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FISHERIES SECTOR REVIEW

REPUBLIC OF THE FIJI ISLANDS

June 2005

CURRENCY EQUIVALENTS

(as of 8 February 2005)

Currency Unit	–	Fijian dollar (F$)
F$1.00	=	US$0.60
US$1.00	=	F$1.68

ABBREVIATIONS

ADB	–	Asian Development Bank
ACIAR	–	Australian Centre for International Agricultural Research
ADP	–	Australian Diversification Programme
AusAID	–	Australian Agency for International Development
CDF	–	Commodity Development Fund
CEO	–	chief executive officer
CIF	–	cost insurance freight
CITES	–	Convention on the International Trade of Endangered Species
DOF	–	Department of Fisheries
EEZ	–	Exclusive Economic Zone
FAD	–	fish aggregation device
FAO	–	Food and Agricultural Organization of the United Nations
FDB	–	Fiji Development Bank
FFA	–	Forum Fisheries Agency
FLMMA	–	Fiji section of the Locally-Managed Marine Area Network
GVP	–	gross value of production
HACCP	–	Hazard Analysis at Critical Control Points
JICA	–	Japanese International Cooperation Agency
LRFF	–	live reef food fish
MAC	–	Management Advisory Committee
MFF	–	Ministry of Fisheries and Forests
MPA	–	Marine Protected Area
MPEPSR	–	Ministry of Public Enterprises and Public Sector Reform
NFA	–	National Fisheries Authority
NFC	–	National Fisheries Corporation
NFTC	–	National Fisheries Training Center
NGO	–	non-government organization
NLTB	–	Native Lands Trust Board
PAFCO	–	Pacific Fishing Company Limited
RAC	–	Research Advisory Committee
RFSC	–	Rural Fisheries Service Center
SPC	–	Secretariat of the Pacific Community
TA	–	technical assistance
TAC	–	total allowable catch
US	–	United States
USP	–	University of the South Pacific
VAT	–	value-added tax
WCS	–	Wildlife Conservation Society
WCPFC	–	Western and Central Pacific Fisheries Commission
WWF	–	Worldwide Fund for Nature

WEIGHTS AND MEASURES

mt (metric tons)	–	1000 kilograms
kg (kilograms)	–	1000 grams

GLOSSARY

Economic over-fishing	–	The case where more fishing vessels (or fishing effort) are utilized than required to maximize economic performance. This is in contrast to biological over-fishing whereby the number of vessels/fishing effort exceeds that required to achieve maximum sustainable yield.
Gross Domestic Product	–	The total money value of all goods and services produced in an economy in a one-year period. GDP can be measured by taking the sum of value-added of each industry, or by the sum of expenditure on the domestic production of good and services.
Hazard Analysis at Critical Points	–	Food safety standards administered by the US Department of Agriculture designed to control food production safety hazards and reduce food-borne illness.
Resource rent	–	The value of the natural endowment of a fish resource. Resource rent is equal to the maximum amount the fisher would pay for continued access to a fishery and is represented by the amount by which actual profits from fishing exceed a "normal" level of profitability for the level of capital invested.
Qoliqoli	–	Customary fishing areas are generally located from the outer edge of the reef to the shore—there are 410 qoliqoli in Fiji.

NOTE

(i) The fiscal year (FY) of Fiji Islands Government and its agencies ends on 31 December. FY before a calendar year denotes the year in which the fiscal year ends, e.g., FY2001 ends on 31 December 2001.

CONTENTS

KEY FINDINGS

The fisheries sector in Fiji makes an extremely important contribution to the lives of many Fijians. The sector is a large employer generating over 9100 jobs and annual consumption of fresh fish is estimated at over 44 kg per capita. With a GDP contribution of some F$92 million, the fisheries sector is the third largest natural resource sector (behind sugar and "other crops") in the Fiji Islands. It is therefore of paramount importance that the Government establishes management settings that are consistent with best practice to enable the Fiji Islands to maximize the economic contribution of the sector whilst ensuring that key conservation and environmental objectives are met. The purpose of this review is to assess existing fisheries policies, programs and institutional settings with a view to identifying the reforms necessary in order to move the management of the Fiji Islands' fisheries strongly towards best practice.

Starting with the ***offshore fishery***, the Ministry of Fisheries and Forests made a fundamental error in diverting from the Tuna Management and Development Plan by increasing the cap on longline licenses to 110—the Tuna Management and Development Plan had clearly set down a cap of 90 licenses for the 2002-2004 period (currently under review). Increasing the cap had a severely detrimental effect on the economic performance of the offshore fishery over the 2003-2004 period. In future the license cap needs to be firmly established and the framework for establishing the cap clearly specified. This will provide for greatly improved fishery performance, and, in addition, will provide an improved investment climate for operators. Increasing license periods from one to five years is another necessary reform—annual license renewal creates too much investment uncertainty making it difficult for operators to raise capital. There should be no further deviations from the Tuna Management and Development Plan other than after formal review processes set down as a result of the current review of the Tuna Management and Development Plan. Institutional reforms, including establishment of the proposed National Fisheries Authority (NFA) should help instill these processes.

Management of ***inshore fisheries*** is a challenging task—this is recognized, as is the progress being made under the joint Department of Fisheries/FLMMA[1] process of surveying inshore areas. However, the process needs to be accelerated, and surveying methods more focused on the pressing issues for the inshore management area rather than on providing a comprehensive species listing. The role of extension officers needs to be modernized and focused more on resource conservation and development of management plans and less on fisheries development—fisheries development is an antiquated concept given the accessibility to vessels and outboards, and the over-exploitation of stock in many areas (particularly areas close to villages and markets). Generally, areas that are not fully exploited are those where it is not economic to fish due to the distance from markets. High priority should be placed on developing management plans and increasing the resources applied to the fish warden system as illegal fishing practices are common in many parts of the Fiji Islands.

The structure for management of the ***marine aquarium fishery*** needs to be solidified. Key concerns include the slow progress of many operators in introducing management plans and the imminent departure of key officers from NGOs who have been driving the management process. Additional resources will need to be applied to the management of the sector to ensure there are no repeats of the ban placed on exports of marine aquarium products from the Fiji Islands in 2002 under the Convention on the International Trade of Endangered Species (CITES) (which caused considerable economic losses).

[1] Fiji Section of the Locally-Managed Marine Area Network.

Focus on management of ***aquaculture*** needs to shift towards the control of environmental impacts. Controls over the location of farms should only be based on environmental concerns as opposed to Fisheries influencing the size and location of farms on the basis of its assessment of an economically-efficient model.

Fishery indigenous participation schemes—such as the 1/3 – 2/3 subsidy scheme, SCARF finance scheme, and reservation of 50% of offshore tuna licenses for Indigenous Fijans, goals for indigenous Fijians to operate 90% of pearl oyster farms—are inefficient and need to be reviewed. Some of these measures could deter much needed entrepreneurial skills and capital from flowing into the sector, and some measures could perpetuate inefficient industry structures. Overall, the Government needs to assess the costs and benefits of all policies designed to promote indigenous participation and major reform of indigenous participation schemes is needed.

A number of ***fisheries taxation*** issues have been identified and need to be further reviewed such as the fuel duty, access fees and low levels of cost recovery. Valuation frameworks to empower qoliqoli owners in negotiations with entities seeking access to their marine resource also need to be developed.

Fishery development programs—such as aquaculture programs, deepwater snapper, and small-scale tuna programs—are currently not subject to rigorous evaluation processes. Ineffective schemes, or schemes targeting uneconomic fisheries, are not being re-designed or, where necessary, discontinued. A more rigorous evaluation process for examining the economics of fishery programs is needed and should become a very high priority for reform. Importantly, individuals not directly associated with the programs should be charged with the responsibility of reviewing programs. Spurious performance indicators, such as the kilograms of fish caught, are being forwarded as evidence of program success. More meaningful indicators such as the economic profits for operators should be focused on.

Generally, ***research*** is poorly focused and needs to be better aligned to with management systems. For example, the types of research undertaken at the Makogai Research Station do not have a close enough linkage with management objectives and there is too much attention presently focused on biological and pure research. There is a need to more finely focus the research needs of the Department, and it is recommended that a Research Advisory Committee be established, drawing on the available expertise from the University of the South Pacific, NGOs and Government Agencies including the Department of Environment and the Department of Fisheries.

In respect of ***institutional reforms*** establishing a NFA to replace the Department of Fisheries would represent a major move towards best practice. The NFA would better align functions and activity centers with the roles of a modern fisheries management agency. The NFA would increase accountability and facilitate a clear distinction between management roles. Given its board structure it would also provide a vehicle for drawing upon the skills and expertise of eminent fisheries specialists working in Fiji for the University of the South Pacific and for various NGOs.

A renewed commitment to ***legislative reform*** is necessary. There are many pending Bills that need to be enacted to support the development of a modern management regime, including: the reform of the Fisheries Act. This reform is needed if: (i) Fiji Fisheries legislation is to be consistent with key conventions to which it is a signatory including the Convention on the Law of the Sea and the 2004 Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean; (ii) the Customary Fisheries Bill becomes law, as expected, by mid-2005; (iii) if the Department of Fisheries is to be able to support management of post-harvest activities; and (iv) to support management of aquaculture. Moreover, the Environment Management Bill was forwarded in 1997 but is

yet to be enacted. The low budget that the Ministry has allocated for this purpose is an indicator of the low priority of legislative reform. This also needs to be addressed.

The Department's in-house capability needs to be greatly strengthened and resources are required to retain expert advice on policy matters. The Department of Fisheries' capability to develop policy papers assessing the economic, social and environmental impacts of policies is quite low, leading to policies being made "on the run" and over-reliance on blunt instruments such as subsidies to assist under-performing sectors. Extensive capacity building is required to help address these problems and to facilitate the reform process. ***A two year technical assistance (TA) program*** is strongly recommended with input for the duration of the TA required from an economist, a policy specialist, and a specialist in management at the local community level. Commitment to an agreed reform program should be a requirement under any donor supported TA program.

Underpinning the current poor capacity to effectively drive the policy development process is the ***lack of capacity within the Department to evaluate the economic effects of fisheries policies***. This shortcoming is considered one of the most serious problems encountered by the Department at this point in time. (This capacity is also required to effectively manage the process of contracting out of specific projects to external research agencies/consultants)

Department morale is being adversely affected by the ongoing ***transparency problems*** and allegations of corruption. A zero tolerance approach is required. The proposed institutional reforms should provide structural support to improvements in the level of transparency.

Realistically, ***sector growth*** will largely be dictated by tuna prices in the United States and Japan, as this will affect the value of the tuna catch. Locally important, but less critical at the national scale, will be growth of pearl oyster farms and possibly shrimp farming. History has proven, however, that aquaculture growth is speculative at best and hence there is a low probability of meeting the Department's ambitious growth expectations for the sector. The offshore fishery may also be able to extend into swordfish fishing but exploratory fishing is yet to confirm whether this is viable. The marine aquarium fishery has strong growth potential—possibly increasing by 3 times its current size to a total export value of F$42 million within a 10-year period.

Ways to promote growth include overcoming the remaining infrastructure deficiencies (eg. Overcrowding at Walu Bay and Lami), and possibly meeting some regional infrastructure requirements (eg. Port in Labasa). Rigorous cost benefit studies and a whole-of-Government approach are required in respect of many of these infrastructure investments, including evaluation of future investment in Rural Fisheries Service Centers.

The most important step that Government can take to promote growth of the sector is to introduce management plans that support healthy fish stocks, thus increasing catch rates and improving the efficiency of fisheries (i.e. lower cost of catching fish). The second most important step is to lower the cost of doing business in Fiji using non-sector specific reforms. This will require vigorously pursuing reform to address the following structural problems: political uncertainty, weak property rights, costly telecommunications, inefficient taxes, burdensome regulation, an ineffective legal system for business, and poorly functioning finance markets. The review team's survey of fisheries sector businesses in Fiji revealed that from the private sector's perspective, the primary impediment to growth is taxes on fuel and other inputs. The second and third most significant problems are finding productive/skilled staff and "unnecessary red tape in dealing with Fisheries and other Government Departments" respectively. The Government should seek to resolve these problems.

Simply put, the MFF is way off track in even considering establishment of a ***NFC***. It is inappropriate for Governments to operate fishing companies as they do not have adequate commercial incentives and a serious conflicts of interest are created. The NFC would either end up being heavily subsidized or going out of business and would crowd out more efficient private sector operators. Therefore, developing a NFC would have the opposite effect of that intended by MFF as it would reduce the economic performance of the sector.

