



Secretariat of the Pacific Community

FIELD REPORT No. 23

on

**DEVELOPMENT OPTIONS AND
CONSTRAINTS INCLUDING TRAINING
NEEDS AND INFRASTRUCTURE
REQUIREMENTS WITHIN THE TUNA
FISHING INDUSTRY AND SUPPORT
SERVICES IN THE REPUBLIC
OF THE MARSHALL ISLANDS**

27 October to 8 November 2003

by

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Secretariat of the Pacific Community
Noumea, New Caledonia
2004

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This field report forms part of a series compiled by the Fisheries Development Section of the Secretariat of the Pacific Community's Coastal Fisheries Programme. These reports have been produced as a record of individual project activities and country assignments, from materials held within the Section, with the aim of making this valuable information readily accessible. Each report in this series has been compiled within the Fisheries Development Section to a technical standard acceptable for release into the public arena.

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Prepared at
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Noumea, New Caledonia, 2004

ACKNOWLEDGEMENTS

The Secretariat of the Pacific Community acknowledges with gratitude the support and assistance provided by the Marshall Islands Marine Resources Authority (MIMRA), and in particular: Mr Danny Wase, Director, MIMRA; Mr Glen Joseph, Deputy Director, Oceanic and Industrial Fisheries, MIMRA; Ms Berry Muller, Intern with the Policy and Planning Division, MIMRA; Mr Manasseh Avicks, Observer and Port Sampling Coordinator, MIMRA; and Ms Florence Edwards, Chief of Coastal Fisheries, MIMRA.

Many other government departments and private sector businesses were consulted during the fieldwork phase of the project, and the Secretariat would like to acknowledge with gratitude the assistance and cooperation provided by: Mr Larry Muller, Principal, Marshall Islands Fisheries and Nautical Training Centre (FNTC); Mr Daniel Timothy, Assistant Chief of Customs and Taxation; Mr Eugene Muller, General Manager, PM&O Processing, LLC (tuna loining facility); Mr Don Hess, Head of Marine Studies, College of the Marshall Islands; Ms Silvia Pinca, Lecturer in Marine Studies, College of the Marshall Islands; Mr Betwel Lekka, Assistant Secretary, Ministry of Transportation and Communication; Mr James Myazoe, Vice President, Trust Company of the Marshall Islands, Inc.; Mr Alan Schollar, Vice President, Trust Company of the Marshall Islands, Inc.; Mr Joseph Bigler, Vice President, Trust Company of the Marshall Islands, Inc.; Mr Joe Tiobech, Director of the Marshall Island Ports Authority; Captain Ninruj Abon, Master Mariner, Harbour Pilot, Marshall Islands Ports Authority; Mr Yen Sheng, Manager, KMI (Kendall Micronesia Incorporation) Fishing Vessel Agency; Mr Mark Canney, Project Manager, ADB Education Project; Ms Deborah Barker, Biodiversity Conservation Officer, Environmental Protection Agency; Ms Masilina Sefeti, Principal, Republic of the Marshall Islands USP Programme; Ms Irene Taafaki, Centre Directorise, USP Centre; Mr Kenneth Kramer, Operations Manager, Pacific International Inc.; Mr Mark Stege, General Manager, Marshall Islands Visitors Authority; Mr William (Billy) Roberts, General Manager, Marshalls Energy Company; Mr Alson Kelen, Programme Manager, Waan Aelon in Majel canoe building project; Ms Jill Luciano, Administrative Trainer, Waan Aelon in Majel canoe building project; Mr Jimmy Kemem, Director, National Training Council; Mr Gerry Yang, Manager, Marshall Islands Fishing Venture Inc.; Mr Jack Chong-Gum, Director, Marshall Islands Airport Authority; Mr Charles Stinnett, President, Marshall Islands Billfish Club; Mr Charles Domnick, local business man and past local tuna longline owner; Mr John Hawley, Manager of Sales and Operations, Micronesia, Aloha Airlines; Mr Wally Milne, Lanai Mechanical Works, and longline fisherman from past project; Mr Kirtley Pinho, local contractor and person involved with past longline project; and many others.

SUMMARY

The Secretariat of the Pacific Community (SPC) was requested to provide input to the drafting of a tuna fishery development plan or strategy by the Marshall Islands Marine Resources Authority (MIMRA) and the Forum Fisheries Agency (FFA). This was a collaborative project coordinated between MIMRA and FFA with input from several sections of SPC. Fieldwork was carried out between 27 October and 8 November 2003, and this report is the input provided to the process.

There is good potential for developing domestic tuna longline fishing operations in the Marshall Islands, because the resource is known to frequent the RMI EEZ and locally-based foreign longline vessels work the area. However, the government needs to provide an enabling environment with infrastructure to encourage development in the private sector. The concept of a new fisheries complex needs to be explored to try to relieve the current congestion at the existing wharves. Availability of land is another issue to be addressed and whether land can be leased, bought or reclaimed. If land is to be reclaimed, then a full environmental impact assessment needs to be conducted first.

Airfreight capacity and cost has the potential to be a limiting factor for the development of domestic tuna fishing operations, as it is no use catching the fish if you can not sell it at a profit. The current air services and freight space availability are nearly used by existing freight from different companies including the fresh tuna from MIFV. Alternatives need to be explored, including the possibility of dedicated cargo flights in addition to the current Asia Pacific Airline flights.

MIMRA has implemented some tuna longline fishing trials and training of local fishermen using their fisheries training vessel. These trials should continue, with as many people as possible introduced to the tuna longline method. This will create a pool of potential crew for tuna longline vessels in the future, which will hopefully encourage Marshallese entrepreneurs to invest in the tuna longline industry.

There is also a need for government support for the existing small-scale tuna and gamefishing or charter fishing fleets with the setting up of an ongoing FAD programme, with the introduction of mid-water fishing techniques to compliment their trolling activities. Such an FAD programme could be funded, in part at least, through the proposed 'development fee' placed on foreign fishing vessels. A 5-year plan could be developed and materials purchased in bulk to reduce costs to the programme. Small-scale fishermen and charter vessel operators would benefit from increased catches and reduced operating costs, plus there is the safety aspect of people fishing in known locations (where the FADs are).

There is also the potential for developing small-scale value-adding to product to reduce freight costs and hopefully increase returns to the country on a per kilo basis. Tuna jerky and salting and drying are the two main small-scale value-adding process that can be explored, especially in the outer islands. Health requirements both locally and internationally would need to be adhered to, with each facility needing a HACCP plan to ensure product could be exported to the US. There is also the potential for additional large-scale value-adding, such as a second tuna loining facility, although a study should be undertaken first to assess if there is an adequate workforce interested in working in such a facility.

Training is the other main area that the government needs to examine, especially in the areas of implementing the tuna management plan and tuna development strategy, surveillance and compliance, observer coverage, and the lack of trained skippers and engineers for developing domestic tuna longline operations. The last point is an important one as there are very few people with skills in hydraulics and refrigeration, which are essential for an engineer working on a medium-scale tuna longline vessel.

RÉSUMÉ

Le Secrétariat général de la Communauté du Pacifique (CPS) a été invité à participer à l'élaboration d'un plan ou d'une stratégie de développement de la pêche thonière par l'Office des ressources marines des Îles Marshall (MIMRA) et l'Agence des pêches du Forum (FFA). Il s'agit d'un projet mené en collaboration par le MIMRA et la FFA auquel ont participé plusieurs sections de la CPS, et dont fait état le présent rapport. Des travaux sur le terrain ont été effectués entre le 27 octobre et le 8 novembre 2003

Il existe, aux Îles Marshall, un bon potentiel de développement de la pêche thonière à la palangre. On sait, en effet, que la ressource est présente dans la zone économique exclusive et que des palangriers étrangers basés localement travaillent dans le secteur. Toutefois, les pouvoirs publics ont besoin de fournir des conditions propices à l'action ainsi qu'une infrastructure pour favoriser le développement du secteur privé. Il importe d'envisager la possibilité d'aménager de nouvelles installations de pêche afin de réduire la congestion actuelle des quais. La disponibilité des terres est une autre question à évoquer, et il convient de déterminer si celles-ci peuvent être louées, achetées ou mises en valeur. Une évaluation complète de l'impact environnemental de la remise en état de terres devrait précéder sa mise en œuvre.

La capacité du fret aérien et les coûts y afférents représentent un autre frein possible à l'expansion des entreprises locales de pêche thonière. Il est, en effet, inutile de capturer du poisson s'il est impossible de le revendre avec un bénéfice. Les services actuels de transport aérien et la capacité de fret disponible sont presque entièrement utilisés par les marchandises expédiées par différentes entreprises, notamment le thon frais provenant du *Marshall Islands Fishing Venture Company*. D'autres options doivent être étudiées, notamment la possibilité de nolisier des avions cargo, dont les vols viendraient s'ajouter à ceux de la *Asia Pacific Airline*.

L'Office des ressources marines des Îles Marshall a effectué des essais de pêche thonière à la palangre et a assuré la formation de pêcheurs locaux à bord de son navire-école. Ces essais devraient se poursuivre, familiarisant ainsi le maximum possible de pêcheurs à la pêche à la palangre. On créera en faisant une réserve de membres d'équipage pour les palangriers thoniers, ce qui devrait encourager des entrepreneurs des Îles Marshall à investir dans l'industrie de la pêche thonière à la palangre.

Il est également nécessaire que les pouvoirs publics soutiennent les petites entreprises existantes de pêche thonière et sportive, ou de location de bateaux, en favorisant la mise en place d'un programme continu de DCP, grâce à l'introduction de techniques de pêche en zone semi-pélagique, de manière à servir de complément à leurs activités de pêche à la traîne. Un tel programme pourrait être financé, en partie au moins, par la « redevance en faveur du développement » qu'il est envisagé de prélever sur les navires de pêche étrangers. On pourrait élaborer un plan de cinq ans et acheter des matériaux en grande quantité pour réduire les coûts du programme. Les petites entreprises de pêche et les exploitants de location de bateaux profiteraient de l'augmentation des prises et de la réduction des coûts d'exploitation, sans compter l'angle sécurité qui consiste à pêcher dans des endroits connus (autour des DCP).

En outre, des possibilités existent pour la création d'entreprises artisanales de valorisation du produit de la pêche dans le but de réduire les coûts du fret, voire peut-être d'accroître le revenu par kilo généré par la filière. La production de la charque de thon ainsi que le salage et le séchage sont les deux principales formes de valorisation qu'il conviendrait d'étudier, en particulier pour une implantation dans les îles éloignées. Il serait nécessaire de respecter les exigences en matière de santé, tant locales qu'internationales, chaque installation devant faire l'objet d'un plan HACCP en vue d'assurer que le produit puisse être exporté aux États-Unis d'Amérique. Des possibilités existent également pour un autre projet de valorisation à grande échelle, tel que l'aménagement d'une deuxième installation de découpe de thon en longes ; toutefois, une étude devrait d'abord permettre de déterminer s'il existe une main-d'œuvre suffisante souhaitant travailler dans un tel établissement.

La formation est un autre domaine auquel devraient s'intéresser les pouvoirs publics, notamment en ce qui concerne la mise en œuvre du plan de gestion et de la stratégie de développement de la pêche thonière, des contrôles et de la conformité, et de la couverture assurée par les observateurs. C'est aussi par la formation que pourra être comblée la pénurie de capitaines et de mécaniciens qualifiés qui pourraient contribuer au développement des entreprises locales de pêche thonière à la palangre. Dernier point, et non des moindres : le pays manque cruellement de personnes possédant des compétences en hydraulique et en techniques de réfrigération, qualifications essentielles pour tout mécanicien employé à bord d'un thonier palangrier commercial de taille moyenne.

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1. INTRODUCTION

The information contained in this report forms a specific component to develop a 'National Domestic Tuna Fishery Development Plan or Strategy' for the Republic of the Marshall Islands (RMI). The development plan will be drafted by the Forum Fisheries Agency (FFA) in consultation with the Marshall Islands Marine Resources Authority (MIMRA), and drawing on input from other sectors involved or interested in the tuna fishery. This report forms part of the development input, which includes training needs and infrastructure requirements, with a focus on domestic small-scale and medium-scale development in the tuna fishery.

The fisheries development specialist from SPC will provide input to the formulation of the development plan for the RMI under the following terms of reference:

- (i) assess the feasible options that are available for domestic tuna development in the RMI, focusing on the scope for tuna longline development;
- (ii) identify constraints to further development of the country's tuna resources;
- (iii) identify potential infrastructure needs that would promote future tuna-related development;
- (iv) review the current availability of skilled fisheries-related personnel in-country (such as vessel officers, crew, welders, electricians, refrigeration mechanics, vessel managers, and so on) and, for the different tuna development options available, identify those skills for which additional in-country and/or regional training is required;
- (v) discuss these issues with relevant national stakeholders, MIMRA staff, FFA staff, and other members of the project team;
- (vi) produce a written report addressing the above issues; and
- (vii) as part of the project team, assist FFA and MIMRA to prepare and review those sections of the draft development plan relating to the above issues.

The Fisheries Development Adviser of the Secretariat of the Pacific Community, Lindsay Chapman, travelled to the RMI (27 October to 8 November 2003) to undertake this work. Initial meetings were held with senior MIMRA staff, who then assisted in identifying and setting up meetings with staff of other government departments, and others with an interest in developing domestic tuna fishing operations in the RMI. Consultations were held with a large number of stakeholders, and many reports were reviewed to gather the information compiled in this report. Appendix A provides a list of the people consulted, while Appendix B provides a bibliography of the reference materials.

The report focuses on the most likely areas for domestic tuna fishery development to occur in the RMI. The suggestions contained in this report are based on information collected during fieldwork in the RMI, and do not account for any changes that may have occurred to legislation or other circumstances, since the time of this work. Therefore, some of the information and suggestions may not now be relevant based on changes that may have occurred since the time the fieldwork was undertaken.

2. BACKGROUND

The Republic of the Marshall Islands (RMI) 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 RMI has an exclusive economic zone (EEZ) of around 2,131,000 km², while only having a land area of around 181 km². The RMI has around 50 per cent of its EEZ bordering international waters,

with the remaining EEZ bordering three Pacific Island nations (the Federated States of Micronesia, Nauru and the Republic of Kiribati) to the south, and the US territory of Wake Island in the north.

2.1 History of the tuna fishery in RMI waters

Records for Japanese pole-and-line activities in the waters around the Marshall Islands go back to the late 1920s, although no catch and effort data is available. After World War II, in the 1950s, Japanese pole-and-line vessels and tuna longline vessels fished in the waters around the Marshall Islands, with Korean and Taiwanese vessels following in the late 1960s.

Catch records are available for tuna longlining in the waters around the RMI from 1962, when Japanese, Korean and Taiwanese vessels caught around 5350 mt of fish, mainly bigeye and yellowfin tuna. Longline catches fluctuated during the 1960s, ranging from a low of 3342 mt in 1964 to a high of 8534 mt in 1966. Again, bigeye and yellowfin tuna made up the bulk of the catch. Longline catches continued at around the same levels during the 1970s.

Although Japanese pole-and-line fishing had been practiced in RMI waters from the late 1920s, catch and effort data are only available from 1972. In this year, the Japanese catch was around 7000 mt. During the 1970s the pole-and-line catch fluctuated from a low of 5364 mt in 1979 to a high of 30,460 mt in 1978. Skipjack tuna made up over 90 per cent of the pole-and-line catch annually.

In 1978, the SPC's Skipjack Survey and Assessment Programme conducted surveys of the skipjack and baitfish resources in the country. Sightings of skipjack schools were low, as was the catch at 1555 kg for the time spent fishing, with 421 fish tagged and released. Baitfishing sets were conducted on five nights at two atolls in the RMI, with an average catch of 122 kg per night. This was low compared to other locations in the region and would make the establishment of a local pole-and-line fishing operation marginal.

The 1980s saw many changes take place in the tuna fishery in RMI waters. Firstly, purse seiners started fishing these waters in 1981, with only small catches reported to start. By 1983, the purse seine catch was almost 2000 mt, although the longline catch in this year was almost 5000 mt and the pole-and-line catch around 28,500 mt. Also in 1985 a tuna longline 'Fishbase' was established in Majuro. The facility was initially managed by the government's Marshall Islands Development Authority (MIDA), however, the facility was not used to its full potential.

