits to Papua New Guinea from the sustainable use of its shark resource.

c) To ensure that the utilization of the shark resource does not have negative impacts on coastal communities.

Management Arrangements

a) The shark longline fishery will be managed nationally. A National Management Advisory Committee (NMAC) may be formed in accordance with paragraph (f) to advise the Managing Director on the management of the shark fishery.

b) The NMAC will advise the Managing Director on management measures including total allowable catch, seasons, reporting, restrictions, trade and any relevant issues that the Managing Director may direct from time to time.

c) The Managing Director may direct the NMAC to examine a particular issue in the fishery or to review the Plan.

d) The Plan will be reviewed by the NMAC at the direction of the Managing Director at least every one (1) year or at such earlier time as the Managing Director shall direct.

e) Any review of the Plan shall be made public by the NMAC and comments will be invited from all stakeholders in the fishery.

f) The National Management Advisory Committee will consist of the following persons, appointed by the Managing Director:

i. two National Fisheries Authority (NFA) representatives (one will be appointed Chair)

ii. one fishery scientist from outside NFA

iii. two fishing industry representatives

iv. a representative from a non-government organisation whose objectives include conservation of the marine environment and resources.

v. one representative from the recreational dive industry.

g) Elected political office holders are ineligible for membership of the NMAC. Should an NMAC member be elected to a national or provincial political office during their term, their membership will automatically lapse.

h) The Managing Director will appoint members to the NMAC for three year terms.

i) The NMAC and its members shall operate in accordance with the following procedures and such other procedures and standards as may be set by the Managing Director:

i. a quorum requires four members and must include one NFA representative;

ii. the NMAC will meet as required, but no less than once a year;

iii. prior to taking up membership, representatives will be required to disclose any direct or indirect personal or pecuniary interests in the fishery, otherwise than as a member of, and in common with the other members of an incorporated company consisting of not less than 25 persons. The nature of his or her interest shall be disclosed as soon as possible to the NMAC. Such a disclosure shall be recorded in the minutes of the NMAC and submitted to the Managing Director;

iv. the NMAC and Managing Director must be advised of any substantive changes in such interests, during the course of membership. The Managing Director will determine if a change in interests will affect that member's term; and

v. where a member who has an interest described in subsection 3(i)(iii), has not made a disclosure in accordance with that subsection, his or her vote shall be null and void retrospectively from the time such interest is considered and determined by the Managing Director and the Managing Director shall terminate the appointment of such a member.

Gulf of Papua Prawn Fishery Management Plan (NFA 1998)

Objectives of this Fisheries Plan

The broad objective of this fishery Management Plan is to reinforce and give effect to the fisheries management principle in the *Fisheries Management Act 1998*, and specifically:

(a) To manage the prawn fishery in the management area so that the size of the stock tends towards that which will give the maximum sustainable yield (MSY), chiefly through control of fishing effort;

(b) Provision of sustainable economic benefit through prevention of growth overfishing on the principal species, the banana and tiger, in order to maximise economic returns;

(c) Conservation of stocks of demersal fish species caught as by-catch;

(d) Promotion of sustainable fisheries development practices;

(e) Development of controlled sustainable small-scale fishery development of the prawn and associated fin-fish resources within selected areas of the three mile zone, for the participation and benefit of the traditional resources owners; and

(f) To manage the fishery with a precautionary approach.

Precautionary approach to prawn management

Consistent with the regional and international management principles, precautionary approaches shall apply for Gulf of Papua Prawn Fishery in accordance with the following provisions:

(a) In the absence of adequate scientific data, the National Fisheries Authority has taken into account the uncertainties with respect to the size and productivity of the stock, to other management reference points such as maximum sustainable yield, the level and distribution of fishing mortality, and the impact of fishing activities on associated and dependent species, and including climatic, oceanic, environmental and socio-economic conditions.

(b) In managing the Prawn fishery, the Authority has considered the associated ecosystems on reefs within the Management Area. The Authority may develop data collection and research projects to assess the impact of fishing on non-target species and their environment, adopt plans as necessary to ensure the conservation of non-target species and consider the protection of habitats of special concern.

(c) The absence of adequate scientific information shall not be used as a reason for postponing or failing to make measures to protect the target and non-target species in the Gulf of Papua Prawn fishery.

(d) The precautionary approach taken in controlling of fishing effort including the recommendation to maintain the number of vessel at 15.

National Fish Aggregating Device Management Policy (NFA 2002c)

Following the FAO Code of Conduct for Responsible Fishing, the management objectives of the Fisheries Management Act 1998, and in line with the objectives of the National Tuna Fishery Management Plan Management Framework, the following policies set out the management arrangement by which the National Fisheries Authority (NFA) will monitor and control the use of anchored Fish Aggregating Devices (FADs) or Payaos in the purse-seine fishery for tunas in Papua New Guinea Declared Fishing Zone (PNGDFZ). These policies have been drawn up following a series of consultative meetings with the locally based purse-seine operators, longline operators and NFA since 1998.

Limits on the number of licensed FADs

a) Only PNG companies with substantive onshore investment, whose purse seine vessels and support vessels are licensed to fish under the Fisheries Management Act 1998 may deploy and use anchored FADs. The total number of anchored FADs allowed to be deployed in the PNG DFZ for the commercial surface fishery shall not exceed 1,500. NFA may allocate to an individual fishing company permission to deploy up to 40 FADs per licensed purse-seine vessel.

b) The total number can be reviewed in accordance with provisions in the National Tuna Fishery Management Plan Management Framework.

c) FADs deployed for the purpose of game fishing and artisanal fisheries are outside the restrictions imposed by this management plan.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in Papua New Guinea

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Molean Chapau, Managing Director, and Ludwig Kumoru, Manager Tuna Fisheries, National Fisheries Authority — NFA (September 2003).	Mainly an ad hoc fishery due to rising costs and marketing problems. Artisanal fishing for these species in several locations, such as Manus and West New Britain with the catch sold locally.	EU has a 4-year project setting up 7 rural centres with the ice plants operated by the local community or cooperatives. ADB project to provide infrastructure to promote fisheries development in 4 locations, Kavieng, Lae, Samarai and West Province. 7 tuna packhouses between Lae and Port Moresby plus several fish shops. Private sector fishing projects in Milne Bay and Wewak plus other locations. 1 Tuna cannery in Madang (120 t/day throughput). 3 plants to come on-line in 2004: tuna loining plant in Wewak (200 t/day); tuna loining plant in Manus (200 t/day); and smoked tuna loining plant in Lae.	Large slipway in Port Moresby mainly doing repair work on cargo boats and large fishing boats. Fibreglass boatbuilding facilities producing boats from 6–7.5 m in both Madang and Samarai. EU project looking at a dory-design boat for tuna longlining (diesel inboard engines in vessels <10 m). Many backyard operations doing repairs on boats throughout the country.
Background References: Chapman 1998; Chapman and Fusimalohi 1998; Dalzell and Preston 1992; DPI 1984; DPI 1983; Fisheries Division 1996; Fisheries Division 1987; Fusimalohi and Crossland 1980; Gillett 2002; Gulbrandsen and Savins 1987; Kent 1978; NFA 1999b; Richards and Sundberg 1984; Richards and Sundberg 1982; Sundberg and Campbell 1982; Sundberg and Richards 1984; Sundberg and Richards 1982; Wellington and Cusack 1998.	Deep-water snapper fishing trials were conducted in 1979 by SPC in the West New Britain area. 10 fisheries extension officers and 15 local fishermen were trained in the gear and method used. In 1982, SPC conducted another training programme on deep-water snapper fishing in 3 locations around PNG, Port Moresby, Samarai Island and Manus Island. Fisheries staff in Kavieng commenced deep-water snapper fishing trials in late 1981, using conventional bottomfishing gear. In 1982–83, the researchers experimented with Japanese-style trotlines, and then trialled PVC pipe droppers on a trotline rig with some success. The researchers conducted scientific fishing trials in set locations and set times to study the feeding habits of the deep-water snappers and the species composition. They came up with some interesting results to their work. Similar research work was being	Ice facility and aribushi plant established in Kavieng in the early 1970s for the pole-and-line fishing operations. Fisheries implemented a programme to establish up to 20 coastal fisheries stations around the country in the late 1970s and 1980s, some established with foreign aid. These fisheries stations were equipped with ice machines, blast freezers and coldstores. Most had their own boats with local fishermen employed to fish them, plus fish was purchased from local fishermen. Some of the fish was sold locally, with most of it transported to Port Moresby or the highlands for marketing. Some fish, such as barramundi fillets, were exported. Several tuna processing and packhouse facilities were established in Port Moresby in 1995–96 to handle the catch from the fledgling domestic tuna longline operations. These facilities provided ice and had	Several of the coastal fisheries stations conducted boatbuilding to get their fishing operations underway. In 1982, UNDP provided PNG with a naval architect, who designed several outrigger canoes over several visits. 1 design was an all-plywood, 11 m outrigger canoe powered by a 15 HP outboard. This vessel also had a sail. Also in 1982, the British Overseas Development Administration funded the construction of 2 x 7.3 m 'Sandskipper' catamarans with a small diesel engine mounted between the hulls. Boatbuilders in Milne Bay were commissioned to construct these vessels. In a later visit by the UNDP naval architect, a raised gunwhale dugout outrigger canoe, 8 m long with a dugout log as the base and plywood extensions for the side, was designed. This vessel had a diesel engine mounted between the hulls

	conducted in Wewak in the early 1980s. SPC was requested to undertake further training in deep-water snapper fishing in 1984. This training was conducted in 3 locations, Manua Island, Wewak area, and the southwest coast of West New Britain. 20 fisheries staff and 29 fishermen received training during this time. Further training was undertaken by SPC in 1988, this time in Oro Bay, Rabaul and Kavieng, the latter in conjunction with the National Fisheries College and its students.	coldstores. Construction on the RD tuna cannery commenced in Madang in 1995, with it being commissioned in 1997. This cannery will process around 100 t/day of tuna. In the late 1990s and early 2000s, several tuna processing and packhouses were established to cater to the increasing domestic tuna longlining fleet. These were in Lae and Port Moresby.	with a chain-driven longtail propulsion unit. The Fisheries Extension Unit was involved in assessing suitable small-scale fishing vessels for use around PNG. In 1986, 4 vessel designs were being trialled, the 11 m plywood outrigger canoe, the 7.3 m sandskipper, and the dugout 8 m outrigger as mentioned above. In addition an 8 m plywood outrigger canoe, designed by UNDP for Kiribati, was being trialled.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in Papua New Guinea

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Molean Chapau, Managing Director, and Ludwig Kumoru, Manager Tuna Fisheries, National Fisheries Authority — NFA (September 2003).	600–700 anchored FADs (government limit of 1000) off northern PNG for the Filipino purse seiners. All FADs funded and maintained by the companies and set outside 12 nm. EU rural centres will have FADs deployed to assist local fishermen. The FADs will be deployed 3–6 nm offshore. New fishery using Filipino pump-boats and fishing techniques will deploy 12 FADs from 3–6 nm offshore to work around.	Government is promoting private sector development. NFA working to put policy in place to provide an enabling environment for development. NFA looking at promoting cooperatives or associations, reducing fuel prices and providing training funds from access fees.	Looking at promoting FADs as a way to encourage small-scale tuna fishing. New Filipino handlining and jigging around FADs being introduced by one company. Some coastal trolling for tuna and other pelagics.
Background References: Beverly and Chapman 1996; Beverly and Cusack 1993; Chapman 1998; Chapman 1982; Habib 1998; Kailola 1995; Sokimi and Chapman 2003; Sokimi and Chapman 2001; Watt 1999.	In 1984, 2 experimental FADs were deployed off Wewak in shallow water (160 m and 390 m) with technical assistance from SPC. The deeper FAD worked well. In 1983–84, 9 FADs were deployed under a Japanese OFCF project around East New Britain, with low catch rates recorded from fishing around these devices. SPC assisted in the deployment of 1 FAD off Port Moresby in 1992 to assist the local fishing community of Daugo Island. In 1993, SPC assisted with	Trolling survey conducted in 1982 around Wewak and Tufi for Spanish mackerel and other coastal pelagics, with good catches recorded at Tufi. In 1984, trolling for small tunas around FADs was conducted by SPC. In addition, several sets of a vertical longline were made to demonstrate this method to fisheries staff. A pilot tuna longline project was implemented in 1993–94 in East New Britain with SPC assistance. Longlining activities produced good catches and many fisheries	Several commercial fisheries for Spanish mackerel have evolved in PNG, at Tufi and Wewak to name just two. Trolling is the main method used, using artificial lures or baits. Local fishermen in some areas, such as Wewak (using paddling canoes), and Port Moresby (using outboard-powered skiffs) trolled for mackerel tuna and other pelagic species outside the reef in the 1980s. With the introduction of FADs in some locations around PNG, local fishermen started to do more trolling to

	the deployment of 3 FADs off East New Britain. In addition, 5 FADs were deployed in the same area by the Mar Fishing Company of the Philippines for the local fishermen. Unfortunately, most of these FADs were cut free by local villagers. In the mid-1990s, the 3 Filipino companies with tuna purse-seine vessels working off the north coast of PNG, deploying about 560 FADs, with the number increasing each year. 2 FADs were deployed off Kavieng in 2001 with assistance from SPC. These were to assist local fishermen as well as the National Fisheries College in the implementation of their training programme. In 1992, SPC assisted with the deployment of 1 FAD to replace one that had been lost due to vandalism.	staff and interested fishermen received training in the gear and fishing technique. SPC worked with the National Fisheries College in Kavieng on several occasions. In 1998–99, assistance was provided with the running of a new course on fishing technology and fishing operations. There was a focus on tuna fishing methods and fishing for deep-water snappers. 40 students and several tutors received training. In 2002, an SPC staff member was hired through a consultancy to help implement a new training course at the college. 28 students and several tutors received training. In 2001, SPC worked with the New Ireland Commercial Fishing Association to train members in deep-water snapper and small-scale tuna fishing techniques used around FADs. 51 association members were trained.	target the aggregated tunas around the FADs. Since the late 1990s, in some locations such as Kavieng and Port Moresby, some local fishermen are starting to use mid-water fishing methods for tuna, especially in association with FADs.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in Papua New Guinea

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Molean Chapau, Managing Director, and Ludwig Kumoru, Manager Tuna Fisheries, National Fisheries Authority — NFA (September 2003).	No public sector tuna fishing company at present. NFA is looking at a commercial arm to generate funds in the future.	4 companies with 22 locally based foreign purse-seine vessels. 7 tuna longline companies with 11 vessels working out of Lae and 20 vessels working out of Port Moresby. Each of the 7 companies has their own processing or packing facility. Currently there are 9 shark boats fishing outside 6 nm. NFA looking to promote the purchasing of purse seiners by the private sector, including other Pacific countries, starting in 2004.	Currently there are 4 purse seiners, several longliners and all shark boats under charter or joint venture arrangements. Government pushing to get the local partners to be the controlling partners of joint ventures in the future.
Background References: Beverly and Chapman 1996; Gillett 2002; Gillett in press; Kailola 1995; Kent 1978; NFA 1999b; SPC 1984.	Pole-and-line fishing operations commenced in 1970 from Kavieng. There was 1 company in 1970, and 4 companies in 1974, with 1 company pulling out in 1975 and another in 1978. The vessels (40 in 1976) unloaded their catch to 5 freezer	In 1993–94, 2 private sector companies attempted tuna longlining. 1 company worked out of Port Moresby and had reasonable catches, but only conducted 3 sets. The other company fished from Finschhafen initially, then moved to East New	Many of the early trawlers (1967–1980s) in the Gulf of Papua prawn fishery were brought in under charter or through joint venture arrangements. Pole-and-line vessels in the 1970s were brought into PNG

	motherships that moored on the baitfishing grounds. The 2 remaining fishing operations stopped in 1982. The pole-and-line fishery commenced again in 1984 with 9 vessels, but stopped permanently in 1985. PNG does not have any public sector companies involved in tuna fishing at present.	Britain and worked with the SPC pilot project for a short time before the company ran into financial difficulty. Domestic tuna longlining started in 1995 when several private sector companies brought in vessels and started to fish commercially. In 1996 there were 9 domestic longliners licensed, and this increased to 39 in 2001. However, not all licensed tuna longline vessel were active during this time. With the opening of the RD cannery in Madang, PNG allowed RD to bring in 10 purse seiners to fish as domestic vessels to supply the cannery. By 2001 there were 3 companies with 16 domestic tuna purse seiners in PNG.	under joint venture arrangements, most with Japanese companies. Many tuna longline and purse-seine fishing operations in PNG in the 1980s and 1990s were based on charter fishing and/or joint venture fishing arrangements with foreign fishing companies. In 1995 there were 3 locally based purse-seine vessels in PNG, although these were foreign vessels under charter to local companies.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in Papua New Guinea

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Molean Chapau, Managing Director, and Ludwig Kumoru, Manager Tuna Fisheries, National Fisheries Authority — NFA (September 2003).	Several charter boats operating in different centres around the country. Quite a few sportsfishing vessels in different centres. Lae, Madang and Port Moresby have annual gamefishing tournaments with 30–40 boats competing.	No real baitfishing, although some catching of garfish on the seagrass flats, with the garfish used as gamefishing bait.	Prawn trawl fishery in the Gulf of Papua and in the Torres straight. Many Indonesian vessels with motherships illegally fishing for squid and Spanish mackerel. NFA trying to licence these vessels. NFA has 12 trial fishing permits for new fishing methods or resources, or for fishing new areas.
Background References: DPI 1984; Kailola 1995; King 1982; SPC 1984; Whitelaw 2001.	Gamefishing has become quite popular in many locations around PNG. There are several charter fishing operations, with 2 in Madang, 3–5 in Port Moresby and in Lae, and 1–2 in Rabaul. In 2000 there were at least 6 gamefishing clubs with both large (>7.6 m) and small (<7.6 m) vessels fishing. In Madang, 10+ large and 20 small; Lae, 15 large and 35 small; Kimbe, 3 large and 10 small; Rabaul, 5 large and 25 small; Port Moresby, 20+ large and 40 small; and Lihir, 1 large and 5 small. Each gamefishing club holds	6 Japanese research cruises were undertaken from 1968–70 to assess the skipjack and baitfish resources in PNG, with good results. Baitfish resources were adequate to support commercial fishing, which commenced in 1970 and ceased in 1982. SPC conducted baitfishing trials on 2 occasions (1977 and 1979) in PNG as part of the regional tuna tagging project. Commercial baiting by pole-and-line vessels commenced again in 1984, but was permanently closed in 1985. There were 14–23 baitfishing	Gulf of Papua prawn fishery has operated commercially since 1967, with 24–27 m trawlers towing twin rigs. Up to 40 species of prawns are taken, with squid a bycatch to the fishery. The catch is processed and frozen on board each vessel. In the 1970s there were 13–14 vessels operating, increasing to 23 vessels in 1987. 1 short survey for deep-water shrimp was undertaken in 1981 off Port Moresby, with traps set in depths from 230–650 m. Catches were low. Fisheries conducted a survey off Kavieng for deep-water

	its own tournaments during the year, some monthly. In addition, there is 1 annual tournament held around April, with this national event rotated around the clubs.	grounds in PNG between 1970 and 1980, with 2 grounds producing 50% of the baitfish catch.	shrimp in 1983, with the traps set in 285–565 m. Again, the catch rates were low.

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Pitcairn Islands

General

The Pitcairn Island group (Figure 1) is made up of two small islands, Pitcairn and Henderson, and two atolls, Ducie and Oeno, located between 23º and 26º S latitude, and 124º and 131º W longitude. Pitcairn Island is the only inhabited island in the group, with 50 people (SPC 2003).

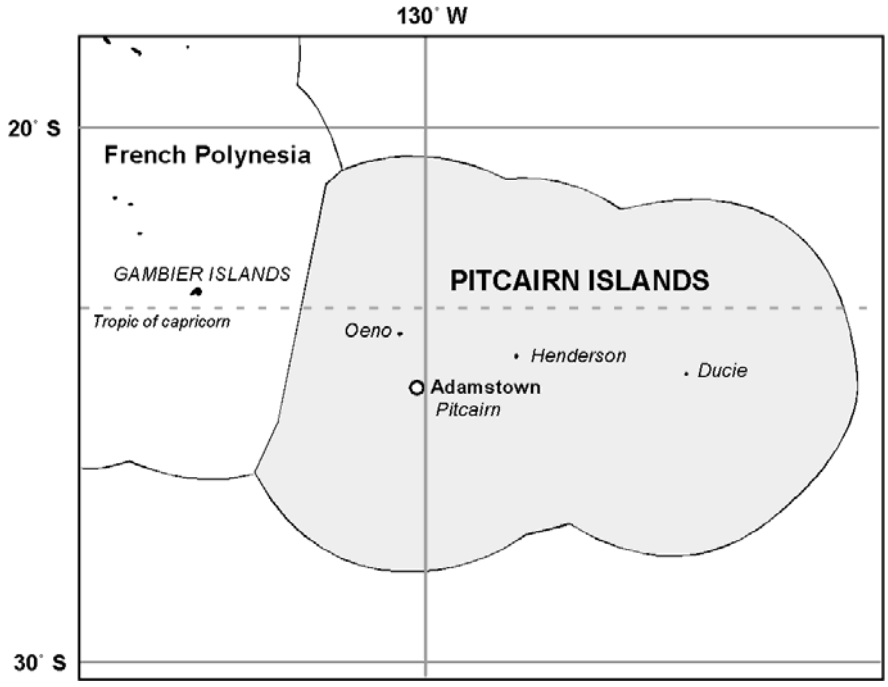

Figure 1: Pitcairn Islands, its EEZ and neighbouring countries

The Pitcairn Island group has an EEZ of 800,000 km^2, while having a land area of only 39 km^2. The Pitcairn Islands EEZ is mainly surrounded by international waters, with French Polynesia to the west being the only bordering country.

Pitcairn Island became a British dependency on 29 November 1838 (Nicolson 1965). Oeno atoll, Ducie atoll and Henderson Island were annexed by Britain in 1902 and were included in the dependency in 1938 (Carter 1981). Today the Pitcairn Islands are administered through the Office of the Governor of Pitcairn, Henderson, Ducie and Oeno Islands, which is housed in Auckland, New Zealand.

Fisheries development and management

The development and management of the marine resources within the Pitcairn Islands falls under the jurisdiction of the Office of the Governor of Pitcairn, Henderson, Ducie and Oeno Islands. There is currently no fisheries legislation covering the group, although some licences have been granted in the past for foreign fishing access.

Nearshore domestic fisheries development and/or management plans and strategies

There are currently no management plans for any fisheries in the waters of the Pitcairn Islands. Fishing pressure is light with a small population harvesting fish for their own needs and to sell small amounts to passing vessels. The 1994 assessment of resources undertaken by SPC (Sharples 1994) indicates that the resources are limited. Pitcairners are keen to develop an economically viable fishery if one exists.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in Pitcairn Islands

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Leon Salt, Commissioner for Pitcairn Islands (October 2003) and taken from Sharples 1994.	Very little deep-water snapper fishing undertaken, and this is done ad hoc by a couple of boats.	There are no fishing centres as the population is small and fish is not sold on the island, although some fish is sold to passing boats.	There is no boatbuilding on Pitcairn Island, although small boat repairs are undertaken when needed.
Background References: Dalzell and Preston, 1992; Sharples 1994.	An assessment was made of the deep-water snapper resource in 1992 by SPC staff (maximum sustainable yield (MSY) of 1.1–3.3 t/year), with this based on fishable depth, as no catch data was available. Fishing trials were undertaken at all 4 islands and atolls in 1994 for deep-water snappers using droplines with very low catch rates.	Pitcairn Island is the only inhabited island, with people having their own freezers for fish storage.	There are several diesel-powered long boats and several small outboard-powered skiffs on Pitcairn island. These have been imported, and only repair work is undertaken locally when needed.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in Pitcairn Islands

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Leon Salt, Commissioner for Pitcairn Islands (October 2003) and taken from Sharples 1994; Argue and Kearney 1982.	There are no FADs in the waters off Pitcairn Islands.	There has been no public sector small-scale tuna fishing.	There is very little domestic tuna fishing activity. The only activity is a small amount of trolling when the weather permits.
Background References: Argue and Kearney 1982; Sharples 1994.	There has been no recorded deployment of FADs in the waters of Pitcairn Islands.	There is no real public sector.	A lot of the fishing is conducted from the shore as the coast is exposed and there is no fringing reef around Pitcairn Island. Long boats and skiffs are occasional used for trolling tuna and other coastal pelagics.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in Pitcairn Islands

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Leon Salt, Commissioner for Pitcairn Islands (October 2003).	There are no public sector tuna fishing companies.	There is no private sector tuna fishery development around Pitcairn Islands.	There are no joint venture tuna fishing operations.
Background References: Argue and Kearney 1982; Sharples 1994.	There has never been any public sector tuna fishing company.	There has been no private sector tuna fishery development around Pitcairn Islands.	There has been no joint venture tuna fishing operation around Pitcairn Islands.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in Pitcairn Islands

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Leon Salt, Commissioner for Pitcairn Islands (October 2003) and taken from Whitelaw 2001, and Argue and Kearney 1982.	There are no charter fishing operations and no gamefishing activities. With the current situation, there is not likely to be any development in this area.	There are currently no baitfishing trials or activities being conducted.	There are no other nearshore fishing trials or activities being undertaken at present.
Background References: Argue and Kearney 1982; Whitelaw 2001.	There have been no charter fishing operations and no gamefishing activities at all in the past.	Baitfishing potential for live bait for pole-and-line fishing operations was assessed in 1980 with very little potential because of limited lagoon size and access for boats.	There are no records for any fishing trials or activities in the deep-water or nearshore waters around the Pitcairn Islands.