The importance of ***change management*** should not be lost on the Government, and the Department of Fisheries will need to increase its economic and policy evaluation capability to assist with critical emerging issues. Change management will be required to address the impacts of new systems for allocating the regional tuna resource under the new Western and Central Pacific Fisheries Commission. While the new Customary Fisheries Bill is expected to have little impact on the management process, it will hand possession of qoliqoli back to the customary owners and hence create an entirely new regime for commercial dealings with customary owners - a regime that will need to be managed and carefully monitored.

I. INTRODUCTION

1. The fisheries sector in the Fiji Islands makes an extremely important contribution to the lives of many Fijians. The sector is a large employer generating over 9100 jobs[2] and annual consumption of fish estimated at over 44 kg per capita.[3] In addition, the fisheries sector is the third largest natural resource sector (behind sugar and "other crops") in the Fiji Islands.

2. It is therefore of paramount importance that the Government establishes management settings that are consistent with best practice to enable the Fiji Islands to maximize the economic contribution of the sector whilst ensuring key conservation and environmental objectives are met. The purpose of this review is to assess existing fisheries policies, programs and institutional settings with a view to identifying the reforms required if management of the Fiji Islands' fisheries is to move strongly in the direction of best practice.

3. This review also focuses on growth potential for fisheries. The Ministry of Fisheries and Forests (MFF) has set a target for the sector to grow to F$1 billion (gross receipts) within 10 years. To support this "bullish" target MFF has set out to review its direction including its future investment program. We assess the veracity of the Government's growth targets and conduct a high-level evaluation of its investment program for the sector. Other aspects of the Government's approach to promoting sector growth are also reviewed. Appropriate investments and interventions to improve the performance of fisheries and stimulate sustainable sector growth, are identified.

II. FIJI ISLANDS' FISHERIES SECTOR

4. The Fiji Islands fish harvesting sector—incorporating offshore, inshore (artisanal and subsistence), aquaculture and collection fisheries (coral and live rock collection, beche-de-mer and trochus)—contributes an estimated F$78.4 million to the Fiji Islands' economy. An estimated 6847 Fijians are engaged in either commercial or subsistence fishing. The annual fish harvest, particularly from the Fiji Island's inshore waters, represents an important source of nutrition, with over 28,000 mt of locally-caught fish consumed by the Fiji Island's population.

5. Suppliers of inputs to the fishing industry (eg., fishing gear, slipway services, docking facilities, etc) and processors also generate substantial economic benefits with processors contributing a further F$9.3 million to GDP and input suppliers contributing F$4.2 million.

6. Including fish harvesting, input supplies, and processing **the total economic contribution of the sector is F$91.9 million or 2.5% of total GDP.**

7. Budgetary impacts of the sector are significant. Total outlays by the Fiji Islands Government, in terms of management, research and enforcement costs, amount to F$7.3 million per annum. However, total access-fee, management/license-fee and other revenues amount to some F$3.8 million, giving a net outlay of F$3.5 million. Donor agencies and non-government organizations (NGOs) also contribute considerable funds to the sector. Donor agencies such as the Asian Development Bank (ADB), Japanese International Cooperation Agency (JICA), and the Australian Agency for International Development (AusAID) have focused on infrastructure requirements, boat subsidies and research into, and support of,

[2] Includes employment in harvesting, processing and input supplying sectors but not employment resulting from broader economic flow-on effects.

[3] Asian Development Bank (ADB). 2002. *The Contribution of Fisheries to the Economies of Pacific Island Countries*, Pacific Studies Series, Manila.

aquaculture. Naturally, NGOs such as TRAFFIC[4] the Marine Aquarium Council and World Worldwide Fund for Nature (WWF) focus predominantly on conservation of marine resources, but, in doing so, they make an important contribution to the long-term economic value of those resources.

A. Capture Fisheries

8. Fish harvesting sectors can be divided into offshore, artisanal (small-scale commercial), and subsistence fisheries. The distinction between subsistence and artisanal fisheries is often blurred with a significant proportion of the subsistence catch being supplied to municipal and non-municipal markets (ie., hotels and resorts, road-side outlets, butchers, fish shops, and supermarkets).

9. Total catch from Fiji Islands' waters currently stands at just under 50,000 mt (Table 2.1), representing a 60% increase from the estimated catch in 1990. This increase is a direct result of the development of the offshore longline fishery—it comprised just six vessels in 1990 compared to its peak of over 100 vessels in 2002. More recently, in response to a reduction in catch rates, vessel numbers have moderated in the offshore fishery with some 85 vessels active in the fishery in 2004. An even lower number applied for licenses in 2005, with a number of charter vessels electing to fish elsewhere in the region. Offshore longliners employ a total of 510 domestic crew in addition to a large number of international crew (Chinese, Korean, Japanese) employed on locally owned, joint venture and charter vessels.

10. There is currently an estimated 895 boats operating in the country's small-scale fisheries, most of which are small 15 foot skiffs, although there are also a small number of small-scale tuna boats and deepwater snapper boats in operation (around 6-10). The total number of crew in the artisanal fleet is currently 2137, although many of the artisanal fishers have additional sources of income.

Table 2.1: Total Capture Fishery Catch, 1997-2003
(metric tons)

Category	1997	1998	1999	2000	2001	2002	2003
Offshore	4256	4801	5025	11,441	12,219	16,472	12,205
Artisanal-Finfish	3494	4183	4711	4047	4329	4040	4439
Artisanal Non-finfish	2326	2630	2679	2634	2757	2832	2232
Subsistence[a]	17,400	17,600	21,600	21,600	21,600	21,600	21,600
Total Catch	**33,296**	**36,028**	**41,405**	**46,403**	**47,991**	**51,814**	**47,146**

Source: Department of Fisheries, ADB 2002 (revised subsistence catch data for 1999-2003).

11. Focusing on the catch taken by the offshore longline fleet it is estimated that 42% of catch is sold to canneries (avg. ex-vessel price[5] of F$3547), 37% is fresh exports (avg. price of F$6207), and 21% is domestic sales (average price of F$2200 for tuna and F$2000 for by-catch). This gives a total value of catch of F$49.5 million for 2003 for the offshore fleet. The Department of Fisheries (DOF) estimates the total value of artisanal catch at F$27.6 million and the ADB[6] estimates the total value of subsistence catch to be equivalent to

[4] TRAFFIC Oceania South Pacific Programme is hosted by the World Wide Fund for Nature in Suva, Fiji and is funded by the Foreign and Commonwealth Office of the UK Government. Its main focus is to work with governments and other stakeholders to build capacity to implement the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) within the region.

[5] FFA/SPC. 2004. *An Economic Analysis of the Fiji Longline Fishery*, Report to the Fiji Islands Government, November, Honiara.

[6] Asian Development Bank (ADB). 2002. *The Contribution of Fisheries to the Economies of Pacific Island Countries*, Pacific Studies Series, Manila.

F$48.6 million. This gives a combined catch value for all of the Fiji Islands' capture fisheries of F$125.7 million for 2003.

B. Marine Aquarium Fishery

12. The marine aquarium fishery consists of just five operators. Due to the importance of being situated close to major airports all of these operators are based on the Fiji Islands' main island of Viti Levu with collection activities taking place on the coral coast (southern coast of Viti Levu) and in islands groups south east of Lautoka (near Nadi). The largest operator, Walt Smith International, exports more than 50% of the industry total and employs 70 on-shore staff and around 300 collectors and divers. Total employment of Fijians in collection/diving is estimated to be close to 650 with about 150 persons employed by marine aquarium companies in on-shore roles.

13. The fishery overcame a temporary ban on exports imposed under the Convention on the International Trade of Endangered Species (CITES) in 2002, and now boasts exports of F$14 million (DOF)—second only to tuna exports. Live rock exports represent F$8 million, live coral exports are worth F$4.5 million and aquarium fish exports are valued at F$1.5 million. The Fiji Islands exports approximately 95% of the world supply of live rock but most of the live rock exports are taken from the wild—some industry stakeholders are pushing to boost exports of cultured live rock to 80% of the total to ensure the ongoing sustainability of the sector. Lovell[7] estimated that some F$2 million in wages and royalties is paid to villages each year. It is also relevant to note that there are significant benefits to local villages from lease payments. Marine aquarium operators make annual access payments of between F$3000 to F$28,000 to local villages and collectors/divers can earn in the range of F$90 to F$228 per week.[8]

14. The upward trend in exports has been quite marked,[9] however, the industry needs to consolidate its management regime if it is continue to grow as the export markets in the United States (US) and Europe will only accept product that has been collected in a fashion that is "non-detrimental" to the environment. Hence management must be sufficiently robust to ensure there are no further CITES bans.

C. Aquaculture

15. The principal types of aquaculture in the Fiji Islands include pearl oyster and seaweed (mariculture), shrimps (brackish water), and tilapia and prawns (freshwater). Clams trochus and turtles are grown at the Makogai Research Station by Fisheries for seeding in areas near villages. Small quantities of carp and ornamental fish are also farmed in freshwater ponds, and there is periodic experimentation with various other forms of aquaculture—currently there is some experimentation with farming of reef fish for the live reef food fish (LRFF) trade.

16. The aquaculture sector has not progressed as rapidly as might have been expected given the large amount of resources that have been invested by donor agencies and Fisheries in undertaking research, subsidizing ponds and other infrastructure, establishing hatcheries and in developing pilot farms. Total aquaculture production for 2003 was 400 mt (mostly tilapia) valued at some F$1.9 million (Table 2.2). However, the value of production

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[7] Lovell, E. 2004. *Determining the Socio-Economic Feasibility and Financial Viability of the Marine Aquarium Trade in the Solomon Islands and Fiji*, A Proposal to the South Pacific Regional Environment Program, Report prepared for the Foundation for the People of the South Pacific – International and the Marine Aquarium Council 2004. June.

[8] Vunisea, A. 2004. *The Challenges of Seafood Marketing in Fiji. Women in Fisheries Information Bulletin #14 – September 2004*, pages 3 – 8, Secretariat of the Pacific Community, Noumea.

[9] Between 1992-97 exports of live coral and/or rock from Fiji doubled or tripled annually (Lovell 2004).

increased significantly in 2004 on the back of strong results from Taylor Shellfish—the Fiji Islands' first commercially successful pearl oyster farm.

Table 2.2: Aquaculture Production, 2003

Category	Amount (kilograms/pieces)	Value (F$)
Brackishwater shrimp	850 kg	25,380
Tilapia	393,000 kg	1,572,000
Carps	160 kg	626
Prawns	6000 kg	108,000
Fancy Carps	17000pcs	68,000
Gold Fish	10420pcs	41,680
Black Pearls	1000 pcs	50,000
Seaweed	24,000 kg	24,000
Total	**424 mt /28,420 pcs**	**F$1,889,686**

Source: Department of Fisheries.

17. In terms of employment, over 400 individuals are directly involved in Tilapia farming, and an estimated 150 Fijians are employed in all other forms of aquaculture. Total employment in the sector is therefore estimated at 550 with high levels of participation by villagers in many aspects of aquaculture (operation of tilapia farms, spat collection and oyster cleaning and line repairs for pearl oyster farming, seaweed farming in the Southern Lau Group, etc). The Department is optimistic about the potential for growth in shrimp, seaweed and tilapia farming, although there remains considerable uncertainty over potential expansion of these sectors (Section VII). If there is growth in aquaculture this could result in significant benefits for local villages through both employment opportunities and access payments. For example, Taylor Shellfish has entered into a commercial agreement with the local village in Savusavu whereby the village receives 5% equity plus an annual lease payment of F$30,000.

D. Charter Fishing/Sport Fishing

18. There is an estimated 20-30 commercial charter and sportfishing boats currently operating in the Fiji Islands, and with rapid recent growth in tourism the sector is enjoying an expansion phase. Billfish are the main species targeted, although mahi mahi and wahoo are more common in the catch. Total receipts for the sector are estimated at approximately F$1.2 million per annum, and employment is about 60 full-time equivalents.

E. Processing

19. Processing of finfish takes four forms: (a) large-scale processing undertaken by the Pacific Fishing Company (PAFCO); (b) smaller-scale canning of predominantly imported mackerel (c) marketing, packaging transport and export of tuna and tuna by-catch by large fishing companies such as Fiji Fish, which operates between 14 and 23 longliners (depending on the size of its charter fleet), and around 6-7 other dedicated processors; and (d) some small-scale fish smoking and fish filleting operations. (We exclude further consideration of output for category (b) because it is essentially a re-export activity with no meaningful linkage with the country's fisheries.)

20. Other forms of processing activity include beche-de-mer processing and button blank manufacturing using trochus shells, and there is also a small amount of value-added of black pearls using village-based labor.