Tuna fishing activity remained foreign focused during the 1980s even though the government of the RMI was actively promoting domestic development. Both foreign pole-and-line catches and tuna longline catches fluctuated during this time. In 1988/89, the RMI government through the Marshall Islands Marine Resources Authority (MIMRA) started licensing foreign vessels that were fishing in their EEZ. This generated new income for the government. The Marshall Islands entered into several joint ventures with foreign companies in the early 1990s to enter the tuna fishery. This was both in tuna longlining and purse seining.

In the early 1990s, the Hawaiian-based company, Mehau Fishing Co. took over the management of the Fishbase. This company had several US-style longline vessels fishing to it in the early 1990s. Catch records are very limited for this fishing operation, which only lasted until 1994.

In 1992, MIDA assisted individual local entrepreneurs in the purchase of four reconditioned tuna longliners and a newly built longline vessel. Each boat was operated and managed as an independent business enterprise. One of the operators purchased an additional vessel, and operated these from 1992 to 1994. The export quality fish taken were flown out on the Air Marshall Islands' DC8 aircraft to Hawaii and Japan for marketing. Unfortunately these operations ran into problems with varying and sometimes low catch rates, a lack of working capital to keep the boats out fishing, and a general lack of fishing experience. There are very few catch records for the fishing activities of these vessels.

After the Hawaiian company moved out of the Fishbase, the management contract was granted to a Taiwanese-based company, Ting Hong, who took over the operation on 1 January 1995. Ting Hong was given a 20 year lease with exclusive rights to service all longline vessels licensed by MIMRA. MIMRA also agreed to issue licences to 70 vessels per year nominated by Ting Hong, while Ting Hong agreed to invest in the RMI tuna fishery and to maintain and improve the Fishbase facilities. Ting Hong operated the Fishbase until 1998 with regular exports of fresh tuna on the company's cargo planes, although the numbers of vessels supplying product to the facility started to drop off.

Also in the mid-1990s, a new company (Marshall Islands Ocean Development (MIOD)) came to the RMI and established a live fish trade business. They operated two boats and had holding cages in the lagoon to store the live fish while getting the amount of fish together for shipments. The operation failed in the late 1990s.

In October 2001, Edgewater Fisheries (RMI) Inc. started fishing for sharks in the RMI EEZ. MIMRA licensed the vessels with a requirement that they fish outside 12 nm to avoid any catching of reef shark species. The company started with two Chinese vessels fishing in 2001 and increased this to 5 vessels in 2003. The company was charged with some illegal fishing activities during 2003, and the company ceased operation while this was being resolved. The company was operating again at the end of 2003.

In 2000/2001, Marshall Islands Fishing Venture (MIFV) commenced tuna longline operations using the Fishbase facilities. They had eight Mainland Chinese vessels working to the company at the end of 2001. By 2003, the number of longliners fishing to MIFV was 28, and these were considered locally-based foreign vessel for licensing purposes. Catches for these vessels fluctuated and for the first nine months of 2003, the boats had recorded a catch of around 1250 mt, of which around 80 per cent was export species.

2.2 History of tuna processing and marketing facilities in the RMI

The development of tuna-related processing or packhouse facilities in the RMI has been a somewhat recent event. This started in 1985, when a tuna longline 'Fishbase' was established in Majuro under a development package provided by the Japan International Cooperation Association (JICA). The facility consisted of wharves, freezers (200 mt capacity), cold stores (100 mt capacity) and ice making facilities (5 mt/day capacity), as well as office space and two processing areas. The Fishbase facility was initially managed by the government's Marshall Islands Development Authority (MIDA).

Also in the mid-1980s, a small *katsuobushi* factory operated for several years, however, the facility closed, as it could not obtain enough wood for the curing/smoking process.

At the end of the 1980s, the MIMRA dock area was established under Japanese aid. The facility had a 20 t blast freezer, 50 t storage freezer and a 5 t/day plate ice maker. This facility was established for coastal fisheries development and was linked in with the establishment of the first rural fisheries base on Arno.

The Japanese Overseas Fishery Cooperation Foundation (OFCF) established infrastructure on Arno Atoll in 1989, which developed a small-scale lagoon, bottom and troll fishery in the area. Local fishermen increased their efforts with increases in catch as a result of this project, with the fish sold in Majuro through the new coastal fisheries development facility.

In the early 1990s, MIDA leased out the Fishbase facility to a tuna longline company, the Hawaiian-based, Mehau Fishing Co. This company increased the ice making capacity with the installation of 4 by 50 t/day plate ice machines. They also established a cold storage facility of 20 to 25 t capacity at the airport so that packaged export fish could be stored there ready to be loaded on flights. Regular exports of fresh fish were made to Hawaii, however, the company's lease was terminated in the mid 1990s.

Also in the mid-1990s, the Marshall Islands Ocean Development (MIOD) company was established in Majuro. They leased an old shed from MIMRA, which was located on the fringe of the MIMRA dock and coastal fisheries development facility. The company installed two by 100 t storage freezers, a 30 t blast freezer and a 20 t/day block ice maker. The freezers were mainly used for storing the imported food for their live fish trade (feeding the fish in the cages in the lagoon). The facility was also used to freeze and store fish that were not suitable for the live fish trade. The operation failed in the late 1990s and the equipment at the facility was handed to MIMRA in default of outstanding payments.

In 1995, the Taiwanese-based company, Ting Hong, took over the operation and use of the Fishbase through a 20 year lease arrangement with MIMRA. The base was used for the packing and exporting of fresh tuna, with regular shipments made using their own charter flights. In 1998, the RMI government ceased the contract with Ting Hong and took over control of the Fishbase. At this time, the machinery and facilities at the Fishbase were in poor condition and needed major repairs and refurbishment, as Ting Hong had not maintained the machinery.

During the 1990s the Japanese government was establishing rural fishing centres in the outer islands of RMI. This followed the success of the Arno project in 1989. From 1991 to 1999 five new centres were established, with freezers and ice machines provided and installed under Japanese aid. These projects focused on catching mainly reef and lagoon species, with the catch transported to either Majuro or to Ebeye for marketing.

In 1999, a tuna loining plant was opened on Majuro. The plant was equipped with a 2000 mt storage freezer to allow for continuity of fish for processing. The loining plant did not buy fish, as this was pre-arranged through StarKist in Pittsburgh. StarKist purchased the fish and directed boats to come and land their catch at the plant. The loining plant processed the fish (cleaned, cooked, loined, scraped off the skin and bones (the front end of a tuna cannery) and re-froze the loins in 11 lb (5 kg) packs. The packs were shipped to American Samoa by the container load. PM&O is paid a fee for doing the work.

When established, the facility had three processing tables with space for one more. The fourth table was put on line in 2000/2001 to increase production. In 1999 the plant employed around 400 people (80% were female working on the processing lines) and had a throughput of around 10,000 mt/year of raw product. Processing was done with the plant working 5 days per week with two shifts. In 2003, the plant employed 500 people in two shifts of 250 people. Production was also up to around 12,500 mt of raw product producing around 5000 mt of loins.

In October 2001, the old MIOD facility was leased by MIMRA to Edgewater Fisheries (RMI) Inc., Edgewater had to recondition most of the machinery, as it had not been used for several years. The company was licensed for shark fishing, so the facility was used for drying shark fins, as well as freezing and storing shark trunks, livers etc. If sharks were filleted the skins were saved and dried as well. All of the shark components were sold on the Asian market.

Also in 2000/2001, MIMRA leased out the Fishbase facility to Marshall Islands Fishing Venture (MIFV). MIFV is a subsidiary of Luen Thai Holdings Ltd, based in Hong Kong. MIFV had to recondition most of the equipment at the Fishbase due to its poor state as a result of Ting Hong's activities. The catch was primarily for fresh export to Japan and US markets. Luen Thai also has two cargo aircraft and they hold the contract for mail between Guam the Marshall Islands and Honolulu. The cargo flights take fresh fish in each direction to connect with other commercial carriers out of Guam and Honolulu.

3. GOAL, OBJECTIVES AND STRATEGIES

The goal, objectives and strategies suggested and presented here are for the domestic development of the tuna fishery throughout RMI, although Majuro is where most tuna fishery development is most likely to occur.

3.1 Goal

In looking at an overall goal for tuna fisheries development in the RMI, the objectives as set out in current legislation need to be taken into consideration. The objectives of the MIMRA Act 1997 and the Fisheries Policy (Anon 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 (Anon 1997) 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.

Given the above objectives and guiding principles, a possible overall goal for domestic development of the RMI tuna fishery could be:

To have a sustainable and profitable private sector tuna industry harvesting at or near the total allowable catch (TAC), fully owned by Marshallese, employing the maximum number of Marshallese, with maximum retained value in the country.

3.2 Objectives

The objectives of developing a domestic tuna fishery in RMI, in addition to those in the MIMRA Act 1997 and Fisheries Policy, could be to:

- Provide an enabling environment that will promote and encourage private sector development in the commercial fishing, charter/sport fishing, processing and support sectors in the RMI;
- Promote sustainable and responsible domestic development and harvesting of the tuna resource in the RMI EEZ in an environmentally friendly way, to provide both food for local consumption and export-oriented income;
- Maximise the benefits and economic return to Marshallese, local communities, and RMI as a whole;
- Create employment and income generating opportunities for Marshallese, including those in the outer islands;

- Collect accurate data from all tuna fishery activities in RMI, ensuring that all bycatch and any interactions with protected species are recorded;
- Ensure that all development within the RMI tuna fishery is consistent and compatible with any obligations or requirements as set out in local legislation and/or international agreements that affect the RMI; and
- Eventually reduce and replace foreign fishing access with Marshallese owned and operated vessels.

3.3 Strategies

The following are some examples of strategies that can be used to meet the proposed objectives and overall goal of developing a domestic tuna fishery in the RMI.

- Identify infrastructure needs and develop projects to address the identified needs;
- Develop specific proposals in identified areas for external funding, that will address part or all of the development objectives;
- Target tuna longlining as the most likely method to be successful, economically viable and adopted domestically, and focus development and training on this in the short-term;
- Look at options for development, which could include post-harvest activities to increase the value of the landed catch;
- Identify constraints and come up with workable solutions to overcome these constraints;
- Develop and implement a long-term data collection system for all tuna fishing activities in the RMI, with regular analysis of the aggregated data provided to industry for their information and benefit;
- Review all government duties and taxes for materials used in the fishing and processing sectors, including fuel, bait, electricity, water, gear, machinery and spares, and assess if these items should be tax and duty free, to encourage domestic development in the tuna fishery;
- Provide training for small-scale operators in different fishing techniques and business management, to ensure they have the best chance of running a viable fishing business;
- Use FADs as a means of assisting small-scale operators and develop a project to support an ongoing FAD programme in the main centres to start, expanding to the outer islands over time;
- Explore different options, including cooperatives and community group ownership, to establish viable projects in the outer islands in the tuna fishery, and explore ways to market the catch; and
- Develop the capacity of MIMRA to be able to better manage the RMI tuna fishery and conduct surveillance of the tuna fishery, including the collection of data, the continued operation of the observer programme and port sampling.

4. INFRASTRUCTURE REQUIREMENTS

There is a need for basic infrastructure within a country to allow development in the marine sector. This infrastructure includes shore facilities such as: wharves, access to fuel, water and ice for operators; support services including slipways, maintenance facilities, trades people to work on vessels; suitable vessels to harvest the resource; processing facilities; and airport facilities and cargo space availability. In the case of Majuro in the RMI, the availability of land also needs to be considered.

4.1 Shore facilities

There are four wharves in Majuro. The two commercial wharves were under the control of the Marshall Islands Port Authority, while the two fisheries wharves were under the control of MIMRA. The international wharf (Delap) is 1014 ft (roughly 320 m) long with a depth of 38 ft (roughly 12 m) at the wharf face. The second commercial wharf (Uluga) was for domestic and inter-island vessels. It was 320 ft (roughly 95 m) long with a depth of 28 ft (roughly 9 m) at the wharf face. The two fisheries wharves were the Fishbase wharf and the MIMRA dock that was used for coastal fisheries.

The commercial wharves were mainly used by the merchant vessels, although larger tuna fishing vessels did use these wharves from time to time when there was space available. These were usually foreign purse seine vessels that were taking on supplies after transshipping their catch to a carrier vessel in the Majuro lagoon. Congestion is a major problem at times when there are a lot of boats in port.

The Fishbase wharf forms part of the Fishbase complex, which is leased out to a foreign tuna longline company. Therefore, the company uses the wharf area for its vessels. When there are 10 or 12 boats in they have to tie up three to five deep and take turns to come into the unloading section of the wharf to discharge their catch. This wharf is fully utilised with the existing vessel numbers, around 30 at present although the company is hoping to increase this number to 40, which will increase congestion at times.

The MIMRA dock is a small area designated to small-scale domestic fishermen so they have somewhere to come and unload their catch and take on provisions. A couple of shark longliners sometimes use this wharf to unload their catch, as the company is situated on this wharf area. Although this wharf is not used as much as the others, it is small and would not handle a lot of boats.

Given the direction that MIMRA is taking with encouraging domestic tuna fishery development, wharf space is going to be a limiting factor. It is unclear if there is scope to extend any of the current wharves, so a study should be undertaken to assess if this is feasible or not. If it is found to be feasible, then a full environmental impact assessment should be made for each possible extension before any work commences.

Suggestion 1: That MIMRA and the Marshall Islands Port Authority have a study undertaken to assess if it is feasible or practical to extend any of the existing wharves.

Suggestion 2: That if the study concludes that some wharves can be extended, then a full environmental impact assessment be conducted for each possible extension before any work commences.

Depending on the size of any wharf extensions, this will probably be a short-term solution to a problem that is going to continue to grow. Therefore, a more long-term solution would be to look for a new area to construct a new wharf for fishing vessels. This could be the start of a new fisheries complex. Possibly the study on wharf extensions could include the identification of sites for a new wharf complex for the fishing industry. The sites will need a depth of at least 5 m at low tide, or dredging may need to be undertaken to achieve this. If sites are identified, MIMRA could choose the

best one or two and have environmental impact assessments undertaken based on the planned construction. Land availability will be an issue, and this is discussed under Section 4.2.

Suggestion 3: That the suggested study on wharf extensions include the identification of sites for a possible new fisheries wharf complex.

Suggestion 4: That MIMRA choose the best one or two sites identified by the study and have an environmental impact assessment conducted including the impact of any dredging if this is required to give a suitable depth of water at the wharf face.

Derelict vessels should not be permitted to take up wharf space or to clutter the harbour, which is a real problem in Majuro at present. Permanent removal of these vessels is the best approach, and MIMRA and the Port Authority could require this. The problem then is that owners may choose to anchor derelict vessels close to the harbour and leave them unattended. Apart from being an eyesore, such vessels could sink where they are anchored or break their mooring and wash ashore, causing additional problems. One solution would be to encourage the owners to take derelict vessels to a designated area where they could be sunk to form artificial reefs or dive sites for local tourist operators. In the event that this approach is taken, care needs to be taken that all toxic wastes and fuels (e.g. diesel, oils) are removed from the vessel prior to sinking them.

Suggestion 5: That MIMRA and the Port Authority work together to identify a suitable site to have derelict vessels sunk to form an artificial reef or tourist dive site.

Suggestion 6: That MIMRA and the Port Authority require that the owners of derelict vessel remove them from wharves and encourage them to sink them at a designated site.

Suggestion 7: That Any vessels to be sunk have all toxic waste and fuel removed from the vessel prior to it being sunk.

In looking at the outer islands in the Marshall Islands, there are six islands or atolls with wharves for small-scale vessels. One on these, Enewetak Atoll, actually has a deep-water harbour with basic infrastructure including a wharf facility to cater to larger vessels, which was put in by the US. This facility is currently not used and it is unclear what condition the wharf is in at present. If the government is looking to decentralise the tuna fishery in the Marshall Islands, then this atoll may be a suitable location for a tuna fishing operation.

Suggestion 8: That if the Government of the Marshall Islands is looking to decentralise the tuna fishery in the RMI, then Enewetak Atoll be considered as a possible tuna fishing base.

4.2 Availability of land

The ownership of land on Majuro is an area that is unclear, with different views being expressed. Some views indicate there is a complex traditional land tenure system that needs clarification so that land leasing and transfer can take place. Other views indicate that in recent years the land has been divided with recognised boundaries, so it can be easily bought or leased. Given the differing views, the process of leasing or buying land may be quite difficult. Therefore, if sites are identified for the construction of a new fisheries wharf complex as suggested in Section 4.1, the government could try to negotiate with the land owner or owners to either purchase the land or enter into a long-term lease for the land.