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Samoa

General

Samoa (Figure 1) consists of two main islands, Upolu and Savai'i, and six other islands, and is between 13º and 14º S latitude, and 171º and 173º W longitude. The mid-year 2003 population estimate for Samoa was 178,800 people (SPC 2003).

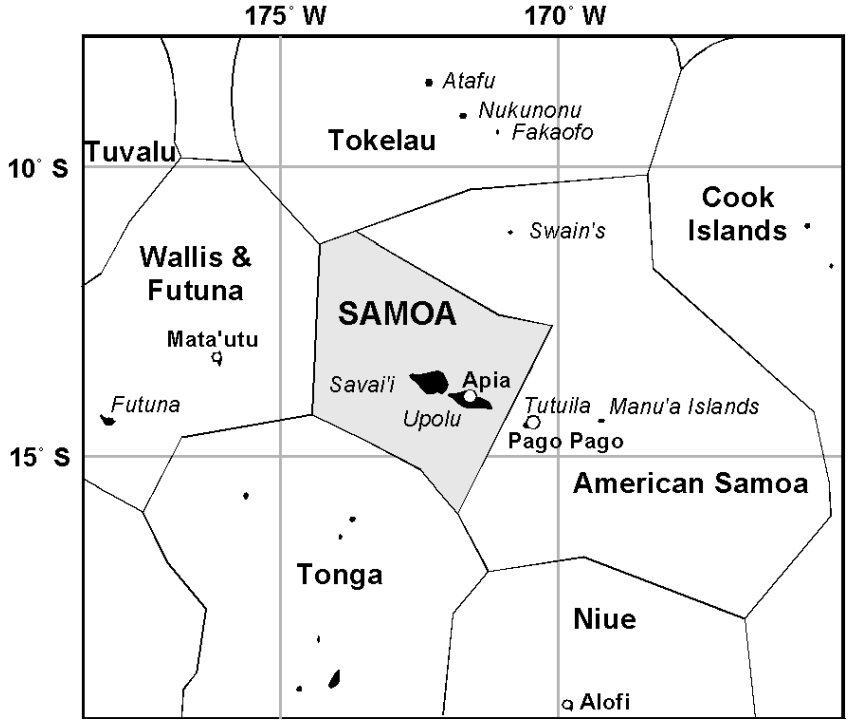

Figure 1: Samoa, its EEZ and neighbouring countries

Samoa has an EEZ of around 120,000 km^2, with a land area of around 2,935 km^2. Samoa's EEZ borders four Pacific nations, Wallis and Futuna to the west, Tokelau to the north, American Samoa to the east and the Kingdom of Tonga to the south.

Fisheries development and management

Fisheries management and development in Samoa falls under the jurisdiction of the Fisheries Division of the Ministry of Agriculture, Forests, Fisheries and Meteorology, through the *Fisheries Act 1988*, which was amended through the Fisheries Amendment Bill 2002. The Fisheries Act is currently being reviewed.

The development of fisheries is also covered in the Strategy for the Development of Samoa — 2002 to 2004 (GoS 2002). In this document there are two main areas that affect the development of nearshore fisheries; improve private sector development and employment creation, and enhance agricultural opportunities. Under these two areas the government makes the following statements (some of these have been expanded with specific strategies as they may relate to fisheries development in GoS 2002).

Improve private sector development and employment creation (private sector development)

The private sector will be further strengthened and supported through ongoing strategies to further improve:

i. enabling environment;
   a) maintain accommodative fiscal and monetary policies to support private sector;
   b) broaden tax base;
   c) continue refining the tax and tariff regime;
   d) remove anomalies and remove income tax and corporate tax exemptions; and
   e) enforce provisions of the companies Act 2000 and associated legislation.

ii infrastructure services;
   a) improve efficiency in the generation and supply of electricity around the country;
   b) expand capacity for telephone and internet connections;
   c) formulate the National ICT strategy; and
   d) expand the Apia port.

iii investment promotion and marketing;
   a) enforce the provisions of the Foreign Investment Act;
   b) enforce the one-stop-shop;
   c) establish small business development schemes to support small business development and employment in rural areas;
   d) establish an agency to lease customary land on behalf of investors;
   e) continue to investigate ways for commercial banks to use customary land as collateral;
   f) support the re-orientation of the manufacturing sector as a result of WTO accession;
   g) exploit opportunities presented by the PARTA;
   h) undertake investment promotion and marketing missions to existing and potential markets;
   i) market Samoa as a stable and terrorist-free destination;
   j) maintain close coordination amongst government agencies and with the private sector; and
   k) investigate feasibility of export processing zone.

iv employment creation; and

v sports development as an economic opportunity.

Enhance agricultural opportunities (agriculture and fisheries development)

Strategies for this sector will continue to focus on improvements and diversification, as appropriate, in:

i commercial agriculture;

ii village and subsistence level agriculture;

iii commercial fisheries management;
   a) develop policy for fisheries;
   b) enforce training on safety;
   c) enforce licensing, certification and safety requirements;
   d) establish marina; and
   e) generate information for domestic and export markets.

iv village and subsistence fisheries;
   a) enforce by-laws;
   b) strengthen supply of fisheries resources;
   c) encourage community ownership and management of fisheries conservation areas;

d) continue site selection of future areas for fish reserves;

e) promote stock enhancement; and

f) develop community capacity to manage inshore areas.

v livestock production;

vi forestry management; and

vii Ministry of Agriculture, Fisheries, Forests and Meteorology (MAFFM) management.

a) implement new corporate plan (2002 to 2005);

b) improve capacity on policy advice and information;

c) disseminate market information;

d) review legislation;

e) strengthen regulatory enforcement; and

f) establish service charter.

Nearshore domestic fisheries development and/or management plans and strategies

The Fisheries Division is working towards the drafting and implementation of development and management plans for domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the tuna fishery. At present there is no development and/or management plan in place for the deep-water snapper fishery, although the Fisheries Division is currently conducting fishing trials to do a stock assessment of these species so a plan can be developed. It is expected that a deep-water development and management plan will be drafted in early 2004 once the stock assessment work is complete.

Most nearshore fishery development in Samoa has occurred in the tuna fishery, and the Fisheries Division has developed a Tuna Management Plan (King et al 1999), with assistance from the AusAID-funded Samoa Fisheries project, for the offshore longline fishery. The Plan has several management options and objectives as well as a licensing scheme that was approved by Cabinet in September 2000 as follows (King et al 1999):

Tuna longline management strategy options

Historically, the main objective of fisheries management has been the conservation of fish stocks. In modern fisheries management this limited aim has been extended to address additional economic, social and environmental objectives such as fishers' welfare, economic efficiency, the allocation of resources, and environmental protection. The broad objectives of fisheries management may, therefore, include the conservation of fisheries resources and their environment, the maximisation of economic returns from the fishery, and payment of fees to the community from profits made by the exploitation of a public resource. Subsuming all these objectives is the need to ensure that fisheries are exploited on an ecologically sustainable basis.

Tuna stocks are large and are spread across large areas of the Pacific. They are fished off the coasts of many countries, and in the open ocean by many distant-water foreign fleets. Allocating a share of the total resource to fishers from different countries has been the subject of difficult negotiations. Under the Law of the Sea Treaty, a coastal country has control of offshore areas, an Exclusive Economic Zone (EEZ), out to 200 nautical miles from its coastline or outer reefs. In the case of shared (straddling) stocks, the Law of the Sea Convention states that the countries shall seek to 'agree upon the measures necessary to coordinate and ensure the conservation and development of such stocks'. The Forum Fisheries Agency in Honiara acts as the negotiating body for Forum member countries.

It must be noted that it is beyond the capacity of any one country to estimate the size and maximum sustainable yield of such a widespread resource. Nevertheless, it is likely that in the future, catch quotas (maximum catch limits) will be imposed on a regional basis for each Pacific island country.

Specific fisheries management objectives depend on the type of fishery under consideration. In a commercial

fishery in which most of the catch is exported, for example, maximising the catch may be chosen as an objective in order to maximise the earning of foreign exchange. Alternatively, maximising profitability may be regarded as an appropriate objective, and this may involve having a smaller number of highly efficient fishing units in the fishery. Conversely, in an artisanal fishery, which provides employment for local people, an appropriate objective may be to ensure that as many individuals as possible have an opportunity to share the resource.

a. Maximising the catch

Allowing fishing effort (say the number of boats in the fishery) to increase without restriction would result in the maximum catch weight being taken from the part of the total tuna stock passing through (or resident in) Samoan waters. However, as the resource would have to be shared by an increasing number of boats in the fishery, the individual catch of each vessel would decrease. The likely result would be a large fleet operating at low profitability. Returns to the country (export income less total fishing costs) would be low. Hence, the strategy of allowing the number of boats in the fishery to increase without restriction in order to maximise the total annual catch weight is not recommended.

b. Maximising profits and returns to Samoa

In order to maximise profits to industry and returns to Samoa, it will be necessary to restrict either the total annual catch or the amount of fishing (fishing effort) so that high catch rates and profitability are maintained. That is, maximum profits will be secured at levels of fishing effort less than that needed to maximise the catch. In other words there is a choice between having a large number of boats securing a large total catch at low profit levels, and a smaller number of boats securing a moderately high catch at higher profits levels. These alternatives are illustrated by the entirely hypothetical scenarios illustrated in Table 3.

Table 3: Two hypothetical scenarios comparing an unrestricted fishery (involving a large fishing fleet) and a controlled fishery (limited by either catch or effort restrictions)

Number of boats	Total catch for Samoa	Individual catch per boat per year	Profitability
Large (500?)	High (10000 t?)	Low (20 t per boat?)	Low
Moderate (200?)	Moderate (7000 t)	High (35 t per boat?)	High

A quota is usually given in terms of a total allowable catch per year. That is, the total allowable catch would be set in terms of an annual quota of, for example, 7000 t catch weight. When this quota has been reached, the fishery would be closed for the remainder of the year. Quotas have been set in other Pacific island countries; Fiji, for example, has had a Total Allowable Catch (TAC) of 3000 tonnes per year for albacore, 2000 tonnes per year for bigeye, and 2500 tonnes per year for yellowfin since 1994.

However, a quota would be difficult to enforce, and could result in a large unprofitable fleet fishing on a seasonal basis. Management by applying an annual catch quota is NOT recommended (although Samoa may be forced to accept a quota under current regional initiatives). As an alternative, it is recommended that restrictions on fishing effort be applied to maintain high catch rates and profitability. Fishing effort can be controlled by restricting either the number of boats, the number of hooks set by each boat, or a combination of both.

Restricting the number of hooks set by a vessel would be difficult (and perhaps undesirable as the number of hooks set by a vessel is a commercial decision based on factors including vessel size). It is therefore recommended that the fishing fleet should be limited to a maximum number of registered or licensed vessels. Restriction to a moderate number of fishing vessels will result in higher catch rates and higher individual profitability. From a community viewpoint, profits to the country (total export income minus total fishing costs) will remain high. A cautionary note is that even if the number of boats is restricted, fishing effort is still likely to increase as boat sizes and the numbers of hooks set per boat continue to increase (see under recommended strategy).

In addition, to maximise profits retained in Samoa, restrictions on foreign ownership of fishing vessels should be maintained at the level, which presently exists. Current guidelines allow for a maximum of 10 large vessels with foreign partnerships.

c. Maximising participation in the fishery

Maximising participation in the tuna fishery would be achieved by having a larger number of smaller fishing vessels. However, such a strategy is often at the expense of economic efficiency (see b. above) and it is suggested that a compromise strategy be adopted. That is, the aim of encouraging wide and local participation in the fishery should be tempered by the need to maintain economic efficiency.

It is recommended that some access in the fishery should be reserved for vessels under 15m in length. That is, a certain percentage of the total number of licenses should be reserved for smaller vessels, which are more likely to be affordable, by local fishers. This would allow the resource to be shared by a larger number of people (at the expense of some increase in the total cost of fishing to the country).

It should be noted, however, that the viability, safety aspects, and catch handling abilities mitigate against the use of very small vessels (including the original 9-10m alias). The small alia (the original FAO-sponsored design) is too small to carry sufficient ice to handle a catch greater than can be made from a single setting of a short longline, and is not designed to operate far from the coast.

Recommended management strategy (tuna longline fishery)

As tuna stocks are large and are spread across large areas of the Pacific, it is not practical for Samoa to address issues concerning the sustainability of the resource. It is beyond the capacity of any one country to estimate the size and maximum sustainable yield of such a widespread resource, and this must remain a task for regional organisations such as SPC. It is suggested that management in Samoa should be based on the view that the fishery is likely to be limited by the quantity of fish passing through (or resident in) Samoan waters in a given time, as well as the small size of the EEZ.

a. Maximising catch rates and profits by licence restrictions

It is recommended that maximising the total annual catch of tuna should not be the aim of management. Instead it is recommended that the aim of managing the longline tuna fishery in Samoa should be *to maximise catch rates, profits and foreign exchange by restricting the number of boats in the fishery. This should be tempered with the secondary aim of encouraging wide and local participation in the fishery.*

The most practical method of restricting effort in the fishery is to restrict the number of boats (although see the cautionary note in the next sub-section). The most convenient way of achieving this is by issuing a limited number of licences in the fishery. In summary, it is recommended that;

- *Participation in the longline fishery should be limited*. It is recommended that 200 licences be issued to fish for albacore, yellowfin and bigeye tuna for the export market.

- *A proportion of the licences should be reserved for smaller (<15m) boats.* It is recommended that 85% of the fishing capacity should be reserved for vessels under 15m in length (ie 170 boats out of the recommended total fleet size of 200 boats). It should be noted however, viability, safety aspects, and catch handling abilities mitigate against the use of very small vessels (including the original 9-10m alias).

It is further recommended that the above restrictions (on the total number of licences and the proportion reserved for smaller boats) should remain in place for two years. After this time, the restrictions should be reviewed in light of additional catch and effort information. Monitoring and managing the fishery relies heavily on obtaining reliable catch and effort data, and it is recommended that these data are collected through logbooks maintained by all licensed fishing vessels.

An additional benefit of a limited-entry fishery is that the registration or licensing of vessels is more likely to be complied with than at present. This will enhance the government's ability to monitor the fishery and its development.

It should be noted that, if the recommendation to restrict participation in the fishery by issuing licences is accepted, several related issues will have to be addressed. These include questions on how the available number of licences should be allocated, and on whether licences should be allocated to boats or to owners. With respect to the former, it is desirable to ensure that all those currently active in the fishery are guaranteed licences. The possibility that licenses will gain a value in the future requires that the issue of disposal of licences (from one owner to another) is addressed.

b. A cautionary note on fishing effort creep

Even if the number of boats fishing is restricted, fishing effort is still likely to increase as boat sizes and the numbers of hooks set per boat continue to increase. The number of smaller alias in the fishery will decrease, and the number of larger vessels will increase. One possible scenario is illustrated in Table 4, in which a moderate number of vessels (200) results in a total fishing effort of over 24 million hooks set per year, well over twice the number of hooks set at present.

Table 4: Scenario for the Samoan longline fishery showing the effects of increases in the number of fishing boats (up to the maximum of 200 vessels), the size of boats, and the number of hooks used per set

Number of boats	Type of fishing boat	hooks per set	days fished per year	1000s hooks set per year
90	small alias	320	160	4608
80	larger catamarans	700	180	10080
30	(>15m) monohull vessels	1500	220	9900
Total 200				24588

Increases in fishing effort related to increases in boat sizes could be prevented by placing limits on the numbers of hooks set by each licence holder or each licensed vessel. However, it is suggested that the enforcement of such limits is impractical at present.

c. Regulations and compliance

To be effective, fisheries regulations must be rigorously enforced. Regulations which are imposed but unenforced, either due to insufficient enforcement staff, or to overly complex and impractical rules, will fall into disrepute. If regulations are unenforced, benefits will accrue to those who ignore the regulations at the expense of those who fish according to the rules. Penalties applied should be significant to the offender, and relevant to the offence. The commercial poaching of high value species by unlicensed operators, in particular, should attract a large fine and gear confiscation to act as an effective deterrent.

The cost of enforcing regulations should be considered when any alternative management strategies are discussed. Enforcement costs often account for a substantial proportion of the total costs of managing a fishery. These costs are particularly high in the case of open sea fisheries, in which fisheries patrol vessels are employed.

In some cases, it is preferable to apply a less direct regulation which is cheaper to police, than a more direct one that is expensive. In the case of the tuna industry, ensuring that only licensed vessels operate in the fishery is likely to be expensive if sea patrols are required, as a large number of boats fish over an extensive sea area. However, as catches are marketed at a limited number of export outlets, it is a simpler task to enforce the rule at the point of sale rather than at the point of capture.

In this case, a regulation making it illegal for processors to buy tuna from an unlicensed operator would be easier to enforce than by conducting boat inspections at sea or at the wharf. Few processors would take the risk of receiving a heavy fine or loss of their export licence by buying fish illegally from an unlicensed operator.

It is usually the case that unlicensed fishers will attempt to find ways of circumventing the proposed regulation. A common method involves an unlicensed fisher selling fish to a processor through a licensed third party. In such breaches of the regulation, heavy fines should be imposed on both the unlicensed and licensed fishers involved; in cases of repeated offences by the latter, it should be made possible for the courts to confiscate the offender's fishing licence.

In summary, it is recommended that it be made illegal for

- unlicensed fishers to sell tuna* to exporters,

- licensed fishers to sell tuna* on behalf of unlicensed operators, and,
- exporters to buy tuna* from unlicensed operators

  * these recommended regulations refer to albacore, yellowfin, and bigeye tuna only.

It should be noted that supplementary regulations may be required to address international concerns such as the taking of shark fins and the killing of pilot whales.

Revision to Tuna Management Plan (Watt 2003)

To ensure the economic sustainability of the tuna fishery the Commercial Fisheries Management Advisory Committee (CF-MAC) in December 1999, proposed a licensing scheme that restricted the number of vessels over 10 m in the tuna longline fishery. Under the plan no restrictions were made on the number of licenses for small alias (10 m or less in length) as the number of alias participating in the tuna fishing industry had declined due to decreasing catch rates and low profits. However, restrictions were placed on the number of licenses for larger vessels. The larger vessels were divided into different classes according to length. Length classes and the recommended number of licenses to be made available were the following:

- *Class A:* vessels up to and including 10 m
  Licenses available: No limit — license fee SAT$ 200
- *Class B:* vessels over 10 m and up to 12.5 m
  Licenses available: 25 — license fee SAT$200
- *Class C:* vessels over 12.5 m and up to 15 m
  Licenses available: 15 — license fee SAT$500
- *Class D:* vessels equal to or greater than 15 m
  Licenses available: 15 — license fee SAT$5000

The proposed licence scheme was approved by Cabinet in September 2000.

Due to the increasing demand for more fishing licenses for vessels, in particular Class D, the OFS met with the CF-MAC in late January 2002 to review the Tuna Management Plan and determine whether additional tuna longline licences should be issued. After a lengthy discussion the CF-MAC members voted in favour of the following licensing scheme:

- *Class A:* vessels up to and including 11 m
  Licences available: No limit — licence fee SAT$200
- *Class B:* vessels over 11 m and up to 12.5 m
  Licenses available: 19 — licence fee SAT$1000
- *Class C:* vessels over 12.5 m and up to 15 m
  Licences available: 21 — licence fee SAT$5000
- *Class D:* vessels over 15 m and up to 20.5 m
  Licences available: 16 — licence fee SAT$10000
- *Class E:* vessels equal to or greater than 20.5 m
  Licences available: 9 — licence fee SAT$15000

  Note: licence fees increased to include resource rent

Cabinet approved the revised licensing scheme in February 2002. The Tuna Management Plan will be reviewed again after a period of two years.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in Samoa

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Tanielu Su'a, Director/ Head of Samoa Fisheries (September 2003).	Fishing is currently ad hoc although increasingly organised as displaced tuna longline alias enter the fishery. Government is promoting this fishery and is conducting fishing trials to gather data for a stock assessment, with this compared to the work of 10 years ago. Once stock assessment is complete, a management plan for this fishery will be developed (early 2004).	Government has 2 ice plants in rural areas with 2 more planned to be installed in 2003–2004. 3 village-owned fish centres on Savai'i and 2 village-owned centres on Upolu. 4 tuna processing and packing facilities in Apia.	4 boatbuilding facilities in Apia, with 1 working full time and the other 3 being semi-active. Boatbuilders work in aluminium making alias and super alias as well as conducting repair work. There is no slipway in Samoa.
Background References: Chapman 1998; Crook 1988; Dalzell and Preston 1992; Fisheries Division 2002; Fisheries Division 1994; Fisheries Division 1993; Fisheries Division 1989; Fisheries Division 1983; Fisheries Division 1981; Fisheries Division 1973; Gillett in press; Gulbrandsen and Savins 1987; Hume and Eginton 1976; Preston et al 1997.	SPC conducted initial deep-water snapper fishing trials and training in 1975 in the area around Asau, Savai'i. Fisheries Division promoted deep-water snapper fishing with many local fishermen taking up this method. SPC assisted the Fisheries Division in 1982–83 to assess if deep-water snapper stocks were declining around the Apia area. Results indicated the resource was not depleted. Bottomfishing trials conducted around Savai'i and the 17-fathom bank in late 1987 to assess the stocks and catch rates in these areas. In 1982, fisheries pole-and-line vessel attempts a trip to Pasco Bank, to conduct deep-water snapper fishing, but bad weather forced the trip to be abandoned. In 1986–87, a 12.5 m vessel was chartered to undertake fishing trials on offshore banks. As part of this project, a 13 m fibreglass vessel was built in 1988, and commenced deep-water	Government set land aside in 1970 for the construction of a Central Fish Market in Apia. Coldstore arrived in 1972 and 2 ice plants in 1973. Government project established with FAO/UNDP and DANIDA for village fisheries development. Fish market constructed and operational in late 1977. Market had 2 x 600 kg/24 hr flake ice machines and a 10 t freezer. 2 x 10 t refrigeration units installed, 1 at Apia fish processing and the other at Salelologa. In 1978, 10 refrigeration units provided under Japanese aid and installed in known fishing areas around Upolu and Savai'i. New fish market and fisheries breakwall/wharf completed and handed over by Japan to government in May 1982. New Fisheries Extension Centres established at Asau and Salelologa on Savai'i in 1992. Freezer supplied to	Government boatyard (Boatcraft) established in 1975 with assistance from FAO, with 120 plywood alia catamarans constructed from 1975–1979. These were mainly powered by 25 HP outboards. In 1978–79 the construction of the alia changed from plywood to aluminium and the size of outboard increased to 40 HP. Over 200 of these were constructed in the 1980s, with some sold to other Pacific countries. During the early 1980s, Boatcraft also made up aluminium FAD buoys for the Fisheries Division and iceboxes for local fishermen. During the late 1980s and early 1990s, Boatcraft reduced the number of boats being built as they could not bring in outboard motors. By the mid-1990s, several other boatbuilding facilities were established in Apia, all building aluminium catamarans for the rapidly expanding tuna longline

	snapper assessments work in late 1988. In 1990 an assessment of the deep-water snapper resource was undertaken, with an MSY of 88 t calculated, which could be caught by 14 alias. Deep-water snapper fishing assessments continued in 1992–1994 as fishermen reported declining stocks.	Asau centre in 1993. With the development of the tuna longline fishery, commencing in 1994, several private sector companies set up to process and export the tuna catch. In 2002 there were 4 companies operating with another under construction. In 2001 the Fisheries Division installed a new 10 t ice plant in Salailua, Savai'i. The following year fisheries installed a second 10 t ice plant at Asau, Savai'i.	fishery. Some companies stretched the alia to 10.5 m, raised the gunwale by 20 cm to increase freeboard, and put larger outboard(s) on them. Many alias produced from 1996–2002 when the fishery started to slow, with reduced orders. 1 company built the 12.2 m super alia for the Fisheries Division in 1999–2000, plus built several others once the design was trialled.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in Samoa