21. Just under 60% of PAFCO's F$22million revenue in FY 2004 was from loining, 38% from canning and a small amount of revenue from the sale of low grade fish to the domestic market. According to the FFA/SPC[10], in recent times around 17% of sashimi grade tuna has been exported to Japan (grade 1 bigeye and yellowfin) and 58% to America (grade 2), while most of the remaining 35% is exported to China, Australia and Canada. Apart from PAFCO there is relatively little value-adding of fish landed in the Fiji Islands (apart from re-exporting of mackerel etc.). Opportunities exist for developing loining and smoking activities but this is dependent on progress being made in applying Hazard Analysis at Critical Control Points (HACCP) standards for fish handling and in overcoming other regulatory impediments (Section VII). There is also some interest in developing smaller-scale value-added operations.

22. Total employment by fish processors is estimated at 1,394[11] including the 800 permanent PAFCO employees. Based on a survey of operators conducted for this review, wages and salaries total an estimated F$8.9 million (includes F$5.4 million in wages and salaries paid by PAFCO).

F. Air Freight

23. Air freight costs are highly significant and represent approximately 30% of the total cost of supplying fresh fish to Japanese and US markets (Pers. Comm. Russell Durham, Business Manager, Fiji Fish). Air Pacific, QANTAS, and Air New Zealand air freight an estimated 5,000 mt of fish each year providing revenue of approximately F$20 million. Industry analysts estimate the Air Pacific component of this revenue to be in the order of 80%, representing an additional flow-on benefit of F$16 million to the Fijian economy from the fishing industry. Air cargo capacity constraints are often cited as a limiting factor in growth of the country's fisheries—this issue is further evaluated in Section VII, but generally operators are able to send fish through Auckland or Sydney if there is no available air-freight space on direct flights to Japan and the US.

G. Fish Markets

24. Most of the artisanal catch, apart from the exported reef fish and LRFF, is supplied to the domestic markets, and, as mentioned, around 21% of the offshore catch is sold domestically. Domestic sales are either through municipal markets or non-municipal markets (fish shops, butchers and supermarkets and hotels). There are 16 municipal markets in the Fiji Islands, seven in the central division, four in the western division, and five in the northern division. It is estimated that around 480 people (Pers. Comm. Warsha Singh, DOF) are employed at the municipal markets, and, given markets operate for about half the week, this equates to 240 full-time equivalent jobs. There are an additional 36 dedicated fish retail outlets, employing some 100 Fijians.

H. Input Suppliers

25. Suppliers to the fishing industry include gear and equipment suppliers, boat builders and vessel maintenance, ice suppliers, slipway service providers, shipping agent services (including transshipment, provision of rations etc), port/jetty services (ie., provision of docking space, fuel, and water) and provisioning. For this review the 12 largest input suppliers were surveyed and they reported aggregate revenue of just under F$30 million, however it is likely that only about 70% of this amount, F$21 million, is revenue from sales to

[10] FFA/SPC FFA/SPC. 2004. *An Economic Analysis of the Fiji Longline Fishery, Report to the Fiji Islands Government*, November, Honiara.

[11] 2005 survey of fish processors undertaken for the ADB Fiji Fisheries Sector Review.

the fishing industry. Total employment for input suppliers is estimated at 185. In addition, some 47 people are employed at fishing jetties, ports and slipways throughout the Fiji Islands, and a further 53 people are employed by the Maritime Ports Authority in Suva. (It is considered reasonable to attribute around 30% of port and slipway related jobs to the fishing sector.)

I. Overall Economic Contribution of the Fisheries Sector

26. The overall economic contribution of the sector to GDP is shown Table 2.3. Table 2.3 shows the value of production, value-added estimates (value-added[12] is the returns to capital and labor and represents the contribution to GDP of a sector) and employment estimates for all of the components of the fisheries sector described above. The aggregate revenue is just under F$200 million, and the aggregate value-added is some F$91.9 million.

Table 2.3: Fisheries Sector Contribution to GDP, 2003
(F$'000)

Category	Revenue (F$'000)	Value-added[a] (F$'000)	Employment (full time equivalents)
Offshore Fishery	49,460	16,322	510
Inshore Artisanal	27,630	16,578	2137
Subsistence	48,600	41,310	3000
Marine Aquarium	14,000	2,800	650
Aquaculture	1,890	810	550
Game & Charter Fishing	1,180	590	60
PAFCO	21,733	6,153	800
Other fish processors[a]	5,254	3,152	639
Input Suppliers	21,000	4,200	185
Fish markets	na	na	340
Department of Fisheries	na	na	243
Slipways/ports	na	na	30
Total	**190,747**	**91,915**	**9144**

a) Value-added is estimated by taking a percentage of revenue considered to represent the returns to capital and labor. The relevant percentages are sourced in the following way: inshore fishery and subsistence (ADB 2002); PAFCO (PAFCO Annual Report 2003, "Other fish processors" ((FFA/SPC 2004), see footnote (b)); and value-added percentages for aquaculture, game and charter fishing, and marine aquarium fisheries were derived from confidential data provided by industry participants.

b) Represents revenue less ex-vessel payments for fish as these payments are reflected in revenue for vessels. Estimate is based on on-shore processing, handling and freight costs of F$850/mt for fresh fish, and F$/185mt for domestic sales and sales to canneries.[13](

Source: Department of Fisheries, Consultant's estimates (based on discussions with fishing industry operators, and a survey of operators).

27. Total sector exports are F$79 million consisting predominantly of tuna exports (F$49 million). The other principal exports are marine aquarium (F$14 million), beche-de-mer (F$8.6 million), trochus (F$1.7 million), deepwater snapper (approx. F$250,000 p.a.) and LRFF (F$450,000 p.a.).

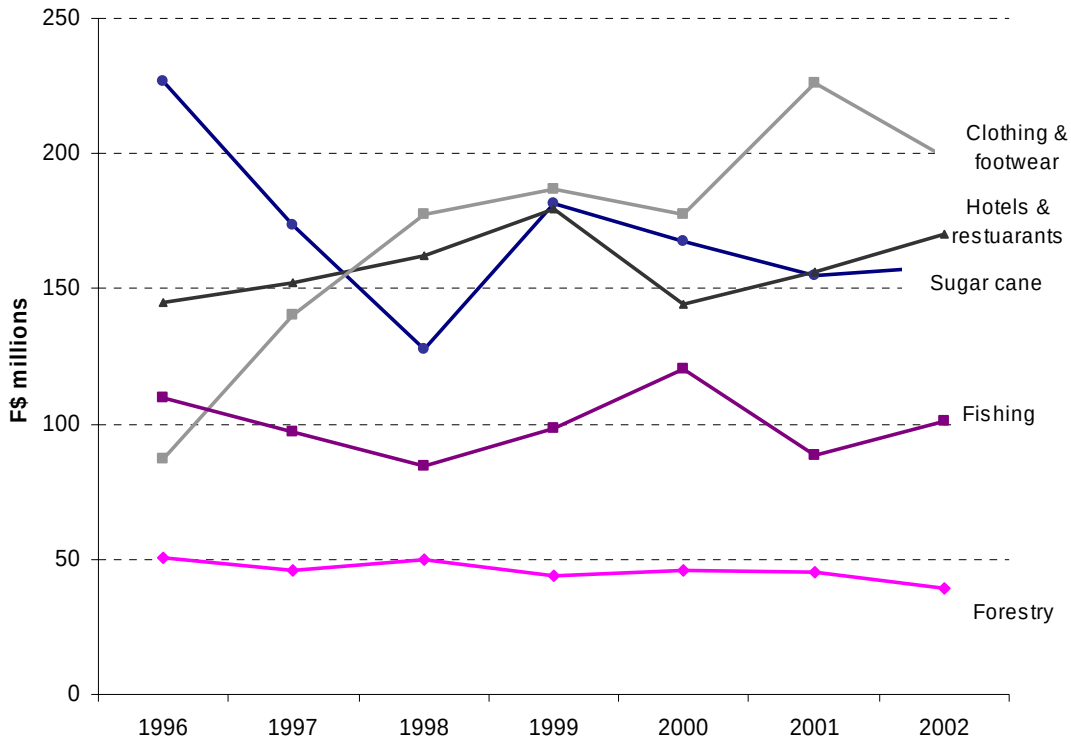
[12] Put differently, value-added is an economic term to express the difference between the value of goods and the cost of materials or supplies that are used in producing them.

[13] FFA/SPC. 2004. An Economic Analysis of the Fiji Longline Fishery, Report to the Fiji Islands Government, November, Honiara.

J. GDP Contribution Comparison

28. From the viewpoint of establishing the appropriate effort that should be applied to the task of improving the efficiency of fisheries management, it is instructive to compare the contribution to GDP of fisheries with other key sectors. Figure 1 shows trends in GDP contribution for the clothing & footwear, tourism (represented by hotels & restaurants), sugar cane, fishing and forestry sectors. For the purpose of this comparison we focus on all of the elements of the fisheries sector represented in the above discussion (ie., fish harvesting, processing, and input supply).

Figure 1: Fisheries Sector GDP Compared with Other Key Sectors, 1990-2003
(F$'000)



Source: Fiji Islands Bureau of Statistics, Consultant's estimates (fishing)

29. From the above figure it can be seen that the fisheries is highly significant, although somewhat lower than other key sectors. In total fisheries contribute around 2.7% of GDP, while employment in the formal sector of 6144 represents around 5.4% of total employment in the Fiji Islands. Recent trends in the fishing sector have predominantly been driven by changes in the offshore fishery catch with the inshore catch relatively stable. There is clearly an upward trend in tourism which is now a key driver of economic activity in the Fiji Islands but both the sugar and clothing and footwear sectors have been in decline.

K. Government Budgetary Impacts

30. The Government receives revenue from the fisheries sector through payment of direct and indirect taxes, access fees, management fees, license fees and fines. Not surprisingly, most revenue is received from the offshore fishery (over F$1.3 million). Access fees are applied at the rate of F$15,000 for vessels less than 20 meters in length and

F$20,000 for vessels greater than 20 meters. These fees apply to charter, joint venture and domestic vessels, but Indigenous license holders are not required to pay an access fee. Management fees are fixed at F$6000 per vessel. (License fees for the domestic fleet only came into effect in 2002 when the Tuna Development and Management Plan was implemented.)

Table 2.4: Government Budgetary Impacts
(F$'000)

Category	2002	2003	2004
Fisheries Department Revenue			
Management fees (offshore fleet)	716.7	626.0	749.4
Access & license fees	843.8	1,100.0	603.9
Berthing fees	46.1	12.5	11.1
Sale of fish & ice	177.6	207.7	227.0
Registration of fishing vessels	3.7	15.0	10.0
1/3 Small scale tuna assistance	174.6	92.8	24.2
Tilapia project freight charge	6.8	28.6	23.4
CITES permits (marine aquarium fishery)	n/a	n/a	26.2
Japanese bilateral, access fees	n/a	n/a	57.3
US multilateral treaty	n/a	n/a	464.6
Total Revenue	1969.2	2082.6	3846.0
(less) Management Costs	n/a	5911.6	7305.7
Net Budgetary Position[a]		**Minus 3,829.0**	**Minus 3,459.7**

a) Tax contributions from the fishing sector are likely to result in an overall positive budgetary impact. Fiji Islands Customs and Inland Revenue declined our request for tax revenue information.

Source: Department of Fisheries.

31. Overall, net budgetary outlays of F$3.5 million are required to support the operations of the DOF. Apart from the offshore fishery, the only other fishery to contribute significantly to management costs is the marine aquarium fishery which contributes annual levies of just under F$30,000. Given the heavy reliance on subsidies it is difficult to envisage increases in the level of cost recovery from other fisheries in the short- to medium-term.

III. EVALUATION OF FISHERY POLICIES

32. The review team assessed all relevant policy documents (although the DOF does not prepare many policy papers *per se,* or, if it does, it did not furnish the review team with many policy papers), conducted a number of workshops and held a series of meetings with a broad spectrum of stakeholders to facilitate the assessment of fisheries policies. Our greatest concerns relate to the lack of adherence to the Tuna Management and Development Plan in the offshore fishery, the absence of effective/responsive inshore fisheries management initiatives and the incorrect focus on product development as opposed to resource management in the inshore fisheries. Also of concern is the slow rate of progress in developing and implementing management plans and in introducing key legislation to support the management process. As can be gleaned from the discussion below, the DOF needs to establish clearer objectives for fisheries management and re-align the processes it uses to assess management performance accordingly.