Suggestion 9: That the government consider negotiating the purchase or long-term lease of land identified in a study as possible sites for a new tuna fishery complex, with land owners in the area.

Another approach could be to try to reclaim land by dredging. A new tuna fishery complex area, once identified, could be dredged out to give the depth of water needed for fishing vessel, with the silt,

sand and rock used as fill behind the wharf structure to provide the land needed for shore facilities. This should be looked at as a feasible alternative if getting access to land becomes too difficult. Any such activity would need a full environmental impact assessment conducted as part of the feasibility study.

Suggestion 10: That the government consider the reclamation of land as an alternative to leasing or buying land from land owners if the process of negotiating for land becomes too difficult.

Suggestion 11: That the government have a full environmental impact assessment conducted as part of a feasibility study for any proposed land reclamation work.

4.3 Support services

A range of support services are required by any fishing industry to keep it operational. In the RMI's case, there is very little domestic development occurring in the tuna fishery, although for development to occur, support services need to be in place. The types of support services required include slipways, trades people in the areas of carpentry, welding (steel and aluminium) fibreglassing, engineering (diesel, hydraulic, refrigeration and general), electricians, and access to fishing gear, safety equipment, vessel electronics and bait. There also needs to be a reliable supply of fresh water and electricity. For Marshallese wishing to enter the tuna fishery with their own vessel, these services are essential.

4.3.1 Slipways

There is currently no actual slipway in the Marshall Islands, although there is a government owned 750 t drydock facility. The drydock works by sinking the dock, driving the boat over the top of the submerged dock, and then pumping the water out (getting air in) to lift the dock with the boat out of the water. Several smaller boats could be lifted out at the same time if needed. The government was allowing one of the private sector companies to operate the drydock, although it was unclear if the government was leasing or loaning the facility.

The same private sector company is looking to put in a new, larger drydock as part of an expansion of the company. The owner had land and part of their engineering shop had already moved. The plan was to have a new wharf built that would have a 1200 ft (roughly 360 m) face with a 3000 t drydock at the end of the wharf. The aim of the proposed larger drydock was to be able to lift out purse seiners to do maintenance work on them in Majuro. Such a facility would be a great asset to the Marshall Islands and the government should encourage the company to go ahead with their plans. However, in saying this, the government should not get involved in assisting financially with this project. The areas where assistance could be provided is in the conducting of an environmental impact assessment for the planned work in regard to the wharf and drydock facility.

Suggestion 12: That the government strongly support the private sector company in their endeavours to construct a new wharf and 3000 t drydocking facility in Majuro.

Suggestion 13: That the government does not assist financially in the proposed drydocking project, but rather assist with conducting an environmental impact assessment for the planned work.

An alternative to the proposed drydocking facility could be to look at a slipway or drydock being part of the proposed new fisheries complex. If the government goes ahead with the study to identify sites, then the inclusion of land for a slipway or drydock could be included. If this approach is taken, then the drydock should be around 3000 t capacity. On the other hand, if a slipping facility is being considered, then it would need to be around 1500 m capacity. It would also be best if this had side slipping capabilities as well, say for three vessels, so that several vessels could be out of the water at the same time.

Suggestion 14: That the government include the possibility of a 3000 t drydock or a 1500 t slipway in the proposed study for a new fishery complex.

Suggestion 15: That if a slipway is considered, it have side slipping capabilities so that up to three vessels can be out of the water at the same time.

The above discussion is focused on drydocks and slipping facilities for large vessels, and the cost of using these for small vessels is high. Therefore an alternative to a slipway or drydock for smaller vessels is to use a travel lift. This is a 'U' shaped crane on wheels that can pick up boats and move them around. What is needed is two parallel concrete piers that the travel lift can drive on over the water. The boat to be lifted out comes in between the two piers. The travel lift will straddle the two piers and lower two large flat belts that are placed under the boat. The travel lift will then lift the boat out of the water using a hydraulic system to raise the two belts. Once the boat is out of the water and the keel is above ground level, the travel lift will move off the piers and take the boat to a position where it is lowered to the ground and chocks are put in place to hold the vessel upright and stop it from tipping over.

The advantage of this type of set up is that many boats can be out of the water at the same time. The main restrictions are the amount of land available to place the boats on, the length and width of vessel that can be hauled out, and the capacity of the unit. In reality, a travel lift with a lifting capacity of at least 100 mt should be adequate for most small-scale and medium-scale longline vessels. A travel lift could be installed in addition to the larger slipway or drydock, and be specifically for the small-scale and medium-scale vessels. Land for such a facility could also be included in the proposed study for a new fisheries complex. This would need to cover both the land for the piers and land to place the boats while they are being worked on.

Suggestion 16: That the government consider a travel lift in addition to a regular large slipway or drydock to cater to the needs of small-scale and medium-scale vessels.

Suggestion 17: That if a travel lift is considered, the capacity of the unit be at least 100 mt.

Suggestion 18: That the government include the land requirements for the piers and boat storage areas for a travel lift in the proposed study to identify a site for a new fisheries complex.

4.3.2 Carpenters, welders (steel and aluminium) and fibreglassers

There are currently a number of people on Majuro with skills in carpentry, welding and fibreglassing. The canoe building project (refer Section 5.1.6) is also providing training in carpentry and boatbuilding. Welders are a little more in short supply, with trades people and others with the skills working at the engineering workshops on Majuro. There are also people who do repair work on smaller boats in their backyard (wood and fibreglass), especially on the sportsfishing vessel of which there are quite a few on Majuro.

Given this scenario, it would appear that there are adequate trades people with skills in carpentry, welding and fibreglassing to provide the necessary support and conduct repair work on tuna fishing vessels when needed.

4.3.3 Engineers (diesel, hydraulic, refrigeration and general) and electricians

There are currently quite a few people on Majuro, some in the private sector, working in the engineering (diesel, hydraulic, general, and to a lesser extent, refrigeration) and electrical trades. There is one large private sector workshop and several smaller ones with skilled staff in these fields. However, it should be noted that many of the trades people are Filipino, as there are very few Marshallese with qualifications in these trade areas. This is because there are no trade certificates offered in the Marshall Islands, and this needs to be changed (refer Section 5.1.2). The government

also has several companies or departments with skilled trades people. Therefore, a new tuna fishing industry should have no problems in getting work done by trades people with these skills in Majuro.

However, the area of refrigeration is one where there appears to be a shortage of trained and qualified trades people. This is in both the public and private sector. MIMRA also needs additional refrigeration mechanics to maintain the ice plants and refrigeration equipment in the outer island fishing centres. Possibly the government could assist with the funding of more training, possibly overseas where a recognised certificate would be issued, in this trade to boost the number of people with these skills in the coming years.

Suggestion 19: That the government consider offering additional training each year, possibly overseas where a recognised certificate would be issued, to young school leavers in the field of refrigeration mechanics, for the next several years.

4.3.4 Suppliers of fishing gear, safety equipment and vessel electronics

There are limited supplies of fishing gear available on Majuro. This gear is generally the common gear components, such as monofilament line, hooks of certain sizes, gillnets, trolling lures etc. For heavier tuna longlining gear, there is very little available, with the tuna longline company bringing in their own gear. This should not be a problem if the gear importers know ahead of time what gear is needed, so it can be order in. The problem will be to get the order in in a timely manner so that it is available when needed. Possibly the tuna longline company currently operation out of the Fishbase could bring in tuna longline gear to sell to local operators in the future. To assist the development of domestic tuna longlining, the government should allow all materials to come in duty free (refer Section 6.2.4).

Suggestion 20: That the government support the private sector to import fishing gears, including the tuna longline company operating the Fishbase.

Few places carry sea safety equipment or vessel electronics on Majuro, however, several companies (private and public sector) are happy to order specific items as requested. The same could apply to vessel electronics. This sort of private sector development should be encouraged by government.

Suggestion 21: That the government encourage the private sector to import and market sea safety equipment and vessel electronics.

4.3.5 Suppliers of ice, bait and export packing materials

The main supplier of ice on Majuro was the Marshall Islands Fishing Venture (MIFV) who operate the Fishbase. MIFV has 3 x 30 t/day plate ice machines (they were originally 50 t/day but the machines are old) that are operational and a fourth that is under repair. MIFV sells their ice at USD \$65.00/t. Edgewater Fisheries, the shark fishing company, has a block ice maker that is not operational, so they buy their ice from MIFV.

MIMRA's coastal fisheries centre on the MIMRA dock has a 5 t/day plate ice machine, with this ice sold to local fishermen. Each of the outer island fishing centres has an ice plant for the fishermen working to each centre.

The production of ice appears adequate for current fishing operations, although it may not be adequate if a new tuna fishing venture started up in the near future. Therefore, if a new company wishes to establish itself, like a tuna longline company, they would need to provide their own ice making facilities for on board chilling of the catch and/or on-shore processing. The capacity of the equipment will depend on the ice requirements of the fishing and processing venture, plus any that the new operation may want to sell to other fishermen or the general public.

Suggestion 22: That any new fishing enterprise to be established on Majuro for tuna fishing have their own ice making facility to meet their needs for both their fishing and processing operation.

Alternately, refrigerated sea water (RSW) can be used on tuna fishing vessels as the chilling medium for the catch and still maintain the quality needed for fresh export to high-priced markets. This is a good option for new ventures where limited shore facilities may be available during the start-up stage.

Suggestion 23: That any new tuna fishing ventures look at RSW as an alternative chilling medium to ice for their fishing vessels.

Bait is an important component of any tuna longline operation. At present there is no one importing bait for sale locally, although MIFV brings in bait for their fishing vessels, and they have sold some bait to MIMRA in the past for tuna fishing trials and training. Given this scenario, any new fishing venture would need to either bring in their own bait, or work in with MIFV to purchase bait from them. If the latter approach is taken, then the new venture would need to work in closely and keep their orders in to ensure that bait was available from MIFV when needed. If a new fishing venture chooses to bring in bait for their fishing operation, they may want to consider bringing in additional bait to sell to local small-scale operators for other fishing operations.

Suggestion 24: That any new tuna fishing venture either bring in their own bait for their fishing operations, or work in closely with MIFV to purchase their bait from them on a regular basis.

Suggestion 25: That if a new tuna fishing venture brings in bait for their fishing operation, they consider bringing in additional bait to sell to local small-scale operators.

The current fish exporters bring in the packing materials they need for their exporting operation. Each uses the appropriate packing materials for the products they are selling. Any new tuna fishing venture will either need to bring in packing materials for their product, or possibly work through MIFV and have them do the packing, and supply the materials. Either approach will work, so it is up to each new venture as to which approach they take.

Suggestion 26: That any new tuna fishing venture either bring in the export packing materials they need, or work in with MIFV and have them do the packing and supply the materials.

4.3.6 Availability of fresh water

The availability of fresh water was generally not a problem, as the Marshalls Energy Company (MEC) had a 36 million gallon storage capacity and they used the runway as their catchment. There was also a water lens at the Laura end of the island with seven wells to extract water from. However, the Laura lens water 'dried up' in times of water shortage. In times of water shortage (January to March) MEC focused on water for the people, so visiting boats and commercial industry were generally not supplied with water during these times. Fresh water was available on the wharf at USD \$6.00/1000 gallons from the main, or \$10.00/1000 gallons if brought to the wharf by road tanker.

Fish processing facilities generally use a lot of water, with the tuna loining plant on Majuro using 25,000 gallons (roughly 87,000 litres) per day. Given this, any new processing facility should have a good water catchment area (roof of the facility) and large storage tanks, possibly under the building itself. Any storage tanks, especially ones under a building, should be well sealed to avoid any contamination from water seepage, especially from the processing facility itself. In addition to the storage tanks, the facility should have a small desalination plant as a back up, with a capacity great enough to meet the needs of the processing facility and any fishing vessels that are supplying them with product.

Suggestion 27: That any new processing facility have large well sealed fresh water storage tanks and a good catchment area to supply water to the storage tanks.

Suggestion 28: That any new processing facility, regardless of fresh water capacity requirements, have a desalination plant of an adequate size as a back-up unit.

When talking about the use of fresh water for fish processing facilities, if export is the primary focus then water quality may become an issue. This can be addressed through the fitting of a filtration or purification system to ensure fresh water quality to meet any export health and sanitation requirements. It would make sense to include such a system as standard equipment so that this is not a problem in the future.

Suggestion 29: That any new fish processing facility include the provision of a filtration or purification system to ensure fresh water quality to meet any export health and sanitation requirements.

4.3.7 Electricity supply

MEC is the power supplier on Majuro. MEC was only working at around 50 per cent of their generating capacity. They could generate 24 megawatts with the current peak load being around 12.3 megawatts. Therefore there was plenty of power available for any new development, such as processing facilities. The main problem for any new facilities is that any equipment needed to be for the US power system of 60 cycles (not 50 cycles as used in other systems) so it can be run on the current grid. This also applied to reefer containers that would be used for bringing in raw materials or exporting processed goods. In addition, any new facility should have a small back-up generator, large enough to keep the essential services of the plant operational, plus a fuel storage tank with adequate fuel for at least one week's operation of the generator. The commercial rate for power on Majuro is USD \$0.16/kWh-hour, which is claimed to be the cheapest in the Pacific. This was the total cost with no extra charges.

Suggestion 30: That any new processing facility ensure that all equipment is for the US power system of 60 cycles, including reefer containers.

Suggestion 31: That any new fish processing facility have a small generator of a size adequate to operate the essential services as a back-up, and a fuel storage tank of a capacity to keep the generator in fuel for at least one week.

4.3.8 Fuel availability

There are currently three fuel suppliers on Majuro, Shell, Mobil and MEC. MEC had the cheapest fuel at USD \$1.13/gallon (roughly USD \$0.33/litre as at November 2003) and this was negotiable on larger volumes. This was around USD \$0.30/gallon cheaper than either Shell or Mobil. This was because MEC did not have the same overheads as the other companies and they only sold fuel on a cash on delivery basis. MEC also had storage tanks that held six million gallons and it was a No. 2 gas oil, which was a higher grade to the diesel usually sold by the fuel companies. It is also noted that diesel fuel is duty free to fishing vessels (above price is duty free price). However, if a fishing vessel did other activities as well as fishing, such as taking cargo to the outer islands on their way out fishing, they would not be entitled to duty free fuel.

Given the three suppliers of fuel on Majuro, there should be no problems with diesel fuel availability. The companies already supply foreign fishing vessels that come to Majuro to tranship. Fuelling would mainly be through tanker delivery to the wharf.

4.4 Local tuna fishing fleet and suitable vessels

In the past, there have been several foreign tuna longline fleets working out of Majuro and using the Fishbase. Foreign purse seiners, plus six flagged in the Marshall Islands, come to the Marshalls from time to time to tranship catch to carrier vessels, or unload to the tuna loining facility.

Purse seining is used in RMI waters when the oceanographic conditions are favourable, by foreign fishing interests through the payment of access and/or licensing fees. This is a proven method, although the current world price for tuna is low and is making many of these fishing operations marginal. The RMI government has experience with purse seining through its joint venture operation, and it is up to the government to decide if they would like to become involved in other joint venture operations in the future. It is doubtful that a private sector entrepreneur in the Marshall Islands will invest in this fishery. However, if one does then the government should ensure that there are no restrictions put in the way, and allow this to happen.

Suggestion 32: That the government ensure that there are no restrictions put in the way of domestic purse seine fishing activity being conducted in RMI waters.

The only tuna fishing activities currently employed by local fishermen are trolling, with a little mid-water handlining, which are all small-scale methods. There is also a strong sportsfishing or gamefishing fleet, based on trolling for tunas and billfish. The vessels range from 4 to 12 m in length, with some outboard-powered and others powered by diesel inboard engines.

There are other small-scale and medium-scale fishing techniques that need to be considered when looking at domestic participation in the tuna fishery in the Marshall Islands. First would be the use of mid-water fishing techniques, especially in association with FADs. FADs have been used in the Marshall Islands in the past. The use of FADs will be covered under Section 6.5.4, while the possibility of promoting small-scale tuna fishing methods is covered under Section 6.5.5.