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Tanielu Su'a, Director/ Head of Samoa Fisheries (September 2003).	FAD programme re-activated in 2002 after many years (last FADs deployed in 1998–99). 1 FAD deployed in 2002 and 2 in 2003. Materials for another 5 FADs on order with the FADs planned for deployment in early 2004.	3-year albacore tagging project commenced in 2003 by the Fisheries Division using vertical longlines around FADs. Training planned for local alia fishermen displaced from the tuna longline fishery. This will commence after more FADs have been deployed in early 2004.	30–50 alias active in 2003 mainly trolling for skipjack around FADs or chasing offshore schools. Some vertical longlining around FADs, with the Fisheries Division encouraging the use of this method to reduce operating costs. 9 alias involved in the tuna longline fishery — a large drop in numbers compared to previous years.
Background References: Chapman 1998; Fa'asili et al 1999; Fisheries Division 1998; Fisheries Division 1994; Fisheries Division 1993; Fisheries Division 1989; Fisheries Division 1985; Fisheries Division 1983; Fisheries Division 1982; Fisheries Division 1981; Fisheries Division 1973; Gillett 2002; Gillett 1997; Gillett in press; King et al 1999; OFP 1997; Sokimi and Chapman 2000a; Sokimi and Chapman 2000b; SPC 1984; SPC 1983; SPC 1977a; SPC 1977b; Stanley and Toloa undated; Watt 2003; Watt and Moala 1999; Watt et al 2001; Watt et al 1998.	5 FADs deployed in 1979 off Samoa by NOAA staff from Hawaii. All 5 FADs were lost in less than 1 year. Samoa Fisheries Division deployed 7 FADs in late 1980, all around 10 miles off the coast and in depths over 1000 fathoms. In 1981, 6 of the FADs deployed in 1980 were lost. These 6 were replaced and another 4 deployed. At the end of 1981 there were a total of 11 FADs in the water. In 1982, 8 FADs were lost and another 11 deployments made. At the end of the year there were 14 FADs around Upolu and Savai'i. During 1983 and 1984 another 17 FADs were deployed, but at the end of 1984, only 1 FAD remained. The loses were attributed to purse-seine vessels setting	Japanese masterfisherman in Samoa from 1971–1973 to train Samoans in tuna fishing techniques (trolling, pole-and-line, longline and baitfishing). Fisheries Division received 3 vessels in 1972–73, a 11.5 m ferro-cement, 8.5 m tuna dory from Fiji and a 12.5 m training vessel from FAO. Trolling survey undertaken by the Pacific Tuna Development Foundation in 1975 using a 13 m vessel, with an average catch of 155 kg/day recorded. Fisheries acquired a 16 t Japanese-style pole-and-line vessel in 1978, with fishing trials conducted in 1979 and 1980 using cultivated live bait as well as wild-caught bait. In 1980 the vessel caught 10.4 t of tuna during 28 trips. Fisheries modified an alia	Many small-scale fishermen trolling around the FADs since their deployment in 1979. 2 private fishermen modified alia catamarans for pole-and-line fishing around FADs in 1980–81. They used cultivated mollies for live bait. In 1982 there were 116 alias fishing full-time and another 22 fishing part-time, mainly trolling for tunas around FADs. Fisheries estimated 2,400 t of fish were landed in 1982 with a value of WST $3.84 m. From 1985–1988 the alia troll fleet caught from 1,000–2,000 t annually. Following the initial vertical and horizontal longline fishing trials in 1990–91 conducted by SPC and the Fisheries Division, 25 alias

	their nets and cutting the mooring lines. From 1985–1988, 10 FADs were deployed around Upolu and Savai'i. Limited FAD deployments from 1989–1993, with a cyclone in 1990 causing the loss of all FADs. In early 1992, 3 FADs were deployed. In 1993–94, 8 FADs deployed, 2 supplied by SPC as experimental designs and 6 funded by the Samoan Government. 4 of these FADs were lost in 1994. From 1996–1998 only a couple of FADs were deployed. In August 1999, 4 FADs deployed, with one lost in the first 6 months.	catamaran in 1980 for pole-and-line fishing around FADs using cultivated mollies for live bait. During 20 trips in 1980, 3.8 t of tuna were landed. Fisheries conducted 3 gillnet sets around FADs for tuna, using mollies to attract the tuna to the net in 1983. 198 skipjack caught on first set and 980 skipjack and yellowfin the second set. Sharks or marlin badly damaged the net on the third set. SPC work with the Fisheries Division and conduct vertical longline fishing trials around FADs in 1990–91. Results were promising with good catches of albacore and yellowfin tuna deep in the water column. SPC assistance provided to the Fisheries Division and interested fishermen in 1999 and 2000. Tuna longline training and fishing trials to increase the catch rate for bigeye tuna undertaken. Sea and fishing trials also undertaken on new design super alia, with good results.	(9–10 m long) took up the methods by the end of 1994 and were fishing commercially. In 1999 the alia tuna longline fleet had increased to 146 vessels (setting around 300 hooks per boat per set), although this number reduced to 116 alias in 2001 due to declining catches and the need to travel farther offshore to fish. In 2002 and 2003 the numbers of alias in the tuna longline fleet continued to decline as catch rates in general declined.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in Samoa

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Tanielu Su'a, Director/ Head of Samoa Fisheries (September 2003).	There are no public sector tuna fishing companies, as the government supports private sector development.	Around 15 companies (4 main ones) all tuna longlining for fresh export or frozen albacore export to tuna canneries. 26 vessels over 15 m currently in the tuna longline fishery.	2 of the larger companies have vessels under joint venture arrangements, with the boats mainly coming from New Zealand or Australia. Government policy allows up to 30% foreign ownership in any business including joint ventures.
Background References: Chapman 1998; Fisheries Division 1993; Fisheries Division 1985; Fisheries Division 1982; Fisheries Division 1981; Boyle 1999; Gillett 2002; Gillett 1997; Gillett in press; King et al 1999; Sokimi and Chapman 2000a; Sokimi and Chapman 2000b; SPC 1984; Stanley and Toloa undated; Watt 2003; Watt	The Fisheries Division commenced commercial fishing activities in the late 1970s using their pole-and-line vessels, although no specific company was established. Fisheries also conducted boat hires. Government brought in a purse seiner from Nauru and another from the US to do trial sets around FADs in	Fisheries issued a licence to Deep Sea Fishing Enterprises of Samoa in 1984. The company chartered a small purse-seine vessel and fished around the FADs, moved the FADs around and fished within the 12 nm Territorial Sea. The vessel departed in 1984–85. In 1992, two fishing vessels, F/V *Marengo-bay* and F/V	The tuna fishery in Samoa started to expand in the late 1990s with larger vessels entering the fishery. Some of these vessels were brought in under joint venture arrangements between the Samoa-based fishing companies or Samoans and overseas interests.

and Moala 1998; Watt et al 2001; Watt et al 1999.	1980 with no catch. In 1981 a US purse seiner caught 130 t of tuna in 4 sets around the FADs in Samoa.	*Puaa-nifo* started horizontal tuna longlining. In 1992–93 these vessels caught 24.17 t of tuna made up of albacore (45%), yellowfin (26%), bigeye tuna (15%) and others (14%). In the mid-1990s, larger vessels entered the tuna longline fishery and by 1999 there were 6 large monohull vessels based in Apia. In 2001 there were 8 tuna longline vessels 12.5–15 m in length and 11 vessels over 15 m in the private sector.	

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in Samoa

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Tanielu Su'a, Director/ Head of Samoa Fisheries (September 2003).	There are 3 charter companies with 4 fishing vessels available for charter. Gamefishing club holds an annual tournament. Several private sportsfishing vessels in Apia.	There are currently no baitfishing trials or activities underway.	No other nearshore fishing activities at present. One proposal is being considered for the mariculture of mahi mahi in nearshore cages (outside the reef).
Background References: Fisheries Division 1981; King 1980; SPC 1984; Whitelaw 2001.	In the late 1990s and early 2000s a range of vessels have been available for charter, from 4.3 m aluminium runabouts to 24 m longliners. In 2000–2001 there were around 40 private vessels, used for gamefishing, although some of these were commercial alia catamarans. In the early 2000s the Samoa International Game Fishing Association held an annual tournament around August, with monthly competitions held as well.	Baiting trials using beach seines and night-lighting techniques were unsuccessful in the mid- to late-1970s. In June 1978 and February 1980 the SPC conducted baitfishing trials using light attraction at night and a bouki-ami net in 5 locations around Samoa with low catch rates recorded. Fisheries Division conducted the cultivation of mollies from 1978–1982, in an attempt to produce live bait for pole-and-line fishing. The project was terminated due to high costs and low catch-to-bait ratios.	Survey conducted for deep-water shrimp in September 1980. 2 entrance conical traps were set in depths from 300–850 m, with catch rates of 0.9–1.4 kg/trap recorded.

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The Solomon Islands

General

The Solomon Islands (Figure 1) is made up of over 350 islands between 5º and 13º S latitude, and 155º and 171º E longitude. Six large mountainous islands with other smaller islands lie in a double chain formation called the main group archipelago. The mid-year 2003 population estimate for the Solomon Islands was 450,000 people (SPC 2003).

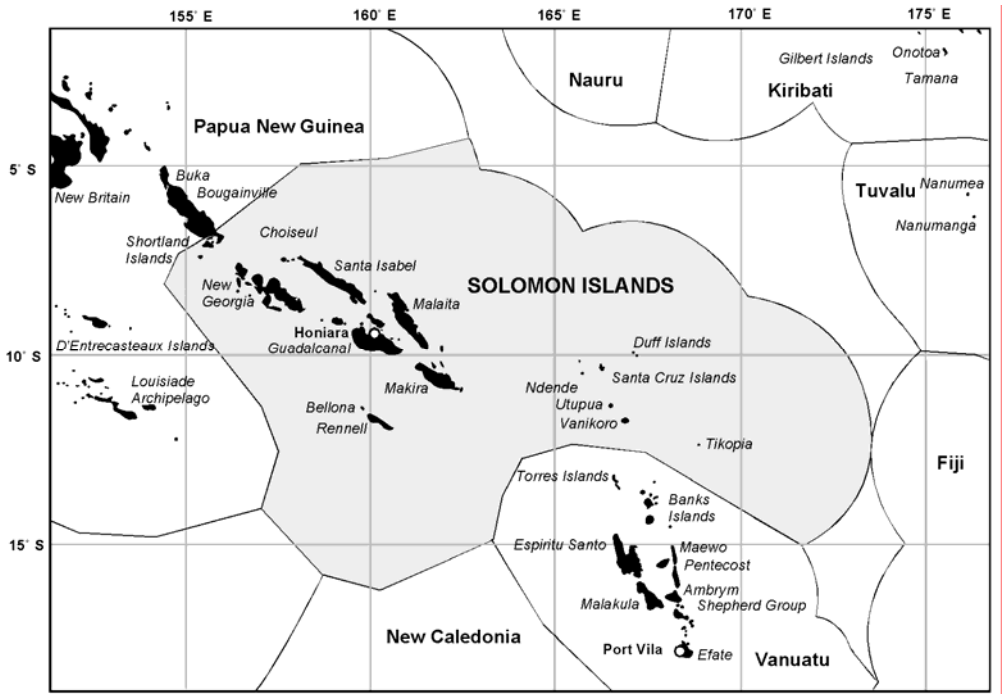

Figure 1: The Solomon Islands, its EEZ and neighbouring countries

The Solomon Islands has an EEZ of around 1,340,000 km^2, and a land area of around 28,370 km^2. The Solomon Islands has around one-third of its EEZ bordering international waters to the northeast and east, while the remaining EEZ borders five Pacific nations, Papua New Guinea to the west, the Republic of the Fiji Islands to the east, the Republic of Vanuatu to the southeast, New Caledonia to the south, and Australia to the southwest.

Fisheries development and management

The development and management of the marine resources within the Solomon Islands falls under the jurisdiction of the Department of Fisheries and Marine Resources of the Ministry of Natural Resources. The Department of Fisheries and Marine Resources works under the *Fisheries Act 1998* and its supporting regulations.

The development of fisheries is also covered in some of the sections in the National Economic Recovery, Reform and Development Plan 2003–2006 (NERRDP — GoSI 2003). The NERRDP focuses more on reform in both the public and private sectors, with development of fisheries and supporting infrastructure covered under several objectives and strategies in two or the five key strategic areas presented. The extracts from the NERRDP presented below cover proposed development in fisheries and support areas including infrastructure, again with a strong focus on reform.

National Development Goal and Objectives

Overall Goal and Objective of NERRDP 2003–2006(GoSI 2003)

The overall national development goal of the National Economic Recovery, Reform and Development Plan 2003–2006 is to enhance and improve the quality of life and the living standards of all the people in Solomon Islands, not just some people or groups but all people and all groups In Solomon Islands.

This goal can be achieved through ensuring that there is peace and harmony and personal safety among the people, increasing incomes and their equitable distribution and increasing the ability and improving the access to social services for everyone.

This means equitable distribution of development between all provinces and people in each province, between social groups and between men and women. It means giving preferential attention to the disadvantaged and marginalised groups as well as areas in the country. It means facilitating and providing assistance directly at the community level and raging and supporting community initiatives.

Immediate Objectives of NERRDP 2003–2006

The immediate objectives of the Plan are to

- Improve the security environment in restoring law and order and fostering peace.
- Strengthen and improve governance institutions and good governance.
- Bring about macroeconomic stability and income growth.
- Restore basic social services in health and education.
- Re-establish the foundations for sustained economic growth and human development.

Key Strategic Areas (KSA) of NERRDP 2003–2006

In the context of its overall goal and its immediate objectives, NERRDP 2003–2006 focuses key strategic areas. These are

- Normalising law and order and security situation.
- Strengthening democracy, human rights and good governance.
- Restoring fiscal and financial stability and reforming the public sector.
- Revitalising the productive sector and rebuilding supporting infrastructure.
- Restoring basic social services and fostering social development.

The expected outcomes in these five key strategic areas at the end of the Plan period are

- The law and order and security situation normalised.
- Democracy deepened, human rights protected and good governance improved.
- Fiscal and financial stability restored and substantial progress made in public sector reform.
- The productive sector revitalised and supporting infrastructure rebuilt.
- Basic social services restored and social development fostered.

Monitoring and assessing the progress of implementing the Plan to achieve these expected outcomes will be done by using measurable indicators including those for the Millennium Development Goals. This will assist in determining the extent to which real progress is made in improving the quality of life and living standards of people in Solomon Islands.

KSA 3 Restoring fiscal and financial stability and reforming the public sector

This focuses on

I. *Restoration of fiscal and financial stability in government.*

Increasing government revenues, reducing and controlling recurrent expenditure al the level that is sustainable by domestic revenue, managing and controlling government debt (formal and informal), and improving the management of public finances.

This will be achieved through:

Increasing government revenues

(a) Improving the revenue collection capacities of Inland Revenue Division, Customs and Excise Division and government departments. Revenue collection will also increase as a result of improvement in the economy.

(b) Reviewing and closing of all departmental accounts that have been opened to transact public revenues without the authority of the Department of Finance.

(c) Improving log export inspection and monitoring as well as enhancing coordination between the Forestry Division, Customs and Excise Division and Central Bank of Solomon Islands.

(d) Improving fish export inspection and monitoring as well as enhancing coordination between the Fisheries Division, Customs and Excise Division and Central Bank of Solomon Islands.

(e) Eliminating transfer pricing practices in the natural resources and other sectors

(f) Implementing import duty charges on agreed products under MSG Agreement.

(g) Reviewing and increasing charges (non-tax sources) for services provided by government departments.

(h) Reviewing tax rates to simplify administration and enhance revenue.

(i) Reforming and building the capacities of the Customs and Excise Division and Inland Revenue Division.

Public financial management

(a) Providing sound fiscal policy advice and budget management strategies.

(b) Completing all outstanding annual government accounts 1999, 2000, 2001 and 2002 and submitting for audit.

(c) Completing all outstanding annual accounts of statutory bodies and other SOEs and audit.

(d) Completing 2003 annual accounts of government and submit for audit on schedule and also 2004 annual accounts and thereafter.

(e) Managing and controlling budget expenditure in accordance with Parliamentary appropriations.

(f) Producing monthly expenditure statements and circulating to all ministries and departments.

(g) Improving accounting capacity of departments and rebuilding Solomon Islands Government accounting Service (SIGAS), particular attention to capacity building for female accounting officers.

(h) Reforming and building capacity of the Treasury Division.

II *Restoration of financial stability in the financial system.*

Negotiating and settling government debt arrears with the commercial banks and financial institutions and the paying of the outstanding required contributions to the National Provident Fund and relevant credit unions in respect of government employees.

III. *Monetary and exchange rate management and financial development.*

Maintaining monetary and exchange rate management policies responsive to the prevailing economic situation, promoting the development of the financial sector to increase access to financial services and credit, particularly in rural areas and ensuring the integrity and security of the financial system.

IV. *Strategic national and regional planning and aid management.*

Improving strategic planning and plan implementation at the national and provincial levels and improving the management and coordination of external assistance to enhance aid effectiveness.

V. *Reforming the public service.*

Downsizing and rightsizing the public service and improving public service performance at the national and provincial levels.

VI. *Reforming state-owned enterprises (SOEs).*

Improving the efficiency of state-owned enterprises including statutory authorities, and developing a privatisation strategy and privatising relevant enterprises.

KSA 4 Revitalising the productive sector and rebuilding supporting infrastructure

This focuses on:

I. *Revitalisation of the productive sector.*

Providing an enabling environment for the private sector to flourish and grow, Providing technical support services and information for sustainable development of natural resources in agriculture and livestock, forestry, fisheries and minerals and in the manufacturing and service industries, with particular attention to smallholders in rural areas and small and medium scale industries and ensuring fair returns to resource-owners for the use of their resources by others.

This will be achieved through broad strategies, policy actions and outcomes

(a) Restoration and normalisation of the law and order and security situation (see A.1).

(b) Restoration of fiscal and financial stability in government especially to enable prompt payment for services provided by the private sector {see A.3 (I)}.

(c) Reforming and improving the efficiency of the public service, in particular those departments that interface directly with the private sector {see A.3 (V)}.

(d) Restoration of financial stability in financial system to enable increased domestic credit to the private sector and rural credit {see A.3 (II)}.

(e) Reforming and improving the operational efficiency of state-owned financial institutions especially OBSI and the public utilities {A.3 (VI)}.

(f) Rebuilding of supporting infrastructure (see A.4 (II) below).

Fisheries

(a) Facilitate the rational management and conservation of coastal fisheries and aquatic living resources through their sustainable utilisation.

(b) Rehabilitate and promote the privatisation and commercialisation of rural fisheries centres.

(c) Promote aquaculture development of aquatic organisms such as seaweed, pearl culture, prawns etc.

(d) Promote tuna fisheries development through foreign and local investment.

(e) Increase revenue through licensing of more tuna fishing vessels under access agreements and domestic licensing arrangements.

(f) Improve the monitoring of fish catches, their exports and value and to share, such information with Customs, CBSI and related agencies.

(g) Review existing and formulate new fisheries legislation and management plans.

(h) Reforming and building capacity of the Department of Fisheries and Marine Resources.

II. *Rebuilding of supporting infrastructure.*

Rebuilding and improving physical and non-physical infrastructure in support of the productive sector and delivery of social services. These include land, sea, air and road transport infrastructure, communications energy, water resources, environment, trade and marketing, regulatory framework and financial services.

Environment

(a) Completing national process for gazettal and enforcement of Environment Act 1998 and the Wildlife Management and Protection Act 1998, preparing regulations and enforcing the Acts.

(b) Selecting a pilot site for International Waters programme focusing on coastal fisheries and developing the pilot site.

(c) Developing and implementing a National Biodiversity Strategy and Action Plan, National Framework for Biological Safety and national programme for national capacity self-assessment for biodiversity, climate change and land degradation.

(d) Developing and implementing National Implementation Plan for Stockholm Convention of Persistent Organic Pollutants, and national action plan for mitigating land degradation and drought.

(e) Review the national environment management strategy (NEMS).

(f) Drafting legislation for access benefit sharing of genetic resources.

(g) Completing National Pollution Prevention Plan.

(h) Reforming and building capacity of Environment and Conservation Division.

Transport infrastructure

(a) Adopting and implementing the National Transport Strategy.

(b) Continuing implementation of Inter-Island Shipping Project.

(c) Continuing implementation of Marine Infrastructure Project.

(d) Completion of Gizo physical infrastructure upgrading and improvement for MSG Summit.

(e) Finalising details of 1998 Shipping Act and Revised Road Act and National Transport Fund.

(f) Continuing to implement national maintenance regime and routine work programme.

(g) Providing appraisals of project profiles for Provincial Shipping Services Assistance Fund.

(h) Formulating medium-term infrastructure development programmes.

(i) Reforming and building the capacity of the Department of Infrastructure and Development.

Nearshore domestic fisheries development and/or management plans and strategies

The Department of Fisheries and Marine Resources (DFMR) is working towards the drafting and implementation of development and management plans for some of the domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the tuna fishery. The DFMR is promoting the development and harvesting of the deep-water snapper resource at present, although there is no development and/or management plan in place for this fishery and there is no immediate plan to develop one.

The management of the tuna resource in the waters of the Solomon Islands is very important to the government. At present tuna fishing is conducted mainly by foreign fishing vessels licensed to fish under access agreements, with some local vessels participating in the tuna fishery. To manage the tuna fishery, the DFMR drafted and implemented the Solomon Islands National Tuna Management and Development Plan — Tuna 2000: Towards a sustainable fishery for the next millennium (GoSI 1999). The management objectives, goals and strategies, and the development strategies for local tuna fishery development as stated in the plan are:

Management objectives

The objectives of the Solomon Islands government in managing its tuna fisheries are:

- to ensure that the tuna resources of the Solomon Islands are not exploited beyond their optimal sustainable yields; and
- within the limit set by this conservation objective, to harvest the resource in such a way that maximises the economic and social benefits received by the people of the Solomon Islands.

Management goals

In working towards the objectives, the main outcomes that management strategies under this Plan seek to achieve are:

1. Stocks are at sustainable levels,
2. Minimal impacts on non-target species and the marine environment,
3. Increased domestic participation in commercial tuna fisheries,
4. Increased revenue from foreign access,
5. Minimal social, cultural and gender impacts,
6. Efficient administrative services to support the management policies, and
7. Accountability to the public for the management of the tuna fisheries.

Management strategies

This Plan adopts strategies relating to the following broad areas:

A. Conservation management,

B. Regional management and cooperation,

C. Data collection and research,

D. Monitoring, control and surveillance,

E. Regulation of related fishing activities,

F. Environmental impacts and bycatch,

G. Domestic participation and development,

H. Foreign access and investment,

I. Social, cultural and gender impacts,

J. Administrative support and licensing systems,

K. Recovery of management costs, and

L. Accountability for management measures.

Development strategies

1. Encourage direct participation in small-scale tuna harvesting sector

- Development of a new multi-purpose vessel
- Local ownership of fishing vessels
- Canoe fisheries for tuna
- Facilitate the financing of chosen options
- Provide incentives to business developments

2. Facilitate the expansion of existing domestic operations

- Expansion of fresh sashimi longlining
- Expansion of the pole-and-line fleets
- Investment in maintenance and upgrading of existing infrastructure
- Local ownership of commercial vessels (discussed under Strategy 1)
- Provision of incentives to business developments (discussed under Strategy 1)

3. Facilitate the development of permanent shore-based facilities

- Large-scale processing facility
- Wharves and slipways
- Link shore-based facilities to foreign access

4. Encourage the development of a supply and service sector

- Development of a local bait supply service
- Expansion of transhipping
- Expand service sector — stevedoring, net repairs, entertainment services etc

5. Value-added processing

- Small-scale processing (smoking, jerky etc)
- Large scale cannery (discussed under Strategy 3)

6. Invest in targeted education and training programs

- Upgrade existing facilities at training institutions
- Develop training courses and workshops for key areas
- Sponsor students to undertake studies in priority areas
- Facilitate upgrading of qualifications of teaching and management staff

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in the Solomon Islands

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Sylvester Diake, Under Secretary for Fisheries, Ministry of Natural Resources (September 2003).	Rural fishing centres (RFCs) target deep-water snapper for both local and export sales. Several boats working out of Honiara target deep-water snappers. Other local fishermen fish deep-water snappers infrequently and ad hoc.	6 RFCs operating under the EU-funded Rural Fishing Enterprise Project (RFEP). There are several other centres around the Solomon Islands, with OFCF providing assistance with the maintenance of the ice machines etc.	2 small boatbuilding yards, all working in fibreglass and making the same 2.5–7 m canoes and skiffs. 1 engineering firm that can make larger vessels in steel or aluminium if boat plans were provided. They also make 3–5 m skiffs in aluminium. 2 slipways have facilities for repairing wood, steel and fibreglass vessels. Soltai has its own slip for maintaining its vessels.
Background References: Dalzell and Preston 1992; Eginton and James 1979; Fisheries Division 1994; Gulbrandsen and Savins 1987; Preston et al 1998.	Deep-water snapper fishing first introduced to the Solomons (Gizo) in 1977–78 by SPC. Boats used for the training were sold to local fishermen so they could continue with the method. In the mid 1980s, a Fisheries Department survey team conducted surveys of deep-water snapper resources in parts of the Solomons. RFCs were set up in many locations around the Solomons, with the basis of these projects being to harvest the deep-water snapper resource for local and export sales. SPC assistance was provided in 1993–94 to train local fishermen at 3 RFCs in deep-water snapper fishing techniques. Deep-water snapper fishing has been the focus of rural fishing projects being set up by different funding organisations around the country in the late 1990s and early 2000s.	More than 25 rural fisheries centres (RFCs) established in the 1980s around the country with funding from a range of sources including OFCF (Japan), CORA (Canada) and USAID. Most of the RFCs fell into disrepair as soon as the aid funding ceased (early 1990s). From 1990–1994, the EU, through the Rural Fishing Enterprise Project (RFEP), rehabilitated 3 RFCs. From 1994–1998, the RFEP rehabilitated or constructed 4 more RFCs. Also in the 1990s, OFCF established several RFCs, and the Nature Conservancy supports 2 new centres. In the early 2000s, RFEP continues with their work with 6 RFPs.	In the late 1970s, 2 companies commenced building mainly 5.5–7.6 m fibreglass canoes, with over 1000 of these built in the first 10 years. These canoes were mainly for transport or fishing in sheltered waters and trolling. In the 1980 and 1990s, 1 local engineering company built boats (merchant, barges and fishing) in steel and aluminium. In the 1990s, a third company commenced making fibreglass canoes and skiffs to the same style as the original 2 companies. Several slipways were constructed in the 1980s and 1990s, with these providing maintenance facilities for working on steel, wood and fibreglass vessels.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in the Solomon Islands