A. The Offshore Longline Fishery

33. The Offshore Longline Fishery had the benefit of considerable resources for the purpose of developing the 2002 Tuna Management and Development Plan. As a result, the fishery should have been at the forefront amongst the Fiji Islands' fisheries in terms of management outcomes. Instead, the fishery encountered extreme economic difficulties in 2003-2004 due to excessive vessel numbers as well as adverse swings in environmental conditions and declining prices.[14]

34. The rapid increase in vessel numbers through the late 1990s and early 2000s (Appendix 2) was poorly managed. Vessel numbers jumped from 43 in 1999 to 103 in 2002. Domestic operators report large financial losses as a direct result of this rapid influx of vessels.[15]

35. MFF should have adopted a precautionary approach and avoided the rapid increase in fishing effort, given the extensive knowledge we have about the tendency worldwide for too many vessels to enter fisheries. Moreover, in the Tuna Management and Development Plan, fisheries had both the advice and the mechanism to adopt a sound management approach.

36. Documents in the plan state that in January 2002, the Cabinet of the Government of the Fiji Islands considered the Plan and decided:

(i) Catch Limits: 15,000t for bigeye, albacore and yellowfin taken in the Fiji Islands' exclusive economic zone (EEZ) in each of 2002 and 2003 (subsequent to release of the plan, the Secretariat of the Pacific Community (SPC) has indicated that the appropriate catch limit should be 10,000 mt);

(ii) License Limits: 90 longliners, including 20 for Indigenous Fijians.[16]

(iii) License Criteria: a set of new criteria to screen license applications, which will favor Indigenous Fijians.[17]

37. According to officials of the Fisheries Department, a Cabinet decision in December 2003 increased the number of licenses to 110, comprising 60 open licenses, 25 reserved for indigenous Fijians and 25 for vessels associated with processors. Other proposals for changes made since the January 2002 Cabinet decision include:

(i) Licensed holders are able to pay access fees on a pro-rata basis, rather than for an entire calendar year (adopted).

(ii) A proposal that the archipelagic zone be reserved for indigenous operators (in January 2005 the decision was made to reserve the archipelagic zone for

[14] Note: in assessing the performance of the tuna fishery it is necessary to take account of trends in the region during the period being examined especially given the migratory nature of the tuna species.

[15] Langley (2003) also reports that negative environmental influences on catch rates could have contributed to poor fishery performance over the 2002-2004 period. In addition, declining prices and rising fuel prices contributed to the downturn in financial performance of the longline fleet.

[16] MFF advised (pers. comm. Miit Baleivanualala CEO MFF) that the number increased to 110 on the request of processors to have dedicated license for supply purpose. However, this does not represent a logical basis for deviating from the TMDP because processors' incentives do not align with incentives for sound fishery management.

[17] According to MFF licenses (pers. Comm. Miit Baleivanualala CEO MFF) will only be issued to indigenous operators if capacity becomes available.

local operators but, surprisingly, there was no evidence of any thorough assessment of the costs and benefits of this policy).[18]

(iii) At a plan review meeting held in November 2003 the idea of an economic review of the longline industry was proposed and supported (undertaken by SPC/Forum Fisheries Agency (FFA) in late 2004).

38. It is important to note that the plan (adopted in 2002) was primarily intended to limit fishing effort during a two-year period of improving the catch and effort database so that resource managers would have better information for management. After a two-year period, the plan anticipates that a "longer term and more complex approach to management of the tuna fishery" will be developed. The plan is currently being reviewed.

39. Since the plan was adopted, longline tuna fishing has been relatively poor, especially in 2003. As mentioned, this caused financial difficulties for the fishing companies and, to some extent, greater friction both within the industry and between the industry and the Fisheries Department as companies struggled to survive. Another result of the poor fishing was that both the industry and the Fisheries Department began paying more attention to economic factors in setting a total allowable catch (TAC) and license numbers—clearly a step in the right direction—rather than the previous focus on biological sustainability. SPC/FFA conducted economic modeling of the fishery but this is not sufficiently well developed to be used for policy purposes (Pers. Comm. Adam Langley, Oceanic Fisheries Programme, SPC). The principal shortfall with the existing version of the model is that it does not account for fishing by domestic longliners outside the zone—this is a significant anomaly given catch from outside the zone comprises up to 40% of the total catch.[19]

40. Apart from the influx of too many vessels, the fishery is confronted by a number of other issues including:

(i) *Fragmentation of the industry*—there is one powerful fishing company, several intermediate-size fishing businesses, single-vessel operations, and the processors (both for fresh and canning markets). Participants include local non-indigenous Fiji Islands citizens, indigenous Fijians, and expatriates. There is no inclusive association and a fully encompassing government-industry dialogue is difficult.

(ii) *Allegations of corrupt practices*—these allegations have been leveled at Fisheries Department officials with licensing responsibilities and associated suspensions occurring. These have challenged the credibility of the DOF but moves initiated by senior Ministry officials are attempting to investigate the allegations and prosecute offenders.[20]

(iii) *Competition for access to infrastructure and services*—many longline vessels that are not licensed to fish in Fiji Islands waters offload their catch at Suva. Some individuals feel that this is beneficial to the Fiji Islands as it generates economic activity, makes additional by-catch available, and assists the process of making Suva a hub for tuna fishing in the Western Pacific. Some

[18] MFF advised (pers. comm. Miit Baleivanualala, CEO MFF) that this was a precautionary approach based on the observation of the plan and to protect locally owned vessels under localization of industry.

[19] In addition, the costs modeling had used average rather than fleet types and sizes, and without sensitivity analyses to help the understanding of the issues. The other issue to be addressed is the tax benefits enjoyed by the different fleet categories and how this affects the evaluation of costs and benefits of alternate fleet sizes and configurations.

[20] MFF (pers. comm. Miit Baleivanualala, CEO MFF) advised that the industry has not filed evidences with Police to progress police investigations.

of the major participants in the tuna industry, however, feel that such vessels are detrimental as they take up limited dock space, utilize much of the scarce air cargo capacity, employ few Fijians, and may be fishing illegally in Fiji Islands waters.

1. Assessment of the Management Effort

41. Significant progress has been made in offshore fisheries management in the Fiji Islands during the last five years. Using the framework of the Tuna Management and Development Plan, there are now sound management systems in place, although there remain numerous difficulties in offshore fisheries management.

42. Key staff with responsibilities in tuna fishery management indicated that the major institutional weaknesses of the DOF are lack of economic expertise and trained staff. According to several tuna industry participants, the main institutional weaknesses of the Fisheries Department are low efficiency, accountability and transparency. As an example of the latter item, fishing companies cite the refusal of the Fisheries Department in late 2004 to make public the list of licensed vessels. To some extent, the views of both groups seem valid:

(i) The tuna industry is now fully-, if not over-developed, and hence the DOF will need to make an increasing number of crucial decisions in fisheries management, many of which require the consideration of economic tradeoffs. The Department presently does not have the economic expertise to make these evaluations.[21]

(ii) Although progress has been made in promoting transparency in the Department, much remains to be done in terms of both process (for example, the evaluating of applications for licenses) and outcomes (for example, the list of licensed vessels).[22] With this in mind, and considering the past problems of the Department associated with corruption,[23] there seems to be a strong case for tuna management to be considerably more transparent than at present.

(iii) One difficulty that needs to be addressed is the issue of departures from the Tuna Management and Development Plan by the DOF. This is of major concern to the industry and is exemplified by the statement of a key longline operator: “80% of our problems with the Department are about them violating their own plan”. There should be mechanisms developed to ensure adherence to the plan. Conversely, it is also important to have a system that is both formal and transparent for modifying the plan when circumstances require this be done.

43. The present Tuna Management and Development Plan contains provisions for periodic review and it is intended that the steering committee established in the formation of the plan will meet regularly to assess progress. What appears to be lacking is a mechanism whereby grievances related to tuna management can be resolved, or at least addressed. This contributes to an unhealthy business atmosphere, continuance of some unfair

[21] This impacts not only tuna management, but also the development and management of other fisheries as well.

[22] The term “transparency” appears several times in the Tuna Management and Development Plan and, indeed, one of the objectives of the plan is to “ensure transparency, accountability and efficiency within the Fisheries Department”.

[23] It would be difficult to argue that the allegations of corruption and conflict of interest in the Fisheries Department grew out of too much transparency.

practices, and promotes an environment whereby non-productive means to address grievances is encouraged.[24]

44. On the basis of the above observations and assessments we make two key recommendations in respect of the offshore fishery.

Recommendation 1. It is recommended that the following be incorporated in the 2005 review of the Tuna Management and Development Plan:

(i) the revised plan should address chartering and joint ventures, as well as the associated issues of re-flagging and accumulating catch history. Prior to doing so, a critical examination should be made of the objectives of chartering, the costs of doing so, impacts on other segments of the tuna industry, and other options available for achieving the same objectives;

(ii) the revised plan should contain mechanisms to encourage adherence by the DOF, and a formal/transparent system for amending the plan when it is required; and

(iii) the revised plan should contain increased provisions for other types of offshore longlining that could become more prevalent in the Fiji Islands in the coming years, such as fishing for swordfish and other species.

Recommendation 2. To improve the management of offshore fisheries at a higher level than the Tuna Management and Development Plan, it is recommended that:

(i) Overall, the Department and Ministry need a change of corporate culture with respect to transparency. This will require a change in attitude from releasing the bare minimum of information to the public, to one of withholding the bare minimum.

(ii) Under the Fisheries Act, all fishing licenses expire on December 31 of each year which means that the maximum period for a license is one year. For the tuna industry, this period is too short, increasing investment uncertainty and thus damaging the capacity of vessel operators to obtain debt and equity finance. Hence, revision of the Fisheries Act should include provision for a much longer license period, say 5-7 years, for offshore fishing.

(iii) Adopting a National Fisheries Authority approach (covering all fishery sub-sectors) would improve the accountability, stakeholder input, transparency, and relevancy that is so desperately needed in the government's interventions in the fisheries sector.

45. Moreover, the DOF will need to closely monitor developments flowing from commencement of new regional management regimes under the recently established Western and Central Pacific Fisheries Commission, implications this has for the TAC and management of the Fiji Islands' offshore fishery. This is a critical element of change management that must be attended to with diligence. Advice from external specialists should be sought in respect of key developments and in evaluating options for country's response to such developments.

[24] The Fisheries Specialist for the Fiji Fisheries Sector Review (Gillett 2005) noted that: "at present, the owner of Fiji Fish has access to the Prime Minister which he uses along with articles in the media when he feels that Fisheries Department activities/policies are unreasonable. Other industry participants do not enjoy such access and are often frustrated in attempting to settle grievances by discussions with senior Ministry officials."

46. Once the fishery has stabilized other issues that should be examined include fisheries taxation. Depending on developments with the recently established Western and Central Pacific Fisheries Commission, it may also be appropriate to examine the option of a transferable quota system (built into this system could be some scope for the TAC to be adjusted (but only following a formal evaluation process), in which case quota would be represented by a proportion of TAC, as opposed to a fixed mt allocation). Davis[25] also identifies considerable potential in respect of a share management system for the offshore fishery which may have merit as the fishery stabilizes. Further review of the experience in other countries with share management is required to identify the common characteristics of fisheries which are considered well suited to share management before this option is developed further[26]. The Department should monitor developments in respect of use of transferable quota for management of tuna and should openly liaise with industry on this issue. However, industry should only be consulted after robust policy and discussion papers/working papers on the issue have been prepared.

B. Inshore Fisheries

47. The status of stocks in the inshore fisheries and across the 410 customary fishing areas, or qoliqoli, varies markedly because the degree of fishing pressure is highly variable across regions.[27] This is to be expected given the differing economic forces at play. Nonetheless, there are several general problems relating to management of the inshore fisheries that need to be resolved.

48. As mentioned, some 895 boats operate throughout the inshore fisheries and hence management and enforcement can be a challenging exercise. The key recent development has been the development of a qoliqoli survey process (marine resource inventory) which is being undertaken by the Fiji Section of the Locally-Managed Marine Area Network (FLMMA) in conjunction with the DOF. Following on from this will be development of management plans which will include much more comprehensive use of management tools. Currently, there is limited use of management instruments, including marine protected areas (MPAs), licensing, and controls over fishing methods. Management plans could potentially also incorporate area closures, protection of spawning aggregations, daily catch limits, and education processes.

49. There are reports of extensive illegal fishing within inshore areas, including fishing in areas without a permit, use of dynamite (particularly in the western provinces) and cyanide fishing. The other management problems include control over the collection and export of beche-de-mer and trochus which are both overexploited. There is a need for tighter controls over the collection of beche-de-mer and trochus and closer monitoring of exports to ensure that export quotas are not being exceeded. Potential for increased utilization of management instruments other than export quotas also needs to be investigated.

50. The recent inshore fisheries management efforts by the Fisheries Department appear to fall mainly into five categories:

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[25] Davis, D. 2005. *The Institutional Setting for Fisheries Management in Fiji: Need for Reform*, Report of the Institutional Specialist ADB Fisheries Sector Review, January, Manila.

[26] One such characteristic is that of a single species fishery, such as tuna.