Small-scale and medium-scale tuna longlining are the main method of tuna fishing with promise for domestic participation by Marshallese. MIFV has around 28 locally-based foreign tuna longliners working to them and Edgewater Fisheries has several shark longliners, so there is infrastructure in place to allow domestic participation in the tuna longline fishery. Of the domestic fishing vessels in the Marshall Islands at present, there are several that are appropriate and have been used for this style of fishing. The Fisheries and Nautical Training Centre under MIMRA has one longline vessel, which was used in 2003 to conduct tuna longline fishing trials and training. There is also one vessel that was used as a longliner in the past, although it is used as an inter-island cargo boat at present.

There are many proven types and styles of tuna longline vessels working in the Pacific at present. A local entrepreneur may wish to bring in one of these vessels. This should be encouraged, especially if the vessel has a proven record as a successful tuna longliner in other locations in the region. The arrangement (joint venture, charter etc.) that the local private sector investor uses to bring the vessel into RMI waters should be monitored by MIMRA, to ensure that a local is not being used as the front person for a foreign company trying to gain access. If the venture is genuinely local, then this should be strongly supported by the government.

Suggestion 33: That the government/MIMRA allow and encourage the local private sector to bring proven tuna longline vessel designs to fish in RMI waters.

Suggestion 34: That the government/MIMRA monitor the arrangements used by the private sector to bring in tuna longline vessels, to ensure that a local is not being used as the front person for a foreign company trying to gain access to RMI waters.

4.5 Processing facilities

There are currently four fish processing facilities on Majuro, with seven outer island fishing centres. The government is looking at ways to encourage additional processing facilities as a way to create employment on Majuro. In support of fish processing facilities, MIMRA has had the Attorney General's Office drafting legislation to support HACCP (hazard analysis and critical control point) arrangements in the Marshall Islands. This legislation has been finalised and will go to Cabinet for enactment.

The largest processing facility on Majuro is the PM&O tuna loining plant, which produces cooked loins (front end of a tuna cannery) that are frozen in eleven pound (5 kg) packs and shipped to StarKist in American Samoa for canning. The facility employs 500 people (80% women on the processing lines) who work in two shifts, five or six days per week. The facility receives frozen tuna from purse seiners and has freezer storage capacity for 2000 t of fish. The facility is covered under a HACCP plan.

MIFV or the Fishbase is the next largest processing facility on Majuro. In November 2003 there were 23 locally-based foreign tuna longline vessels working to the facility (17 Chinese from two different companies, 4 from Clearwater Fisheries in FSM, 1 from Taiwan and 1 from Australia). The facility focuses on fresh export of tunas and other species to markets in Japan and the US. Non-export fish that were marketable were frozen down and shipped by carrier vessel to Taiwan for marketing. The facility was old but in reasonable condition, although the packing area may need to be upgraded. Given the HACCP plan was several years old, it may be worthwhile having this revised.

Suggestion 35: That MIFV look at revising their HACCP plan for the Fishbase facility.

Edgewater Fisheries has a facility, which is focused on processing shark. They have several vessels targeting shark, with most parts of the shark being landed for sale. The facility has a processing area, blast and storage freezers. The shark flesh is frozen for marketing while the fins are dried. This facility was focused on marketing in Asia, so there was no need for a HACCP plan.

The fourth processing area is the MIMRA dock facility, which focuses on coastal fisheries development, and collects fish from several of the outer island fishing projects. The Majuro facility has two storage freezers and a plate ice machine. They receive around 2000 lb (roughly 900 kg) per week of fresh fish from the outer island fishing projects, with most of this being reef fish. The fish is currently sold on the domestic market in Majuro, although there is scope for export in the future. If the MIMRA dock facility does look at exporting product, they will need to develop a HACCP plan. In addition, if they plan to export any of the fish it receives from the outer island fishing centres, then these stations will also need to have a HACCP plan, as they will form part of the catching and processing chain. Temperature control of the product will be the primary focus of the centres, as the fish will need to be reduced to a temperature of below 4° C as quickly as possible and maintained at or below this temperature, including the transportation of the fish to Majuro. The MIMRA dock base will then need to continue the temperature chain through to the product arriving at the export market. Staff at all facilities will need to be trained in the monitoring and recording requirements of the HACCP plan.

Suggestion 36: That a HACCP plans be developed for the MIMRA dock facility if product is to be exported from the facility.

Suggestion 37: That HACCP plans also be developed for each outer island fishing centre if they are to be involved in providing fish to the MIMRA dock facility to export.

Suggestion 38: That the staff of the MIMRA dock facility and the staff of any outer island fishing centres involved in exporting receive training in the monitoring and recording requirements of a HACCP plan.

There is scope for additional processing facilities to be established, and the government and MIMRA are keen to see this happen. Land availability may be an issue and this was discussed in Section 4.2. However, if the concept of a new fisheries complex goes ahead and a study undertaken, then the concept of additional land for at least one processing facility should be included in the study. It should be noted that any new processing facility, whether part of the proposed fisheries complex study or not, should take into consideration all requirements for HACCP as well as any local health and sanitation requirements when the facility is planned and constructed. In addition, if processing facilities in the future are to look at marketing in the EU, then different requirements need to be met, and these are discussed in Section 6.2.3.

Suggestion 39: That the concept of additional land for at least one processing facility be included in the suggested study to identify a suitable tuna fisheries complex location.

Suggestion 40: That any new processing facility take into consideration all requirements for HACCP as well as any local health and sanitation requirements when the facility is planned and constructed.

4.6 Airport facilities and cargo space availability

The runway on Majuro was around 7900 feet (roughly 2000 m) long. This was large enough to cater to aircraft equivalent to a Boeing 747. The problem was that the apron area was too small, and if there was an aircraft of this size on the ground, the runway could not be used until the plane had departed. Therefore, if the RMI Government wanted larger aircraft to operate out of Majuro, then the apron area needed to be extended. In addition, the surface of the runway was over 30 years old and needed to be re-surfaced. Rumour was that the US Civil Aviation Authority had indicated to the RMI Government that the re-surfacing was essential or US flights may not be able to use the runway in the near future. The Airport Authority was looking at funding options to do this as Majuro was very dependent on airline services. Once funding is identified, tenders should be called for the work and an appropriate contractor hired to do the re-surfacing as soon as possible.

Suggestion 41: That the RMI Government and Airport Authority work together to expand the apron area at the airport so that larger aircraft can be used on a regular basis.

Suggestion 42: That the RMI Government and Airport Authority work together to identify funding to have the runway re-surfaced as a matter of urgency.

Suggestion 43: That as soon as funding is identified, the Airport Authority call for tenders for the work and an appropriate contractor hired to do the re-surfacing as soon as possible.

Looking at the current services there were a range of carriers, some with cargo space available and others without. There were also a couple of proposals in from other airlines to fly in and out of the Marshall islands. In summary:

- Continental Airlines, 6 flights/week, 3 in each direction (Guam and Honolulu). Boeing 737-800 series used with passenger luggage using hold space. There would be little if any cargo space available on these flights given the number of passengers plus Continental was not keen in handling fresh fish cargo;
- Aloha Airlines, 4 flights per week to Honolulu with a Boeing 737-200 series used. This was to be upgraded shortly to a Boeing 737-700 series due to the loss of Johnston Atoll as a refuelling stop. The new planes would have up to 3000 lb (roughly 1400kg) of cargo space, although this would fluctuate to zero space based on passenger and luggage loads during peak periods;
- Air Kiribati, one flight per week to Tarawa. This aircraft has little cargo space and Tarawa was not really on a flight route for fresh fish export;

- Asia Pacific Airlines, 8 flights per week, 4 in each direction (Guam and Honolulu). Boeing 727-200 series used and this was a cargo flight with the mail contract. Flights to Guam around 5 t of freight space available, while flights to Honolulu had around 15 t of space. These were the flights that MIFV used to export their fish and they tried to keep this flight full whenever possible;
- Air Nauru was looking to fly to the Marshall Islands and had a proposition before the RMI Government for consideration. The flight would be Majuro, Tarawa, Nauru to Brisbane. It is not sure whether there would be any freight space available or the cost, as Nauru is trying to develop an export tuna fishery as well and it is expected that Nauruan fish would take freight preference on the Nauru to Brisbane leg;
- Another Australian cargo company was interested in setting up a run from Brisbane, however, there was not enough guaranteed business out of Majuro at this stage; and
- Aloha airlines would be interested in setting up a dedicated or charter cargo flight if business men in Majuro could put together a business plan on the volumes of cargo to be carried in each direction.

Based on the above, the unused cargo space availability on airlines currently flying into Majuro seems limited. The Asia Pacific Airlines flights do have good freight space, however, at times this would be limited due to the MIFV fish. Aloha Airlines will have small amounts of cargo space available, however, this will be dictated by passenger numbers and their luggage. Therefore, there is scope for a small increase in fresh export fish based on current airline schedules, so a small tuna longline operation could start up and export their fish. However, the freight rates would need to be negotiated. In the case of Aloha Airlines, the Majuro to Honolulu rate was USD \$1.75/kg. However, the airline agent said that this price was negotiable for larger and consistent volumes of cargo. Given this, any new fishing venture should sit down with the different airlines to compare rates and negotiate a rate that will give their operation a chance of success.

Suggestion 44: That any new tuna longline company wishing to export fresh fish negotiate with the different carriers that may have cargo space available on existing flights to get a freight rate that will give their operation a chance of success.

An alternative for a new tuna longline company may be to work in with MIFV on cargo space to make sure that all available space on the Asia Pacific Airlines flights is taken. This could work to the benefit of both companies in getting the freight rate down and maximising the load on each flight.

Suggestion 45: That as an alternative, any new company work in with MIFV to get the freight rate down and maximising the load on each Asia Pacific Airlines flight.

The only other option is to go with dedicated cargo flights, and this can be done in two ways: scheduled cargo flights and unscheduled charter flights. Both Aloha Airlines and another Australian cargo company have indicated their interest in this sort of activity. There can be scheduled flights of a freighter, possibly organised through one of these companies or another agent, with the flight going to several countries to try to reduce the freight rate and increase the amount of cargo uplifted. People or companies would need to commit to taking space to be able to attract a cargo plane to come to the Marshall Islands. Possibly the above carriers or other freight carriers in the region can be approached to get a costing so that the economics can be worked out. As part of this exercise, the government or Airport Authority should contact all the local businesses to get an idea of current and future freight needs, so that this can be factored into the economics. It would then be a decision by government whether or not to proceed and which freight carrier to use.

Suggestion 46: That the government and Airport Authority conduct, or contract an agent to undertake:

- an assessment of the air freight needs of both the public and private sectors on Majuro (short-term and long-term);
- an assessment of the different air freight carriers in the region, through getting them to propose a freight schedule (time, costs and freight space) including other neighbouring countries or islands; and
- an assessment of the viability of entering into a scheduled air freight flight to the Marshall Islands, and provide recommendations to government/the Airport Authority on the findings.

The alternative to scheduled cargo flights is to have unscheduled charters when the need arises. This can be done by either the public or private sector. However, in the case of the private sector the RMI Government will need to give the chosen company landing rights and any flights will need to work in with already scheduled flights by other carriers.

Suggestion 47: That if unscheduled charter flights are used, the RMI Government give the chosen company landing rights while ensuring the flights work in with already scheduled flights by other carriers.

5. TRAINING NEEDS AND REQUIREMENTS

There is a range of training requirements in the RMI to meet the future needs of the fishing industry, the support sector, and those of MIMRA.

5.1 Marine-focused training institutions

There are several organisations and institutions involved in fisheries-related training activities, although there seems to be very little communication or collaboration between them. The institutions are the Fisheries and Nautical Training Centre (FNTC), the College of the Marshall Islands, University of the South Pacific (USP), the RMI USP programme, the ADB Education project, and the canoe building project. In addition to these, a National Training Council has been set up to be the overarching body in future for training in the Marshall Islands. They have conducted an employment needs survey in 2002, although this is ongoing as new areas are identified.

Suggestion 48: That all of the training institutions and projects fully support and work within the guidelines of the National Training Council.

5.1.1 Fisheries and Nautical Training Centre (FNTC)

The FNTC is currently under the control on MIMRA, from where it gets its budget allocation each year. The centre is focused on giving school leavers the skills they need to get employment as deckhands on fishing vessels, whether on domestic or foreign vessels. The centre is also focusing on the delivery of courses for people wanting lower-level skipper and engineering qualifications for fishing vessels. Unfortunately, no fisheries-related courses have been run in 2002 or 2003 due to a shortage of funds and human resources. The centre seems isolated from all other training institutions, and it appears that other MIMRA activities rate more highly when budget allocation time comes around. Given the current situation, it would make sense to move FNTC out from MIMRA and have it be part of the Ministry of Education. It could form part of the vocational training being planned for young school leavers as covered in Section 5.1.2 below. It should also be noted that FNTC needs to be fully recognised by, and represented on, the National Training Council.

Suggestion 49: That the government consider moving the FNTC out of MIMRA's control and placing it under the Ministry of Education.

Suggestion 50: That the government needs to have FNTC fully recognised by, and represented on, the National Training Council.

During 2002 and 2003, FNTC had been organising bridging courses for Marshallese seafarers, which is not a normal activity for the Centre. The courses were funded by SPC and implemented by trainers from New Zealand with New Zealand certificates issued. The reason for this was that FNTC was in the process of getting accredited under the STCW-95 requirements for training and certifying seafarers, so therefore could not issue certificates that were internationally recognised. FNTC passed its second audit in June 2003, so are now accredited to provide STCW-95 recognised training. This is a big step forward for the FNTC and they now need to focus on providing the training that meets the needs of both the fishing and merchant sectors. FNTC has the materials for STCW-95 recognised courses, however, as previously stated they are lacking the human resources to deliver them. Regardless of whether FNTC stays with MIMRA or is moved under the Ministry of Education, suitably trained and qualified staff need to be recruited. Once this is achieved, FNTC can be one of the streams of vocational training offered to school leavers that has a career path and internationally recognised certificates.

Suggestion 51: That the FNTC look at the needs of the fishing and merchant sectors and start to provide STCW-95 recognised courses to cover the needs that are identified.

Suggestion 52: That additional staff that are suitable trained and qualified are recruited to FNTC so they can implement more courses.

Suggestion 53: That FNTC become one of the streams of vocational training offered to school leavers that has a career path and internationally recognised certificates.

5.1.2 ADB Education Project — National Vocational Institute

The ADB has commenced a new 5-year project on vocational training and were establishing the National Vocational Institute under the Ministry of Education. The approach is going to be 3-tiered, with the focus on students who did not make it to highschool (over half the students do not go past Grade 8). The aim was to train students to be trainable through focusing on their numeracy and literacy skills.

Tier 1: A new 5 classroom building had been built for this with two of these rooms fitted with computers for computer assisted learning. The focus was on increasing numeracy and literacy skills. The first group was expected to start in January 2004.

Tier 2: Another building was being refurbished for this component. Again the focus was on increasing numeracy and literacy skills and students would sit a Graduate Equivalency Diploma (GED). There was also discussion on whether the standards for the GED needed to be upgraded. It was hoped that this would commence some time between June and September 2004.

Tier 3: This was the level where students received their hands-on vocational training. This level was still in the planning stages and they were looking at the options. Options included sending students overseas to places like the Community College in Hilo, Hawaii for specific trades. This was the most cost efficient for small numbers of students in the trades. If there were local courses at USP, CMI or the FNTC, then students could go there. There was also the canoe building project (refer Section 5.1.6) that could be used as a stream for vocational training.

Suggestion 54: That the government and all of the marine-focused training institutions fully support the concept and work with the National Vocational Institute to ensure quality vocational training in the Marshall Islands.

Given that FNTC (Section 5.1.1 above) is basically a vocational training centre specific for the fishing and merchant sectors, then this could form part of, or a stream as part of the National Vocational

Institute of the Ministry of Education. With such an approach, funding may be more readily available for FNTC to overcome their current funding and human resource problems.

Suggestion 55: That if the government places FNTC under the Ministry of Education, that it form part of the National Vocational Institute and be funded appropriately.