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Sylvester Diake, Under Secretary for Fisheries, Ministry of Natural Resources (September 2003).	FAD programme in place with NFD and Soltai for their tuna fishing fleets (purse-seine and pole-and-line vessels), with around 100 FADs maintained. RFEP have deployed several FADs to assist their rural fishing projects.	There is no small-scale public sector tuna fishing activities in the Solomons.	Some local fishermen troll for tuna around the closer FADs put out by NFD and Soltai, plus chase tuna schools at different times of the year. Rural fishing projects starting to fish around FADs for tuna, both to sell and to use for bait for deep-water snapper.
Background References: Chapman 1998; Chapman 2000; Sibisopere 1999.	Solomon Taiyo Limited (STL) deployed the first FADs in the Solomons (30 FADs in 1981) to support their group purse seiner. STL increased the number of FADs during the 1980s and 1990s to maintain around 100 devices for both the group purse seiner and their pole-and-line fleet of 21 vessels. National Fisheries Development (NFD) also commenced a FAD programme for their vessels in the early 1980s. NFD maintained over 50 FADs through the 1990s. The Fisheries Department in the Solomons has had no involvement in FADs or FAD programmes.	The Fisheries Division purchased some tuna longline gear for fitting out their research and extension vessel in 1999. The hydraulic reel was too large for the boat so the gear was never fitted to the vessel.	Small-scale operators in the vicinity of the STL or NFD FADs would troll around these when weather permitted. When foreign tuna vessels were transhipping their catch in the late 1990s, locals would take out vegetables and fruits and exchange for reject tunas, bringing the fish ashore to eat or sell on the domestic market.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in the Solomon Islands

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Sylvester Diake, Under Secretary for Fisheries, Ministry of Natural Resources (September 2003).	Soltai tuna cannery (previously Solomon Taiyo) has 12 operational pole-and-line vessels, a 1600 t freezer, arabushi fish smoking plant and office and engineering facilities based in Noro, Western Province.	NFD is a locally based foreign company that operates 3 purse seiners out of Noro. Solco Company Limited (previously Solgreen) is a joint venture operation with 8 tuna longliners. They used to land their catch in the Solomons, but the catch is now landed in Australia. Shark company has 10–15 longliners targeting sharks and 1 group purse seiner.	Solco is a joint venture operation with 8 tuna longliners exporting fresh tuna, mainly to Japan. Soltai is a joint venture between the government and the Western Province. Shark fishing company is a joint venture operation.
Background References: Chapman	NFD limited was formed as a	1n 1994, Solomon Islands	STL was established in 1973

1998; FFA 1996; FFA 1995; Gillett 2002; Gillett in press.	partnership by STL and the Solomon Islands Government in 1977. The company was then fully taken over by the Solomon Islands Government. The company started with 10 pole-and-line vessels in 1977, and purchased 2 purse seine vessels in 1988.	Imports and Exports Ltd (a local company) entered into an agreement with C&L Exports in Australia to longline and export fresh tuna. This project ran into financial difficulty and ceased operation in 1995. In 1990 NFD was sold off to British Columbia Packers, and became a locally based foreign company. In 2001 the company moved operation to Noro and had only the 2 purse seine-vessels.	as a joint venture between the Solomon Islands Government and the Taiyo Fishing Company in Japan. The company had a tuna cannery, arabushi plant, fishmeal plant, 21 pole-and-line vessels and 1 group purse seiner with carrier vessels. STL closed in 2001 after civil unrest in the country saw the Japanese partner pull out. From 1991–1994, 7 proposals were under consideration or agreed for joint venture arrangements between provincial governments and different foreign fishing companies. These have all ceased. Solgreen was established in 1995 as a joint venture between a local entrepreneur and the Sanwa Trading Co. of Japan, with 10 longline vessels targeting tunas for fresh export.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in the Solomon Islands

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Sylvester Diake, Under Secretary for Fisheries, Ministry of Natural Resources (September 2003).	Several charter vessels at Gizo. Yacht club in Honiara holds 2 gamefishing tournaments per year.	Baitfishing conducted by Soltai pole-and-line vessels in the lagoons. No other baitfishing activities conducted at present.	No other fishery development projects for fishing outside the reef at present.
Background References: Chapman 1998; Gillett in press; SPC 1982; Whitelaw 2001.	Several charter boats stationed in Gizo during the 1990s for gamefishing and diving. Also a couple of charter boats in Honiara at the same time. These are all private sector boats. Several local gamefishing vessels in Gizo and Honiara, with 1 or 2 gamefishing competitions held each year.	SPC conducted baiting in the waters of the Solomon Islands from 1977–1980 as part of the regional tagging project, with good catches. The pole-and-line vessels of STL and NFD paid royalties to local villages for fishing access to catch live bait for their fishing operations, from the 1980s to 2000. Soltai now pays a royalty for fishing access to lagoons for its 12 pole-and-line vessels to catch live bait. No other baitfishing activities have been recorded in the Solomon Islands.	No records of other types of domestic fishery development projects undertaken outside the reef.

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Tokelau

General

Tokelau (Figure 1) is made up of three low-lying atolls, Nukunonu, Fakaofo and Atafu, that are located between 8º and 10º S latitude, and 171º and 173º W longitude. Tokelau also has a claim over Swain's Island, which is currently under the jurisdiction of the US through American Samoa. The mid-year 2003 population estimates for Tokelau was 1500 people (SPC 2003).

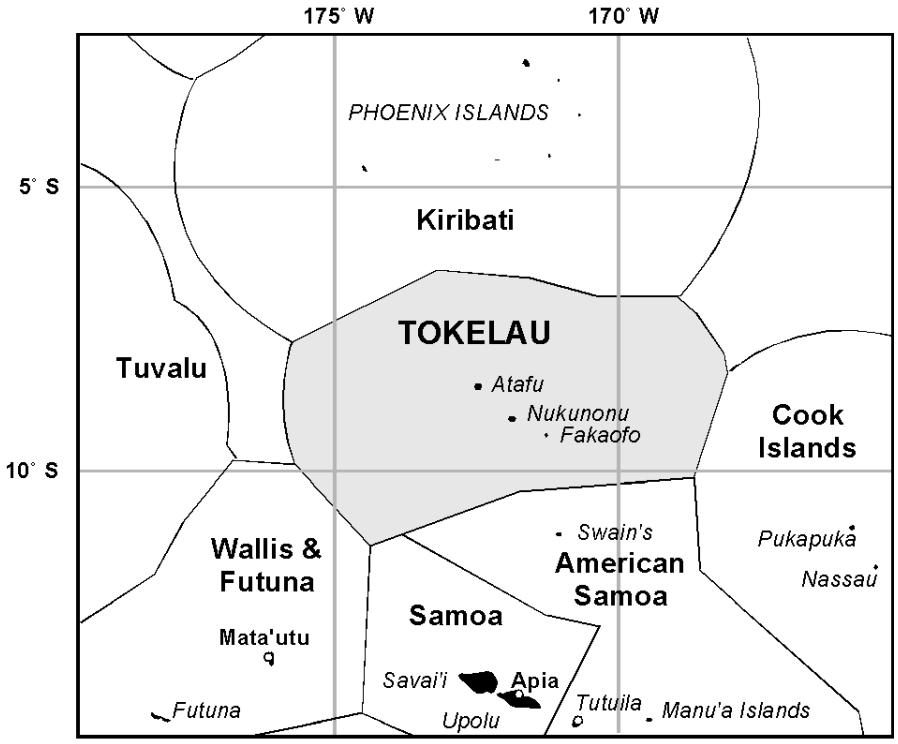

Figure 1: Tokelau, its EEZ and neighbouring countries

Tokelau has an EEZ of around 290,000 km^2, while having a land area of only 12 km^2. Tokelau's EEZ borders that of five other Pacific Island nations (the Republic of Kiribati to the north, the Cook Islands to the east, American Samoa and Samoa to the south, and Wallis and Futuna to the southwest), with around 15 per cent of the EEZ bordering international waters to the northeast and west.

Fisheries development and management

The development and management of the marine resources within Tokelau waters falls under the jurisdiction of the Department of Natural Resources and the Environment of the Office of the Council of Faipule. The Department of Natural Resources and the Environment works under the *Tokelau (Territorial Sea and Exclusive Economic Zone) Act 1977*. It is likely that this Act will be reviewed in the near future as Tokelau works towards the development of their tuna fishery and other management and international requirements.

The development of fisheries is also covered in the Government of Tokelau Planning for 2002–2005: Strategy Plan (GoT 2002). Under this strategy there is a Tokelau Fishery Development Plan for which the vision is '*To improve the quality of life for people living in Tokelau*'. The purpose, goals and strategies as presented in the Tokelau Fishery Development Plan (GoT 2002) are:

Purpose

The ocean surrounding Tokelau is a significant resource and a key asset for Tokelau economic development. As yet little is known about the potential for the fishery, although considerable work has been done at an international level in establishing Tokelau's rights to develop the pelagic fishery and on cooperation with other fishing nations (Samoa, USA, NZ) and, multilateral agencies. Continuing effective participation in international forums is a critical element in maintaining credibility and the voice of Tokelau on fishing matters.

The Tokelau Fishery Development Plan aims to advance commercial development of the pelagic fishery over time in a manner consistent with the objectives of sustainability and the greatest possible involvement of Tokelau in all aspects of the fishing industry.

The Council of Faipule has been instrumental in the preparation of the Plan for full consultation before decisions on direction and resources are made.

Subject to consultation, the Government of Tokelau intends adopting the following long term goals for fisheries development:

First. ***Commercial development*** of the marine resource within the Tokelau EEZ for the benefit of residents of Tokelau and the Government of Tokelau. Development does not mean exploitation if this in any way poses threats to marine resource sustainability, or traditional village food sources.

Second. ***Relationship with New Zealand.*** New Zealand is Tokelau's development partner. GOT will seek assistance and support from the Government of New Zealand to implement its Fisheries Development Plan as part of its determination to develop sustainability and independence.

Third. ***Cooperation*** with other fishing nations and multilateral agencies to ensure the sustainability of the pelagic fishery.

Fourth. To foster ***partnerships*** with commercial and government organisations that share Tokelau's long-term vision for sustainable marine resource development and our aspirations and economic development goals.

Fifth. Retain ***control*** by Government of Tokelau over the management of the fishery resource within the Tokelau EEZ.

Sixth. To increase ***Government*** **of** ***Tokelau revenue*** from fisheries.

Seventh. To promote ***employment opportunities*** for Tokelau residents in all aspects of the fishing industry, harvesting, processing, marketing, management and related supporting industries).

Eighth. To promote increasing ***Tokelau ownership*** of successful businesses in the fishing industry. In this context ownership includes, but is not limited to, government and/or resident, village cooperatives, family, private and public company ownership arrangements so long as majority ownership and effective control are in Tokelau hands.

Ninth. Creating an ***information asset.*** To systematically collect, analyse and present information on the marine resource so as to inform all stakeholders (on and outside Tokelau) and industry participants about progress, potential and development opportunities. This will be undertaken in collaboration with multilateral fisheries organisations.

Tenth. To ***promote understanding*** and debate on Tokelau about the opportunities, and how to participate fully in the global fishing industry.

To achieve these goals the Government of Tokelau has established three broad strategies, described below. These strategies are the foundation stones of the Tokelau Fishery Development Plan. The purpose of this document is to set target goals for each strategy that will be reviewed from time to time to determine their continued relevance, establish performance against target, and whether the goals should be reaffirmed or modified.

Strategy 1: "Alia" Boat Pilot Project:

Pilot project for provision of 6 "Alia" boats, freezers, training, and transport facilities.

Objective:

1. Determine the commercial viability of atoll-based pelagic fishing.
2. To provide food supplies for villages.
3. To provide training and skills development.
4. To provide related infrastructure, e.g. 24 x 7 electricity.

Strategy 2: Foreign Licensed Fishing Vessels:

Licensing foreign vessels to fish in Tokelau waters. This is the first year of operation in which FLV will fish in Tokelau waters.

Objective:

1. To increase GOT revenue.
2. To gather information on catch and resource.
3. To learn about dealing with commercial fishing companies.
4. To develop a platform for greater direct Tokelau involvement in commercial fishing.

Strategy 3: Tokelau Fishing Industry

Develop goals for a Tokelau owned, controlled, managed and run commercial fishing industry. There are important interdependencies between this strategy and the “Alia” and FLV strategies that need to be explored and understood.

Objective:

1. Set goals for 1, 3, 10 and 20 years.
2. Identify and investigate options.
3. Identify and make contact with potential strategic commercial partners.

Accountability

Objective: To promote understanding and accountability for the Fishery Development Project and the Role of the Government of Tokelau in fisheries development.

Nearshore domestic fisheries development and/or management plans and strategies

The Department of Natural Resources and the Environment (DNRE) is working towards the drafting and implementation of development and management plans for many of the domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the tuna fishery. At present there is no development and/or management plan in place for the deep-water snapper fishery, and there is no immediate plan to develop one.

The management of the tuna resource in the waters of Tokelau is very important to the government. At present there is very little tuna fishing undertaken, although it is thought that some illegal tuna fishing occurs within the Tokelau EEZ. To manage the tuna fishery, the DNRE has requested assistance from the Forum Fisheries Agency to design and draft a National Tuna Fishery Development and Management Plan. This work is currently underway, with input provided by SPC and it is expected that a draft plan will be available in early 2004.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in Tokelau

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Mose Pelasio, Senior Policy Advisory Officer, Natural Resources and Environment Unit, Office of the Council of Faipule (September 2003).	Deep-water snapper fishing is conducted ad hoc by small-scale private sector fishermen on all 3 atolls and used for home consumption.	There are no actual fishing centres in Tokelau, although freezers have been set up on 2 atolls, Fakaofo and Nukunonu, as part of a proposed community tuna fishing project. These facilities are run by the Taupulega (Council of Elders) on each atoll.	There are no boatbuilding facilities in Tokelau, and boats are imported. Small repairs are undertaken on aluminium boats on all 3 atolls. On Atafu, some traditional outrigger canoes are still built and repairs are undertaken from time to time.
Background References: Dalzell and Preston 1992; Gillett 1985; Gillett and Toloa 1987; Taumaia and Cusack 1990; Taumaia and Preston 1985.	Handlining for deep-water snappers was carried out traditionally by a few fishermen, with local names for some species. In 1982, SPC encouraged fishing of deep-water snappers with training of local fishermen on all 3 atolls. Further SPC training on deep-water snapper fishing in 1986 at Nukunonu and Atafu. With very low catch rates, deep-water snapper fishing was conducted ad hoc only through the 1990s and early 2000s by some fishermen.	No fishing centres were established until the Kileva Fisheries Project on Atafu, which commenced in 1990. This focused on catching tuna for processing into tuna jerky. Unfortunately, the project lasted only 2 years, as fishermen stopped supplying the processing facility. Freezer facilities (20 cubic metre blast and 20 cubic metre holding) established on Fakaofo and Nukunonu in 2002 and 2003 for each community as part of the 'Ika project'.	7–10 m outrigger canoes were traditionally built from carved planks stitched together with sennit or nylon line. 3 x 8.5 m aluminium alia catamarans were provided to Tokelau in 1980 (one for each atoll) by UNDP. Other small aluminium dinghies 3–5 m, were imported by local fishermen from the 1980s to present. 6 larger aluminium 'alia-type' catamarans purchased from Samoa (2 for each atoll) by the local government for the community 'Ika project' in 1999 and 2000. Some maintenance or repair work has been conducted on the atolls for the traditional canoes, timber or plywood boats and aluminium dinghies.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in Tokelau

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Mose Pelasio, Senior Policy Advisory Officer, Natural Resources and	No FADs in the waters of Tokelau at present. New FAD programme to be	'Ika project' planned to be implemented by the communities at each of the 3 atolls. 2 alia-type aluminium	Limited private sector development because there are no local markets for selling fish. Many local

Environment Unit, Office of the Council of Faipule (September 2003).	implemented in 2004 if donor funding support is identified.	catamaran vessels with tuna longline gear at each atoll. Tuna longline fishing trials planned to commence in 2004 if donor funding support is identified.	subsistence fishermen fishing part-time, mainly trolling with some mid-water handlining and poling using pearlshell lures from small outboard-powered dinghies or canoes.
Background References: Crossland and Grandperrin 1979; Gillett 1985; SPC 1983; Taumaia and Cusack 1990; Watt and Chapman 1998.	From the early 1980s to 1990, 9 FADs were deployed in Tokelau between the 3 atolls. In 1986, SPC provided training in the construction and use of vertical longlines around FADs. Trials were undertaken as part of the training, although not many fish were taken and the method did not catch on. In 1993 SPC trained Tokelauan counterparts and assisted in the deployment of 6 FADs, 2 off each atoll. Several of the FADs were replaced in the following years when lost. The FAD programme finished in 1998 with no new deployments, although some FADs lasted to the end of the 1990s.	Public sector in Tokelau means more community activities. The Kileva Fisheries Project on Atafu was for fishermen to sell their catch to. This processing facility then produced tuna jerky. This project ran from 1990–1992. The 'Ika project' was commenced in 1999, with Tokelau using US Treaty funds to purchase 3 larger alia-type aluminium catamaran vessels with tuna longline gear (1 for each atoll). In 2000–2001, 3 additional vessels of the same design were purchased, 1 for each atoll. In addition, in 2002 and 2003, two freezer complexes were constructed, 1 on Fakaofo and 1 on Nukunonu.	Traditionally, outrigger canoes were used by Tokelauans for trolling, pearlshell poling and mid-water handlining of tunas. Noose-fishing was also conducted for pelagics outside the reef. Motorised skiffs were introduced in the early- to mid-1970s. In 1979 it was estimated that there were 244 private fishing vessels in Tokelau, about half of these were open skiffs and the rest were canoes, some with small outboard motors. Many worked outside the reef for tuna. In the 1980s and 1990s, the number of canoes decreased as fishermen preferred the skiffs for offshore trolling and poling using pearlshell lures. Aluminium skiffs or dinghies were imported by local fishermen for trolling outside the reef. Poling using pearlshell lures dropped off during the late 1990s. Some fishermen continue using the mid-water drop-stone fishing method for targeting tunas.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in Tokelau

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Mose Pelasio, Senior Policy Advisory Officer, Natural Resources and Environment Unit, Office of the Council of Faipule (September 2003).	There are no public sector fishing companies in Tokelau at present. There is however, a community fisheries project (the 'Ika project') on each atoll, which is under the control of the Taupulega on each atoll.	There is 1 domestic medium-scale tuna fishing operator on Nukunonu, although this venture is just commencing.	There are no joint venture fishing operations in Tokelau at present.
Background References: Watt and Chapman 1998.	The Kileva Fisheries Project on Atafu that ran from 1990–1992 was not a tuna fishing company or project, but rather a processing facility that purchased tuna from local fishermen, and then	There has been no attempt at developing domestic medium-scale tuna fishing operations in Tokelau at present.	In the early 2000s, several Samoan-based fishing companies have put proposals forward to the Tokelau administration to enter into joint venture arrangements to allow their fishing vessels to

	processed this into tuna jerky. The community-based 'Ika project' was commenced in 1999 on each of the 3 atolls. However, very little fishing has been undertaken due to limited marketing options, transportation limitations and high operating costs for the vessels.		fish in Tokelau waters.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in Tokelau

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current Status Information provided by Mose Pelasio, Senior Policy Advisory Officer, Natural Resources and Environment Unit, Office of the Council of Faipule (September 2003).	There are no charter vessels in Tokelau, although local fishermen will take people out from time to time. There is no organised gamefishing in Tokelau at present.	There are currently no baitfishing trials or activities underway in Tokelau.	Traditionally, Tokelauans have fished for flyingfish outside the reef, and this continues today, although more modern gear is used. No other nearshore fishing activities at present.
Background References: Gillett 1985; SPC 1983; Taumaia and Preston 1985; Whitelaw 2001.	Small outboard-powered skiffs or dinghies are used for trolling for gamefish species, although this is subsistence or artisanal fishing. There are no organised gamefishing activities as tourism is very limited and local fishermen fish for food, not for sport.	Baitfishing trials were conducted in 1983 in the lagoons of Atafu and Fakaofo using light attraction at night and a lampara net, or a beach seine net during the day. Catches were very low and the main species were not considered good live bait for pole-and-line fishing operations. The trials were conducted from skiffs, as there is no access to the lagoons in Tokelau for larger fishing vessels. Baitfish species have been reported outside the reef seasonally in schools, although no fishing of these schools has occurred.	For decades, Tokelau fishermen have used canoes and scoop nets with light attraction (burning coconut fronds) to fish for flyingfish at night. From the late 1970s, changes in the gear have occurred (the use of hurricane lanterns, outboard-powered skiffs, monofilament netting for the scoop net), although the basic techniques have not changed. Another traditional fishing method is noose-fishing, using a rope with noose and bait to attract pelagic fish to it. This method has all but died out in recent years.

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Kingdom of Tonga

General

The Kingdom of Tonga (Figure 1) is made up of around 170 islands and atolls in three main island groups, Vava'u, Ha'apai and Tongatapu, between 15º and 23º S latitude, and 173º and 177º W longitude. The islands are a mix of uplifted coral atolls with a few volcanic islands. The 2003 mid-year population estimate for Tonga is 101,700 people (SPC 2003).

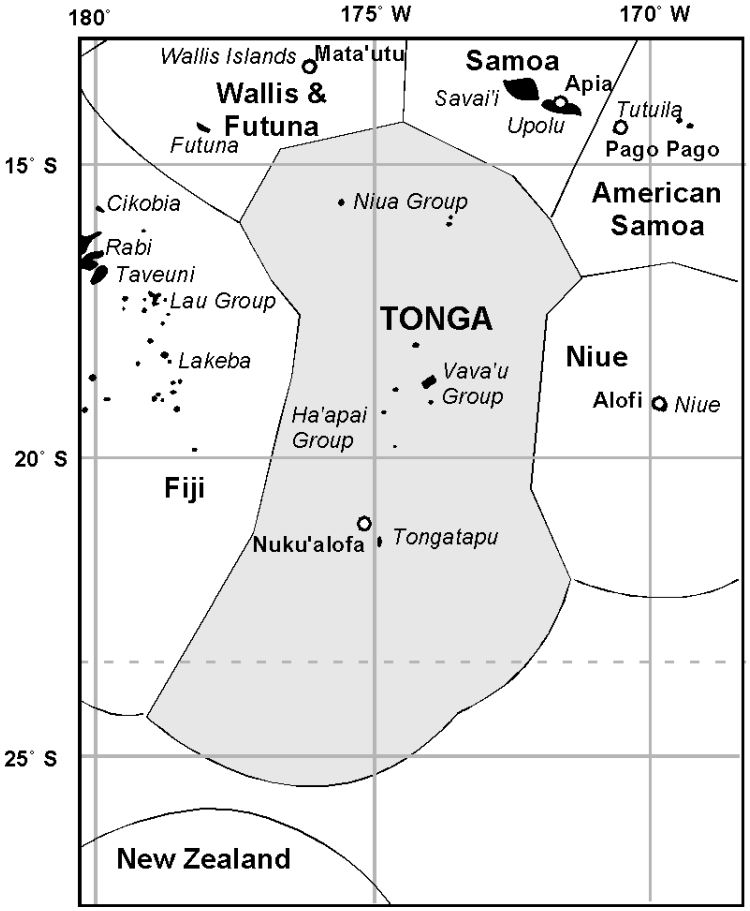

Figure 1: The Kingdom of Tonga, its EEZ and neighbouring countries

The Kingdom of Tonga has an EEZ of around 700,000 km^2, while having a total land area of 650 km^2. The Tongan EEZ shares common borders with five other Pacific Island countries or territories, the Republic of the Fiji Islands to the west, Wallis and Futuna to the northwest, Samoa to the northeast, American Samoa also to the northeast, and Niue to the east, with around 25 per cent of the EEZ bordering international waters to the south.

Fisheries development and management

The development and management of the marine resources within the Kingdom of Tonga falls under the jurisdiction of the Ministry of Fisheries. The Ministry of Fisheries works under the *Fisheries Act 1989* (Section 59) and the Fisheries (Conservation and Management) Regulations 1994. In addition to this legislation, the Kingdom of Tonga has a National Strategic Development Plan (7), 2001 to 2004 (GoT 2001a) that also covers marine resources. In the National Strategic Development Plan 7, 2001 to 2004 (GoT 2001a), the objectives as stated are:

Objectives

- well educated and skilled labour force, and a healthy population;
- efficient, well structured state owned enterprises (public utilities);
- sound and encouraging environment for the development and increased involvement of the private sector in economic activity;
- efficient and well structured government sector, with the qualities of good governance and accountability;
- well maintained physical infrastructure;
- prevent or minimise the degradation of the environment and misuse of resources;
- active participation of Civil Society Organisations and the community in economic development;
- development benefits being distributed equitably;
- low crime and guaranteed national security; and
- stable macro-economic environment.