[27] Quite simply we would expect more fishing activity in areas close to markets (ie., population centers) and near villages where fish are caught for direct consumption. The director of Fiji's inshore fisheries management estimates that 70 qoliqoli are over-exploited, around 250 are fully developed and the remaining 90 qoliqoli could sustain more fishing pressure (although it is probably uneconomic to do so given the distance from markets). These estimates would need to be checked but give some initial guide as to the variability of fishing pressure across qoliqoli.

(i) attempts to apprehend violators of the Fisheries Act, and those violations related to fishing in an area without a license or using illegal fishing techniques such as cyanide fishing, use of spear guns and/or SCUBA equipment;

(ii) cooperation with NGOs in village-level efforts that mainly involve the establishment of MPAs;

(iii) processing applications for licenses for commercial fishing inside customary fishing areas;

(iv) cooperating with other government agencies to comply with externally imposed requirements (CITES, US Government); and

(v) requirement for permits to export fishery products, including those from inshore areas.

51. In reviewing the inshore fisheries management situation of the DOF (activities, attitudes, and capacity), many difficulties are evident. The Review Team's Fisheries Specialist[28] noted that:

> … there seems to be some uncertainty as to the precise nature of fisheries management. Fiji's inshore fisheries are dynamic. Many significant changes in resources and fishing activity occur each year, but fisheries management responses to changing circumstance (if any) appear to be sluggish at best. In the Fisheries Department there appears to be considerably more enthusiasm for increasing fishery production from inshore areas, than for management interventions to protect over-exploited resources. This seems ironic, considering that many of Fiji's important inshore resources are either fully exploited or very much over-exploited.
>
> Creating an enabling climate for traditional authorities to effectively manage their own fishing rights areas is an important role for the Fisheries Department and is likely to become more prominent in the future, especially when the ownership of sea beds and reefs in customary fishing areas is transferred to traditional owners. The present production orientation of many of the staff together with their weak capacity in fisheries management suggests the management assistance provided to communities may not be very useful. As put by a recent report "the Fisheries Department currently has limited ability to assist rural communities in fisheries and marine environmental management" (University of the South Pacific (USP)/Fiji Institute of Technology 2004).

52. The above issues present a number of challenges to the DOF. Overall, it can be concluded that the Department needs to be more active in inshore fisheries management but a series of more specific recommendations (see below) flow from the above observations.

[28] Gillett, R. 2005. *Aspects of Fisheries Management, Legislation, Research, Development, Extension and Aquaculture in Fij*, Report of the Fisheries Specialist ADB Fisheries Sector Review, January, Manila.

Recommendation 3. In order to become more active in inshore fisheries management, it is recommended that a firm policy is established that the priority for the Department's involvement in inshore fisheries areas should be resource protection, rather than the promotion of increases in production.

Recommendation 4. It is also recommended that there be a requirement that the major commercial inshore fisheries (beche-de-mer, trochus, finfish gillnetting, spearfishing, aquarium fish) are actively managed by the use of management plans. Appropriate plans could address many of the weaknesses in fishery management in the Fiji Islands. This includes promotion of management oriented to objectives, assuring greater stakeholder involvement, transparency, and adaptation to changing circumstances.

Recommendation 5 To support management of customary fishing areas, or "qoliqoli" it is recommended that a number of management initiatives be introduced. These initiatives are as follows:

(i) with respect to assisting in the management of customary fishing areas, the Department should place priority on firmly establishing a policy that the protection of village fishery food supplies is paramount;

(ii) the Department needs to create an awareness in communities of the need for, and benefits of, fisheries management and advise communities on the preparation of management plans and on reduction of perceived threats to the marine resources;

(iv) rather than the fairly weak present activity of "cooperation with FLMMA", the Department's objectives, and planning, should be based around eventually assuming the role that FLMMA has successfully pioneered; and

(v) the Department should actively revitalize the system of fish wardens to address widespread problems of illegal fishing.

53. To support the above recommendations it would be beneficial to develop a fisheries management white paper providing the in-principle statement on the goals of management, the tools available to achieve management outcomes, and the processes to be used to develop, enforce and monitor management plans.

C. Aquaculture

54. There can be no doubting the enthusiasm of both the Government and donors in promoting aquaculture in the Fiji Islands. Conservatively, it is estimated that over F$25 million has been invested in the sector over the past 15 years, and there are plans to invest a further F$8-10 million over the next 2 years. The key issue from the Department's perspective is what its role should be in respect of aquaculture sector development, and how it is performing at present in respect of aquaculture management. To assist in this regard, we focus on the Department's approach to aquaculture development, progress in developing suitable legislation and management plans for the sector, and the merit of its attempts to promote small aquaculture farms. We also examine a range of issues relating to aquaculture research in Section V.

1. Aquaculture Support & Subsidies

As mentioned in Section 2, aquaculture remains poorly developed in the Fiji Islands and this is despite financial support to the tune of many millions of dollars from the Government and donors (Appendix 3). Examples of the extent of recent support are as follows:

(i) at the height of the ***seaweed industry*** in 2000, 658 farms had been established in 47 villages/settlements around the coast and maritime zone with an average annual production of 300mt valued at F$275,000.[29] Since its inception in 1998, Government has spent over F$1.8 million in direct Seaweed assistance to farmers with total production of 1,413.8 mt with an export value of F$1.5 million. (In other words the value of exports is less than the total subsidy) Production was just 24 mt and 48 mt in 2003 and 2004, respectively;

(ii) ***Shrimp farming*** has been the recipient of more than F$4 million in support over the last 10 years but production remains low (currently about 1 mt);

(iii) since 1997, Government has spent F$2.02 million in the development of infrastructure and extension services to support the development of ***Tilapia and fresh water prawns***. To date there are 300 fish farms of different sizes, covering 48.22 hectares of land, but only17 farms are commercial; and

(iv) since its inception five years ago, the Government has allocated F$420,000 for ***pearl farm*** development in the country. And, on a positive note, the industry has had some recent success with production of over 30,000 pearls in 2004.

55. Overall, the aquaculture sector has been the recipient of substantial support and there is much enthusiasm for the future of aquaculture in the country but the economic performance has been quite poor. This is likely to be due to: (i) problems dealing with assessing opportunities, (ii) development interventions, and (iii) underlying governance issues. Rather than continue with “more of the same medicine”, the priority activity should be promotion of objective marketing and feasibility studies. The DOF could contribute its fisheries perspective to efforts to improve the business environment in the Fiji Islands, including features relating to the tax structure, administrative blockages, investment, and land/marine tenure. More importantly, the Department should rigorously assess the benefits and costs of programs that support aquaculture and ensure that it does not fund projects that are unlikely to succeed. Funding provided should be commensurate with the expected future returns (taking into account the high level of uncertainty associated with aquaculture developments as a result of: declining prices, risk of disease, problems in producing post-larvae, and other difficulties in maintaining yields such as those related to sourcing of feed at a reasonable cost).

56. From the above information (and information presented in Appendixes 3 and 8) it can be concluded that there has been considerable aquaculture work in Fiji (marine, brackishwater, freshwater) stretching over a long period and covering large variety of species. The reality is, however, that aquaculture remains poorly developed in Fiji. This carries some suggestion that either:

(i) the potential and opportunities provided by aquaculture in the country have been over-estimated; or

[29] Billings, G. 2004. *National Aquaculture Sector Overview*, December, Suva.

(ii) past aquaculture development work has been inappropriate; or

(iii) there are governance issues that negatively affect aquaculture; or

(iv) there is still need to remove impediments to growth (see Section VII).

57. The Department also needs to clearly identify its role and not venture into private sector activities related to the sector. For example it plans to develop six tilapia markets, but, clearly, tilapia farmers are best placed to supply markets if they consider there is money to be made. In addition, MFF's plans to protect the shrimp fishery using subsidies should be scrapped as this represents a tax on the tourism industry and the shrimp fishery is already the recipient of significant government support. The Department's efforts to promote large-scale aquaculture should focus on creating a facilitating environment, primarily formulating and implementing consistent and supportive policies (see Box 1). Additional activities should include those related to necessary quarantine measures, and liaison with traditional authorities.

Box 1: The Facilitation Role of Fisheries

Fiji Pearls, based at Savusavu, comprises a large private sector development, one that will be an 'industry leader' and, potentially, underpin the development of a pearl industry in the Fiji Islands. Officers from the DOF played an important role in facilitating negotiations between the proponents of the investment and the Tikina from whom the farm area of 30 hectares was ultimately leased. Other roles for the DOF in a newly developing industry like pearls would be to advise villagers on how to become involved in spat collection, facilitate research into particular questions of importance to the industry, and provide information on getting into the pearl industry, such as the costs of establishment, operational costs and potential returns, the processes for negotiating with customary owners and obtaining a license, and criteria for selecting a suitable farm site.

58. Finally, if there are social objectives in respect of some aquaculture subsidy programs (eg., seaweed (outer islands development) and tilapia (food nutrition value)) then these subsidies should be properly costed (including subsidies under the 1/3 – 2/3 subsidy scheme) and the net benefits of such programs need to be evaluated in a rigorous fashion.

2. Promotion of Small Farm Sizes

59. The Department has indicated that 90% of pearl oyster farms will be small farms owned and operated by Indigenous Fijians. It is also actively promoting small shrimp farms. Similarly, the Department is looking to promote satellite clusters of up to six small tilapia and prawn farms.

60. However there are concerns that promotion of small farms could undermine aquaculture's viability in the Fiji Islands. There is a strong sentiment in the aquaculture industry and amongst regional/international aquaculture advisors that, for some of the commercially-oriented types of aquaculture, economies of scale are required to achieve profitability. (This is hardly surprising given the large supply quantities and competitiveness of the industry). This has been expressed in a variety of ways:

(i) a large pearl farmer in the Fiji Islands has stated that a farm needs to implant 50,000 pearl oysters each year to be viable (but the Department is promoting farms which only produce 1500 pearls. Moreover the Department's own economic modeling has indicated that a small-scale pearl farm's cost structure will exceed the prevailing farm-gate prices of US$20/pearl);

(ii) a tour of Fiji Islands aquaculture facilities in mid-2004 by notable aquaculture specialists from regional and international institutions (SPC 2004) concluded: “it was probably not financially viable for small pearl farms to operate”;

(iii) the SPC/ACIAR Black Pearl Culture Workshop in Kiribati carried out economic modeling and concluded “a small private sector (5,000 oysters) integrated operation, culturing round pearls is relatively high risk”;

(iv) experience in French Polynesia suggests that the small pearl farms are non-viable; and

(v) in dealing with another aquaculture commodity, marine shrimps, an established farmer in the Fiji Islands states that a minimum farm size of 10 to 12 hectares is required for viability.

61. Considering this experience, the Fisheries Department should reconsider its stated intentions of encouraging small pearl farms as stated in the 10 year development plan, and promoting small marine shrimp farms as indicated by some fisheries officers.

62. Ideally, the only role for Government in determining farm location and size should be in respect of reducing the risk of disease outbreak and in controlling the impact of waste from aquaculture farms. Economic decisions regarding farm size and location should be left to the private sector. It may be suitable for the DOF to provide information on appropriate locations for fish farms given knowledge about environmental factors and how they affect yields but it should not make the final decisions on such matters. Information about efficient farm size—ie., the farm size required to minimise costs—could also be provided to potential investors, along with information about how costs increase if farm size is lower than the efficient size.

63. An additional suggestion is that DOF should focus on consolidating existing activities: progressing current initiatives (tilapia, seaweed, and freshwater prawns) to the point where they can be sustained without continuous government intervention. This should occur before expansion of those activities or before promoting other forms of small-scale aquaculture. Any new initiatives should be formulated mindful of (a) issues relating to economies of scale, and (b) the need for provisions for phasing out any subsidies (realistic exit strategy) so that the activity does not terminate when government funding priorities change.

3. Legal Environment

64. The present legal regime is not adequate for aquaculture development. It is suggested that the DOF actively promote legislation that (a) adequately defines and distinguishes aquaculture from capture fisheries, (b) contains provisions for a licensing scheme specifically for aquaculture, (c) has appropriate environmental protection, and (d) establishes property rights in the marine and coastal areas and the right to exclusively take fish in the farm area. An additional issue that needs to be examined is that of land tenure with the current maximum lease period of 15 years being too short and representing a potential impediment to growth of the sector (Section VII). Legislation also needs to be introduced to enable water leases (ie. leases from below the high water mark).

4. Environmental Management

65. A primary concern at this point is the absence of environmental controls and monitoring with respect to aquaculture activity. The Department of Environment does not have any capability in this area and this is a matter that needs to be addressed as a matter of urgency. The Department of Environment is a key stakeholder agency and should be

actively involved in the management process and in assessing aquaculture farming applications.