In looking more closely at vocational training, especially in the trades that are needed in the support sector for any fishing operation (carpenters, welders, engineers, mechanics, electricians etc) it appears that there are currently no formal qualifications available. When talking to people in industry, they are bringing in Filipino trades people who train up local Marshallese. However, the skills of the Marshallese are not recognised formally as there is no system in the Marshall Islands to certify people with the required skills and issue a formal qualification that recognises this. This is an area that the National Vocational Institute needs to address as a matter of urgency. If there are no recognised qualification for apprentices to work towards then Marshallese will be reluctant to seek training and employment in these fields. FNTC now can offer courses with recognised qualifications, as to can the canoe building project, as their course has been certified by the National Training Council. Therefore, these two institutions should be used as streams for vocational training at the Tier 3 level. Alternately, as stated above, some students could be sent to a recognised vocational training centre overseas for training if the numbers of students in some trade areas are low.

Suggestion 56: That the National Vocational Institute develop or acquire appropriate courses in the areas of trades to allow the Institute to teach and evaluate students and issue a formally recognised qualification or certificate to those that meet the skills level required.

Suggestion 57: That the National Vocational Institute use both the FNTC and canoe building project in their Tier 3 training as they can offer courses with certified or recognised qualifications at the successful completion of the course.

Suggestion 58: That for trade areas where there are only a small number of students involved, the concept of sending them overseas to a recognised vocational training centre or institute be explored.

5.1.3 College of the Marshall Islands (CMI)

CMI use to be the centre of vocational training for the trades, such as carpentry, mechanics, boatbuilding and repairs etc. However, they ceased these courses as they could not get the students, and those that did start ended up dropping out and not completing the course. This left a hole in the vocational training area that the new National Vocational Institute will now fill.

The marine studies area of CMI commenced around 4 years ago, and was set up to provide a basic course in marine and environmental science. The course had a focus on inshore fisheries (reef and aquaculture), although this was very broad. Topics included oceanography (advanced course), basic marine biology and integrated inshore management. The course was 2 years, although people generally needed longer to complete this. Students that pass end up with an 'Associate of Arts' degree. This was equivalent to a diploma from a US community college.

CMI was planning to commence a new certificate course in the summer of 2004 as a pilot. This course would have a marine conservation focus to meet the needs of the community fisheries projects that were being implemented. The aim was to look at the implementation side rather than the programme side. The course as outlined had no fisheries management component, and this may complement the other parts of the course. This could be added as a separate module in case some students were not interested in this.

Suggestion 59: That CMI consider developing a fisheries management module for their new certificate course to broaden the current scope of the course.

It should be noted that CMI was having problems in getting students interested in the marine studies areas. It seemed that fisheries or marine had very little appeal to students as an area that they would want to work or have a career in. In addition, students felt that the course was more difficult than others and the technical terms were hard to learn and understand.

5.1.4 RMI University of the South Pacific Programme

The RMI USP programme is designed to take highschool leavers and prepare them to meet the entry requirements of universities and tertiary institutions. This is a 2-year course with the first year spent on bridging courses and the preliminaries to get skill levels up. The second year is the foundation, where students sit an external exam at the end of the course. The exams are set and marked in Fiji and students have to pass English and six other subjects to meet the entry requirements of the USP for diploma, certificate or degree courses.

5.1.5 University of the South Pacific (USP) Centre

All of the marine studies courses offered by USP could be taken in the Marshall Islands, mainly through remote learning. There were several computer rooms, and several classrooms set up with video camera and TV sets. Lectures could be taken in several ways. If there were five or more students taking a subject, then an interactive lecture was given via video/camera. Also for these courses, a lecturer may travel to the Marshalls for a week or two to give face-to-face lectures. If there were only one or two students taking a course then this may be done through e-mail contact and general course work.

The USP centre currently has around 400 students doing a range of courses, however, there was very little interest in the marine studies area. A couple of students were doing a GIS systems course on remote sensing. There seemed to be a reluctance with the Marshallese to take courses in the marine studies area even though there were diploma, certificate and degree courses to choose from in ocean resource management, fisheries economics and management, physical oceanography, and tropical seafood.

This is the same problem as expressed by the staff at CMI, little if any interest by students in entering a career in the marine field. This needs to be looked at closely by the Ministry of Education as well as the institutions. Possibly there needs to be an awareness campaign put together to let school leavers know what their options are when it comes to employment in marine areas, and the importance of the marine resources to the country. Possibly with heightened awareness, more students may take an interest in studying in this area.

Suggestion 60: That the government in conjunction with CMI and USP, try to raise the awareness of the importance of marine resources to the RMI, and encourage students to study and make a career in this field.

5.1.6 Waan Aelon in Majel canoe building project

The canoe building project has evolved over the years from the documenting of the construction techniques on a 42 ft (roughly 13 m) traditional outrigger sailing canoe in the outer islands to the training programme it is today. The skills taught include carpentry, fibreglassing and traditional canoe building. This also covers full size canoes and model canoes. They currently have a project to build 8 canoes for the schools on Majuro, so that some traditional knowledge can be passed on to the school children.

The canoe building project had developed a course and this has been certified under the National Training Council. In fact, this was the first course the Council had certified in quite a while. The staff of the project were working in with the National Vocational Institute, as they felt they fitted in under

Tier 3 of this structure. They were looking to get some funding support from the Institute as well as students who had completed the first two tiers, and wanted to gain skills in boatbuilding.

The staff of the canoe building project were also interested in the outer island fishing centres, as these centres were bringing in small-scale boats under Japanese Aid to conduct the fishing activities from. The staff felt that they could build the necessary boats for these centres, and this would benefit the Marshall Islands much more than bringing in imported fibreglass skiffs. The traditional canoe designs could be used, or they could look at building a similar skiff to that being imported. The benefits would be in the training of Marshallese in boatbuilding skills, local employment, ongoing maintenance of the boats and Marshallese would keep some of their tradition if the canoe designs were used. To do this though, MIMRA would need to approach the Japanese International Cooperation Agency (JICA) who were funding all of the outer island fishing centres, including the provision of boats, to see if the boats could be constructed locally, possible with JICA assistance in the initial stages.

Suggestion 61: That MIMRA looks at approaching JICA to have small-scale fishing boats for outer island fishing centres built in Majuro by the canoe building project in future.

Suggestion 62: That if JICA approves the building of small-scale fishing boats for outer island fishing centres in Majuro by the canoe building project, MIMRA also ask JICA for some training assistance with the building of the first few boats.

5.2 Fishing industry

An important point to note is that all people heading to sea need a STCW-recognised sea safety certificate (this came into effect on 1 February 2002) if they want to work outside of the Marshall Islands. This can only be issued by an STCW-95 accredited institution. FNTC has now been accredited by the International Maritime Organisation (IMO) to conduct STCW-recognised sea safety certificates. This means anyone wanting to commence a tuna fishing venture in the Marshall Islands will require crew with current sea safety certificates. MIMRA needs to work together with the Marine Division so that everyone is aware of this requirements, and FNTC can be asked to run short courses for people to get their sea safety certificates when the need arises.

Suggestion 63: That MIMRA work with the Marine Division and FNTC in setting up short courses for people to get sea safety certificates as and when the need arises.

5.2.1 Crew for offshore tuna vessels

There are quite a few Marshallese people who have received training from FNTC over the years, including the bridging courses arranged by FNTC in 2002 and 2003. These people continue to move in and out of the country, working on foreign vessels and then returning home. The students from FNTC have been mainly placed on merchant vessels, as there is very little on fishing methods in the past courses. FNTC has been working on courses for the fishing industry, although they have not been implemented to date. Possibly FNTC could look at developing a short course specifically covering tuna longlining with practical at-sea sessions, coupled with a sea safety certificate and offer this to local people wanting to work in the RMI on tuna longliners. The current format of having the students live-in should be maintained at FNTC to simulate what it will be like to be restricted to a fishing vessel for a week or two at a time.

Suggestion 64: That the FNTC look at developing a short course specifically covering tuna longlining with practical at-sea sessions, coupled with a sea safety certificate and offer this to local people wanting to work in the RMI.

Suggestion 65: That if FNTC does develop such a short course, they stick to their current method of having the students live-in for the duration of the course.

5.2.2 *Skippers for offshore tuna vessels*

There are very few qualified skippers in the Marshall Islands with experience on fishing boats, and with experience on tuna longliners almost non-existent. FNTC has a skipper for their fisheries training vessel, FTV *Wa-Bal*, although he does not have a formal qualification. The principal of FNTC is trying to arrange training for this skipper in Japan so that he can gain an internationally recognised skippers ticket and come back to FNTC to take up his duties. MIMRA should support this training, and possibly look at similar training for other people on the training vessel in future.

Suggestion 66: That MIMRA support the training in Japan of the skipper of FTV *Wa-Bal*, and possibly look at similar training for other crew members in the future.

There is a need for more skippers in the private sector, especially with the MIMRA objective of promoting tuna fishery development in the RMI. The FNTC has the training modules to run Master Class 6, 5 and 4 skippers tickets, although they have not run any of these courses to date. The reasons have been a shortage of staff (refer Section 5.1.1) and a shortage of funds. FNTC should as a matter of urgency, try to locate funds so that at least one Master Class 6 skippers ticket course is conducted in the first half of 2004. Additional courses, and courses for higher levels (Master Class 5) should also be run as the need is identified.

Suggestion 67: That the FNTC locate funding and run at least one Master Class 6 skippers course in the first half of 2004.

Suggestion 68: That FNTC conduct additional courses, and courses for higher levels (Master Class 5), as the need is identified.

5.2.3 *Engineers for offshore tuna vessels*

There is also a shortage of engineers at present in the Marshall Islands. FNTC is able to provide the training for Class 6, 5 and 4 engineers, although again, they have not run any courses to date. Given the need for engineers for fishing vessels, FNTC should be looking at ways to attract funding and students to run such courses. Possibly FNTC could look at some cadetships for engineers on their training vessel, with the aim of training them up and then encouraging them to go and work in the private sector.

Suggestion 69: That FNTC look at having a couple of cadetships for engineers on their training vessel, with the cadets encouraged to enter the private sector once they have successfully completed the engineering course.

Other ways to identify engineers need to be found as well. Possibly the government could fund one or two Class 6 engineer courses for interested school leavers who were mechanically minded. Some sort of screening process would need to be put in place, including some sea time to make sure the people wanted a career at sea. Once the participants successfully completed the course, FNTC could assist them to find employment on merchant and/or fishing vessel, possibly under a cadetship type arrangement. If this does occur, then the engineering areas that should be focused on are diesel engines, hydraulics and refrigeration.

Suggestion 70: That the government fund one or two Class 6 engineer courses for interested school leavers who are mechanically minded.

Suggestion 71: That if courses are held through FNTC, that a screening process be put in place, including some sea time to make sure the people wanted a career at sea.

Suggestion 72: That FNTC assist students who successfully completed the Class 6 engineers course to find employment on merchant and/or fishing vessel, possibly under a cadetship type arrangement.

Suggestion 73: That an engineering course for the fishing industry have a focus on diesel engines, hydraulics and refrigeration.

5.2.4 *Small-scale coastal tuna fishermen*

The small-scale fishing sector will require different training to the medium-scale tuna fishery. Small-scale operators will need training in appropriate tuna fishing methods for their size vessels, such as trolling and mid-water fishing techniques (especially vertical longlining), which are often used in association with FADs. It is noted that there is a small-scale fleet including sportsfishermen and gamefishermen, who troll for tunas and other pelagic species. Other areas of training are in the correct handling and chilling of the catch and possibly post-harvest activities, such as value-adding processes. The best approach to this style of training is hands-on workshops, both in the main centres and in village settings. Depending on the subject area, this could be done by MIMRA's extension service (fishing techniques), or technical assistance can be requested from SPC. The most important point though is that the MIMRA, in consultation with the Billfish Club, identifies the type of training needed, and then organises the most appropriate trainers to undertake the training. It should also be noted that it will be very difficult for all small-scale fishermen to focus on fishing for tunas only. Some may choose to do this, but not all. This would especially be true for outer island locations, and it would be best if training of outer island fishermen be done in their home location. Therefore the training should be more general, especially in village settings, and not just covering tuna-related topics, but also include topics like basic outboard maintenance and repair, and other fishing techniques (deep-water snappers etc).

Suggestion 74: That MIMRA, in association with the Billfish Club, assess the needs of small-scale tuna fishermen and identify the most appropriate training for different locations.

Suggestion 75: That MIMRA either organise, or identify the appropriate group to organise, tailored training in the form of hands-on workshops, with the most appropriate people used for the training.

Suggestion 76: That training for small-scale operators be undertaken in their village setting, rather than bringing the people, especially those from remote areas, to be trained in a main centre.

5.2.5 *Managing a small fishing business*

As more people become involved in commercial fishing (not just tuna fishing), especially if export markets are established, small fishing companies may be established. These will more than likely be family businesses that may expand over time. To assist local fishermen develop their businesses, there is a need for specific training in running a small fishing business. CMI does provide training and their Business Department was about to implement a certificate course. However, this course is not specific to running a small fishing business. SPC has specific training materials available for the financial management of a small fishing business, and MIMRA and CMI could request these to develop a more specific course for small fishing businesses in the Marshall Islands. A short course would be the best approach and possibly there could be several modules to break it up into smaller chunks for people to learn.

Suggestion 77: That MIMRA and CMI request the SPC to provide their training materials for financial management of a small fishing business, so they can develop an appropriate course for the small fishing companies in the RMI.

Suggestion 78: That CMI run the small fishing business course as a series of short course modules to break the course up into smaller chunks for ease of learning.

People or companies in the Marshall Islands wishing to run a larger fishing operation, may find the two-week regional SPC and New Zealand School of Fisheries (NZSOF), 'Enterprise Managers Course' useful. This course covers business management on a larger scale including vessel

management, joint ventures and charter arrangements, an introduction to HACCP requirements for marketing seafood in the US, and a range of other topics specific to operating or managing a larger-scale fishing operation. As this is a regional course run each year, the Marshall Islands will need to apply to attend; normally, one position is available per country.

Suggestion 79: That MIMRA support Marshallese entering or expanding their fishing business to a larger-scale, by nominating them to attend the annual SPC/NZSOF Enterprise Management Course, to develop better business management skills.

5.3 Processing sector

There is a significant processing sector in the Marshall Islands, with most facilities having HACCP plans in place as discussed in Section 4.5. There is also scope for the processing sector to expand in future, and any new facilities should also have HACCP plans developed at the time. There is an ongoing need for staff that work in each of these facilities to be trained in HACCP, to ensure that if trained staff leave that there are others with the skills to replace them. This training should also flow through to the staff of the outer island fishing centre, as product received from each of these centres may be exported in the future.

Suggestion 80: That each of the processing facilities make HACCP training a high priority for staff to ensure adequate people are trained.

Suggestion 81: That MIMRA ensure that some staff from each of the outer island fishing centres are included in the HACCP training, so that the facility on Majuro receives high quality product from them.

Product development is an area the processing sector should be looking at. With the increase in tuna and associated species (byproduct) expected to be landed, and the limited air freight space and higher air freight costs, processors need to do more processing or value-adding in Majuro. There is a range of known products that processors can moving into. However, there could be new products that can be developed. USP in Fiji has the facilities and students doing higher education. Possibly the processing sector could request that some students be encouraged to look at new value-added products that could assist local product development. Even better, possibly MIMRA or the RMI government could provide a couple of scholarships for Marshallese students at USP, with the requirement that their studies be in food technology and their thesis be on product development or another post-harvest activity. This would assist in there being experienced food technologists in the Marshall Islands to assist the processing sector in future.

Suggestion 82: That MIMRA, through the RMI Government, approach USP and request that some students be encouraged to look at new value-added products for tunas and byproduct species, that could assist local product development.

Suggestion 83: That MIMRA, through the RMI Government, provide several scholarships for Marshallese students at USP in the field of food technology, with their thesis to be on product development or another post-harvest activity.

5.4 Support sector

The support sector seems to be reasonably well established on Majuro, with plenty of skilled and some qualified trades people in both the public and private sector in most trades. However, many of the trades people are Filipino as there are few qualified or certified Marshallese in the trades. There is also limited vocational training available at present, and a shortage of Marshallese entering the trades, as discussed in Section 5.1.2. Therefore there is a need for more Marshallese to enter the trades and the RMI Government needs to support this type of training, possible through offering apprenticeships or cadetships to school leavers to look at this for their career.

Suggestion 84: That the RMI Government look at offering cadetships or even apprenticeships to get young Marshallese taking up a trade career.

5.5 MIMRA

The staff of MIMRA will need a range of training to gain the necessary skills to manage different fisheries in general, and implement both the National Tuna Management Plan and the National Tuna Development Strategy for the RMI when finalised.