Fisheries is identified as Priority Policy Sector 2, with the following Policy Guidelines presented:

- ensure the enforcement and successful implementation of fishery management plans;
- invest and adopt a forthright plan in administering and promoting tuna development;
- review and abolish where appropriate, existing fiscal disincentives to the development of the tuna fisheries;
- encourage and enhance private sector participation especially in commercially viable fishery like tuna and pearl farming;
- consider privatising fisheries government going concerns that are commercially viable;
- establish a thoughtful strategy for foreign involvement in commercial fishing interests namely for tuna and pearl farming;
- establish a more sophisticated, efficient and effective smart marketing arrangement with a particular focus on high value fishery;
- strengthen fisheries institution and stakeholder input in the Ministry's institutional reform as well as fisheries research;
- manage depleted inshore fisheries, in particular restrict the exploitation of bottom fisheries;
- prioritise and develop pearl farming through:
  - segmenting the industrial production responsibilities in order to spread the risks on waiting for the first economic returns;
  - resolving and establishing aquaculture leases, otherwise assess the feasibility of a licensing system;
  - establish a hatchery for higher value pearl culture; and
  - airfreight capacity to expand hand in hand with the expansion in the volume of fish exports.

Nearshore domestic fisheries development and/or management plans and strategies

The Ministry of Fisheries has been developing several fishery management plans that cover domestic nearshore activities in their tuna fishery, deep-water snapper fishery, and charter fishing operations.

Tonga National Tuna Management and Development Plan [GoT 2001b]

Consistent with Part II Section 3 of the Fisheries Act 1989 the purpose of the Management and Development Plan for the Tuna Fishery is to establish:

- objectives and strategic direction for the conservation and management of tuna resources and the fulfilment of the economic potential of the tuna fishery;

- clear and transparent rules for licensing, monitoring, and regulating fishing activities in Tonga's fisheries waters;
- guidelines for decision-making, consultation and administration in regard to the tuna fishery; and
- measures for tuna conservation and management at the national level that are compatible with those established both regionally and internationally.

Part IV of the National Tuna Management and Development Plan focuses on the development of the tuna fishery to fulfil economic potential. The section states:

The development aspects of the Tuna Plan set out a broad summary of issues for the further consideration of government. These are areas that will rely on input and action from other government agencies and extensive discussion with industry.

Implementation of the strategies and achievement of the goals outlined in Part IV will be a major factor in the Tuna Plan meeting the overall objectives of the fishery:

- ensure that the utilisation of Tonga's national tuna resource is compatible with the sustainable harvesting of the tuna stocks throughout their range; and
- maximise economic benefits to Tonga from the utilisation of its tuna resources, including harvesting and processing.

Further development of the domestic tuna industry

Investment policies

An investment regime conducive to industry growth should be administratively efficient, consistent, transparent and competitive with other countries in the region. The current investment regime would not appear to meet these requirements and a review of current arrangements is recommended.

Foreign investment

Current government policy restricts participation in the tuna fishery to 51% owned Tongan companies. This restricts the level of foreign investment and has led to limited growth in the fishery and a high turnover of participants in the industry. It is recommended that the ownership limitations be relaxed and foreign owned companies incorporated in Tonga and having their primary base of operations in Tonga be allowed to establish operations. However, vessels operated by foreign owned companies would have to base locally and preference would be given to Tongan companies in the allocation of licences. The government is reviewing the Foreign Investment Act and the outcomes from this review will have implications for the fisheries sector.

Credit

The Fisheries Sector Review stated that the repayment term is inadequate given the start-up uncertainties of new fishing ventures. The lack of familiarity on the part of the banks with the nature of the fishing industry is often highlighted as causing reluctance on the part of the banks to make loans available to the sector. To address this it is recommended that technical assistance be sought to provide training to the major banks in appraising fisheries loan proposals thereby making the banking sector more responsive to the needs of the industry.

Infrastructure

The development of the tuna industry in Tonga is dependent on the provision of adequate supporting infrastructure, particularly wharves, onshore processing facilities, including ice making capacity and the provision of airfreight services. Government has been involved in the operation of onshore processing facilities, but the stage of development of the private sector would now suggest that the private sector should assume this role. However, the government does have a role in facilitating such developments.

Training and education

The Tonga Maritime Polytechnic Institute is the primary institute for maritime training in Tonga. However, there is currently no course specific to the needs of the fishing industry being run by the Institute. In order to

better service the fishing industry, specialised training for fishing crews is required including pre-sea training.

In addition, a programme within the school system educating students on the importance of marine resources to the economy of Tonga. Such a programme should also promote greater awareness of the need to protect the marine environment and adopt practices to reduce marine pollution. Future opportunities for employment in the fisheries sector, both nationally and regionally, could be highlighted as part of this programme.

Enhanced fleet opportunities

Fleet characteristics

Small vessels have already proved to be unsuitable in Tonga as longline vessels (FV *Capricorn I*, FV *Capricorn II*, and FV *Avalon*). Furthermore, smaller vessels in the 15 m or less range have been unsuccessful as domestic longline vessels in Federated States of Micronesia — largely because of their limited fuel capacities and fish holding capacities. However, some smaller vessels in the 15 m range operating in Fiji and French Polynesia have had some success.

In general it would appear that larger vessel of at least 18 metres in length are the most suitable vessels for the Tongan longline fishery. However, such vessels might not be suitable for use in the outer islands of Vava'u and Ha'apai due to infrastructure constraints. The use of smaller vessels in these areas would also provide the opportunity for small-scale fishermen to enter the commercial tuna industry due to the lower cost of such vessels.

Increase revenue generated from the tuna fishery

Domestic licence fees and charges

The fee for a local fishing licence for a typical longliner in Tonga is in the vicinity of T$100. In reality the fee level represents a nominal figure. There would appear to be scope for increasing this fee, although this might only be appropriate if other taxes and duties being imposed on the industry were reduced. Given the paucity of available data, it is difficult to base a proposed licence fee on any economic rationale. To address this problem, an independent study on options for domestic licensing fees will be commissioned. In addition, in the medium term, consideration should be given to implementing some form of cost recovery into licensing fee calculations.

Foreign access fees

The standard fee for access in the region is currently set at 5% of the value of the anticipated catch for each vessel, with the amount of catch being based on historical records. However, the quality of data from the longline fleets has been generally poor and Tongan waters have not attracted high levels of foreign fishing. Under such circumstances it is difficult to recommend an appropriate fee level for foreign fishing operations in Tonga. However, the current fee of US$10,000 per vessel seems a reasonable bottom line, as this has been the maximum fee paid by frozen longline vessels operating in countries neighbouring Tonga. The study referred to in Section 6.1 could also consider this issue in greater detail.

Foreign exchange earnings

Exports of tuna can make a major contribution to foreign exchange earnings in Tonga. Current estimates of foreign exchange earnings from the tuna fishery in Tonga are not precise. The Ministry of Fisheries sets a price of T$3–50 which is used for the calculation of export tax. The real price on the Japanese market may at least be three times higher. The Customs Department reportedly uses information at the time of export, which again will not be the true price as the product is sold at auction on arrival at the overseas market. Obtaining a reliable estimate of the foreign exchange earnings from the tuna fishery will require a follow-up with industry perhaps through the Customs Department. A more accurate value is expected to be of benefit in:

- attracting investment and external donor funding for tuna related issues;
- providing government with a better guide for the allocation of natural resources; and
- understanding the true value of the fisheries resources of the nation.

Final Draft Deep-water (Bottom-line) Fishery Management and Development Plan [GoT undated(a)]

Management objectives

Recognizing the shift in emphasis from relieving the fishing pressure on the inshore areas to a more export-oriented industry, the Ministry of Fisheries revised the original stated objective of fisheries development plan for the Kingdom of Tonga. The 5-year (1990–1995) Fisheries Development Plan stated that the overall objectives of fisheries development in Tonga are to;

'Create an environment conducive to the development of private sector involvement in fisheries; encourage commercial production of quality fish and marine products for both domestic and exportation markets; encourage alternative fishing habits to prevent overexploitation of traditional grounds; encourage technology transfers to increase productivity and profitability of fishing activities; encourage the development of market outlets, both locally and overseas, for fish and other marine products; improve the existing marketing systems; improve fish handling techniques and encourage fish processing under quality control measures; develop the Fisheries Department's scientific and technical capabilities to support the development of the sector ...'

Objectives and performance indicators

The key to success is managing the Deepwater Drop-Line fisheries resources is the setting of agreed objectives against which the management arrangements can be evaluated. The following have been suggested by research and discussions with the stakeholders.

1. *To increase export earnings from the deepwater fishery.*

   Performance Indicator is the current level and trends of export earnings.

   Trigger Point is decline or marginal improvement in export earnings.

2. *To review the Maximum Sustainable Yield.*

   Performance Indicator is the percentage of catch that is small.

   Trigger Point is a considerable increase in the percentage of catch that is small (large margin between TAC and MSY).

3. *To increase the level of employment of Tongans in the deepwater fishing sector.*

   Performance Indicator is number of Tongans currently employed.

   Trigger Point is no increase in Tongans employed in the fishery.

4. *To reduce fishing pressure on the inshore reefs.*

   Performance Indicator is the level and proportion of catch from inshore reefs.

   Trigger Point is no reduction in inshore fishing pressure or transfer of boats from these waters.

5. *To use precautionary measures to maintain sustainable stock.*

   Performance Indicator is the proportion of known MSY taken.

   Reference Point is 350 mt MSY (Latu and Tulua 1992).

6. *To establish an economic (resource) rent regime for the deep-water fishery to increase economic benefits to Tonga.*

   Performance Indicator is the level of rent earned.

   Trigger Point is declining economic rent due to poor performance of the industry.

7. *To maintain and improve the quality of the current catch.*

   Performance Indicator is the number of boats with improved handling procedures (e.g. using Ike jimi (spiking methods).

Trigger Point is low adoption rate of better handling procedures.

8. *To establish participatory approach to fisheries management of the fishery including Government, fishers and the industry.*

   Performance Indicator is the effective working of a Deep-water Drop-Line Fishery Management Committee.

   Trigger Point is the poor performance of the Deep-water Drop-Line Fishery Management Committee

Development of the deep-water line fisheries

As the deep-water snapper fishery is considered fully developed in catching capacity, it is strongly recommended that the area of quality improvement for the main export species be developed, and value be added to the bycatch and species destined for the domestic market. The consensus of the stakeholders is that the deep-water snapper fishery is both biologically and economically marginal. Given the importance of export to the Tonga economy there is scope for development in improving the quality and quantity of the export product. This includes marketing some of the species that are currently sold locally at overseas markets and marketing value-added products from the bycatch in both the domestic and overseas markets.

Charter Boat Fishery Management and Development Plan — Final Draft [GoT undated(b)]

Objectives and performance indicators

The key to success in managing the charter fisheries resources is the setting of agreed objectives against which the management arrangements can be evaluated. The following have been suggested by research and discussions with the stakeholders.

1. *Encourage the economic contribution of this fishery to Tonga through increasing foreign earnings.*

   Performance indicator is the number of tourists coming and annual tournaments held.

   Trigger Point is poor improvement in economic contribution of this fishery to Tonga.

2. *Identify and promote new methods and technological advances relevant to the fishing charter industry.*

   Performance Indicator is better and professional catch methods.

   Trigger Point is non-adoption of new methods and tag and release.

3. *Provide standards* of *conduct for all persons involved in the Tongan Fishing Charter Industry.*

   Performance Indicator is the acceptance of a Charter Boat Industry Code of Conduct for responsible fishing.

   Trigger Point is no Code and lack of compliance and shallow knowledge on the fishery and the kind of regulations that should be followed.

4 *Conserve, enhance, and restore recreationally important fish stocks and their habitat.*

   Performance Indicator is the level of recorded results of species caught.

   Trigger Point is increasing level of over exploitation of certain important species in Tonga.

5. *Adopt and implement better strategies for sustainable whale watching*

   Performance Indicator is a Code of Conduct for whale watching in Tonga.

   Trigger Point is the lack of acceptance of the management and monitoring of whale watching in Tonga.

6. *Develop opportunities for increased recreational fishing access and facilities in the marine environment, especially for Tongans.*

   Performance Indicator is the level of registered and licensed recreational fishing vessels and qualified operators in the fishery.

   Trigger Point is lack of accessibility (for Tongans) and unqualified and unlicensed operators.

7. *Promote public education and support for marine resource conservation, and angling ethics.*

   Performance Indicator is encouraging and supporting tag-and release methods, especially for tourist recreational fishers and educating them on angling ethics.

   Trigger Point is the current lack of support on tag and release methods of fishing and careless attempts in angling.

8. *Work cooperatively with Government, industry, user, conservation groups and other potential partners to advance marine resource conservation, enhance recreational fishing opportunities and establish cost share programs.*

   Performance Indicator is the training programmes for communities, fishers and operators and encouragement for tournaments.

   Trigger Point is the lack of training on the fishery and very little support of tournaments in Tonga.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in Tonga

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Vilimo Fakalolo, Principal Fisheries Officer, Policy and Planning Section, Ministry of Fisheries (September 2003).	2 main companies targeting deep-water snappers for export, 1 company has a processing facility in Vava'u as well as in Nuku'alofa. 24 vessels targeting these species (18 from Nuku'alofa and 6 from Vava'u). Other fishermen fish deep-water species ad hoc, with the fish eaten at home or sold on the local market.	Government has 3 ice plants in the Ha'apai Group and 1 in Nuku'alofa. 5 processing or packing facilities, 1 owned by government and leased to the private sector. 3 of these facilities are for tunas and associated species, 1 for deep-water snappers and 1 for both tuna and snappers. The last company has facilities in 2 locations. 3 of these companies have ice-making facilities.	Government boatyard in Vava'u where local timber boats are refurbished under a special scheme where the owner pays 25% and the government pays 75% of the costs. 1 company building fibreglass skiffs from 6–7 m in length, and also do repair work in fibreglass. Several places where repair work can be done on wood, plywood or fibreglass boats. 1 slipway which can do repairs work on steel or wood boats, although this is limited.
Background References: Chapman, 2001; Dalzell and Preston 1992; GoT undated(a); Gulbrandsen and Savins 1987; Mead 1987; Mead 1980; Mead 1979; Mead and Chapman 1998.	Deep-water snapper fishing trials were first conducted in Tonga from 1975–1977 as part of an FAO/UNDP exploratory fishing project. In 1978 SPC conducted fishing trials and training in deep-water snapper fishing, with additional training provided and fishing trials conducted in 1979, 1980 and 1981. The Samoan wooden handreels were used for fishing in 100–400 m depths.	Government fish market established in the late 1970s for fishermen to sell their fish. In the early 1980s, the government using aid funds set up ice plants and freezers in Ha'apai and Vava'u. A new fish market, ice plant, boat harbour, slipway and freezers were constructed in Nuku'alofa in 1986–87. During the 1990s the government ice and freezer	5 different prototype vessels constructed in Tonga in 1980–81 as part of an FAO/ UNDP boatbuilding project. SPC conducted an assessment of the vessels during deep-water snapper fishing trials. Boatyards were established at both Vava'u and Ha'apai. UNCDF boatbuilding project constructed 20 vessels 6–9.4 m long by 1985 with fishermen buying these boats with assistance (pay 50% of

	In 1980–81, some bottom longlining and trapping was also trialled. Additional fishing trials and training were undertaken in 1985–86 to further promote deep-water snapper fishing. This fishing targeted the seamounts around Tonga. During the late 1980s and early 1990s, over 40 local vessels targeted deep-water snappers, especially fishing the seamounts where better catch rates were achieved. During this time, export markets were developed for many of the species. Towards the end of the 1990s, catch rates dropped as people travelled further offshore in search of new seamounts. As a result, the number of vessels dropped. Management arrangements for this fishery were also introduced around this time.	facilities were refurbished, mainly under Japanese aid. In the early 2000s, the government fish market in Nuku'alofa was leased out to a private sector tuna longline company to operate. In 2001–2002, a new AusAID project started which included new ice plants and processing facilities in Ha'apai.	the cost) through the boatbuilding project. By 1988, 40 deep-water snapper vessels 8.4 m long had been constructed. Boatbuilding declined in the late 1980s and early 1990s as the demand for vessels for deep-water snapper fishing declined. The yards focused more on maintenance work than building new boats. During the 1990s, imported aluminium and fibreglass vessels became popular with local fishermen and tourist operators. 1 local company established to build fibreglass boats locally. In the early 2000s, the boatyards in Vava'u and Ha'apai were just repairing vessels as part of the government-funded boat refurbishment project.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in Tonga

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Vilimo Fakalolo, Principal Fisheries Officer, Policy and Planning Section, Ministry of Fisheries (September 2003).	4 FADs deployed in 2002 and 16 in 2003 (throughout Tonga) as part of the AusAID assistance project to Tonga. Currently 18 on station. AusAID project also looking at shallow-water FADs as well as deep-water. Some maintenance of the FADs is also undertaken. Sportsfishing Association in Vava'u has several sub-surface FADs.	No small-scale public sector tuna fishing activity except for the FAD programme. Government is promoting private sector development. Some fisheries training provided through the Maritime and Fisheries Training College, but this is mainly for tuna longlining.	Around 20–30 part-time fishermen trolling around the FADs and coast for tunas and other pelagics in season.
Background References: Chapman 2001; Gillett 2002; Gillett in press; Gillett and Lightfoot 2001; Mead 1979; Mead and Chapman 1998; OFP 1997; Wellington and Chapman 1999.	First FADs deployed in 1981–82 by the Fisheries Department. From 1984–1988 fisheries deployed 9 FADs, mainly off Vava'u and Nuku'alofa. Some FADs lasted only a couple of months while others lasted around 3 years. Additional FADs were deployed during the early 1990s, with most being concentrated off Tongatapu and Vava'u. In 1993, SPC assisted with training local	Initial fishing trials around FADs were undertaken by the Fisheries Department in 1981–82. SPC conducted a gear development project in Tonga in the late 1980s to develop mid-water fishing techniques (especially vertical longlines) that could be used in association with FADs. Fisheries staff conducted training with local fishermen on mid-water fishing techniques in the early 1990s,	In the late 1970s when deep-water snapper fishing was starting, very little trolling for tuna occurred. Local vessels started trolling for tunas and other coastal pelagics in the early- to mi-1980s, when FADs were in place to fish around. Some local fishermen experimented with mid-water fishing techniques such as vertical longlining in the early 1990s after the SPC gear development work in the late

	staff in rigging and deployment techniques, with 2 FADs deployed off Tongatapu. In the late 1990s the FAD programme was not really in existence except in the Vava'u area. The reason for the success there was that the local charter fishermen and gamefishing club took over the project and did all the rigging, deploying and maintenance. In 2001–02 a new FAD programme was established with AusAID funding.	but the methods did not catch on. In the late 1990s, the government focused more on developing medium-scale tuna longlining.	1980s, but these methods quickly died out. Tuna fishing during the 1990s was governed by the availability of FADs in different locations, with trolling being the main method used.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in Tonga

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Vilimo Fakalolo, Principal Fisheries Officer, Policy and Planning Section, Ministry of Fisheries (September 2003).	Ministry of Education uses the government tuna longliner for training longline crew, by fishing the vessel commercially to try to cover costs. Trained crew are encouraged to seek employment in the private sector. Ministry of Fisheries has 1 smaller tuna longline vessel.	Around 9 tuna longline companies plus government with 32 vessels currently tuna longline fishing. Of the 32 licensed vessels, 17 are locally owned (7 not fishing due to financial difficulty), 13 are locally based foreign vessels, and 2 owned by government. These vessels work to 3 of the 4 packhouses, the other packhouse is closed at present due to financial difficulty.	3 of the longline companies have between them 13 locally based foreign vessels under joint venture or charter arrangements.
Background References: Chapman 1997; Chapman 2001; Gillett 2002; Gillett in press; Gillett and Lightfoot 2001; GoT 2001b; RDA 1994; Sokimi and Chapman 2002.	The Government of Tonga commenced commercial fishing operations in 1982, when Japan donated a 30 m tuna longline vessel (F/V *Lofa*) to them. In 1991, the government decided to corporatise their fishing operation, and established the Sea Star Fishing Company (SSFC), which was 70% government owned. F/V *Lofa* was transferred to this company. Also in 1991, the government started a USAID-funded project on assessing the potential for small-scale tuna fishing operations. The project ran until December 1994. Good catches were reported on a seamount using a small 200-hook longline. In 1993, SSFC purchased its	In 1993, the government rescinded its decision to give SSFC the sole rights to exploit the tuna resource in Tonga, which allowed the private sector to enter the tuna fishery. Following the results and recommendations of the RDA study and fishing trials, several local people brought in small tuna longline vessels around 14 m in length in 1995–96. These companies used the government fish market for processing and packing their fish for export, with the rest of the catch sold on the local market. These vessels were unsuccessful and too small for the type of fishing needed in Tongan waters. Other local companies were	In the late 1990s when the tuna fishery was expanding, several of the companies entered into joint venture arrangements to bring in foreign vessels and base them locally.

	first additional boat, with 2 more vessels purchased in 1994. Persistent vessel breakdowns limited the fishing activities undertaken. In 1996, SSFC received more funding through an ADB loan, which funded the purchase of several new vessels and the building of a new processing plant. In 1998, the Government of Japan donated a new 39.5 m tuna longline vessel FTV *Takuo*, for training purposes to the Government of Tonga, and this vessel was given to the Ministry of Fisheries to operate. In the later 1990s and early 2000s, the Ministry of Fisheries ran FTV *Takuo* and another smaller vessel under commercial conditions to cover the running cost of the vessel.	established in the late 1990s, with 1 of the deep-water snapper fishing companies becoming involved. They used their processing facility for exporting tunas. By 2000–2001 there were 12 private sector tuna longline vessels operating to 4 processing facilities. Some of these companies started to bring in foreign skippers as there was a shortage of qualified local skippers. In 2002 the vessel numbers increased again, although 1 of the larger companies ran into financial difficulty and had to tie up their 7 vessels. This company also operated the government fish market under lease, and this has ceased operation as well.	

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in Tonga

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Vilimo Fakalolo, Principal Fisheries Officer, Policy and Planning Section, Ministry of Fisheries (September 2003).	Around 8 charter boats operating out of Vava'u. Annual gamefishing tournaments with additional international vessels participating as well as the local boats.	Currently no baitfishing trials or activities underway.	2 ex-Korean vessels doing exploratory fishing (with observer coverage) in deep-water. 1 vessel is trapping and the other is bottom longlining. Fishing trials commenced in September 2003.
Background References: Kearney and Gillett 1978; King et al 1994; OFP undated; RDA 1994; SPC 1983; Whitelaw 2001.	Charter fishing and gamefishing commenced in the late 1980s in Tonga, with the main centre being Vava'u. Charter fishing was tied into tourism development, with people coming to Vava'u specifically to go fishing. A few charter operators set up in Nuku'alofa in the late 1990s, although these operations were more focused on recreational activities in the lagoon rather than gamefishing. By 1999–2000 there were 5 full-time charter operators in Vava'u, with the main fishing season being June to November. Several other charter vessels came from New Zealand to fish the	Several surveys for skipjack tuna, which included baitfishing, were conducted in the late 1950s and 1960s. Baitfishing trials were conducted by Japanese vessels in the early- to mid-1970s. The baitfishing trials were tied into pole-and-line tuna fishing surveys. In the late 1970s the SPC conducted baitfishing trials in Tongan waters as part of their regional tagging programme on skipjack tuna. Baitfish were caught during all trials, but the type of bait, quality of bait, and its effectiveness was not good. In addition the supply of bait was inconsistent for regular	Tongans have a tradition of whaling, taking around 10 humpbacks per year. This practice ceased in 1979 following a royal decree. Surveys for deep-water shrimp were carried out in the early 1980s, with the species being present in the waters around Tonga, but the quantities were low. A series of research trawling cruises have been carried out in the Tonga Trench area in the 1980s, 1990s and early 2000s to identify new species, commercial species in harvestable numbers, and species that may have a medicinal value.

	season, which took the number of boats to 7. The charter fishermen in Vava'u maintain a good FAD programme in support of their fishing activities. At least 3 major fishing tournaments are held each year, 2 international billfish tournaments, and a national billfish tournament. These are conducted out of Vava'u.	pole-and-line fishing operations. Baitfishing trials were also undertaken by the Fisheries Department during the 1980s and into the early 1990s. In 1992 and 1993, baitfishing trials were conducted in the lagoon of Vava'u using light attraction and a small purse-seine net to catch suitable bait for tuna longlining activities. Catch rates dropped off in 1993 over the 93 sets made during the trials.	

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Tuvalu

General

Tuvalu (Figure 1) is made up of nine distinct coral atolls, which lie between 5º and 11º S latitude, and 176º E and 180º longitude. The mid-year 2003 population estimate for Tuvalu was 10,200 people (SPC 2003).