5. Assessment

Recommendation 6. On the basis of the above considerations, recommendations for aquaculture are as follows:

(i) Develop and introduce legislation that (a) adequately defines and distinguishes aquaculture from capture fisheries, (b) contains provisions for a licensing scheme specifically for aquaculture, (c) has appropriate environmental protection, (d) establishes property rights in the marine and coastal areas and the right to exclusively take fish in the farm area, and (e) provides for water leases (preferably for periods of up to 30 years).

(ii) Develop a capacity within the Department of Environment to assess the impacts of aquaculture.

(iii) Detailed economic evaluations of aquaculture programs need to be undertaken both during the design phase and evaluation phase. The current quarterly performance reviews are not sufficient for this purpose.

(iv) Develop an effective and cost-efficient quarantine facility.

(v) Leave decisions on the location, configuration and size of aquaculture farms to the private sector, unless there is some firm environmental or disease risk management basis for imposing such restrictions.

(vi) If there are social objectives in respect of some aquaculture subsidy programs (eg., seaweed (outer islands development) and tilapia (food nutrition value) then these subsidies should be properly costed (including subsidies under the 1/3 – 2/3 subsidy scheme). Net benefits of such programs need to be evaluated in a rigorous fashion.

(viii) Plans to protect the shrimp fishery using subsidies should be scrapped as this represents a tax on the tourism industry and the shrimp fishery is already the recipient of significant government support.

D. Marine Aquarium Fishery

66. Considerable progress has been made in developing a robust management structure for the marine aquarium fishery. However there is some way to go in terms of ensuring the maximum benefits from the existing management structure with some stakeholders holding the view that the full effective operation of the structure is some five years away.[30]

67. There are still companies that have not developed management plans—assistance has been provided by NGOs (TRAFFIC and Marine Aquarium Council) but these companies have not come forward and requested plans for their collection areas. Industry regulations should be introduced that require all industry participants to submit plans for the areas they wish to collect in to ensure that the fishery maintains its non-detriment status and that there are no further bans placed on Fiji Islands exports by CITES. One potential problem is that not all areas are subject to the one area/one operator guideline, reducing incentives to develop management plans.

[30] This reflects the recent establishment of all main components of the management framework, including the Scientific Council, Fiji Marine Aquarium Council, and Marine Ornamental Traders Association. Each of these entities were established during the past 12-24 months.

68. Guidelines for management of the Marine Aquarium Fishery have been drafted with the assistance from NGOs and are awaiting action from the Solicitor General. The Guidelines provide some key controls over marine aquarium activities such as limits of one company per collection area (for greater incentives to conserve the resource), no collection activity in front of hotels, and no use of crow bars for the collection of corals. The Guidelines have been with the Solicitor General's office for some months now—action is clearly required from Solicitor General's to enable the Guidelines to be formalized and there is no reason as to why this process should not take place within a very short timeframe given that no new regulations or legislation are required to support implementation of the guidelines. In fact it is questionable as to whether the Solicitor General's office should even be involved in the process at all, raising the broader issue of whether the chief executive officer (CEO) for Fisheries and Forests should not be able to sign off on management plans.

69. A continuing concern is that collectors/divers operate on a sub-contract basis and therefore are not directly covered by existing management structures. Further work is required on this issue, and in overseeing continued development of the management structure that has been put in place. TRAFFIC and an officer seconded to the Department of Environment to introduce systems to meet CITES requirements have been assisting the Department in developing management structures, but these NGO programs are scheduled for completion in the middle of 2005. Moreover, the imminent departure of these NGOs has been raised as a potential risk factor in terms of continuation down the path of implementing a robust management structure for the industry.

70. Another perceived deficiency identified by industry participants is that the Scientific Council rarely meets to discuss management issues.

Recommendation 7. Recommendations flowing from the above assessment are as follows:

(i) Given that the marine aquarium fishery represents possibly the best growth prospect for the sector, it is recommended that additional capacity building programs be established to offset the effect of the departure of key NGOs. This is important because growth of the sector is inextricably linked to external perceptions about the effectiveness of management.

(ii) High priority should be placed on the assessment/approval of the Draft Management Guidelines for the marine aquarium fishery by the Solicitor-General's Office. The CEO of the Ministry of Fisheries and Forests should directly make a formal request to the Solicitor General's Office on this issue.

(iii) Companies should be required to introduce management plans for their collection areas.

(iv) The Department needs to further assess ways of improving management of collectors/divers.

E. Fishery Development Activities

71. Fishery development programs have focused on aquaculture (seaweed, shrimps, tilapia, and black pearl). In recent years, the DOF has also provided substantial assistance to small-scale fishers, including activities related to fish aggregation devices (FADs), training of fishermen for the revival of the deepwater snapper fishery, facilitating the establishment of the LRFF fishery, small-scale tuna development, ice production, awareness training at rural

fisheries service centers (RFSCs), and building punts[31]. The National Fisheries Corporation (NFC) and RFSC program (discussed later in this report) are also intended to assist small-scale fishers.

1. 1/3 – 2/3 Subsidy Scheme

72. In the past few years much of the assistance to small-scale fishers has involved the provision of free fishing gear. The 2003 DOF Annual Report states: "31 identified small-scale tuna fishers were assisted through providing fishing gears, safe affordable and recommended outboard engines and punts, under the small-scale subsidy scheme of a total sum of F$332,999." The DOF's 2004 Quarter One Report states: "Identified and assisted 31 fishermen on a 1/3 and 2/3 basis—provision of fiberglass punts, outboard engines, fishing gear, and safety components. Total 1/3 received is F$123,273".

73. The long-term development implications of such one-time grants of gear are unclear. Although the subsidy scheme has been in operation for several years, no documentation was available to the Fisheries Sector Review on any follow-up monitoring that would give some information on the effectiveness of the scheme. Given the expense of the program, such follow-up and analysis should commence in the near future. As small-scale subsidies are an area in which allegations of corruption are common, if such subsidies are to continue there appears to be a need for greater transparency in the process.[32]

74. Moreover, broadly targeted subsidies represent an extremely blunt instrument for achieving fishery development and social objectives. Heavy reliance on use of subsidies to achieve fishery goals is symptomatic of a lack of expertise in economic and policy evaluation. In addition, there is a concerning pattern with respect to failing fishery programs. That is, after a program fails the DOF seeks to resume responsibility for marketing and to increase vessel subsidies. These approaches, however, are likely to simply "further extend the pain" rather than provide a cure.

2. Fish Aggregation Device Deployment

75. The FAD program warrants some degree of critique as the program for deploying FADs has not been especially active in 2004. According to the officer presently in charge of FADs at DOF, the last FAD deployment occurred in mid-2003. FAD fishermen state there have not been any FADs in the Suva area since late 2003, but that small-scale tuna fishing (including that promoted by the subsidy scheme) is not feasible without FADs. DOF officials cite the large expense of FADs and non-availability of a vessel large enough to deploy a FAD (or high charter costs of such a vessel) as reasons for the lapsed FAD program.

76. Some comment should be made on the value of FADs. Across the Pacific Islands several decades of small-scale fisheries development experience[33] suggest that any country that is serious about assisting small-scale fishers should have an active and well-managed FAD program. On this issue, the Fisheries Specialist for the Review noted that:

> Over the last three decades a very large number of initiatives have been undertaken by Pacific Island countries to develop small-scale tuna fisheries. These have included deploying

[31] The aquaculture development activities are considered in a subsequent section.

[32] MFF has advised (pers. comm. Miit Baleivanualala, CEO MFF) that cabinet approval has been granted for implementation of criteria that would strengthen the governance of the scheme evaluation process and enhance transparency. The Government, however, will need to closely monitor the application and effectiveness of these criteria.

[33] As detailed in the FFA Report "Domestic Tuna Industry Development in the Pacific Islands: The Current Situation and Considerations for Future Development Assistance."

> FADs, governments constructing appropriate small tuna fishing vessels, providing subsidies and grants for vessels and gear, providing hire vessels for offshore fishing, encouraging production of tuna jerky and salted tuna, experimenting with novel tuna products, installing freezers on outer islands for holding tuna, collecting tuna caught by outer islands fishers, establishing schemes for purchasing tuna from artisanal fishers at subsidized prices, longlining from small boats, promoting "ika shibi" fishing, copying Maldivian tuna fishing, promoting small-scale pole/line fishing with live bait, sponsoring overseas study tours, upgrading fishers to medium-scale longlining, and many other schemes.
>
> In reviewing the history of development of small-scale tuna fisheries, one of the few initiatives that has been successful and continues to contribute to the success of small-scale fisheries is the FAD.
>
> Despite decades of small-scale tuna development efforts throughout the Pacific Islands, FADs remain one of the few innovations that allow small-scale fishers to economically take advantage of the region's large tuna resources. This suggests that any country that is serious about assisting small-scale fishers should have an active and well-managed FAD program. By this, it is meant a FAD program that is financed by national sources (rather than dependent on volatile donor funding) and in which, as one individual stated, "a lost FAD gets replaced in 5 days, not 5 months or 5 years".

77. Moreover, a key indicator of the significance of FADs is that when there were FADs off Suva there were some 20-30 small-scale tuna boats in operation. Since the loss/breakage of the FADs, the number of small-scale tuna fishers has fallen to just six—unambiguous evidence of the economic importance of deploying FADs.

3. Assessment

78. Examples of successful fisheries development interventions in small-scale fisheries by the DOF are not common, but they do exist. A recent review of the situation in the Fiji Islands was less charitable: "Artisanal fisheries development programs have not been successful, largely because of poor planning, unrealistic expectations, and inefficient and corrupt practices" (USP and Fiji Institute of Technology, 2004). It would therefore seem appropriate to introduce some much needed reform measures, and we make a number of key recommendations in this regard.

Recommendation 8. On the basis of the above assessment, it is recommended that the DOF increase the priority accorded to its FAD work, re-direct fisheries development funding from less effective fisheries development activities and, for a deployment vessel, either (a) explore some of the small vessel FAD deployment techniques recently developed by SPC, and/or (b) be more energetic in exploring vessel charter options.

Recommendation 9. With respect to any future work in fisheries development, it is imperative that the DOF strive for a higher degree of success. Five obvious recommendations for improvement are:

(i) more rigorous technical and economic evaluation in the planning stages;

(ii) greater input from stakeholders in the Fiji Islands and from the regional organizations involved in fisheries;

(iii) more professional and impartial review of fishery programs. The existing quarterly reviews are quite "tokenistic" and highly "spurious" indicators of fishery performance are presented (eg., no. of kilograms exported). Proficient officers, preferably from the planning section within MFF, should be commissioned to conduct rigorous annual assessments of programs;

(iv) reduce reliance on subsidy programs to achieve fishery development and social objectives; and

(v) Introduce explicit exit strategies to phase out subsidies provided to specific fisheries.

F. Rural Fisheries Service Centers

79. A major component of the DOF' strategy for rural fisheries development is the use of RFSCs. Two new centers have recently been established. A total of F$7 million was proposed in the public sector investment program 2004-2006 for RFSCs and F$1.6 million has subsequently been approved in the 2005 budget.

80. This represents one of the most important financial commitments of the DOF. Because the RFSC model will have much to do with the success or failure of the DOF's efforts in rural fisheries development well into the future, some further examination of the subject is warranted.

81. It is important to note that the RFSC concept is not new. Such centers have been established in PNG (government funding and International Fund for Agriculture Development), Solomon Islands (EU and Japan), Vanuatu (EU), Tuvalu (Japan), the Marshall Islands (Japan), and Tonga (Australia and Japan). The Fiji Islands also had a few such centers in the early 1970s. In contacting people knowledgeable about each of those projects, certain patterns emerge:

(i) In none of those countries did the centers become self-supporting and most of the RFSCs are now defunct. Common problems are: (a) the cost of operating the centers exceeded what could be supported by the center buying/selling fish, (b) ice is inherently expensive to produce in remote areas, and (c) the lack of planning in the early stages of the projects for the required long-term subsidies.

(ii) In cases where the government or donor was committed to long-term subsidies, over-exploitation of inshore fishery resources became a concern. In extreme cases, the centers which were intended to help disadvantaged rural communities resulted in a reduction of food fish for those communities.

82. Although it could be argued that the Fiji Islands can be distinguished from the other countries and conditions are more favorable for the viability of RFSCs, this does not appear

to be the case; no factors are apparent in the Fiji Islands' RFSC scheme that would result in uncharacteristic profitability.

83. NGOs in the Fiji Islands are critical of the lack of conservation measures that parallel development attempts of the DOF, especially the construction of RFSCs. In looking at the situation at the Wainikoro RFSC, the present efforts to counter possible over-exploitation of inshore fishery resources appear to be fairly weak: some plans to eventually encourage offshore fishing, and some attention to establishing MPAs. The present managers of the Wainikoro center indicate that they are unable to even avoid buying fish that contravene fisheries legislation.