Under the current education and training system in the Marshall Islands, it would appear there is a limited focus on the marine sector. This needs to change as the marine sector is such an important area for the country. Therefore, more Marshallese should be encouraged to do a degree in marine sciences. MIMRA realises this and has two interns commencing overseas Marine Biology courses in 2004. The USP also offers several courses in the marine sciences, included a Diploma in Tropical Fisheries, a Diploma in Ocean Resource Management and Policy, and a Diploma in Fisheries Economics and Management. There are also other overseas courses that can be undertaken.

MIMRA is trying to raise the profile of marine science in the RMI, especially in regard to tunas, as there is an ongoing need for fisheries and environmental scientists. The latter is an area MIMRA needs to focus on, as conservation issues and interactions of gears on non-target species may become an increasing component of their work. MIMRA needs to identify these as priority areas, and seek government scholarships in these fields.

Suggestion 85: That MIMRA identify environmental science and fisheries science, with a focus on tuna, as areas requiring qualified staff, and request the government to offer scholarships in these fields.

No staff at MIMRA appear to hold qualifications in fisheries management. Those that are becoming involved in management come from a more scientific background or have worked their way into this with no formal qualification. The problem is that fisheries management is becoming much more complex, and there is a need for specific training in this area. A good example of this is the implementation of the National Tuna Management Plan — there may not be anyone at MIMRA qualified or able to implement this plan effectively.

The people involved in the implementation of the plan need specific training in the areas of fisheries management, developing and implementing management plans, and developing and implementing small-scale tuna fisheries projects. Some training is available through USP courses, or people can be sent overseas for training. One approach to addressing this training need could be through a job exchange programme with a recognised agency involved in fisheries management. This approach would allow staff to be trained while they are working, both in the RMI and in the agency involved in fisheries management or fisheries development.

Suggestion 86: That the Fisheries Division arrange for staff involved in the implementation of the National Tuna Management Plan to receive training, either through a USP course, by sending them overseas on recognised courses, or by entering into a job exchange programme with a recognised agency involved in fisheries management and/or fisheries development.

Surveillance and compliance will be required with the implementation of any management plan. However, it is particularly relevant with the National Tuna Management Plan as there are international implications for the Marshall Islands, as they have several access agreements within their EEZ with specific terms and conditions. The Forum Fisheries Agency (FFA) has completed a vessel monitoring system (VMS) programme, which is being implemented regionally, and countries should require this under fishing access agreements. MIMRA should ensure the implementation of VMS as part of any future access agreement. VMS should also be a requirement for domestic tuna

fishing vessels, as there are flag-state control issues that the RMI will need to address if their vessels happen to fish in the zone of a neighbouring country by mistake. VMS is also an additional piece of safety equipment for all vessels fishing offshore.

Suggestion 87: That MIMRA fully implement the requirements of VMS in all future and current fishing access agreement under the terms and conditions of access.

Suggestion 88: That MIMRA implement VMS as a requirement for domestic tuna fishing vessels, as there are flag-state control issues that the RMI is responsible for, and VMS is a good piece of safety equipment.

There also appears to be a need for on-the-job training in some fields of surveillance and compliance, including prosecution workshops, evidence collecting, and verification of catch records. This type of training is necessary to ensure that officers know how to conduct their surveillance activities accurately, as some of this work may lead to prosecution, with appeals from the defence side. On-the-job training is suggested for these officers as they need to know how to work in their own environment with the equipment available to them. MIMRA and other relevant government departments should identify specific areas of training in surveillance and compliance, and approach either Australia, New Zealand or the US for assistance with the provision of a suitable trainer in the areas identified, if a suitable trainer is not available locally.

Suggestion 89: That MIMRA and other relevant government departments identify specific areas of training for surveillance and compliance officers, and approach Australia, New Zealand or the US for assistance with the provision of a suitable trainer in the areas identified, if a suitable trainer is not available locally.

Another way of conducting surveillance on fishing vessels is to have observers on board to monitor and verify catch (including bycatch and discards), to monitor fishing location, and to collect any samples or specific data needed by scientists. Around 40 Marshallese have been trained as observers to the end on 2003, although very little observer work is undertaken. There is a need to increase observer placements, to meet requirements and ensure accurate data is provided under the National Tuna Management Plan. For maximum efficiency and to minimise long-term costs, it would be best if the observers were not government employees. This would allow observers to be employed on a casual basis when there was work available, and would increase the skills in the private sector workforce.

There may be the need to train up more observers in the future as people are not available or there is just a need for more trained people. Both SPC and FFA have been involved in training national observers in the region, including the Marshall Islands, for tuna fishing vessels. Both SPC and FFA are in a position to assist in the running of future observer workshops when the need arises. This would keep a pool of qualified observers to assist in the monitoring of catch and fishing location of tuna fishing vessels working in RMI waters under the National Tuna Management Plan, or to work through FFA to observe on US purse seiners under the Multilateral agreement.

Suggestion 90: That MIMRA request both FFA and SPC to assist in the setting up and running of future observer workshops in the Marshall Islands as the need arises.

Suggestion 91: That MIMRA preferably select non-government employees as observers, to increase the skills of Marshallese in the private sector workforce, with MIMRA employing these people on an as-needs basis.

Port sampling is conducted in Majuro at present, although this is mainly on transshipment of foreign catches through the port and at MIFV. With the focus on developing a domestic tuna longline fishery, the amount of port sampling may need to be increased, so that data can be collected from a

representative sample of the domestic landed catch as well as the foreign transshipments. There are probably enough trained port samplers to do this in the immediate future.

6. CONSTRAINTS AND OPTIONS FOR DEVELOPMENT

There are a range of constraints facing domestic development of the tuna fishery in the Marshall Islands. Some of these are related to financing, government policy, and the cost of fuel and other items needed to operate. If some or all of these constraints can be overcome, there is a greater chance of domestic development and involvement of Marshallese in the tuna fishery. Such involvement in the tuna fishery can be in several areas. Previous sections have already looked at the training needs and infrastructure requirements. The other area that development can occur is in post-harvest activities, once the fish have been initially caught, including employment opportunities. However, the initial stage of any development will require a government structure to foster this, and this is the aim of MIMRA at present.

6.1 Encouraging private sector development

The RMI Government has been involved in several attempts to develop domestic tuna fisheries in the country, especially tuna longlining. This commenced in the 1980s with the building of the Fishbase under Japanese Aid. Unfortunately the Fishbase has been operated by foreign fishing companies throughout its life as there has not been a domestic fishing operation. In the early 1990s, several Marshallese entrepreneurs were assisted financially to purchase second-hand vessels from the US and have them fitted out for tuna longlining. However, the boats ended up not being the most appropriate for the fishing venture and there were problems with cash-flow, air freight and export markets, which resulted in these vessels ceasing operation within three years of commencing. These early attempts by the RMI Government focused on infrastructure and financing the private sector to develop domestic tuna fishing operations. It is also noted that there has been no attempt to set up a government fishing company, but rather the government has focused on private sector development, and this approach should be continued.

Suggestion 92: That the government continue their current policy of promoting private sector development of the domestic tuna fishery.

The best way forward for the RMI Government is for them to fund developments in infrastructure needs. This could include the suggested development of a new tuna fisheries complex if a suitable site can be located (refer Section 4.1) and land either leased or reclaimed (refer Section 4.2), which may encourage fishermen to purchase larger vessels and moor them there. When larger vessels are brought in by the private sector, support services will develop or adapt to maintain the vessels, as well as employment being generated on the vessels themselves. The bottom line is that the government needs to provide an enabling environment to encourage the private sector to invest in the tuna fishery.

Suggestion 93: That the RMI Government focus on providing infrastructure that will create an enabling environment for private sector development in the fishing sector.

The RMI Government, through MIMRA, has been conducting tuna longline fishing trials while training up interested Marshallese in the gear and fishing technique, with technical assistance from SPC. This is a good start to introducing and promoting the tuna longline technique to Marshallese, and this should be continued. However, this should remain a training exercise and not expand into MIMRA starting up their own fishing venture. The only problem with the current approach is that the people being trained are not the entrepreneurs with access to finance to buy a boat. Identifying these people and encouraging them to invest in the domestic tuna fishery will be very difficult.

Suggestion 94: That MIMRA continue the tuna longline fishing and training trials ensuring that their efforts do not lead to a government fishing venture being established.

One area that the government could greatly assist is in financing domestic fishing operations. In the past they purchased vessels for private sector operators and this did not work. A better approach could be for the government to identify a sum of money, possibly several million dollars, and set up an account (revolving fund) as seed funding for tuna longline fishery development. Local entrepreneurs could then take out loans against this account to purchase boats and equipment. The loan would be on favourable terms at a low interest rate of three or four per cent, with a grace period before the first payment was due. As people paid off their loans, other fishermen could borrow against the account. The government would need to keep control of this fund, although it is not something that falls under the charter of MIMRA and they would not have the expertise. Possibly the fund could be administered by the Marshall Islands Development Bank, with loan applications and business plans assessed by MIMRA. It is also suggested that bank fees and charges should be kept to a minimum for the fund, so it is used for its intended purpose and not to prop up the Development Bank and its infrastructure.

Suggestion 95: That the RMI Government look at setting up a revolving fund of several million dollars specifically for tuna longline development projects (buying boats and equipment) in the private sector.

Suggestion 96: That the revolving fund have favourable terms and conditions with an interest rate of three to four per cent, with a grace period before the first payment is due.

Suggestion 97: That the government keep a tight control of the fund, and have it administered through the Marshall Islands Development Bank, with their fees and charges kept to a minimum.

Suggestion 98: That MIMRA assess all funding applications and business plans to ensure the proposals are realistic and feasible.

6.2 Government policies and the role of MIMRA

There are a range of government policies that can effect and/or assist the development of the tuna fishing industry including: maritime regulations, new legislation; duty on fuel, bait, fishing gear and other items; licensing; and data collection and use.

6.2.1 Role of MIMRA

As previously stated, MIMRA should not be involved in commercial activities. Their primary role should be to manage the resource sustainably, so as to maximise the economic returns to the RMI, local communities, and the private sector. Managing the resource includes the surveillance and monitoring of both local and foreign fishing activity in the RMI EEZ. These are all areas that will come out in the National Tuna Management Plan, and other team members are working on these areas.

MIMRA also has a major role to play in extension, to work with and train local fishermen in different fishing techniques and fish quality. Extension activities for training and encouraging development in the tuna fishery will be discussed in later sections of this report.

6.2.2 Marine Division Regulations

Domestic vessels in the RMI come under the Domestic Watercraft Act 1992. This Act was amended on 2000 to bring it in line with STCW-95 requirements for merchant vessels and seafarers working on these vessels. Below are some extracts from the amended Act as they apply to non-convention vessel, which covers fishing vessels.

609 Authority to issue Licenses, Certificates, Etc. (selective extract only)

- (1) The Minister is authorized to issue all such licenses, certificates and seafarer identification books for officers and ship's personnel on vessels involved solely in domestic trade within waters of the Republic pursuant to the Act; provided the vessel types, characteristics and operation do not subject the ship's personnel to the provisions of the STCW Convention 1995, as amended. A notation of any limitations shall be affixed and readily visible on all issued licenses, certificates and seafarer identification books. The Minister shall establish a Board of Marine Inspectors to determine the qualifications of all applicants for licensing, certification and seafarer's identification for those vessels which do not come under the provisions of STCW Convention 1995, as amended.
- (3) Non-application of the STCW Convention, Amended 1995. Ship's personnel serving on board the following categories of vessels shall be exempt from compliance with the STCW Convention while remaining subject to the regulations promulgated by the Minister in fulfilment of the purposes of the Act.
 - 3.1 Fishing Vessels (Article III of the STCW Convention)
 - 3.2 Government vessels engaged in non-commercial service (however, persons serving on board such ships must meet the requirements of the Convention so far as is reasonable and practicable). (Article III of the STCW Convention)
 - 3.3 Ships which navigate exclusively in inland waters or closely adjacent to, sheltered waters (i.e. lagoons). (Articles 11(g) of the STCW Convention)
 - 3.4 Pleasure yachts not engaged in trade. (Article III of the STCW Convention)
 - 3.5 Wooden ships of primitive build. (Article IV of the STCW Convention)
 - 3.6 Engineer officers and engine ratings serving on commercial vessels less than 750 kw propulsion power. (Regulations 111/3 and 111/4 of the STCW Convention)
 - 3.7 Deck ratings serving on commercial vessels less than 500 gross tonnage. (Regulation 11/4 of the STCW Convention).
- (5) For the purposes of this Act, failure of an owner of a vessel of the Republic to ensure that each officer employed on the vessel is the holder of a valid license of competency of the Republic to fill the position held by him/her and all seafarers in general have a valid identification book shall subject the owner to a fine of \$750 per non-complying officer and \$250 per non-complying seafarer. However, such penalty shall be rescinded if the proper license and identification book is obtained within 30 days from notice of violation.
- (6) The Minister shall promulgate with Cabinet approval all regulations deemed necessary and proper for carrying out the purposes of this Act as it relates to ship's personnel exempted from compliance with the STCW Convention 1995, as amended.

Based on the above sections of the Act, there appears to be no specific licensing requirements in place for vessels at present, nor is there anything specific for crew manning levels or qualifications of crew on non-convention vessels. This needs to be resolved quickly, and the Act specifies the process for this to happen. First the Minister needs to establish a Board of Marine Inspectors to determine the qualifications of all applicants for licensing, certification and seafarers on non-convention vessels. MIMRA should request the Marine Division to do this as soon as possible and ensure that they are represented on the Board to ensure that realistic requirements are being put in place for fishing vessels that will allow development to occur while ensuring the seaworthiness of the vessels and the safety of the crew on board. Once determinations have been made on licensing, certification and seafarers for non-convention vessels, Regulations need to be drafted and enacted, with all those in the fishing industry made aware of the requirements. There may need to be a phase in period to allow vessel owners and their crew to gain necessary qualifications for their fishing operations.

Suggestion 99: That MIMRA request the Marine Division to urgently establish a Board of Marine Inspectors to determine the qualifications of all applicants for licensing, certification and seafarers on non-convention vessels.

Suggestion 100: That MIMRA ensure that they are represented on the Board to ensure that sound and realistic requirements are being put in place for fishing vessels and crew on these vessels.

Suggestion 101: That once determinations have been made by the Board on licensing, certification and seafarers for non-convention vessels, Regulations are drafted, enacted, and circulated to those in the fishing industry.

Suggestion 102: That MIMRA and the Marine Division consider a phase in period for any new Regulations to allow vessel owners and their crew time to gain necessary qualifications for their fishing operations.

One possible approach could be to follow the lead of other countries in the Pacific who are also developing manning levels and qualifications for crew on fishing vessels. In Kiribati, they are proposed regulations as follows: a 20 mt vessel would be able to work within the Kiribati EEZ with a Master Class 6 skipper plus a Class 6 engineer (can be the same person); and vessels 20 to 80 mt working within the EEZ would need a Master Class 5 skipper, Master Class 6 mate, and a Class 5 engineer (engines under 250 kWt) or Class 4 engineer (250 to 500 kWt engine). This would cover most vessel up to 30 m in length, which would be used for developing a domestic tuna longline fishery.

Suggestion 103: That MIMRA and the Marine Division consider using similar qualifications and manning levels for the fishing industry as those being proposed by Kiribati for their fishing vessels.

Sea safety requirements also need to be addressed by MIMRA and the Marine Division. When looking at sea safety requirements, and sea safety appliances, they need to be matched to the size of the vessel and the area of operation. One set of regulations will not suit all vessels. Therefore, a range of equipment requirements are needed, based on vessel size and area of operation. Possibly MIMRA can work with the Marine Division to come up with a workable solution for this and have the appropriate Regulations drafted and enacted.

Suggestion 104: That MIMRA and the Marine Division work together to develop workable requirements for sea safety appliances, based on size of vessel and area of operation, and once agreed, have appropriate Regulations drafted and enacted.

6.2.3 EU requirements for a Competent Authority

Under the EU certification system for countries to export fish product to the EU, certain guidelines must be followed. First, a company can gain ‘satellite’ status, which means that the EU inspectors deal direct with the company, and this is outside any local government legislation. No company in the Marshall Islands would qualify for this status.