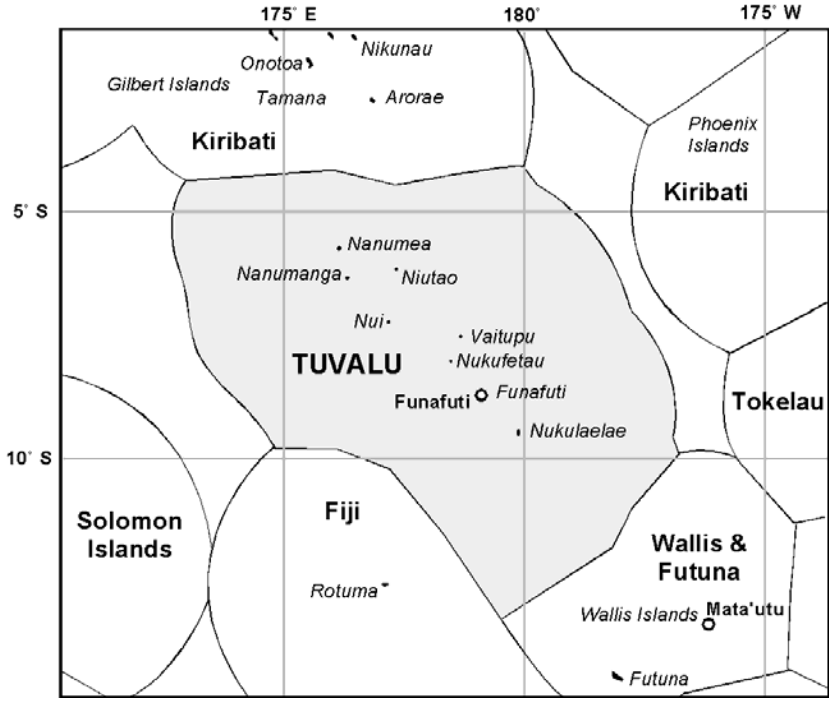

Figure 1: Tuvalu, its EEZ and neighbouring countries

Tuvalu has an EEZ of 900,000 km^2, while having a land area of only 26 km^2. Tuvalu borders three other Pacific Island countries, the Republic of Kiribati to the north, Wallis and Futuna to the southeast, and the Republic of the Fiji Islands to the southwest, with around 40 per cent of its EEZ bordering international waters to the east and west.

Fisheries development and management

The development and management of the marine resources within Tuvalu falls under the jurisdiction of the Fisheries Department of the Ministry of Natural Resources Development. The Fisheries Department works under the *Tuvalu Fisheries Act 1978* (CAP 45) and the associated fisheries regulations, and there are also areas under the *Tuvalu Marine Zone Act 1984* (CAP 24A) that the department needs to work within. The Fisheries Department is currently drafting a new Marine Resources Act that will strengthen domestic management, give more prominence to the sustainable harvest and use of marine resources and to meet the requirements of international agreements.

The development of fisheries is also covered in the latest Kakeega o Tuvalu or National Development Strategy — 1995 to 1998 (Government of Tuvalu 1995). In this document the industrial development of tuna fisheries is the main focus, including some changes to past strategies in developing this sector, as follows:

Industry Development

Against the background outlined in Section 4.1, the aim of the Government's industry development policies is to:

> *Engender structural change in economic activity towards export oriented industries with growth potential.*

The strategy for industry development

Industry development policies will be targeted on creating several relatively large scale export oriented commercial ventures using foreign direct investment (FDI) to supply inputs that are not readily available in Tuvalu. These ventures would in turn help to support enduring small enterprise activity. Drawing on the discussion in Chapter 2, a number of broad principles will be used to shape the programmes to establish relatively large scale industries in Tuvalu (see Box 5.1 overleaf).

Although the Government would not wish to exclude any potentially viable investment activity, the bureaucracy, and a number of consulting reports, have identified commercial fishing; tourism, and small scale manufacturing as having the greatest potential for commercial ventures. Complementing these activities, the Government will continue the support of smaller scale domestic businesses through training, technical assistance, and improving the availability of capital for investment (see also Section 4.3).

Commercial fisheries

The optimism about prospects for commercial fisheries development is largely due to the nation's vast ocean area. Tuvalu's Exclusive Economic Zone (EEZ) encompasses 900,000 sq km. Moreover, these marine resources are largely untapped except for deep water fishing by Deep Sea Fishing Nations.

Tuvalu has a small but very efficient artisanal fishing industry that supplies fish on the domestic market at prices from $0.50 to $2.00 per kg. An RDA assessment suggests that there are deep sea fish resources sufficient to support a fleet of 3 to 4 boats (RDA, 1995) exporting about 50 tonnes per year. Other marine products are available in Tuvalu but not on a large scale given concerns about depleting stocks.

Tuvalu has a good supply of relatively low cost labour that is accustomed to working at sea. In particular, with minimal retraining — perhaps 'on the job' — these seamen could be used to help man long distance fishing vessels, such as purse seiners and deep sea snapper fishing vessels.

Although shore based infrastructure is limited, Tuvalu does have lagoon anchorages and some shore based services such as fresh water, minor repairs and maintenance, fuel, health services, an international airport, and entertainment for resting crews.

Tuvalu also has some institutional advantages in fisheries. Since it is a member of the Parties to Nauru Arrangement (PNA), Tuvalu can access other PNA member country EEZs by becoming a party to the FSM Regional Fisheries Arrangement. There is also the possibility that Tuvalu could flag foreign fishing vessels on more favourable terms than some other countries.

However, Tuvalu suffers from some deep seated disadvantages in the areas of investment capital (finance), management and technical skills, technology, marketing infrastructure, and shore based infrastructure. The major natural disadvantages and constraints can be summarised as the lack of:

- Domestic capital to finance relatively large scale commercial projects;
- Domestic investors willing to commit finance to risky commercial ventures;
- Effective means to transport fish to overseas markets;
- Supporting infrastructure, including comprehensive shore facilities and protected anchorages for smaller artisanal craft;
- Managerial expertise to successfully guide a commercial venture;

- Skills and technology in a range of areas needed to underpin a commercial export oriented fishery, including: fishing, processing, storage, and shore based skills such as marketing, accountancy, and repairs and maintenance;

- Difficulties in equitably promoting commercial fisheries programs among all communities, especially on outer islands; and

- Potential threat of deterioration of nearshore resources due to over-exploitation by the large population on Funafuti.

Box 5.1: Principles underpinning strategies for development of commercial industries

1. Tuvalu plays to its comparative advantages, in natural resources, in human resources, in financial resources, and in geographical characteristics.

2. The strategy is based on institutional realities. The key institutional reality is that commercial ventures perform best if they are financed and operated by private investors, with government playing a policy based facilitating role.

3. The strategy is based on the Tuvalu way of doing things. Wherever possible strategies would build on the culture and social structures, while applying strict business practices, rather than trying to transplant institutions and practices from elsewhere.

4. Projects and activities need to be supported by broad policies that are consistent with the objectives of the development programme.

5. Government polices, projects and activities within the strategy must be formulated in consultation with actual and/or potential commercial participants in the industries concerned.

6. The strategy would need to take a long term view.

There are additional, more behaviour related, constraints that include a lack of:

- Adequate training of local personnel in the repair and maintenance of onshore equipment, boats, etc;

- Incentives to attract local fishermen to participate in a commercial venture;

- Institutional weaknesses in NIFICOT and in the Fisheries Division; and

- Lack of consistent data gathering required to assess and monitor fisheries activities.

The very small size of the domestic market (total demand was about AUD$0.6m in 1990), combined with the efficiency of artisanal fishing and marketing, means that successful commercial operations must be aimed at the export market. This is consistent with the Government's strategy to restructure the economy towards export oriented business investment.

These above opportunities and constraints have shaped the goals of this Government in respect of commercial fisheries development. These are to support the establishment and development of:

> *A Tuvaluan flagged purse-seine fishing company through a joint venture between foreign investors and private domestic investors; a small scale deep sea snapper fishery, mainly financed and operated by private domestic investors; and the capability of exports for commercial artisanal fisheries.*

Strategies

The deep seated nature of the constraints to development of commercial fisheries suggest the need for relatively large scale assistance in its development. In the past Tuvalu has relied on ODA to provide this assistance — with poor results. This Government intends to pursue a new strategy for commercial fisheries development based on direct involvement of private investors (foreign and domestic) in commercial fishing

operations, with ODA utilised to provide infrastructure support and technical assistance. The Government will focus on the establishment of a positive policy climate that is attractive for investors. Box 5.2 outlines the reasons for this shift in strategy in more detail.

Box 5.2: Why change the strategy to develop commercial fisheries?

This Government acknowledges the failure of the existing strategy, based largely on aid financed injections of capital to Government owned and operated ventures, for commercial fishing development. This approach has not only failed in Tuvalu, but throughout the region. Moreover, it has been pursued in Tuvalu for almost two decades, which suggests that the problems with it are not temporary. Rather, they are embedded within the strategy, which needs to be changed. The major reasons are:

1. The institutional arrangements under aid based financing of Government owned and operated ventures are geared to failure. Governments are not adequately equipped to own and operate commercial ventures generally, let alone high risk and high capital cost fishing ventures. In addition, few of Tuvalu's ODA based development partners have programmes that are sufficiently large to accommodate the capital injections required for development of export oriented commercial fisheries. Moreover, the bureaucracy of aid is not sufficiently flexible to accommodate commercial needs.

2. Foreign Direct Investment (FDI) is the most efficient mechanism for transferring the relatively large scale finance, investment, technology, skills, and marketing networks required for a successful commercial fishing venture. The advantages held by FDI investors are almost a perfect offset to the pervasive operational constraints to developing successful commercial fisheries in Tuvalu.

3. Using FDI to finance relatively large scale commercial operations frees up ODA resources to be used in areas where they are better suited to make a strong contribution to a successful industry, such as infrastructure support, and education and training. These are areas where ODA financing has a strong record of success, and they are also critical for successful industrial development.

4. Domestic investors in commercial fisheries have better incentives to increase production and much higher levels of productivity than do government employees. They would also have more immediate access to a wider workforce and the range of skills required to run a successful operation. Moreover, the involvement of private investors is consistent with the Government's desire to see the benefits of development diffused more widely in the community.

Establishing a purse-seine fishery

The establishment of a domestically flagged and part owned purse-seine company is consistent with the strategy to establish large scale export oriented commercial ventures which would provide backward linkages that would help to support enduring small enterprise development. (See Chapter 2 and Section 4.1.) It is also consistent with the principles guiding the development of commercial activities outlined in Box 5.1. It also follows recommendations in recent studies by the ADB (1994) and the CFTC (1994).

Such a venture would need to be largely financed by a foreign investor who has a current, proven track record in purse seining, with some small scale injections of capital from private domestic investors. The main benefits that Tuvalu would expect to derive from such a venture would be:

- Maximisation of employment opportunities for Tuvaluans.
- Maximisation of training and technology transfer.
- Higher tax revenue. (Note that the precise tax arrangements would be negotiable.)
- A share of profits for domestic investors, with a phased buy back option that may be exercised gradually over the very long term (say 20 years or more).
- Assistance with designing a programme for the storage and export of artisanal fish products.

The Government recognises that both foreign and private domestic investors may prove difficult to attract to the venture.

Attracting foreign investors would require an intensive cycle of advertising, negotiation, consultation, and review of proposals. The review and improvement of the climate for FDI investors outlined in Section 4.3 would assist in this process.

Attracting private domestic investors may be more difficult. As noted in Section 4.3 individual saving and wealth in Tuvalu is generally very low. Most saving is channelled into community funds. Moreover, the Tuvaluan people have proven to be very risk averse. That said, island communities could be the ideal private domestic investors in order to maximise community involvement and obtain the best possible work effort from Tuvaluans employed by the company.

There may be a case for attracting domestic investors with incentives such as soft loans to expand the domestic equity base in the joint venture. Other measures might include: establishing a special fund in the Development Bank of Tuvalu (eg, through soft loans from ODA sources or government equity) which could be used to make large scale and risky loans[28] to more entrepreneurial private investors with a good track record.

In addition, the Government may need to provide institutional support for the domestic investment vehicle, eg through a management company. Technical assistance may be needed to strengthen the advisory capability of such a company.

The Government will also negotiate special incentives for foreign investors where appropriate, eg through tax holidays. In addition, both foreign and domestic investors will need assurances that the value of their assets will not be reduced through government action. The comprehensive review and improvement of all policy settings that have a bearing on the investment climate outlined in Section 4.3 will assist in this regard.

Some high quality technical assistance would also be needed at various stages in the negotiation, consultation, and review of proposals. Technical assistance could be used to advise on experiences in other countries; any treaties, legal, and financial issues involved with flagging foreign vessels; information about access agreements; and any other issues that may need to be considered in designing Tuvalu's negotiation and review stance. Technical assistance would also be required in some negotiation processes, and to pass on negotiation skills to relevant government officials.

ODA development partners may also be able to assist by helping to advertise Tuvalu's intention of identifying prospective foreign investors in a purse seine company operating in Tuvalu. They might also assist by helping to vet potential investors.

As part of an overall programme devised through negotiation and consultation with the FDI investor, government may need to provide some infrastructure in support of the purse seine operation. Some training assistance might also be needed. The government would seek ODA assistance with financing such projects. The key approach in the programme outlined above, however, is that the design of infrastructure, technical assistance, and training projects would be responding to the requirements of existing commercial operators.

Finally, Government recognises that the process may be long term. In particular. Tuvalu may not be able to provide the necessary support services and infrastructure to see the .joint venture established rapidly — and it may take time to identify a willing FDI investor. However, the Government is keen to begin the process as quickly as possible so that its future investments in infrastructure and human capital will be informed by the observations of successful commercial operators.

Establishing a deep sea fishery

The establishment of a deep sea fishery aimed at the export market is consistent with recommendations made by the RDA International (1994). The RDA estimates that the deep sea fish resource in Tuvalu could sustain a 3 to 4 boat operation producing 40 to 50 tonne of bottom fish per year. However, the profitability of these operations is sensitive to using very fuel efficient vessels, and to the maintenance of high catch rates for the higher value export species of bottom fish. The limitation of the industry to 3 to 4 vessels is seen as important to maintain high catch rates and to protect fish stocks. Profitability is also sensitive to fishing effort, transport costs to market, and export prices.

Such an industry is likely to generate local wages of $45,000 to $50,000 annually, employ about 12 people, and generate foreign exchange, net of direct imports, of about $150,000 to $170,000 annually. The RDA has specified the appropriate design of the vessels to be used for deep bottom fishing. The capital costs of establishing an operation are estimated at $50,000. The 36 foot vessels are capable of being constructed on

Funafuti. The Government will attempt to attract private domestic investors for financing and operations, through targeted financial and tax incentives and by providing any further technical assistance that is necessary (eg, training in business management, gear and boat maintenance and application, and ship management and navigation on long voyages).

However, the capital costs are high, for individuals at least — and there are few Tuvaluans with the knowledge and experience to immediately take advantage of bottom fishing opportunities. Moreover, the RDA report suggests that following the cessation of training provided as part of its project — bottom fishing and marketing skills imparted could be lost if they are not practically applied in the near future.

This argues for a continuation of training programmes in fishing, processing and marketing for future operators using the Government vessel, the *Manaui*. In addition, the RDA raised the option of seeking ODA finance for the construction of a vessel, which could be used by the Government to continue training of domestic fishermen. The successful construction of such a vessel would inspire confidence in potential private investors, as well as contribute strongly to attracting additional investors in future through specialist deep bottom fisheries research and extension activities.

Technical assistance would also be needed to provide institutional strengthening for the fisheries division. This would involve assistance with assessing fish resources and monitoring stocks, investigation and negotiation of export market opportunities for deep snapper, introducing inspection techniques and management systems for inspecting fish ready for export, and assistance with the establishment and implementation of fish quality control measures.

The upgrading of NAFICOT under the Overseas Fisheries Co-operation Foundation (OFCF) is also critical for providing adequate shore based facilities for a deep water snapper fishery. This programme involves rehabilitation of NAFICOT's processing area, fish market and refrigeration equipment, and fishing vessels. In addition, the Fisheries boat slipway is in need of substantial repair and maintenance. The programme to upgrade NAFICOT is expected to be complete by the end of 1996. In line with the public sector reform programme the future ownership and operation of NAFICOT will be reviewed in 1996.

The government will also help commercial fisheries development by improving transport links to market, both intra-island and international (see Section 6.1).

Developing artisanal fisheries for export and other fisheries

The approach used by the RDA project (1994) of preparing a draft fisheries management plan for sustainable exploitation and management of the deep snapper fishing grounds will be extended to include a management plan for inshore and coastal fisheries.

All avenues for developing export infrastructure and marketing networks for artisanal fisheries will continue to be exploited and explored further. The construction of Community Fishing Centres for the processing and storage of the artisanal catch will be extended to other outer islands. This will be supplemented by efforts to improve intra-island transport, eg by refitting the *Te Tautai* as a refrigeration vessel. An investigation of options for installing safe anchorages for boats on all islands will be conducted.

There is a natural market for minor sea products in supplying domestic food outlets such as the Vaiaku Lagi Hotel, restaurants, the Nivaga, TMS, and the Hospital. A programme to systematically extend the range of seafood products on the menu of food outlets would have benefits for domestic fishermen selling the products, as well as for the food outlets (in keeping the customer satisfied). There may also be potential for expanding the supply of these products through small scale mariculture and aquaculture.

Nearshore domestic fisheries development and/or management plans and strategies

The Fisheries Department is working towards the drafting and implementation of development and management plans for some of the domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the tuna fishery. A management plan for the deep-water bottomfish fishery in Tuvalu (King 1995) was drafted in 1995 as part of a USAID aid project being conducted in the country, although it is unclear whether this plan was formally implemented.

The management of the tuna resource in the waters of Tuvalu is very important to the government. At present tuna fishing is mainly conducted by foreign vessels licensed to fish under access agreements. To manage the tuna fishery, the Fisheries Department has drafted a National Tuna Development and Management Plan, 2002 to 2006 (Fisheries Department undated).

Deep-water bottomfish fishery

The development and management strategies as presented in the management plan for the deep-water bottomfish fishery in Tuvalu (King 1995) are:

Fishery development strategies

A likely fishing operation will be one in which a vessel completes 30 trips each year, 3 fishing days each trip, and uses each of the four fishing reels for an actual fishing time of 6 hours each day. Based on a catch rate of 4 kg per line-hour for the main target species, a fishing operation would land 288 kg per trip and 8.6 mt of exportable fish each year (Table 9-1). This assumes that catch rates can be maintained at the survey level. The expectation is that a commercial vessel will initially improve on the survey catch rates as higher densities of fish are targeted, but catch rates will slowly decrease as the stock biomass is markedly reduced by fishing.

Table 9-1. Fishing operational information and estimated catch per trip per year from one vessel.

Trips per year	Fishing days per trip	Line-hours per day	Catch (kg) per line-hour	Catch (kg) per trip	Catch (mt) per year
30	3	24	4	288	8.6

If fishing operations conform to the scenario suggested in Table 9-1, the sustainable yield of 76 mt from Tuvalu could be taken by approximately nine vessels. A smaller number of vessels than this, would result in the maintenance of higher catch rates and greater profitability.

There are many alternative strategies for developing the deep-water snapper fishery in Tuvalu, but taking into account the high setting-up expenses, it is likely that only one or two purpose-built vessels will start fishing for deep-water snappers within the foreseeable future. Their fishing operations would ideally consist of fishing on seamounts within a 150 nautical mile radius of Funafuti when weather permits, and fishing around Funafuti only in unsettled weather. As the annual sustainable yield for Funafuti itself is perhaps 8 mt, it is essential to ensure that this more accessible stock is not overexploited.

Although economic analyses are the subject of a separate report, The Commercial Feasibility of Bottomfishing in Tuvalu: Final Economic Evaluation (Rowntree 1994), early indications are that an operation based on a moderately sized vessel would be profitable.

If the initial one or two vessels in the fishery prove successful, their profitability is likely to encourage others to enter the fishery. However, the addition of more fishing effort will necessitate vessels travelling further afield in order to maintain high catch rates, and to avoid overexploiting stocks closer to Funafuti. Travelling to the more distant fishing grounds (up to 250 nautical miles) is likely to require larger vessels (for safety reasons), and the increased costs may make fishing unprofitable.

For the reasons given above it appears prudent to restrict the number of vessels in the fledgling fishery to a maximum of about three moderately-sized vessels which have low running costs, and could be used safely within a 150 nautical mile radius of Funafuti.

Management strategies

Historically, the main objective of fisheries management has been the conservation of fish stocks. In modern fisheries management this limited aim has been extended to address additional economic, social and environmental objectives such as fishers' welfare, economic efficiency, the allocation of resources, and environmental protection. The broad objectives of fisheries management may, therefore, include the conservation of fisheries resources and their environment, the maximization of economic returns from the fishery, and payment of fees to the community from profits made by the exploitation of a public resource.

Subsuming all these objectives is the need to ensure that fisheries are exploited on an ecologically sustainable basis. As the proposed fishery makes use of passive (non-towed) fishing gear in deeper water habitats which are ecologically divorced from traditionally exploited inshore ecosystems, there is likely to be little environmental and sociological impact in developing the fishery. Three broad and alternative objectives are: maximizing either participation, sustainable yield, or economic yield from the fishery, and these are discussed briefly below.

Maximizing participation

Maximizing the participation of local people in the developing fishery would involve encouraging and providing training for local fishers to fish for deep-water bottomfish off nearby reefs. As the vessels used would be those already in existence, their size and range suggests that this fishing effort would most likely be concentrated on the 40 nautical miles of reef surrounding Funafuti lagoon.

This strategy would result in a large number of fishers using relatively inefficient and discontinuous fishing operations to catch small numbers of fish per trip. In addition, it would be difficult to maintain the quality of the catch, and to coordinate its landing and export. Also, the collective catch of these fisheries would almost certainly exceed the sustainable yield of Funafuti Atoll which is estimated at approximately 8 mt.

As this management strategy would undoubtedly result in local overexploitation, and a catch suitable only for local markets, it represents a waste of a resource which is potentially valuable to Tuvalu in terms of earning export income.

Maximizing sustainable yield

This strategy would involve maximizing the net financial returns from the fishery by allowing the entry of a relatively large number of vessels. The maximum sustainable yield of 76 mt for all of Tuvaluan fishing areas may be taken by approximately nine vessels (assuming that these vessels fish according to the operation summarized in Table 9-1). Haight (1994), using an alternative assumed scenario, suggested that the maximum sustainable yield (76 mt) could be taken by as few as six vessels.

However, the disadvantage with this strategy is that, at this level of exploitation, catch rates will be much lower than those obtained at lower rates of exploitation. Theoretically, catch rates in a fully exploited fishery are about half of those obtained initially. Such low catch rates are unlikely to cover the high costs of fishing, and at the point of maximum sustainable yield, financial returns (net profits) from the fishery are likely to be low or negative. (See Rowntree, 1994)

Maximizing economic yield: The recommended option

Maximizing the net financial returns from the fishery and profit to the country, in general, requires a fleet which is small but efficient.

A strategy of maximizing profits will exclude the use of larger vessels with high operating costs, and require the use of smaller more efficient vessels. These could be used safely within a 150 nautical mile radius of Funafuti, but may not be capable of reaching the more distant grounds surveyed except in extended periods of good weather. An additional advantage of this strategy is that the level of fishing required is biologically conserving, and is unlikely to overexploit the fish stocks.

A disadvantage is that, in the longer term, the profits made by a few boats are likely to attract others into the fishery. However, the economic benefits from the fishery will only be maximized if the number of vessels in the fishery is restricted. At higher levels of exploitation, the average catch rates of all vessels will be reduced below that necessary to cover costs. In other words, the fishery will only be profitable if entry into it is restricted to a few efficient vessels.

In summary, management strategies which maximize participation in the fishery and sustainable yield may be appropriate in the case of artisanal inshore Pacific Island fisheries, where the resource provides employment or food for a large number of fishers; in this context employment and food gathering may be chosen in favor of efficiency. The deep-water bottomfish fishery, however, is a commercial export-based operation, and there is a strong case for maximizing foreign earnings to the country from the fishery.

It is therefore recommended that fishing effort is restricted in order to maximize economic yield. The most direct method of restricting access to the fishery is by means of a licensing system which is discussed in the

following section. The number of vessels in the fledgling fishery should be restricted to a maximum of about three moderately sized vessels which have low running costs, and could be used safely within the area of Tuvalu's distant seamount fishery. This number of vessels should ensure that high catch rates are maintained, and that the fishery has a good chance of being profitable.

An additional option: Limited foreign access

The recommended fishery management strategy is to maximize the net financial returns from the fishery and to maximize profit to the country. This requires the use of smaller, low cost (< A$40,000; see Rowntree, 1994) vessels which have the capacity to exploit grounds, first within a 150 nautical mile radius and later within a 250 nautical mile radius of Funafuti. The use of smaller vessels may in effect leave the more distant but productive grounds unexploited.

One option available to the government is to allow foreign vessels to have access to stocks which are inaccessible, for cost reasons, to the Tuvaluan fleet in return for a negotiated fee. For example, Fiji-based fishers may be allowed to take fish up to a maximum allowable limit from seamounts located from 150 to 250 nautical miles from Funafuti. Access fees paid by the fishers would ensure that excess profits accrue to the government and people of Tuvalu.

The disadvantages include the burden of placing observers on board the foreign vessels to ensure that the total allowable catch is not exceeded. In addition, if foreign vessels landed their catches in Funafuti, they may compete with local fishers for limited ice and air-cargo space.