84. On the positive side, there are some favorable experiences, aspects of which could possibly be incorporated into the Fiji Islands RFSC model:

(i) the use of existing/cheap transport for private entrepreneurs to bring fairly low quality fish to urban markets seems to work in some cases (Vanua Levu to Suva, Ha'apai to Nuku'alofa), but this does not involve the overheads of a center nor business complexities of a cooperative;

(ii) benefiting from the experience of many failed RFSCs, Papua New Guinea is now using a revised development model in which government builds the infrastructure (wharves and associated facilities) that the commercial fishing industry needs to operate in remote parts of the country. This makes the location sufficiently attractive for the commercial sector to establish and operate fish processing and distribution facilities in those places. Once commercial production is under way, products from the artisanal sector can be 'piggy-backed' onto the commercial traffic. However, the cost of the infrastructure does represent a direct subsidy and costs and benefits would need to be assessed before moving in this direction.

Recommendation 10. Given the above assessment, it is recommended that consideration should be given to modification of the Fiji Islands' RFSC scheme along the following lines:

(i) although the RFSC model is predicated on the centers becoming financially independent, this is not likely to occur. Accordingly, the need for an on-going subsidy should be acknowledged in the planning process, project documentation, Ministry budget, and how the centers are presented to the intended beneficiaries;

(ii) in planning for RFSCs, much more attention needs to be focused on mechanisms to prevent over-exploitation of adjacent inshore resources, including the careful monitoring of trends in abundance of important species; and

(iii) full cost benefit analysis be undertaken before investing in further RFSCs, including comparison with the net benefits of viable alternatives (eg., contracting out of required services to private operators, use of a carrier vessel that could service any number of outer islands, and /or completely different ways of providing income support to outer islands).

G. Extension Officers

85. The DOF has a large network of capture fisheries extension officers. The extension officer system was established several decades ago and (according to the 1979 Fisheries Division Annual Report) the original purpose of the officers was to introduce new technology to boost production by the rural sector. In the 2005 budget the section on "Extension

Fisheries Capture" lists 31 established staff, 6 un-established staff, and a budget (not including construction costs) of F$1,127,000.

86. Since the establishment of the fisheries extension officer system, there have been many changes in the Fiji Islands including those affecting inshore fishery resources, fishing effort targeting those resources, the development of the private sector, and the types of problems confronting coastal villages. A major issue for the DOF is whether the role of extension officers has evolved with the changing times or whether the services they provide are more relevant to a previous era.

87. The staff of the DOF seem satisfied with the present role of the extension officers and indicated that a re-orientation to conservation/management work occurred in the late 1990s. Others outside the DOF, who are familiar with the work of the extension officers, believe differently. In discussions with individuals in other government departments, the FLMMA Network, other NGOs, regional fisheries organizations, international development banks, and bi-lateral agencies, a strong sentiment emerges. There is the general feeling that, with the rise in concern about over-exploitation and destructive fishing methods in even isolated Fijian villages, the fisheries extension role should be altered so as to be much more closely aligned with conservation/management objectives.

88. The Review Team's Fishery Specialist[34] noted that that "the extension officers must carry out a variety of non-management duties, but generally their major role should move from a development focus to a management one, with emphasis on advising communities on management issues."

Recommendation 11. The DOF should assesses the merit of:

(i) refocusing extension work to a management role with associated re-training of extension officers in the management of inshore fishery resources (this is likely to be attractive to several donors); and

(ii) renaming the fisheries extension officers to something like "small-scale fishery management advisors" to signal a new direction in the work of these officers.

89. The Review Team's Fishery Specialist[35] noted that in Samoa the fisheries extension service went through a transition similar to that promoted above. According to individuals who assisted the transformation, one of the greatest difficulties was the attitudes of the long-established staff. One of the most important factors influencing the eventual success was being able to start fresh with a sizeable team of new, young, enthusiastic fisheries officers.

IV. BENEFIT SHARING

90. Benefit sharing in respect of the Fiji Islands' fisheries needs to be closely examined to determine an equitable sharing of the profits from the country's endowment of marine resources. Benefit sharing in inshore fisheries is not a major issue at present because a broad section of the community participates in the fishery. There are, however, potential issues relating to access fees paid to qoliqoli owners and an appropriate framework needs to be established for determining "fair payments" for access. Taxation issues need to be

[34] Gillett, R. 2005. *Aspects of Fisheries Management, Legislation, Research, Development, Extension and Aquaculture in Fiji*, Report of the Fisheries Specialist ADB Fisheries Sector Review, January.
[35] ibid.

explored in respect of offshore fisheries which are currently subject to quite low access fees. Conversely, input taxes, particularly the fuel duty, remain high.

A. Cost Recovery

91. With the exception of the offshore longline fishery and the marine aquarium fishery there is very little cost recovery from the Fiji Islands' fisheries. However, access fees are paid by the brackishwater and pearl oyster farmers and marine aquarium fisheries in the form of direct payments to villages and Tikinas.

92. At this stage, there are very limited prospects to increase cost recovery due to the low economic performance of most sectors. A necessary first step is to reduce the dependence of fishery sectors on subsidies followed by an evaluation of fishery performance to determine capacity to pay for management costs. Fisheries should be charged a levy based on production value. The framework for determination of the levy will need to be clearly set out and explained to industry. A percentage of the levy payments should be directed to the proposed Research Advisory Committee (RAC) (Section V) for allocation to suitable research projects. Peak industry bodies would also have a role in allocating research funds.

B. Fisheries Taxation

93. In respect of fisheries taxation, the principal issues to be examined relate to the fuel tax, access fees for offshore fisheries, future use of taxation incentives (which is discouraged) and payment of access fees to customary owners. There are also some administrative problems which need to be resolved, particularly the timing of VAT repayments.

94. Industry has been quite vocal about the fuel tax. Revision of the fuel tax duty could be considered by the Government but this should be coupled with a review of other relevant tax matters such as the current exemption on company tax for processors exporting fish (the definition of processor is quite broad and includes packaging).

95. The fuel tax is also a significant cost burden on inshore fishers, and examination of the issue would need to be coupled with an assessment of the subsidies currently provided to them. It may be appropriate to consider reducing fuel tax while also scaling down the level of subsidies for boats and equipment.

96. The total access fees paid by the offshore fleet of around F$600,000 p.a. is well below the potential value of resource rent if the fishery is optimally managed. A recent study by FFA/SPC[36] estimated fishery resource rent to be in the order of F$6 million for the scenario whereby the fishery is performing at maximum efficiency. Operators have in the past earned rates of return of around 35% on invested capital—well in excess of a normal risk adjusted rate of return, and indicative of scope to increase access fees in the future.

97. It is imperative, however, that any introduction of access fees be coupled with offsetting tax reforms such as the lowering of fuel duty. A long-term view is required in setting the access fees which takes account of environmental fluctuations (ie they should not be set on the basis of catch rates and profits in a good year but should reflect the level of resource rent in an average year.)

98. In its 2004-2006 Strategic Development Plan MFF announced an intention to introduce further tax incentives for processing plant by 2005, with the objective of promoting

[36] FFA/SPC. 2004. *An Economic Analysis of the Fiji Longline Fishery*, October, Honiara.

local value adding and downstream processing for export. Providing a tax bias in favor of processing, as is the case with subsidy schemes, increases the chance of developing uneconomic enterprises that are dependent on Government support. Ultimately, due to social dislocation costs there is considerable pressure on Governments to continue supporting uneconomic fish processing plants (especially if they helped create them). Further, as is the case with Solomon Taiyo in the Solomon Islands, promotion of uneconomic processing activity can lead to a dissipation of benefits from a countries natural endowment of fish resources. This scenario is to be avoided, and therefore Government support of processing activity should be restricted to supporting of HACCP and EU standards and introduction of reforms that lower the cost of doing business in the Fiji Islands.

99. To fish in a qoliqoli it is necessary to seek permission from the provincial owners and to have a permit issued by the DOF. The principal change following enactment of the Customary Fisheries Bill will be that Customary Owners will have direct commercial dealings with those entities seeking access—a process that will be administered by the Native Lands Trust Board (NLTB). A very important issue is the establishment of a framework for assessing suitable compensation to qoliqoli owners for access to marine resources and for leases of their marine areas. Practical benefit sharing regimes need to be established and ways of helping traditional owners learn about the commercial value of access need to be investigated.

100. Operators have also complained of excessive delays in receiving value-added tax (VAT) refunds, with one longline company reporting a six month delay in receiving a VAT refund of F$400,000. This places great strains on the working capital requirement for the affected company(s), particularly in periods when finances are already strained due to poor fishing performance and low tuna prices. Ways of avoiding future financial mismanagement by Fiji Islands Revenue and Customs Authority need to be investigated to ensure that VAT refunds are paid in a timely fashion.

Recommendation 12. A review of fisheries taxation is recommended. This review should include assessment of access fees, cost recovery, and development of frameworks and processes for ensuring customary owners of qoliqoli receive fair compensation for access to, and utilization of their marine resources. The review could incorporate economic and social assessments of the plethora of fishery subsidy schemes, as fishery subsidization is clearly an issue that is directly related to the overall benefit-sharing regime.

C. Indigenous Participation

101. There are a number of schemes operated by the DOF and by the Fiji Development Bank (FDB) including:

(i) the Seed Capital Revolving Fund (SCARF) which provides interest free loans for up to 35% of the capital requirement to successful applicants;

(ii) FDB concessionary loans which provide financing at the rate of 8%;

(iii) 50% of offshore, EEZ and processing licenses are to be allocated to ethnic Fijians and Rotumans under the Social Justice Act (to be achieved by 2020);

(iv) waiving of offshore fishery access fees for indigenous operators;

(v) the 1/3 – 2/3 vessel subsidy scheme, which provides 2/3 of the capital cost for various categories of investment in the fishing industry;

(vi) charter and joint venture arrangements[37] which are designed to increase domestic participation in the offshore tuna fishery by overcoming capital constraints; and

(vii) various other fishery development schemes (as identified above).

102. The focus of this assessment is indigenous participation schemes that relate to the offshore fishery,[38] but many of the same issues apply to other schemes.

103. There are several measures in place to promote indigenous participation in the tuna industry. These include reserving a number of tuna licenses and concessionary loans. These programs have had a low success rate, however. Responsible officials in the DOF consider that more of the same remedy is required (the maximum amount of loan from the Ministry has been raised). On the other hand, some of the major participants in the industry feel that the current programs are unrealistic and should be revamped to overcome some of the common problems encountered, such as mentoring to help with business difficulties often experienced by Fijians.

104. Some of the affirmative action initiatives assume that lack of capital is the major constraint preventing indigenous participation. Considering that the Ministry now has considerable experience with seed capital, this may be an appropriate point to critically review that assumption. In reality, a blend of fishing skills and high level business skills are required to succeed in the fishing industry.

105. A number of the initiatives proposed under affirmative action would place restrictions on the existing tuna industry. At least some of those restrictions may cause severe hardships to present operators without actually assisting in indigenous promotion. An example of this was the proposal that the archipelagic zone be reserved for indigenous operators. This type of activity appears to be contrary to one of the basic principles of the Tuna Management and Development Plan, that measures "do not jeopardize the current efforts by the present industry stakeholders'.

106. In promoting indigenous Fijians for ownership roles in the tuna industry, less fortunate Indigenous Fijians should not be overlooked. Chartering foreign vessel has been an affirmative action tool, but because many of these vessels operate with mostly foreign crew, deck-level jobs are denied to unskilled Fijians. Considering the country's large unemployment situation, ways of promoting use of unskilled deck crew should be investigated. Currently, only around 50% of crew are indigenous Fijians. The effects on vessel performance of having Indigenous Fijian crew may need to be assessed. A system whereby access fees are discounted by a proportion of the payments to Indigenous Fijians may also have merit.

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[37] Chartering of overseas vessels has apparently been instigated to assist entry of individuals who are short of capital into longline fishing. According to Fisheries Department officials, the scheme was also intended to give the local charterers business experience in the tuna industry. Individuals/companies who are presently chartering vessels strongly defend the scheme, saying it is providing them with real opportunities. Many individuals/companies in the Fiji tuna industry that are not involved in the scheme strongly oppose it, saying that most of the charterers have no real involvement in the business, are not learning the tuna industry, the vessels imported for charter are driving legitimate local vessels out of business, and the money that the charterers are paid is really a charge on the fishing company for operating in Fiji – something that should not accrue to individuals.

[38] The promotion of indigenous participation in the tuna industry is an established objective of the Tuna Management and Development Plan, a component of the Social Justice Act, and is actively being pursued by the present Government.