For other companies wishing to export product to the EU, especially fresh fish, they need to have their processing facilities up to EU standards and be inspected by an EU inspector. Each consignment sent from the processing facility also needs to be inspected and certified by a recognised inspector under a Competent Authority, which is set up under government legislation. In looking to the future, the EU could be a lucrative market for the Marshall Islands. To be prepared for this the government should start the process of establishing a Competent Authority. MIMRA and the Health Department need to get together to first work out whether the Competent Authority best fits under the health or fisheries legislation. Once decided, the legislation needs to be developed and the Competent Authority established.

Suggestion 105: That MIMRA and the Health Department get together to work out whether a Competent Authority best fits under health or fisheries legislation.

Suggestion 106: That once a decision is made under which legislation the Competent Authority should be established, the legislation be developed to allow this to happen as soon as practical.

Once the Competent Authority is established, then staff will need to be trained as inspectors to meet the requirements as set out by the EU and a laboratory identified for doing random testing of fish products. All of this needs to happen before trail exports can be sent to the EU to establish markets in the future.

Suggestion 107: That once the Competent Authority is established, inspectors are trained and a laboratory identified, so that all of the EU requirements can be fulfilled.

6.2.4 Duty and taxes on gear and equipment used in the tuna fishery

In the Customs Act, the rate for duty was 8 per cent on everything, boats, fishing gear, processing equipment, spare parts etc. For goods arriving by sea, the duty was charged on the CIF (cost, insurance, freight) price, while goods arriving by air were charged on the FOB (free on board) value, which did not include the freight component (duty on food items was charged at a rate of 5%). The only item for the fishing industry that was duty free was diesel fuel. Having to pay import duty on all fishing equipment including boats is a major disincentive to developing a domestic tuna fishery.

There was a section in the Customs Act that covered Fisheries and Manufacturing, which made these two areas duty free (could bring in anything tax/duty exempt). However, in 2000/2001 the government removed this section of the Act, so now duty was payable on everything in the fishing industry except fuel. The section of the Act that gave Fisheries a duty free status should be re-instated to provide an incentive for people in the private sector to invest in the tuna fishery and bring in vessels.

Suggestion 108: That the RMI Government re-instate the section of the Customs Act that gives Fisheries goods a duty free status.

As stated above and in Section 4.3.8, diesel fuel for fishing vessels is duty free. MEC had the cheapest fuel at USD \$1.13/gallon (roughly USD \$0.33/litre as at November 2003) and this is negotiable on larger volumes. This is a good incentive for people wishing to enter the tuna fishing in the Marshall Islands.

6.2.5 Licensing

The issue of licensing will be covered by another of the team members, as the issue of licence numbers, fees, and the criteria for eligibility is an issue that needs resolution sooner rather than later. The input here is more to do with observer coverage and possible funding of observers and trying to create a development fund using part of the licence fee.

Having observer coverage on tuna fishing vessels is an important monitoring tool, for validating the actual catch and position, as well as providing additional information on species composition and bycatch. The latter information is becoming very important as conservation groups look closely at bycatch species and the interaction of fishing techniques on non-target species. The Marshall Islands may also have international obligations to validate catches from vessels, which it flags. Therefore, it is essential that MIMRA expand their observer programme to validate the catch of tuna vessels working in its EEZ. The easiest way to ensure this is to make this a licensing requirement under the National Tuna Management Plan for all foreign fishing vessels and domestic vessels over a specified length working in the RMI EEZ.

Suggestion 109: That MIMRA make it a licensing requirement under the National Tuna Management Plan, for all foreign fishing vessels, and domestic vessels over a specified length working in the RMI EEZ, to carry an observer from time to time.

The idea of having a separate fee to cover the wages and allowances of observers has been considered by government, and set at USD \$1000/licence/year for foreign fishing vessels. MIMRA has been collecting this fee for several years, with the funds paid into a separate account, specifically for this task. This seems to be working well, although very few observer placements have been made. MIMRA may also want to consider implementing the same requirement for domestic medium-scale tuna vessels as the fishery develops, but at a much reduced rate as these vessels would be working in and out of Majuro. A realistic fee for local Marshallese medium-scale tuna vessels would be around USD \$300/licence/year.

Suggestion 110: That MIMRA consider implementing an observer fee of USD \$300/licence/year for domestic medium-scale tuna vessels.

When looking at the perceived benefits to the small-scale fishing and gamefishing sectors from having foreign tuna fishing vessels working in the RMI EEZ, there are few. In fact, some groups within these sectors would argue that having tuna longline vessels working in the RMI EEZ is a negative benefit, as the catch from these vessels may be perceived as effecting the catch rates of small-scale vessels and gamefishermen. Having the trust fund to deposit an observer fee to cover the cost of observers is a good first step in increasing the perceived benefits from foreign tuna fishing activity by the small-scale domestic fishing sector. However, observers are used to monitor and verify the fishing activities occurring in the RMI EEZ, so there is only a small perceived benefit to the small-scale fisheries and gamefishing sectors from this activity. What would be perceived as a benefit or even a boost to these sectors, would be if some of the licence fee was set aside for fisheries development work.

A similar approach could be used to the observer fee, except it could be called a ‘development fee’, which is specifically used for development work. The same trust fund could be used with a separate account for development work, or a separate fund could be established. The fee could be set at around USD \$1000/licence/year for foreign fishing vessel. For local medium-scale tuna vessels, the amount could be a lot less (USD \$300/licence/year), paid into the development fund.

Suggestion 111: That MIMRA collect a ‘development fee’ as an additional charge or portion of a licence under the Plan, and deposit these funds in a trust fund/account for specific work in fisheries development.

Suggestion 112: That the ‘development fee’ be set at around USD \$1000/licence/year for foreign fishing vessels, and around USD \$300/licence/year for local medium-scale tuna vessels.

In collecting the development fee, it would be wise to use this on small-scale tuna fishing development projects. Such a project would be the funding of an ongoing FAD programme in locations where they will benefit local fishing communities and the gamefishing sector.

Suggestion 113: That MIMRA use the development fund on small-scale tuna fishing development projects, such as an ongoing FAD programme.

6.2.6 *Data collection and use of data*

There is a data collection system in place for the foreign tuna fishing fleet in the Marshall Islands. Each fishing vessel completes a logbook with their fishing activities. However, there is no logbook system in place for the domestic tuna longline fleet, as this is yet to develop. In this regard, MIMRA should work with SPC’s Oceanic Fisheries Programme (OFP) and use the logbooks that have been developed for the region. SPC currently has a one line per day logsheet for tuna longlining, which is

currently under review and being totally revised into a one page per day logsheet. MIMRA could adopt the SPC longline log, and make this a licence requirement for all domestic tuna longline vessels.

Suggestion 114: That MIMRA adopt the SPC regional tuna longline logbook for domestic tuna longlining activities, and make the completion of this logbook a licensing requirement.

A good cross check for the catch data would be the use of observers in the tuna fishery. This has been discussed under Section 6.2.5, which looks at the need for observers.

There is a significant small-scale domestic tuna fishery or gamefishery conducted in the waters around Majuro. The estimates of catch vary greatly, and there appear to be no official figures for the catch taken by these vessels. Most of the catch is taken by trolling. It is hoped that in the near future a new FAD programme (refer Section 6.5.4) will be implemented. As part of this project, mid-water fishing methods will also be demonstrated with fishermen encouraged to use these methods. With this potential development, it would be good to start to collect catch and effort data by fishing gear type. Possibly MIMRA could look at developing a simple logbook for the small-scale tuna fishery, or seek SPC assistance in developing the log.

Suggestion 115: That MIMRA look at developing a simple logbook for the small-scale domestic tuna fishery, or seek SPC assistance in developing the log, with the catch split by fishing method, and have fishermen complete it and provide copies to fisheries and SPC on a monthly basis.

6.3 Financing for new fishing operations

The financing options for Marshallese to get their own vessel and enter the tuna fishery are being covered by another member of the team working on this project. This is a difficult area to address, given the amount of money needed to purchase a suitable tuna longline vessel. One possible suggestion is made under Section 6.1, with the use of a government revolving fund specifically for financing domestic tuna longlining projects.

6.4 Charter fishing operations

There is currently a significant gamefishing and charter fishing sector in the Marshall Islands, with around 25 charter boats on Majuro and another 10 split between Kwajalein and Arno. The Billfish Club in Majuro is also very active with a tournaments held every month. This is an area of the tuna fishery that could continue to grow, especially if the tourist trade increases. MIMRA should support this part of the fishing sector as much as possible.

Suggestion 116: That MIMRA support and encourage the private sector to expand their current gamefishing and charter fishing operations in Majuro, Kwajalein and Arno.

6.5 Development options

A range of development options are possible for the Marshall Islands in relation to the tuna resource that passes through its EEZ. These options cover potential areas of employment in the tuna fishery and possible support to the fishery. This section explores these different options as to their viability and practicality in the Marshall Islands based on the current situation and the information available.

6.5.1 Transshipment of tuna catches and the use of Marshallese stevedores

The waters of the RMI provide a major fishing ground for the foreign tuna fishing fleets in the western and central Pacific Ocean at different time, based on oceanographic conditions. As a result of this, at different times of the year there is a lot of transshipment activity, as the foreign fishing vessels unload their catch to carrier vessels to take to market. Some of the vessels use local stevedores to do

the transshipment work, while others use the crew from the vessel. This is an area where the government could encourage other vessels to use local stevedores, to provide income earning opportunities for local labourers.

Suggestion 117: That the government try to encourage more tuna vessels transshipping their catch in Majuro to use local stevedores to do the work.

6.5.2 *Marshallese crewing on domestic and foreign tuna fishing vessels*

The Marshall Islands has provided crew for both merchant vessels and foreign fishing vessels in the past, although in small numbers. In support of this, the Fisheries and Nautical Training Centre has held courses in the past to give potential seafarers the basic skills need to work on boats. There appears to be no company that handles crewing contracts for merchant or fishing vessels. This is an opportunity for a private sector company provided there are an adequate number of people wanting to work on foreign vessels. The other point here is that a standard employment contract needs to be drawn up so that both the seafarer and the company employing them clearly know that the terms and conditions of employment are. Possibly MIMRA or the Marine Division could assist with the drafting of a standard employment contract, possibly using those used in other countries such as Kiribati and Tuvalu as a model.

Suggestion 118: That MIMRA and the Marine Division look at developing a standard employment contract for Marshallese looking to work on foreign fishing vessels, possibly using existing contracts used in Kiribati or Tuvalu as a model.

Suggestion 119: That MIMRA and the Marine Division encourage a private sector company to take on the placement of Marshallese seafarers on both merchant and fishing vessels using the standard employment contract once developed.

Crewing on domestic tuna fishing vessels has not been a problem to date, as there has not been any local boats. It is hoped that this will change in the near future, as development occurs and the private sector starts to invest. With the number of Marshallese that have been trained up over the years at FNTC, and the recent and planned tuna longline training on the FTV *Wa-Bal*, there are potential crew in the Marshall Islands for initial domestic tuna fishing operations as they develop.

6.5.3 *Observer programme and port sampling*

MIMRA has an active port sampling project to monitor the catch from vessels transshipping tuna in their ports plus an observer programme that is not so active. A new coordinator has been appointed to the observer and port sampling programme, and he is working to improve all aspects of the programme, including getting more observers on vessels. An observer training course was held in Majuro in November/December 2003, so there are adequate trained people now available. The coordinator is working with the SPC's Oceanic Fisheries Programme (OFP) to determine the level of observer coverage and any specific data requirements the scientists may need. This will allow the observer programme to meet the needs of the RMI Government and the scientists who will use the information in the regional stock assessments.

Suggestion 120: That the MIMRA observer programme continue to work with SPC's OFP to set the level of observer coverage and any specific scientific data requirements.

6.5.4 *Fish aggregating devices (FADs)*

There is scope for development and assistance in the artisanal, subsistence and charter fishing areas based on the tuna fishery and the use of fish aggregating devices (FADs) to concentrate these species in known locations. FADs have been used in the Marshall Islands in the past with mixed success, with these devices attracting tunas and associated species. However, premature loss of the FADs did not

allow the full benefits of the devices to be realised. Currently there is one FADs in the water off Majuro. MIMRA has no funding in their budget for FAD materials, and no proposals in for funding with donor agencies. Therefore, the main problem with having an ongoing FAD programme appears to be locating funds. A possible solution to the funding issue, or at least partial funding, has been presented in Section 6.2.5, through the implementation of a 'development fee' of around USD \$1000/year on all foreign fishing licences. Regardless, MIMRA needs to identify funding to allow an on-going FAD programme to be implemented.

Suggestion 121: That regardless of whether or not the funding mechanism of a development fee on foreign fishing licences is implemented, MIMRA identifies funds in their budget to commence an on-going FAD programme.

The extension section of MIMRA should establish a five-year FAD programme for Majuro, Kwajalein and Arno to start, and possibly extend this to the outer islands fishing centres in the future. Such a programme could be used to encourage development and expansion of Marshallese becoming involved in the tuna fishery, albeit on a smaller-scale. Such a programme would provide specific fishing locations for subsistence, artisanal and gamefishing operators, allowing them to minimise their running costs while maximising their chance of a good catch. From a sea safety perspective, knowing where people are working at sea on smaller vessels will greatly assist if a vessel was to break down and there was a need to mount a search and rescue operation for the overdue vessel.

Suggestion 122: That MIMRA, through their extension section, consider implementing a five-year FAD programme under the National Tuna Development Strategy, for the Marshall Islands.

A FAD programme should include the bulk purchase of materials to maintain a set number of FADs at the main fishing locations around the country. The number of FADs could be based on the number of main fishing locations and markets for the catch, with possibly two or three FADs off Majuro, one off Kwajalein and one off Arno to start. Spare materials will need to be kept on hand at each location to replace lost FADs in a reasonable timeframe. A set maintenance programme needs to be implemented by the extension section to try to maximise the lifespan of each FAD, thus reducing the overall cost of the programme. Data collection should also be implemented as a requirement of fishing around FADs, so that a cost benefit analysis can be undertaken periodically through the life of the FAD programme, monitoring the success and the dependence of fishing operations on FADs.

Suggestion 123: That if MIMRA implements a FAD programme under the National Tuna Development Strategy, the following requirements be included:

- Bulk ordering of materials to reduce costs;
- Spare materials be kept on hand to replace lost FADs in a reasonable timeframe;
- A set maintenance programme be implemented to increase the lifespan of FADs in the water;
- Data collection system implemented for all operators fishing around the FADs; and
- A cost benefit analysis be undertaken periodically through the 5-year programme to monitor the programmes' success.

MIMRA has a suitable vessel with GPS and plotters for deploying FADs, although they do not have a suitable deep-water echo sounder (to work in 2500–3000 m). The vessel can be used to deploy FADs in several locations, although at least one deep-water echo sounder is needed to ensure accurate deployment. Therefore, funding for an on-going FAD programme should include the purchase of at least one deep-water echo sounder for the fisheries training vessels, whether this funding is through the development fund or the fisheries budget.

Suggestion 124: That MIMRA include funding in any on-going FAD programme budget to purchase at least one deep-water echo sounder (rated to 2500–3000 m).

Several of the current fisheries staff as well as people in the private sector have been involved in the construction and deployment of FADs. The lifespan of the FADs have been around one year in most cases, so it would seem opportune for MIMRA to seek assistance and training from the SPC in FAD work, if a FAD programme is developed under the National Tuna Development Strategy. This would allow the transfer of technical information and skills from SPC staff to staff of MIMRA and other fishermen that wanted to participate.

Suggestion 125: That MIMRA officially request technical assistance from SPC in the conducting of site surveys, and the construction and deployment of FADs if a 5-year FAD programme is developed and funded as part of the National Tuna Development Strategy.

6.5.5 *Promotion of small-scale tuna fishing methods*

There is no record of mid-water tuna fishing methods having been tried in the Marshall Islands. There is a large potential for mid-water tuna fishing activities in the RMI, provided there is an on-going FAD programme to support this. Such methods used around FADs could reduce operating costs to local fishermen in the short term. Fishermen will need to focus on producing a good quality product, especially skipjack tuna and small yellowfin tuna, when they are caught from small vessels.

MIMRA could promote small-scale mid-water tuna fishing methods around FADs. Such fishing techniques would include vertical longlining (both with rope and monofilament gear), mid-water handlining (both drop-stone and palu-ahi methods), single-hook driftlining (light and heavy gear), and ika-shibi (night fishing for tuna with light attraction). Rather than fitting out the fisheries training vessel to demonstrate these methods, a better approach would be to run a series of workshops at different locations to make up the gear, and then use the vessels of workshop participants to do practical fishing trials around the FADs. SPC could be approached to provide technical assistance in the running of the first couple of workshops and train up fisheries staff at the same time to run future workshops. MIMRA would need to identify funds for purchasing materials to make up the mid-water fishing gears needed at the workshops, and possibly fund the operation of the practical fishing trials.