An additional management measure: Quality control

In any management strategy which relies on maximizing returns from exported fish, the maintenance of quality is essential. The poor sale value of fish exported from some Pacific Islands has been mentioned previously. The success or otherwise of the Tuvaluan deep-water bottomfish fishery is highly dependent on maintaining a good reputation and market price for its products. As a single shipment of poor-quality fish is likely to undermine the efforts of those who have been striving to maintain a good reputation for Tuvaluan fish exports, a quality control system is recommended.

A full quality control system would involve the government inspection of fish intended for export, and approval to export would be given only for fish reaching a defined minimum standard of quality. However, the requirement for inspection before exportation should not be such that it delays the air-shipment of a highly perishable product. An alternative to inspection of all exports would be the random inspection of fish being landed and packed.

Tuna fishery

The main objectives, management objectives, development objectives and development strategies as stated in the current draft National Tuna Development and Management Plan, 2002 to 2006 (Fisheries Department undated) are:

The Plan has two major overall objectives:

- To maximise the long term economic and social benefits for the people of Tuvalu from the development of tuna resources; and
- To ensure the sustainability of harvesting of tuna resources.

Management objectives

These are the objectives for the management of tuna fishing during the Plan period:

- continuing to strengthen the exercise of sovereign rights by Tuvalu over tuna;
- increasing the economic gains received by Tuvalu from the exercise of its rights over tuna;
- ensuring effective participation by Tuvalu in regional tuna management activities; and

- reflecting customary values in tuna policy and planning; including recognition of the importance of the contribution of tuna to food security, protection of the interests of small scale tuna scale fishers, respect for local bylaws and bycatch management.

Development objectives

- Increase the participation of private sector interests in Tuna fishing through the provision of infrastructure needed to foster development, such as an anchorage for fishing vessels, and land availability for constructing support services, like processing and/or storage facilities;
- Work with other government departments in overcoming the logistical problems of transporting products, especially fresh fish, at a cost effective price both internally, and to export markets from Tuvalu;
- Promote value-adding to tuna catches in Tuvalu, to maximise local employment, and produce a low weight, high value product to minimise freight costs to export market;
- Establish an effective extension service to introduce alternative small scale and medium-scale harvesting techniques to Tuvalu when the main infrastructure constraint are overcome and fish can be exported easily; and
- Encourage the private sector to enter into joint ventures with foreign investors to establish viable fishing operation with shore facilities for processing and exporting fresh or processed tuna based in Tuvalu.

Development strategies

a) Improving infrastructure, principally to support private sector development.
b) Encouraging the use of new fishing methods:
    - small-scale mid-water fishing around Fish Aggregating Devices (FADs); and
    - medium scale tuna longlining.
c) Export market development:
    - Improving air freight services;
    - Promoting small-scale value-added processing; and
    - Evaluating Larger-scale value-added processing.
d) Enhancing the skills of Tuvaluans in Tuna Fisheries.
e) Increasing domestic development benefits from foreign vessels:
    - Joint ventures or charters; and
    - Domestic fisheries development fund.
f) Promoting domestic tuna development in other ways:
    - Community fishing centres;
    - Small boat regulation;
    - Export control; and
    - Financial policies.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in Tuvalu

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Sautia Maluofenua, Director of Fisheries, Ministry of Natural Resources Development (August 2003).	Fishing is currently ah hoc, conducted by subsistence and artisanal fishermen. At present there is no company or fishermen specifically targeting these species. Plan to target seamounts between Tuvalu and Fiji (Tuvalu zone) using larger vessel when NAFICOT gets such vessels.	Currently there are 7 community fishing centres (CFCs) in the outer islands of Tuvalu, all operational. Fish from CFCs sold to NAFICOT in Funafuti for local marketing. CFCs also produce some salted and dried fish for local sale in Funafuti.	No boatbuilding facilities in Tuvalu at present. Some people in private sector build small craft in plywood when needed or do repairs on existing small-scale vessels. NAFICOT has a slipway and can do repairs on fibreglass and aluminium vessels.
Background References: APTA 1991; AusAID 1997; Berdach and Maynard 1994; Chapman 2001; Chapman and Cusack 1990; Commonwealth Secretariat 1994; Dalzell and Preston 1992; Eginton and Mead 1978; Fisheries Department 1993; Gulbrandsen and Savins 1987; King 1995; RDA 1995; Rowntree 1994; Taumaia and Gentle 1982.	SPC conducted initial fishing trials and training of local fishermen for deep-water snappers around Funafuti in 1976–77. SPC conducted further training with Funafuti fishermen in 1980–81. Deep-water snapper fishing trials and training of local fishermen undertaken by SPC in Funafuti, Nukulaelae, Vaitupu and Nukufetau in 1983. USAID deep-water snapper project implemented from September 1991 to September 1994. Project included resource assessment of the deep-water snappers, training of fishermen, and an economic evaluation of developing a deep-water snapper fishery. Management plan drafted in 1995 for the deep-water snapper fishery in Tuvalu as part of the USAID project. Some local fishermen fish deep-water snappers from time to time, but there are no full-time fishermen targeting these species at present.	Fish market constructed on Funafuti in 1985–86 (opened May 1987) for the Fisheries Department, but transferred to NAFICOT, with British and Australian aid. The market had 0.5 t/day ice plant, 8 m^3 chiller, blast freezer, 10 m^3 holding freezer, 6 domestic freezers and 2 smokers. This equipment was all inoperable by 1990–91. Community Fishing Centre (CFC) constructed on Vaitupu in 1992–93, which included the construction of a small-boat harbour and wharf. NAFICOT's fish market rehabilitated by OFCF in mid-1990s plus a new 2 t/day plate ice machine was installed. CFCs constructed on Nanumea and Nukufetau in 1995–96, with the centres focusing on catching tunas and processing them to tuna jerky or salted and dried pieces. Production from these centres slowed after the expatriate staff left, so the government provided ice machines and freezers so that fresh and frozen fish could be shipped to Funafuti. From 1998–2000, the Government of Tuvalu established CFCs on the remaining 4 outer islands, with ice machines and ice crusher, freezer and generator for operating each facility. NAFICOT has 2 retail outlets on Funafuti besides the processing facility. The retail	Tuvalu has a history of building traditional outrigger canoes on most islands in the group. Boatyard established on Funafuti by the US 'Save the Children Federation' in 1983. Boats constructed included several diesel-powered launches, several catamarans for lagoon transport and 60 fibreglass-sheathed plywood sailing canoes. In 1984–85 a jetty and slipway were constructed on Funafuti using New Zealand aid. Several people on Funafuti build small plywood skiffs in their backyards. Repairs can be conducted on wood, plywood, steel and fibreglass vessels through the Fisheries Department, NAFICOT, Public Works and several private sector people or companies.

		outlets are associated with stores on the island.	

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in Tuvalu

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Sautia Maluofenua, Director of Fisheries, Ministry of Natural Resources Development (August 2003).	No FAD programme or FADs in Tuvalu at present. Looking at starting a FAD programme, especially for the CFCs in the outer islands — no funding available at present.	Tuvalu has the National Fishing Company, NAFICOT. NAFICOT has 3 boats around 9 m in length, all trolling and deep-water snapper fishing. NAFICOT purchases fish from the government's CFCs and from local fishermen on Funafuti (not tuna, though).	Around 10 full-time small-scale vessels, mainly trolling tuna schools off Funafuti, with a lot of part-time vessels as well. Outer island fishermen also troll and fish deep-water snappers, selling the catch to the CFCs.
Background References: Berdach and Maynard 1994; Chapman 2001; Chapman and Cusack 1990; Commonwealth Secretariat 1994; Eginton and Mead 1978; Fisheries Department 1993; Petaia 2000; Petaia and Chapman 1997; RDA 1995; Taumaia and Gentle 1982; Taumaia in press.	UNDP funded the first 2 FADs for Tuvalu in 1983. 1 was deployed off Funafuti and 1 off Vaitupu. UNDP provided additional funding for FADs in 1984, with additional funding provided by the Britain and Canada. Around 18 FADs were deployed from 1984–1989, with regular losses occurring. As part of the USAID project, 1 FAD was deployed at each island/atoll in Tuvalu, 9 in all. The deployments took place in 1993 with many FADs lost in 1994–95 after the project was completed. SPC provided technical assistance in 1995 and 1996, conducting training in site surveys and in the construction and deployment of FADs. 1 FAD was deployed off Nanumanga in 1996, with the trained fisheries staff deploying another FAD off Nukufetau. No records of any other FAD deployments in Tuvalu from 1996–2003.	SPC conducted fishing trials and provided training in mid-water fishing techniques for tunas around FADs in 1985–86. Fisheries Department staff and local fishermen were trained. JICA donated a 19 m extension vessel and 6 x 9 m launches to the Fisheries Department in 1989. All of these vessels were used for catching tuna, mainly by trolling, and were refurbished in 1990–91 by OFCF, although one launch was lost. Fisheries Department kept the 19 m extension vessel, but transferred ownership and operation of the 5 remaining launches to NAFICOT in 1991 and 1992, although another 2 launches were lost. These launches both trolled for tuna and fished for deep-water snappers. The Fisheries Department was given a new 19 m research and extension vessel by OFCF in 1991. Government aid facilities in the form of CFCs established on Vaitupu (1993) and Nanumea and Nukufetau (1996) focusing on processing tuna to tuna jerky. Government established CFCs on the other 4 outer islands from 1998–2000.	Traditionally tuna fishing was conducted from paddled or sailed outrigger canoes, with poling using pearlshell lures and trolling being the main methods used. Some mid-water handlining of tunas in 'tuna holes' also carried out. In the late 1960s and early 1970s, outboard motors were added to some canoes and some outboard-powered aluminium dinghies were introduced. An estimate of 350 t of tuna was caught annually in the early 1970s. In the late 1990s there were around 125 small-scale fishing boats on Funafuti, 10–20 of these fishing commercially for tuna, with trolling being the main method used. With the establishment of the CFCs on 3 outer islands in the mid-1990s, local fishermen at these islands fished for tunas to supply the centres. The fish was processed (salted and dried or made into tuna jerky) for transport and sale in Funafuti. Now CFCs on all islands in Tuvalu, with trolling for tunas and other pelagic species the main method used by local fishermen to sell the catch to the CFCs.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in Tuvalu

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Sautia Maluofenua, Director of Fisheries, Ministry of Natural Resources Development (August 2003).	NAFICOT is the only public sector fishing company in Tuvalu and they want to get into tuna fishing. NAFICOT has been given 2 vessels by Korea, and these are being assessed for converting to tuna longlining and may start fishing in early 2004 if this project proceeds.	There are currently no medium-scale tuna fishing activities conducted by the private sector.	Negotiations or discussions are under way between NAFICOT and an Australian company to have vessels fish in the Tuvalu EEZ under a joint venture arrangement. If this proceeds the fish will probably be exported through NAFICOT.
Background References: Berdach and Maynard 1994; Chapman 2001; Chapman and Cusack 1990; Commonwealth Secretariat 1994; Gillett 2002; Gillett in press; JICA 1987; Petaia 2000; Wilson 1995.	NAFICOT was established in 1981 under the Ministry of Fisheries to develop industrial fishing in Tuvalu. The Government of Japan donated a 173 GRT pole-and-line vessel, F/V *Te Tautai*, to Tuvalu in 1982, and this was placed under NAFICOT to manage and operate. JICA chartered the F/V *Te Tautai* from 1984–1986 to undertake a fisheries resources survey in the waters around Fiji and Tuvalu. F/V *Te Tautai* operated in Fiji and the Solomon Islands during 1987–88, landing 1,090 t of tuna in 1988. SPC chartered F/V *Te Tautai* from NAFICOT from 1989–1992 to conduct a regional tuna tagging project. F/V *Te Tautai* was used by the government as an inter-island cargo vessel from 1993–1996. The vessel sank in the Funafuti lagoon in September 1997.	There are no records of any medium-scale tuna fishery development by the private sector in Tuvalu.	No records were found of any joint venture fishing operations in Tuvalu, either by government or the private sector.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in Tuvalu

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Sautia Maluofenua, Director of Fisheries, Ministry of Natural Resources Development (August 2003).	There are currently no specific charter vessels in Tuvalu. Some fishermen will take paying passengers out fishing, during their normal fishing operations (not gamefishing).	No specific baitfishing trials or activities. Some local fishermen troll for skipjack or jig for bigeye scad for bottomfish bait.	Scoop netting flyingfish outside the reef at night is an important local fishery. There are no other nearshore fishing activities being trialled at present.

Background References: Chapman 2001; Chapman and Cusack 1990; Eginton and Mead 1978; Ellway et al 1983; Gillett 1985; Ika Corporation 1980; JICA 1987; Whitelaw 2001; Wilson 1995.	No history of sportsfishing or gamefishing recorded and no vessels at Funafuti. Fishing tournaments are held on special occasions throughout the year, with local fishermen (commercial and artisanal) competing.	Tuvaluans have used a traditional rig to catch bigeye scad, which is used for bait. FAO/UNDP conducted a survey in 1970 to research the potential for a skipjack fishery, but information on baitfish was not available. Baitfish survey conducted by the Van Camp Seafood Co. in 1972 with little bait caught. A survey in 1976 by consultants concluded that there was not much baitfish in Tuvalu waters. SPC conducted skipjack tagging and baitfishing trials around Funafuti in June–July 1978 and July 1980, with good catches in 1978, but much smaller catches in 1980. In 1980, baitfishing trials were conducted by 2 pole-and-line vessels from the Fiji Ika Corporation, with limited success. Tuvalu received a pole-and-line vessel from Japan in 1982, but owing to the lack of consistent bait, the vessel fished in Fiji and the Solomon Islands. In 1983–84 an SPC/FAO project to catch baitfish on the coral heads in the lagoon was conducted. The catch was encouraging but limited.	Scoop netting of flyingfish is a traditional method used from outrigger canoes in Tuvalu. In the late 1960s and early 1970s, outboards were added to some canoes and outboard-powered aluminium skiffs were introduced to the fishery. In the early 1970s the annual catch of flyingfish was estimated at 420 t. Catching flyingfish using scoop nets and light attraction at night is still a major fishing method in Tuvalu. No records found on other fishing methods trialled or used outside the reef.

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Republic of Vanuatu

General

The Republic of Vanuatu (Figure 1) is made up of 13 large mountainous islands and about 60 smaller islands and islets forming a 'Y'-shaped archipelago between 13º and 21º S latitude, and 166º and 171º E longitude. The mid-year 2003 population estimate for the Republic of Vanuatu was 204,100 people (SPC 2003).

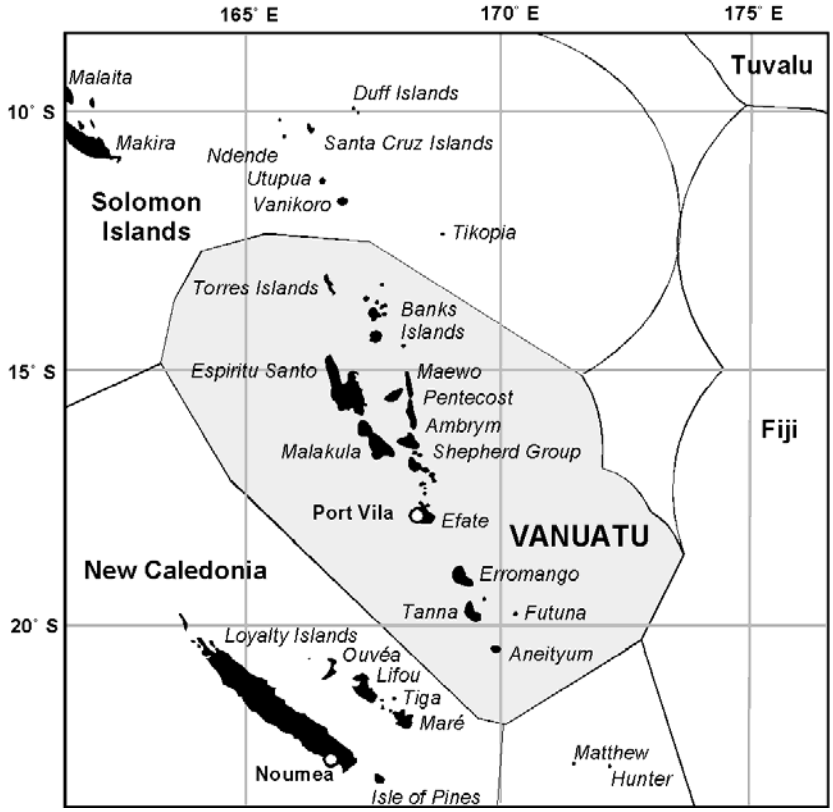

Figure 1: The Republic of Vanuatu, its EEZ and neighbouring countries

The Republic of Vanuatu has an EEZ of around 680,000 km^2, while having a land area of around 12,190 km^2. The EEZ of the Republic of Vanuatu borders three Pacific Island nations, the Solomon Islands to the north, the Republic of the Fiji Islands to the east, and New Caledonia to the west, with around 15 per cent of the EEZ bordering international waters to the east. In addition, the waters around Mathew and Hunter to the south are disputed between the Republic of Vanuatu, and France (New Caledonia).

Fisheries development and management

The development and management of the marine resources within Vanuatu falls under the jurisdiction of the Fisheries Department of the Ministry of Agriculture, Quarantine, Forestry and Fisheries. The Fisheries Department works under the *Fisheries Act (CAP 158) 1982*, although a new Act to replace this is before parliament and this will probably be passed in 2004.

The development of fisheries is also covered in the Corporate Plan (2000 to 2004) for the Ministry of Agriculture, Quarantine, Forestry and Fisheries (GoRV 1999). The document states that this Corporate Plan replaces the 5-year National Development Plan previously engineered by the National Planning Office. The Development and management directions stated in the Corporate Plan (GoRV 1999) are:

Fisheries Division

The Fisheries Division provides intellectual and operational leadership in fisheries matters in the Ministry. It develops and implements policies and strategies for the sustainable management of Vanuatu's fish resources. It will strengthen its services to the rural population to enhance maximum benefits of their resources, through the Rural Fisheries Development Program (RFDP). It will work cooperatively with local authorities and fishermen agents and associations in developing and strengthening their network in terms of security, production and marketing.

Vision

To ensure sustainable development of the Fishery Sector with particular focus on the establishment of rural-base commercial fishing in achieving a long-term utilization of Marine Resources.

Mission Statement

To develop and implement policies to ensure sustainable management, development and conservation of Vanuatu fish resources in order to achieve maximum social and economic benefits to Vanuatu for current and future generations.

Value Statement

The staff of Fisheries Division believe in the values of Integrity, Team Work, Honesty, Commitment, Innovation, Creativity, Effective Communication and Outstanding Services in the improvement of service delivery to all people.

Objectives and Strategies

Objective 1. Improve Resource Management and Marine Conservation

Strategies:

- Formulate sound management and development policies
- Develop and facilitate marine environment and conservation plans

Objective 2. Improve Participatory and Integrated Policy Development

Strategies:

- A more balanced approach to the social, economic and environmental aspects of the sub-sector and increasing harmonization between policies in these three areas
- Harmonization of integrated policy development processes

Objective 3. Facilitate Development of Fishery Industries

Strategies:

- Encourage proper utilization of Vanuatu's fish resources to provide employment opportunities and economic growth

Objective 4. Increase Quantity of Landed Fish and Other Marine Products

Strategies:

- Facilitate the supply of improved inputs to development of cash income from fish resource
- Provide technical assistance and advice to small-scale (rural) fishing projects
- Identify and promote appropriate fishing methods and technologies that will improve fishers' fishing efficiency

- Train the Fisheries Extension Officers on skills and knowledge for the effective implementation of fisheries programs
- Identify and promote appropriate fish preservation methods for rural areas
- Motivate full time and part time subsistence fishers by providing essential support services. Facilitate combined efforts or programs with donor agencies and non-government organizations at raising rural prosperity
- Review Rural Fisheries Development Programs to address the basic needs of the fishermen
- Investigate potential fishing techniques and vessels for particular environment

Objective 5. Increase Rural Income through Commercial Fishing and Improve Livelihood

Strategies:

- Promote self-sustaining private-led fishing enterprise
- Identify and promote alternative marine resource initiatives to disadvantaged rural population
- Identify and improve existing rural marketing system for marine products
- Enhance fishermens' basic management skills so as to guarantee future re-investment
- Promote women's participation in rural fishery

Objective 6. Improve Fisheries Research Development

Strategies:

- Conduct applied research to advance knowledge for sustainable utilization, management and conservation of Vanuatu's fish resources

Objective 7. Improve Fisheries Surveillance and Enforcement

Strategies:

- Develop a surveillance mechanism for fishing vessel activities
- Improve data collection from foreign and locally based fishing operators
- Review current licence fees and licensing system
- Improve enforcement of fisheries legislation
- Collaborate with existing private fishing companies or associations to monitor fishing activity of Vanuatu flagged vessels in the Pacific Region to ensure compliance with UNCLOS

Objective 8. Improvement and Strengthening of Executive Management

Strategies:

- Provide regular advice to the fishery sector
- Improve divisional management.
- Improve personnel management
- Improve liaison with other organizations with common interests to the Division
- Establish liaison with relevant regional and international organizations/institutions
- Maintain high level donor confidence and commitment of support
- Develop staff training plans by seeking training opportunities and liaise with training providers

Objective 9. Develop Effective Standardized Information Technology and Data Communication Systems

Strategies:

- Provide in-house staff support
- Design data standardization system
- Design staff in-house training
- Design a staff development plan
- Provide information exchange (library and archiving) and development services
- Assess and upgrade current computer hardware and software to ensure compliance with Y2K standards

Objective 10. Construct Affordable Seaworthy Fishing Vessels to Facilitate the Development of Rural Fishing Sector

Strategies:

- Produce artisanal fishing craft
- Production of other fishing accessories as required by fishers
- Provide vessel repair services
- Produce larger vessels
- Design new vessels that would improve fishing effort

Objective 11. Generate Sufficient Revenue to Fund the Division's Program Activities and Provide Surplus for General Revenue

Strategies:

- Develop a divisional local licensing policy
- Develop an inspection policy
- Design a foreign licensing policy
- Develop a procedure for bilateral fishing access agreements

Nearshore domestic fisheries development and/or management plans and strategies

The Fisheries Department is working towards developing and implementing development and management plans for many of the domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the tuna fishery. At present there is no development and/or management plan in place for the deep-water snapper fishery, but the Fisheries Department is looking to develop arrangements in the near future with outside assistance.

The management of the tuna resource in the waters of Vanuatu is very important to the government. At present tuna fishing is mainly conducted by foreign fishing vessels fishing, licensed to fish under access agreements. To manage the tuna fishery, the Fisheries Department drafted and implemented a Tuna Management Plan — A National Policy for the Management of Tuna Fisheries (GoRV 2000) in 2000. The management objectives and the strategies for local tuna fishery development as stated in the plan are:

Tuna Management Objectives

These four overarching objectives capture the long term intentions of tuna management. They state why the fishery is to be managed in particular ways.

1. To ensure that the exploitation of the tuna resources that are found in and pass through Vanuatu waters is compatible with the sustainability of the stocks throughout their range.
2. Within the limits of the sustainability objective, to ensure the harvest is taken in a way that maximizes the long term economic and social benefits received by the peoples of Vanuatu.
3. To contribute to the food security of Ni-Vanuatu.
4. To meet regional and international responsibilities for tuna management.

Strategies for Local Tuna Fishery Development

The Tuna Management Plan supports the development of all aspects of the tuna fishing industry including:

Tuna fishing	1. Small artisanal vessels catching tuna and tuna-like species around FADs. 2. Medium size multipurpose vessels that engage in tuna fishing in addition to other forms of marine harvesting and other maritime activities such as cargo transportation. 3. Charter sportsfishing vessels that in addition may act as commercial vessels and sell some of their catch to the local market. 4. The development of a small locally based and owned fleet targeting tuna and focussing on the export market with some local sales. 5. The development of larger, locally based, tuna fishing operations where appropriate investment can be found to develop a long term sustainable operation.
Other tuna related industries	1. Local retail sales and consumption including the restaurant trade, 2. Local processing facilities, 3. Tuna export businesses, 4. Maintenance, supply and provisioning of foreign vessels.
Creation of employment	1. Crewing on foreign vessels, 2. Crewing on local and locally based foreign vessels, 3. Associated service industries.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in Vanuatu

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Moses Amos, Director of Fisheries, Fisheries Department (September 2003).	Deep-water snapper is the main target fishery in Vanuatu with over 100 small-scale vessels of 5.6–7.5 m. 3 vessels of 9–10 m fish the same areas as the small-scale vessels, and they fish on seamounts. 2 vessels over 10 m also fishing deep-water snappers, with these vessels required to fish outside 6 nm.	There are 6 provincial centres in Vanuatu, 2 have ice plants and processing facilities (Tafea and Shefa Provinces) provided by government. These are managed by fishing associations with assistance from the Provincial Govt. 2 more centres to be established in late 2003 with the remaining 2 set up in 2004. Under an Australian funded project (Rural Economic Development Initiative), solar-powered freezers are being established on the remote islands (7 in the 2 provinces with facilities). 2 private sector fish markets in Port Vila.	Government boatyard in Santo making mostly 5.6 m vessels out of plywood sheathed in fibreglass. Boat repairs also undertaken. 1 private company in Port Vila making aluminium boats of 4.0–5.6 m and also does repair work. 1 private company in Port Vila making fibreglass boats 7.5 m, plus repair work. 1 large slip on Santo for mainly cargo boats with repair and maintenance work undertaken, mainly in steel. 1 travel lift in Port Vila mainly for pleasure boats and yachts.
Background References: Bell and Amos 1993; Chapman and Cusack 1997; Cillaurren et al 2001; Dalzell and Preston 1992; Fisheries Department 2000; Fisheries Department 1996a; Fisheries Department 1996b; Fusimalohi 1979; Fusimalohi and Preston 1983; Gillett 2002; Guerin 1989; Gulbrandsen and Savins 1987; Hume 1975.	Initial deep-water snapper fishing trials were conducted by SPC in 1974–75 in Lamap and the Port Sandwich region with reasonable catches recorded. SPC conducted additional training and survey fishing in Tanna in 1978–79 with low catch rates (1.8 kg/reel-hour) recorded. In 1980–81, SPC provided training and survey work for deep-water snappers in 5 locations around Vanuatu (Paama, Pentecost, Ambae, Santo and Malekula). 108 local fishermen received training during this project, with good catch rates recorded. In 1983 SPC conducted further training in deep-water snapper fishing as well as tuna-related activities in Vanuatu. Snapper fishing was conducted in 6 locations around the country, in support of the rural fishing projects. 48 fishermen received training during the project. Fisheries continued to promote deep-water snapper fishing as part of their rural fishing centre scheme, with the Fisheries Extension	South Pacific Fishing Company (SPFC) Limited was established a tuna transhipment facility at Palekula, Espirito Santo, in 1957. The facility had slipways, workshops, and thousands of tonnes of freezer storage. This facility was upgraded in 1974 with new freezers (3 x 600 t) and engineroom (3 large motors and generators). The facility closed in 1986. 2 government fish processing and marketing facilities established in 1983, 1 in Port Vila and 1 in Luganville. These facilities had ice plants, blast freezers and coldstorage as well as domestic retail outlets. In 1982–83, 9 rural fishing projects were set up on 6 northern islands, with more started in late 1983 and 1984. In total, 23 projects were to be established. Canadian volunteers were provided for each rural fishing project, to assist the Ni-Vanuatu with their fishing operations and to manage the operation of the ice plant/freezer and fishing vessels. In the late 1980s, 1 private	Fisheries established a boatyard in Santo (Luganville) in 1983, to build fishing vessels suitable for the rural fishing project being set up under foreign aid projects. FAO provided input to the design of 2 vessels in the mid-1980s, a 4.3 m plaining skiff, extended to 5.7 m over time to meet Vanuatu conditions, and a 10 m diesel half-cabin boat, built as a prototype. The fisheries boatyard worked on a revolving fund from 1985–1998, which self-funded the full operations of the yard. From 1983–2000, over 300 boats in the 5–7 m range were constructed, plus several larger boats on a one-off basis. The yard also did a lot of boat repair work. In the mid- to late-1990s, 2 small boatyards were established in Port Vila, 1 constructing boats in aluminium and 1 constructing boats in fibreglass.

	Service and the Fisheries Training Centre holding specific workshops for local fishermen through the 1980s and 1990s. In the mid 1990s, two larger vessels commenced fishing for deep-water snappers outside 6 nm on seamounts. These vessel mainly used droplines and short bottom longlines, with around 60 hooks/line.	sector company set up to buy deep-water snappers as well as catch their own. In the 1990s, this company regularly exported some deep-water snappers to Australia. In 1995, the government fish processing facility in Port Vila was leased to a New Zealand longline company. This company failed in 1997, and the facility closed. Several years later the facility was sold and the building demolished. Several other small private sector 'fish shops' were set up in the 1990s in Port Vila and Luganville to buy and sell fish locally.	

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in Vanuatu

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Moses Amos, Director of Fisheries, Fisheries Department (September 2003).	Currently 2 FADs in the water off Port Vila. They were mainly funded by the private sector. Maintenance of the FADs undertaken by the private sector. French funding for 14 FADs in late 2003 and 2004. Some FADs to be deployed in areas to assist provincial fishing centres. Additional Chinese funding for FADs in 2004.	Government is staying out of developing the tuna fishery themselves. Their focus is on the FAD programme and the provincial centres. Government is looking at ways to assist private sector tuna fishery development.	About 20 small-scale vessels trolling for tunas around the FADs off Port Vila. Some tuna sold, and others used for bait in deep-water snapper fishery. Small market developing for tuna as local people accept the eating quality of these fish.
Background References: Bell and Amos 1993; Chapman 2000; Chapman and Cusack 1997; Cillaurren et al 2001; Fisheries Department 1995; Fisheries Department 1989; Gillett 2002; Gillett in press.	Fisheries deployed several FADs in late 1982 and early 1983 off Port Vila, with local fishermen and charter vessel operators encouraged to fish around them. The South Pacific Fishing Company (SPFC) deployed 5 FADs in 1984, with several of the devices lost after a couple of months. From 1983–85, fisheries deployed FADs at some of the rural fishing centres to assist the local fishermen with catching bait, as well providing an alternative protein source for villagers. With the conclusion of the rural fishing centres project in the late 1980s, fewer FADs were deployed in rural areas.	In 1983, SPC conducted fishing trials using 150 mm gillnets around FADs. The nets were tied to the FAD and allowed to hang in the current. Unfortunately, sharks were the main catch, especially next to where a tuna was caught in the net. The SPC 1983 trials also looked at vertical longlining around FADs, trolling around FADs, and the use of a 'Z' trap to catch baitfish. A small-scale SPFC fishing vessel (8.6 m) conducted pole-and-line fishing around FADs in 1984, and caught 7.7 t of tuna, but fishing was stopped with the loss of several of the SPFC FADs. Overseas Fisheries	Ni-Vanuatu fishermen traditionally focus on harvesting inshore fisheries resources, not fishing offshore. With the introduction of FADs in 1982, and the promotion of the Fisheries Department, several operators started trolling around the FADs and marketing their catch in Port Vila. Other fishermen involved in the deep-water snapper fishery would sometimes catch tuna from the FADs to use as bait for their bottomfishing activities. In 2001 it was estimated that there were 5–10 fishermen involved in full-time trolling activities around the FADs

	In the 1990s, most FADs were deployed off the two main centres in Vanuatu, Port Vila and Luganville. Most FADs deployed by fisheries from 1982–1995 were funded by the EU as part of the funding of the Fisheries Extension Services. From 1999 on, local charter vessel operators have contributed to the cost of materials used for the FADs off Port Vila, and they do the deploying and maintenance work on the FADs.	Cooperation Foundation (OFCF) conducted mid-water fishing trials around FADs in 1985–86.	for tunas and related pelagics, with another 5–10 part-time operators.

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in Vanuatu

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Moses Amos, Director of Fisheries, Fisheries Department (September 2003).	There are no public sector fishing companies as the government is promoting private sector development.	No medium-scale domestic tuna fishing operations in Vanuatu at present. Government committed to private sector development in this area, and looking at ways to kick-start domestic development. One approach may be to bring in a charter boat.	No joint venture arrangement at present.
Background References: Chapman 2000; Fisheries Department 1996a; Gillett 2002; Gillett in press; Kingston et al 1996; Wright 2000.	There are no records of any public sector tuna fishing companies or operations in Vanuatu.	International Tuna Services Limited (ITSL) was established in Vanuatu in the mid-1990s. This company operated 2 purse seiners and 1 tuna longliner. The vessels rarely fished in Vanuatu waters, though. Also in the mid-1990s, a second tuna company, Toho Vanuatu Limited (TVL), was established. This company operated 1 freezer longliner. In late 1995, Vanuatu Fishing Investments Limited (VFIL) was established and leased the government processing facility in Port Vila for its tuna longline venture. 1 tuna longliner fished as a locally based foreign vessel for 2 years, with VFIL closing in December 1997. In 2002, 2 US longliners were based in Port Vila; however, the vessels fished in the Vanuatu EEZ and landed their catch in Fiji for processing and marketing.	The SPFC transhipment complex at Palekula that operated from 1957–1986 was a joint venture between the Japanese Mitsui Company and the Government of Vanuatu (7%). Both ITSL and TVL were joint venture companies, 51% Vanuatu owned. VFIL was a locally incorporated company owned by New Zealand interests, with a Ni-Vanuatu partner through a joint venture arrangement.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in Vanuatu

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Moses Amos, Director of Fisheries, Fisheries Department (September 2003).	About 7 charter boats working out of Port Vila and 2 working out of Santo. About 10 sportsfishing craft fishing out of Port Vila and another 4 in Santo. Annual fishing tournament held in Port Vila with about 15 vessels fishing.	Currently no bait fishing trials or activities underway or planned.	One vessel trapping deep-water crabs in depths of 500 to 700 m with the crabs exported.
Background References: Bell and Amos 1993; Chapman 2000; Fisheries Department 1980; Guerin 1989; SPC 1983; Whitelaw 2001.	Charter fishing vessels have been operating out of Port Vila since the late-1980s, mainly catering to foreign tourists. The charter vessels rely heavily on the FADs deployed off Port Vila to increase their chance of a good catch for their paying customers. In 2000 there were 5 charter companies in Port Vila operating 8 vessels, plus 1 operator with 1 vessel operating out of Luganville. There is 1 major annual fishing tournament, the Vanuatu International, plus other tournaments held at different times of the year, including Easter.	Japanese vessels conducted initial baitfishing survey in Vanuatu in the early 1970s, averaging around 30 kg of bait/set. SPC conducted some baitfishing in Vanuatu as part of their regional tagging project for skipjack. These bouki-ami net sets were made in 1977–78, with an average catch of 31 kg/set over 4 hauls. Only 3 locations were considered suitable for bait based on the limited baiting undertaken. Fisheries conducted beach seine and lampara net surveys for baitfish in the Santo area in 1982 in conjunction with OFCF of Japan. Catch rates averaged 29 kg/set over 9 sets of the beach seine and 39 kg/set for 14 sets of the lampara net.	Initial survey of the deep-water shrimp resource was undertaken in 1979–80, with traps set in depths from 229–650 m. Fisheries and ORSTOM conducted a second survey of the deep-water shrimp resource in 1982, with traps set from 400–700 m. Best results were obtained from the traps set in 450–500 m depths. During experimental trap-fishing trials for deep-water snappers in 1987 and 1988, a significant catch of nautilus were recorded.

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Wallis and Futuna

General

Wallis and Futuna (Figure 1) consists of two distinct island groups. The Wallis group is made up of one main island, with several smaller ones, all encircled by a barrier reef. Futuna on the other hand is made up of two islands with no fringing reef. The islands in the two groups lie between 13º and 15º S latitude, and 175º and 178º W longitude. The 2003 mid-year population estimate for Wallis and Futuna is 14,800 people (SPC 2003).

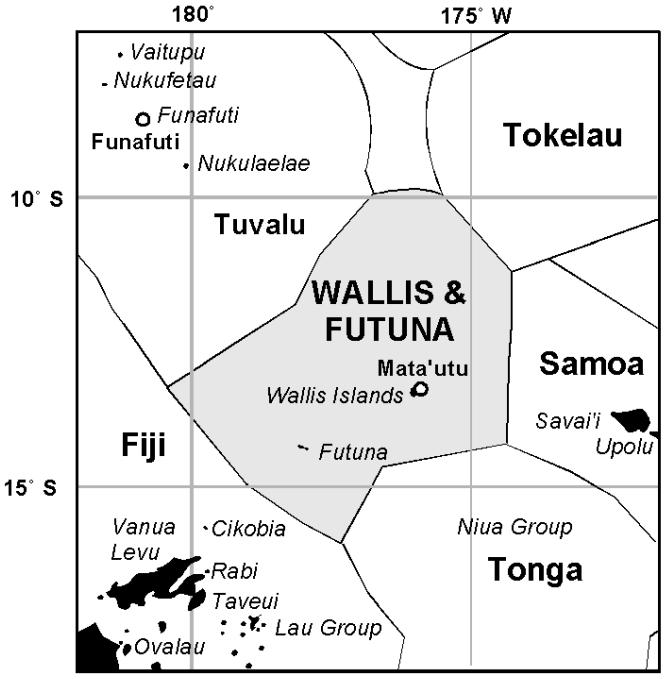

Figure 1: Wallis and Futuna, its EEZ and neighbouring countries

Wallis and Futuna has an EEZ of 300,000 km^2, while having a land area of only 142 km^2. Wallis and Futuna borders five other countries, Tokelau to the northeast, Samoa to the east, the Kingdom of Tonga to the southeast, the Republic of the Fiji Islands to the southwest, and Tuvalu to the northwest, with only a small part of its EEZ bordering international waters to the north.

Fisheries development and management

The development and management of the marine resources within Wallis and Futuna falls under the jurisdiction of the Service de l'Économie Rurale et de la Pêche (SERP). There is currently no specific fisheries legislation under which the SERP works. It is planned that fisheries legislation will be drafted in the near future, after new staff have been recruited to the fisheries area of SERP.

In the interim, a fisheries development policy statement, 'General Fishing Industry Development Policy for Wallis and Futuna (TAWF 2003) or politique générale du développement des filières pêche du territoire de Wallis et Futuna' has been developed and was implemented in February 2003. In this document, the policy objectives, and objectives for 2003 to 2005 as presented in the document are:

Policy objective (English translation)

The objectives of this policy, in close collaboration with the sustainable development strategy signed by the French Government and the Territory on 20 December 2002 are, in nature:

- technical, through efforts to ensure reasoned and sustainable exploitation of the many different resources

available and optimum management of stocks, knowledge and assessment of which must be evaluated on a regular basis;

- social, through support for a sustainable and economically viable local industry based on exploitation of the Territory's fisheries resources, generating stable employment in the private sector for the men and women of Wallis and Futuna;
- economic, through the best possible integration of the Territory's seafood products into those local, regional and international trade circuits likely to offer the best earning power with regard to the economic laws that govern these markets;
- political, through the assistance and support public authorities provide to the initiatives of private investors, the momentum behind the industry and its development.

Original French version

Les objectifs de cette politique, en liaison avec la stratégie de développement durable signée entre l'Etat et le Territoire le 20 décembre 2002 sont de nature :

- technique, par la recherche d'une exploitation raisonnée et durable des diverses ressources disponibles et une gestion optimale des stocks dont le niveau de connaissance et d'évaluation doit être régulièrement apprécié,
- sociale, par l'accompagnement d'une filière autochtone, durable et rentable basée sur l'exploitation des ressources halieutiques du Territoire, génératrice d'emplois stables dans le secteur privé au bénéfice essentiel des hommes et des femmes de Wallis et Futuna,
- économique, par la meilleure intégration possible des produits de la mer du Territoire dans les circuits commerciaux locaux, régionaux et internationaux susceptibles d'offrir la meilleure rentabilité au regard des lois économiques qui régissent ces marchés,
- politique à travers l'accompagnement et les soutiens apportés par les pouvoirs publics aux initiatives des investisseurs privés, moteur de la filière et de son développement.

Objectives for the period 2003 to 2005 (English translation)

Conducted over a period of three years (2003–2005), this first three-year phase has the following objectives:

- Improve operating conditions for existing nearshore fisheries and prepare for a transfer of activity towards oceanic fisheries;
- Begin development of fresh fish oceanic fisheries with the aim of meeting the needs of the local market and to validate as many of the theories made on this resource as possible with the first operational units. Agreements will be drawn up between the Territory and ship owners according the current arrangements within the Pacific Community;
- Conduct research and development activities so as to validate certain aspects of stock management;
- Invest in development of the Halolo Port to make it capable of hosting the Territory's future fishing fleet and to improve the operating conditions for nearshore fisheries;
- Set up the administrative structures needed to manage development (Territorial Fisheries Service, French Maritime Affairs Department);
- Formulate a development assistance budget calendar and set up appropriate funding structures;
- Implement the legislation needed to provide a regulatory framework for the industry (fishing permits, social status of sea fishers, etc.) and for the development of its economic activity in an international context (export of products to the European Union).

Original French version

- Conduite sur trois ans (2003–2005), cette première étape sur trois ans a pour objectifs.
- L'amélioration des conditions d'exploitation de la pêcherie de proximité existante, et la préparation à un transfert d'activité vers la pêcherie hauturière,
- Le démarrage du développement de la pêcherie hauturière en pêche fraîche en vue de satisfaire le marché local, et pour valider le maximum d'hypothèses émises sur la ressource avec les premières unités

opérationnelles. Des accords seront conclu entre le Territoire et les armateurs selon les dispositions en vigueur au sein de la Communauté du Pacifique.

- La conduite des actions de Recherche Développement afin de valider certains aspects de la gestion des stocks,
- la réalisation des investissements portuaires d'Halalo aptes à accueillir la future flottille de pêche du Territoire et ceux permettant d'améliorer les conditions d'exercice des pêches de proximité,
- la mise en place des structures administratives (Service Territorial des Pêches, Service d'Etat des Affaires Maritimes), nécessaires à l'encadrement du développement,
- la programmation budgétaire d'aides au développement et la mise en place de structures de financement adaptées ,
- la mise en place d'une législation nécessaire à un encadrement réglementaire de la filière (licence de pêche, statut social du marin pêcheur etc. . . .) et au développement de son activité économique dans un contexte international (exportation de produits vers l'Union Européenne).

Nearshore domestic fisheries development and/or management plans and strategies

The SERP is planning to draft and implement development and management plans for some of the domestic fisheries. When looking at the nearshore resources, the two main fisheries are the deep-water snapper fishery and the tuna fishery. There is no development and/or management plan in place for the deep-water snapper fishery at present. The same situation exists for the tuna resource that passes through the EEZ of Wallis and Futuna.

Current status with background information on nearshore domestic fisheries development

Tables 1–4 summarise the current status in a range of areas, with some background information for domestic development in the nearshore fisheries. The main focus is on developments in the tuna fishery, both public and private sector, as this is where most effort has been and is being directed. The tables provide a snapshot based on the information available at the time.

Table 1: Current status, with background information on deep-water fishing, rural and urban fishing centres and boatbuilding activities in Wallis and Futuna

Country/territory	Deep-water snapper fishing	Rural and urban fishing centres	Boatbuilding (public and private sector)
Current status Information provided by Jacques Fourmy, Chef des services territoriaux des affaires rurales et de la pêche de Wallis et Futuna, (October 2003).	Deep-water snapper fishing is conducted ad hoc with around 10 vessels operating around Wallis and another 10 vessels around Futuna, with the fish sold on local markets.	1 private sector fish market on Wallis with a small ice machine for its own use. 1 private sector part-time fish market on Futuna with another being established. No ice available for local fishermen at present at either Wallis or Futuna. New harbour project for Wallis in 2004–05, which will include ice-making facilities.	1 government boatyard making plywood skiffs, although this is scheduled to close shortly. 1 private sector boatbuilder making pleasure craft in plywood for use on the lagoon. Many people bringing in aluminium skiffs and dinghies from Australia and New Zealand in preference to the locally built boats. Repairs can be made on small plywood and aluminium boats.
Background References: Dalzell et al 1996; Dalzell and Preston 1992; Fusimalohi and	SPC conducted initial deep-water snapper fishing trials and training with local	In 1981 the government installed a 10 m^3 cold room and 600 kg/day ice plant on	In 1970 a small government boatyard established on Wallis, building small

Grandperrin 1980; SPC 1984; Taumaia and Cusack 1997; Virmaux et al 2002.	fishermen at Wallis and Futuna in 1980. The FAO-design Samoan wooden handreel was introduced at this time for fishing. In 1984, SPC conducted additional training and fishing trials at Wallis and Futuna to encourage fishermen to fish deep-water snappers outside the reef. Government Fisheries Service conducted additional training in deep-water snapper fishing during the 1980s and 1990s, and this was sometimes coupled with boat subsidy schemes.	Wallis to promote fisheries development. Also in 1981, the territory acquired a fisheries research and support vessel with a 4 t freezer. The boat fell into disrepair within a couple of years. Government put in new boat ramps, 1 at Wallis and 1 at Futuna in 1987.	wooden boats of 4.5–9 m in length. In 1975, a small boatyard established on Futuna to produce flat bottom timber and plywood vessels for use in the lagoon. In the mid- to late-1970s, the boatyards started making 8.6 m plywood alia catamarans using the FAO design. In 1984, a private boatyard was established building fibreglass vessels. The 1990 census showed that there were 333 boats, 272 on Wallis and 58 on Futuna, although none were engaged in full-time fishing.

Table 2: Current status, with background information on FAD programmes, and public and private sector small-scale tuna fishing projects in Wallis and Futuna

Country/territory	FAD programmes and or deployments	Public sector development (small-scale tuna fishing)	Private sector development (small-scale tuna fishing)
Current status Information provided by Jacques Fourmy, Chef des services territoriaux des affaires rurales et de la pêche de Wallis et Futuna, (October 2003).	Currently only 1 FAD off Futuna. The 2 FADs that were off Wallis have gone. Funds are available for new FADs, with materials to be ordered in late 2003.	Local government with French aid assistance is supporting a fisherman in the private sector to purchase a 15 m tuna longline vessel.	1 person in the private sector is buying a 15 m tuna longliner with financial assistance. Boat scheduled to arrive in about mid-2004. Around 10 small-scale vessels trolling for tunas and other pelagics off Wallis and another 10 trolling the FAD and open water off Futuna. These are the same boats that are deep-water snapper fishing.
Background References: Beverly et al 1999; OFP 2001; SERP 1996; SERP 1995; SPC 1984; Taumaia and Cusack 1997; Virmaux et al 2002.	SPC provided training in the conducting of site surveys to select suitable FAD deployment sites in 1992, with 3 sites selected, 2 off Wallis and 1 off Futuna. French navy and Marine Marchande from New Caledonia deployed 3 FADs in 1996 at the sites chosen by SPC. 2 FADs lost, 1 in 1993 and 1 in 1994, with replacement FADs deployed by the French navy with Marine Marchande and SPC assistance in mid-1995. The third of the original FADs was lost in mid-1995 and replaced in late 1995. In 1996, materials for 5 replacement FADs purchased,	Government implemented a subsidy scheme in 1975 for locally built fishing vessels with government covering 75% of the value of the boat and outboard. In the early 1990s, new training programmes introduced by government to encourage fishing outside the reef. This was coupled with the FAD programme. In 1994 a new training scheme was introduced to focus on fishing outside the reef, and on fish quality, with trainees subsidised into fishing boats. After 1 year, 86% of these ventures had failed.	Before the 1950s, fishermen from Wallis and Futuna fished tunas from canoes, but this ceased when many people, including the fishermen, moved to New Caledonia for employment in the nickel industry in the 1950s. Government promoted small-scale private sector tuna fishery development with trolling the main method used. FADs were deployed for the fishermen and subsidised boat schemes introduced, but with little success. During the 1990s, few private sector fishermen pursued tuna fishing.

	with these rigged and deployed as needed by the local Fisheries Service from 1996–2001.		

Table 3: Current status, with background information on public sector tuna fishing companies, medium-scale private sector and joint venture tuna fishing operations in Wallis and Futuna

Country/territory	Public sector tuna fishing companies	Private sector development (medium-scale tuna fishing)	Joint venture tuna fishing operations
Current status Information provided by Jacques Fourmy, Chef des services territoriaux des affaires rurales et de la pêche de Wallis et Futuna, (October 2003).	There are no public sector tuna fishing companies — the government policy is to promote private sector development.	No development in this area at present. Just 1 x 15 m tuna longline vessel due to arrive in mid-2004.	No joint venture fishing operations at present.
Background References: OFP 2001.	No public sector tuna fishing companies at all in the past.	No development of medium-scale tuna fishing in the private sector.	No joint venture fishing activities undertaken in Wallis and Futuna.

Table 4: Current status, with background information on sportsfishing and gamefishing, baitfishing trials and activities, and other fishing methods trialled in Wallis and Futuna

Country/territory	Sportsfishing and gamefishing	Baitfishing trials or activities	Other fishing methods trialled
Current status Information provided by Jacques Fourmy, Chef des services territoriaux des affaires rurales et de la pêche de Wallis et Futuna, (October 2003).	No charter fishing operations at present. Gamefishing club at Wallis with 10–15 sportsfishing vessels. Club holds an annual gamefishing tournament.	No baitfishing activities undertaken at present.	No other nearshore fishing activities undertaken at present.
Background References: OFP 2001; SERP 1996; SPC 1984; Whitelaw 2001.	Very little history of sportsfishing or gamefishing in Wallis and Futuna.	In 1973, a Japanese research vessel spent 7 days baiting and pole-and-line fishing in the waters off Wallis and Futuna, with encouraging catches of bait in the lagoon. SPC's Skipjack Programme conducted experimental baitfishing and pole-and-line fishing in 1978, with good catches of baitfish in the lagoon at Wallis, with an average catch of 291 kg per haul of the bouki-ami net. SPC's Skipjack Programme returned to Wallis in 1980 for 13 days of pole-and-line fishing and baiting, with good catches of bait recorded. In 1981, the aquaculture potential for live baitfish was assessed favourably by CNEXO. In 1982, Transpêche Fishing Co. had 1 vessel fish around	Training in scoop netting of flyingfish provided by SPC in 1995. No records of other deep-water fishing trials or other activities undertaken outside the reef.

		Wallis for 13 days, with reasonable catches of baitfish in the lagoon.	

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