Suggestion 126: That MIMRA look at introducing mid-water fishing techniques in association with FADs, through a series of workshops at different locations, using participant's vessels to conduct practical fishing trials using the new gear.

Suggestion 127: That MIMRA identify funding to purchase materials for making up mid-water fishing gears and to cover operating costs of practical fishing trials, so that workshops to introduce these techniques can be set up.

Suggestion 128: That if the workshops on mid-water fishing techniques are to go ahead, MIMRA approach SPC for technical assistance in running the first couple to train up fisheries staff, with these staff conducting future workshops in other locations.

An alternative source of funding for FADs is to apply the user-pays principle. That is, those fishermen that want to fish around FADs pay a fee or contribute to the cost of the FAD. In practice this is very difficult to do as there is no way to monitor and control who actually fishes around the FADs. It also can create jealousy as some people can and some cannot fish around the FADs, and this may lead to vandalism and loss of the devices. A better approach would be to implement a small licence fee for local fishing vessels, and use the fee to partially fund an on-going FAD programme, this way everyone is contributing to the cost of the FADs, and each fisherman can choose if and when he wants to fish around them.

Suggestion 129: That MIMRA not look directly at the user-pays approach for funding FADs, but rather consider the implementation of a small licence fee for all commercial vessels, with all or part of the fee partially funding an on-going FAD programme.

The mid-water fishing techniques proposed for fishing around FADs will require fishermen to purchase specific gear that is readily available in other countries, but not in the Marshall Islands. It is hoped that a supplier of fishing gear in the Marshall Islands will bring in the appropriate materials once these methods are introduced to local fishermen. MIMRA could assist local suppliers of fishing gear by providing them with the contact details of potential overseas suppliers and the specifics of the actual gear.

Suggestion 130: That MIMRA provide a list of specific gear needed for mid-water fishing techniques and possible overseas suppliers to local stores in Majuro who may want to sell the gear, so that this gear can be purchased and made available for sale to local fishermen after the methods are introduced.

The final component required for mid-water fishing is suitable bait, as multiple-hook rigs like a vertical longline require 15–20 baits per line per set, depending on the number of hooks used. Local bait such as bigeye scad (*Selar* sp.) and small mackerels (*Decapterus* sp.) would be the best, although they may be difficult to purchase on a year-round basis. To overcome this, imported frozen tuna longline bait may be the best alternative, as it can be purchased when needed. This will be discussed more under Section 6.5.6.

6.5.6 Promotion of medium-scale tuna longlining

The next level of tuna fishing development, which is higher than the small-scale fishing activities suggested in Section 6.5.5, is small-scale and medium-scale tuna longlining. Tuna longlining targets the larger, deeper-swimming tunas that are generally handled carefully and exported fresh to overseas markets. It is a very expensive step up from a small-scale vessel conducting small-scale fishing methods to tuna longlining, even to a small vessel of 11–14 m in length. To put this in perspective, small-scale tuna longlining needs to be looked at separately to medium-scale longlining.

There is one tuna longline fishery in the Pacific that has used small tuna longline vessels successfully — Samoa. They established a fishery using 9–11 m aluminium catamarans with outboard power. The mainline reel used is hand-crank, and generally around 300 hooks are used per set. The catch rates were high although the handling of the catch was marginal in some cases. Albacore tuna was the target species, generally landed fresh to the processors, frozen and then shipped to the canneries in American Samoa. The whole situation in Samoa worked and was profitable using these small longline vessels from 1996 to 2001/2002. However, 2002 and 2003 saw low catch rates and most of the small-scale longliners dropped out of the fishery as their fishing range was too limited.

Prior to the declining catch rates, the Fisheries Division in Samoa was trying to rectify other problems such as sea safety and fish quality encountered on the smaller aluminium catamaran vessels called *alias*. The Fisheries Division had a new *super alia* built, which is 12.2 m long, powered by twin inboard diesel engines and has two built-in insulated fish holds, one in each hull. The vessel has a cabin with bunks, modern electronics for navigating and fishing, and a hydraulic system for the fishing operation. SPC supervised the sea and fishing trials on this new *super alia*, which has a Samoan skipper and crew. The results from the fishing trials indicate this vessel is a large improvement on the smaller vessels, with increased fish quality, increased crew comfort, and increased vessel stability. The projected fishing ability and catch for a 12 month period, based on the catches and expenses recorded through the four month fishing trials, indicates a good profit after all costs (fixed and variable) are subtracted. The economics of the operation could be very different now with the low catch rates, the still limited operating range of this vessel, and the limited carrying capacity for longer trips. Given the limitations of the smaller vessels, especially in times of low catch rates, they may not be the best vessel types in the RMI.

Suggestion 131: That MIMRA steer away from small-scale tuna longline vessels, such as those used in Samoa in the past, and look to encourage the private sector into medium-scale vessels for developing the RMI tuna longline fishery.

MIMRA has commenced some tuna longline fishing trials and training using FTV *Wa-Bal*, a 14 m monohull vessel, with technical assistance provided by SPC. These trials should be continued with trial export shipments of fresh tuna made to Hawaii and Japan through MIFV. In addition, and in support of this project, MIMRA could consider requesting further technical assistance from SPC for the fishing trials. Such assistance would be good training for the skipper and crew of the vessel in tuna longlining gear and techniques. If further assistance is requested from SPC, this should be after the vessel has fished consistently for 6 to 12 months so that the skills of the skipper and crew can be fine-tuned.

Suggestion 132: That MIMRA continue the tuna longline trials on FTV *Wa-Bal* out of Majuro, with trial exporting of the catch to Hawaii and Japan through MIFV.

Suggestion 133: That MIMRA consider requesting additional technical assistance from SPC for the fishing trials after the vessel has fished consistently for 6 to 12 months so that the skills of the skipper and crew can be fine-tuned.

Once the trials are conducted and the success of the operation proved, the technique of tuna longlining should be demonstrated more widely to private sector fishermen in the hope that they will invest in the fishery by purchasing a larger vessel. Workshops could be run, which would include at-sea fishing trials so they see the gear in operation.

Suggestion 134: That MIMRA set up a training programme to familiarise small-scale fishermen with tuna longlining gears, possibly through workshops including sea time to undertake trial sets.

Looking to medium-scale tuna longline vessels in the 18–25 m length range, the costs involved in purchasing such vessels is very high. If in the future there is private sector development in tuna longlining, Marshallese may look to the purchase of second-hand vessels. It is important that fishermen purchase suitable vessels for the type of fishing they are planning to undertake. Therefore, before people select a vessel for tuna longlining, they need to consult with experienced people, including SPC, to get advice on the vessel parameters needed for this type of fishing. Another important consideration is to ensure that a second-hand vessel has common brand-name machinery that spare parts are readily available for in the region. This includes all machinery (engines, refrigeration equipment, hydraulic equipment (mainline reel, line shooter, anchor winch), generators, pumps etc.).

Suggestion 135: That people in the private sector wishing to purchase a second-hand tuna longliner seek advice from experienced people, including SPC, on the vessel parameters needed for this type of fishing operation.

Suggestion 136: That the private sector be cautious when purchasing second-hand tuna longliners, to ensure they have common brand-name machinery that spare parts are readily available for in the region.

If local Marshallese do enter the tuna longline fishery, they should seek technical assistance from SPC in preparing their boat for fishing, and actually fishing. This request will need to go through MIMRA and the Department of Foreign Affairs. Such training would include the correct on board handling, processing and chilling of the catch.

Suggestion 137: That MIMRA request technical assistance from SPC to work with any new entrants in the private sector who undertake tuna longlining activities, including the rigging of vessels and gear, and on board handling, processing and chilling of tunas to export standards.

6.5.7 *Sea safety issues, especially for small-scale fishing operations*

The development of small-scale offshore fishing operations is not without safety problems. The Samoa fishery during its early years of development lost 25 fishermen and many boats over an 18 month period in the late 1990s. More recently, two small Samoan longliners have showed up months after they have gone missing, in each case, several people have died. The Marshall Islands wants to ensure that they do not go down the same path, but rather learn from the Samoan experience and implement a sound sea safety policy and provide training in this area.

There are quite a few small-scale tuna fishing vessels and gamefishing vessels, although they appear to have very limited sea safety equipment. This needs to change, with the boat owners and operators encouraged or even forced through regulation to purchase and carry sea safety equipment, including life jackets, flares, an EPIRB, hand-held VHF radio etc on their boats. The initial cost of the sea safety equipment will be high for each fisherman, so the government may need to look at ways to implement this, possibly with a soft loan that is paid off over a specified timeframe. The same should apply to any small-scale or medium-scale tuna longline vessels starting to fish in the RMI EEZ.

Suggestion 138: That MIMRA and the Marine Division encourage local small-scale vessel operators and future medium-scale tuna longline fishermen to purchase sea safety equipment for their vessel, with the government assisting with the provision of a soft loan for the initial purchase of the gear.

Having sea safety equipment on board a small-scale fishing vessel is no good if no one knows how to use it. Therefore MIMRA, through their extension section, should run a sea safety awareness campaign including the use of the equipment, for all small-scale fishermen. SPC has materials that could be used as part of the awareness campaign. Coupled with this should be regulations, under either the Fisheries or Marine Legislation, and this has been covered under Section 6.2.2.

Suggestion 139: That MIMRA develop or request materials from SPC, and run an awareness campaign on sea safety and the use of safety equipment, for all small-scale fishermen.

A final point on sea safety equipment. Some of these materials, such as flares, have expiry dates, and these need to be changed at the appropriate time. Other appliances such as EPIRBs have batteries that need to be changed by a specified time. Fishermen need to do the appropriate maintenance on their sea safety equipment and keep them up to date — an EPIRB with a flat battery will not help anyone in an emergency.

6.6 **Value-adding processes as development options**

The Marshall Islands has several constraints to developing economically-viable domestic tuna fishing and processing operations, both on Majuro and the outer islands. Without developments in the basic infrastructure of the country, which have been identified in earlier sections of this report, development options are limited. The exporting of fresh chilled fish is the first step and MIFV is doing this.

It is easy to increase the production of fish in the Marshall Islands, with more FADs or other small-scale and medium-scale fishing techniques, although marketing becomes a problem area, both in actual transport out of the country, and in cost. Given the limitations with getting export items out of the country, it makes sense to do as much processing in-country as possible, to minimise the weight of product being exported and maximising the per kilo value of the item to be exported. For fish products, value-adding through small-scale processes would appear a logical approach for the Marshall Islands. This can be at both the small-scale and the large-scale level.

Small-scale value-added processes can be conducted by small-scale operators, especially in the outer islands where refrigeration and transport become major limiting factors. The two products that could be looked at to start are tuna jerky and salted and dried tuna pieces. These are low technology processes, although they need to be done correctly and the processing facilities need to meet all local

and export health standards. A HACCP plan would also be required if product is to be exported. MIMRA should support any initiatives from the private sector to enter into small scale value-adding processes.

Suggestion 140: That MIMRA support any initiatives from the private sector to enter into small-scale value-adding processes.

Suggestion 141: That any facility used for small-scale value-adding processes meet all local and export health standards, with a HACCP plan also developed for the processing being undertaken if the product is for export.

When looking at large-scale processing, there is already one tuna loining facility that processes around 12,000 mt of tuna per year and employs around 500 people. The manager of this facility suggests that this is the minimum size for a tuna loining facility to be viable. Given this and the fact that it has taken several years to get the number of reliable employees that are needed to operate the facility, it is doubtful that there would be enough people to staff a second loining plant. If a second loining plant was established in Majuro, then they may be competing for the same people to work in the facilities. This point would need to be fully researched before a decision for a second loining facility for Majuro is considered.

Suggestion 142: That the government fully research the availability of people interested in working in a tuna loining facility on Majuro before any decision is made for a second loining facility.

Possibly there is scope for a loining facility to be built on one of the outer islands, although this would need to be researched to ensure there is adequate land, water and electricity, but most importantly, there is a sizable workforce who are interested in working in a tuna loining facility. In addition, there would need to be deep-water access so that tuna purse seiners can come and unload their catch and cargo vessels can come in to pick up the containers of frozen tuna loins.

Suggestion 143: That the government have a study undertaken to identify if any of the outer islands would be suitable to construct a tuna loining facility on, given the above criteria.

7. CONCLUSIONS

There is good potential for developing domestic tuna longline fishing operations in the Marshall Islands, because the resource is known to frequent the RMI EEZ and locally-based foreign longline vessels work the area. However, the government needs to provide an enabling environment with infrastructure to encourage development in the private sector. The concept of a new fisheries complex needs to be explored to try to relieve the current congestion at the existing wharves. Availability of land is another issue to be addressed and whether land can be leased, bought or reclaimed. If land is to be reclaimed, then a full environmental impact assessment needs to be conducted first.

Airfreight capacity and cost has the potential to be a limiting factor for the development of domestic tuna fishing operations, as it is no use catching the fish if you can not sell it at a profit. The current air services and freight space availability are nearly used by existing freight from different companies including the fresh tuna from MIFV.

MIMRA has implemented some tuna longline fishing trials and training of local fishermen using their fisheries training vessel. These trials should continue, with as many people as possible introduced to the tuna longline method. This will create a pool of potential crew for tuna longline vessels in the future, which will hopefully encourage Marshallese entrepreneurs to invest in the tuna longline industry.

There is also a need for government support for the existing small-scale tuna and gamefishing or charter fishing fleets with the setting up of an ongoing FAD programme, and with the introduction of

mid-water fishing techniques to compliment their trolling activities. Such an FAD programme could be funded, in part at least, through the proposed 'development fee' placed on foreign fishing vessels. A 5-year plan could be developed and materials purchased in bulk to reduce costs to the programme. Small-scale fishermen and charter vessel operators would benefit from increased catches and reduced operating costs, plus there is the safety aspect of people fishing in known locations (where the FADs are).

There is also the potential for developing small-scale value-adding to product to reduce freight costs and hopefully increase returns to the country on a per kilo basis. Tuna jerky and salting and drying are the two main small-scale value-adding process that can be explored, especially in the outer islands. Health requirements both locally and internationally would need to be adhered to, with each facility needing a HACCP plan to ensure product could be exported to the US. There is also the potential for additional large-scale value-adding, such as a second tuna loining facility, although a study should be undertaken first to assess if there is an adequate workforce interested in working in such a facility.

Training is the other main area that the government needs to examine, especially in the areas of implementing the tuna management plan and tuna development strategy, surveillance and compliance, observer coverage, and the lack of trained skippers and engineers for developing domestic tuna longline operations. The last point is an important one as there are very few people with skills in hydraulics and refrigeration, which are essential for an engineer working on a medium-scale tuna longline vessel.

People consulted during the study

- Danny Wase, Director, Marshall Islands Marine Resources Authority (MIMRA);
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- Daniel Timothy, Assistant Chief of Customs and Taxation;
- Eugene Muller, General Manager, PM&O Processing, LLC (tuna loining facility);
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- Alan Schollar, Vice President, Trust Company of the Marshall Islands, Inc.;
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- Jack Chong-Gum, Director, Marshall Islands Airport Authority;
- Clyde Heine, General Manager, Majuro Stevedore and Terminal Co., Inc.;
- Bori Ysawa, Manager, Central Pacific Maritime Agency;
- Peter Debrum, Assistant Manager, Central Pacific Maritime Agency;
- Charles Stinnett, President, Marshall Islands Billfish Club;
- Charles Domnick, local business man and past local tuna longline owner;
- Amon Tibon, Manager, Marshall Island Development Bank;

- Ms Yumi Crisostomo, Director, Office of Environmental Planning and Policy Coordination, Office of the President;
- John Hawley, Manager of Sales and Operations, Micronesia, Aloha Airlines;
- Giff Johnson, Editor, The Marshall Islands Journal and founding member of the Marshall Islands NGO Council;
- Wally Milne, Lanai Mechanical Works, and longline fisherman from past project;
- Kirtley Pinho, local contractor and person involved with past longline project; and
- Carl Hacker, Director, Office of Economics, Policy, Planning and Statistics.

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