107. The enthusiasm of the Ministry for promoting indigenous Fijians in longlining should be tempered with some hard realities. In recent years in Fiji several of the longline fishing companies with experienced business managers from overseas and a long heritage in tuna fishing have collapsed, causing one to wonder about the chances of a less-experienced Indigenous operator. From a larger regional perspective, a report by the FFA on domestic tuna industry development in all Pacific Island countries[39] is especially relevant here. It stated that for operating a tuna longline business:

> The major activity is less about catching fish and more about management of a complex international business in an environment where there is much tough competition. Some of the most spectacular bankruptcies in domestic tuna industries have involved good fishermen who made poor tuna vessel managers.

108. Overall, the indigenous participation schemes are disjoint and in some cases promote inefficient industry structures. Costs are likely to outweigh the benefits in many cases and different models need to be compared and contrasted with the existing scheme for the purpose of identifying the most efficient way of meeting the indigenous participation objectives. We are not advocating termination of indigenous participation schemes, but there is a need for such programs to be grounded in reality, and very actively managed by skilled/motivated Ministry staff who have no compromising interests. The schemes need to be constantly evaluated, and modified if the costs are outweighing the benefits (or if there is a more cost effective way of achieving the same benefits). Moreover, further evaluation of Fiji's policies for promoting indigenous participation should incorporate case studies on the effectiveness of affirmative action policies adopted to improve the welfare of indigenous people in other countries such as Australia and New Zealand.

Recommendation 13. Given the above assessment it is strongly recommended that the Ministry commission a major review of its approach to promoting indigenous participation. The review should incorporate consideration of a rationalization of schemes, and impacts of indigenous participation schemes on efficiency of sectors and growth potential. Ways of encouraging indigenous participation which have a minimal impact on economic performance of sectors need to be identified.

V. RESEARCH & DATA COLLECTION

109. Data collection and research are the foundation of good management decisions and effective policy development. It is therefore extremely important that the DOF assesses the existing structures and systems for research and data collection, and considers the potential for re-focusing its attentions towards the introduction of data collection systems and research programs that will better promote the management effort.

A. Aquaculture Research

110. Much of the DOF's attention, and that of donor agencies, in supporting aquaculture has been in the area of research, with Government research activities amounting to F$600,000 p.a.. Research relates to the culture of fish species, production of post larvae, disease risk assessment, and genetic modification. Aquaculture research activities are presented in the table below.

[39] Gillett, R. 2003. *Domestic Tuna Industry Development in the Pacific Islands: The Current Situation and Considerations for Future Development Assistance*. Report 03/01, Forum Fisheries Agency, Honiara.

Table 4.1: Aquaculture Research Programs

Category	2004 Budget (F$)	Focus
Makogai Vasua & Inshore Fisheries Culture Research	194,000	Culture of giant clams. Farming new species such as beche-de-mer & trochus, coral. Assessing re-seeding potential for selected MPA sites. Assist in market research & product development. Sea turtle research.
Galoa Shrimp Hatchery	300,000	Production of post larvae/baby shrimps to support private sector development.
Naduruloulou Research Station		Since the introduction of freshwater culture programs in 1995 at the Naduruloulou Research Station, the major species of focus have been on Tilapia, Freshwater Prawns, Asian Carps and Ornamental Fish. These species were imported from Asia.
Pearl Pilot Farm	100,000[a]	Pilot farm for research, training and extension.

111. As can be seen from the above table, the DOF has a significant budget for aquaculture research. Donor support for aquaculture has also been very extensive over the past 30 years. (Appendix 3). Current donor support includes ACIAR assessment of disease risks for pearl oysters, while the University of Hawaii has just entered into a partnership agreement for research activities at the pearl oyster farm. The Department of Marine Studies at USP has also had an ongoing role in fisheries research, with current involvements including research into production of shrimp post larvae. The DOF should continue to embrace programs of this kind but it clearly needs to help push donor support in the right direction—ie., into areas that will support management efforts and/or help overcome technical constraints for development of aquaculture.

112. It is beyond the scope of this review to fully explore the effectiveness of the current research effort, but we do make some key observations:

(i) the Makogai Giant Clam Mariculture Project and inshore fisheries research should be reviewed in the near future. Ten years ago the Food and Agricultural Organization of the United Nations (FAO) recommended an independent appraisal of the Makogai hatchery and mariculture activities (Kailola, 1995). Apparently, this did not occur. Based on the lack of technical reports from work on Makogai, the stated nature of research being carried out at the facility, and enquiries made during the sector review, an evaluation of Makogai activities should be undertaken as a priority. The attention presently focused on biological and pure research at Makogai Island research should be redirected;

(ii) the private sector has also questioned the performance of the Galoa shrimp hatchery and is looking to establish its own hatchery. The Fiji Islands is considered too small to support two hatcheries and if the private sector hatchery proves more successful then an evaluation of the need to continue operating the Galoa shrimp hatchery may be required; and

(iii) aspects of the operation at the freshwater research facility at Naduruloulou, such as the supply of fingerlings to tilapia farmers, have also been questioned.

Recommendation 14. On the basis of the above observations, it is recommended that the DOF commission an independent external review of (i) all operations at the Makogai research station; (ii) operations at the Galoa shrimp hatchery as this activity may be more efficiently undertaken by the private sector; and (iii) aspects of the freshwater hatchery program at Naduruloulou Research Station.

B. Data Collection

1. Inshore fisheries

113. A system for collecting statistics on the inshore artisanal fishery was established in 1977 and a crude scheme for estimating production in the inshore subsistence fishery was formulated in 1978. The main outputs of these systems have been: (a) artisanal: estimates are made of amounts and values of finfish and non-finfish at the municipal markets and some outlets on the two main islands, and (b) subsistence: for each year over the past 26 years, estimates have been made simply by adding 200 mt annually to the questionable 1978 production figure.

114. In addition, the DOF maintains a database of fish exports (unverified) and a database of exports covered by CITES. An important issue here is whether the outputs of these systems address the critical need for information on the condition, trends, and potential of inshore fishery resources. It appears that this fundamental issue should be addressed before further institutionalizing the present statistical systems[40].

Recommendation 15. It is recommended that to improve the available data on inshore fisheries the results of major projects aimed at improving the Fiji Islands' inshore fisheries data (three since the late 1980s[41]) should be incorporated in official catch statistics. There should also be greater use made of the opportunity to monitor fisheries products at the point of export. Finally, greater use should be made of surveys outside the fisheries sector: at little cost, production information on small-scale fisheries could be collected through such tools as the national census, nutrition surveys, agriculture census, household income and expenditure surveys, and poverty studies.

2. Offshore Fisheries

115. The Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean entered into force on 19 June 2004. The Fiji Islands is a full member of the Western and Central Pacific Fisheries Commission (WCPFC) that the Convention established. Eventually most, if not all, of the coastal states of the central Pacific and distant water fishing nations operating in the region are expected to be members of the Commission. As one of the major objectives of the Commission is long-term conservation and sustainable use of highly migratory fish stocks in the area, it is expected the Commission will place controls on fishing effort and/or make catch allocations

[40] Budgetary requests have been made ($1,260,900 for 2005-2007) for such items as database improvement, hardware, and technicians to handle the information being produced by the present system.

[41] Cook (1986), Rawlinson et al. (1993), and the 1995 Fisheries Division survey of Vanua Levu.

to coastal and fishing states. There is some thinking that one of the objectives of tuna management in the Fiji Islands should be to look beyond the immediate situation and position the country favorably with respect to any such controls that the Commission may establish in the future.

116. Related to the above is that the WCPFC will require the member countries to furnish various types of data. Other information on the tuna fisheries needs to be collected and analyzed for domestic and regional purposes. The capacity of the DOF to carry out these activities and the priority it assigns to these tasks need to be considered when formulating the work plans of the DOF.

117. In these work plans it is also important to consider that some of the competent staff of the DOF's Offshore Fisheries Management Services Division are likely to assume significant Commission responsibilities and therefore have less time available for tuna management activities in the Fiji Islands. In 2003 some recommendations were made to strengthen the country's capacity to meet the likely data requirements of the Western and Central Pacific Fisheries Commission (SPC 2003). These were:

(i) Further strengthen data entry and data management procedures.

(ii) Increase the level of observer coverage of the longline fishery.

(iii) Collect logsheet data from the domestic pole-and-line fishery

(iv) Develop the capacity for staff to analyse catch and effort data to enable routine monitoring of the fishery.

(v) Introduce annual returns for vessel activity and vessel characteristics for all domestic vessels.

(vi) Systematically collect unloadings data for all landings and transshipments in Fiji Islands ports.

Recommendation 16. The DOF should note the required improvements to the data collection system for offshore fisheries (see above) set down by the Western and Central Pacific Fisheries Commission and work towards aligning its data collection systems accordingly.

C. Marine Resource Inventories

118. For 2004 the budget for Marine Resource Inventory Surveys was some F$200,000, the focus of which is the qoliqoli surveys which are carried out in conjunction with FLMMA and result in development of management plans for qoliqoli. The Surveys also incorporate some socio economic assessments and development of MPAs using the community based management approach

119. A substantial portion of the work of the Research Division of the DOF has been oriented to compiling resource inventories for the large number of customary fishing areas in the country under the Marine Resource Inventory Survey Program. The Ministry's 2004 Corporate Plan indicates that 12 qoliqoli are to be surveyed and 12 management plans are to be prepared in 2004. Although an enormous amount of time is required for this task, there is some question as to its usefulness to the target communities or in the management process. The general concern is that the surveys are too comprehensive and need to be more focused on the collection of information relevant to management needs. There is also a need to focus on the qoliqoli most at threat and/or which have the highest environmental

values. This could greatly increase the effectiveness of the survey/management plan development process in managing risks associated with over-exploitation.

Recommendation 17. For improving the information available on customary fishing areas a shift in priorities is recommended. Less emphasis should be placed on undertaking resource inventories and, in accordance with the general priorities for the DOF's dealings with customary fishing areas (see Section 3.B), more emphasis should be placed on collecting information related to reducing the perceived threats to the marine resources.

D. Product Development

120. Research into product development receives a fair amount of attention in the DOF. The 2003 Annual report lists "product development for tilapia, carps, prawns, and ornamental fish including local species" and "product development and downstream processing of low value species", while the Ministry's Annual Corporate Plan for 2004 lists "ongoing national research on product development".

121. From a historical perspective, the DOF's many years of product development work does not appear to have been extremely fruitful. On the other hand, the private sector in the Fiji Islands seems better at identifying/developing opportunities and indeed had considerable success (e.g. smoked fish products). This would suggest that the DOF should orient its practical product research to such topics as economic feasibility and marketing studies, rather than over product development and market creation. Inshore fisheries and aquaculture research are associated with more difficulties and are explored below.

E. General Assessment of Research Focus

122. The existing research program, research priorities, and the approach to research projects need to be reviewed. Research activities should be driven by the demand for knowledge. Research is expected to provide information and knowledge that can be used by other sections in the management of various fisheries, along with provision of information to private fishers, whether involved in commercial or subsistence activities. Specific review of activities such as the Makogai facility should be undertaken.

123. More recent research projects by the DOF are summarized in the annual reports. Presently, the DOF has significant involvement in research dealing with inshore fisheries, offshore fisheries, and aquaculture. This work is supported by both the DOF's budget and external funding.

124. From the perspective of the Fiji Islands Fisheries Sector Review Team, some of the major issues in fisheries research in the Fiji Islands are:

(i) whether the right research is being done: Is adequate research being focused on obtaining the information lacking to make important fisheries management decisions?;

(ii) whether the current research represents the best use of available funding;

(iii) whether the research results are being adequately reported and effectively used;

(iv) whether there is adequate oversight of the present research

125. The Review Team's Fishery Specialist[42] also identified a lack of responsiveness in changing research focus:

> In the Fisheries Department a persistent pattern in many areas of the work program, including fisheries research, is the situation where staff feel quite comfortable with certain activities and consequently those activities are continued long after they are useful. This points to the need for periodic examination of the value of the fisheries research initiatives, rather than rolling over the same activities year after year.
>
> The concept that fisheries research should be oriented to supporting management objectives is not well-ingrained in the corporate culture of the Fisheries Department. This suggests a need to develop mechanisms to encourage the thinking that management decisions can be improved through the collection of relevant information.

126. In addition, there is a large difference in opinion as to the condition and potential of the Fiji Island's inshore resources. This uncertainty could easily be one of the most important questions associated with the management of inshore fisheries resources in the country. Present research efforts to determine the condition and potential of the country's inshore resources appear inadequate.

127. Considering the large need for such research, some of the inshore research subjects that have received attention in recent years seem odd. Included in this category are "investigate the adaptability of culture technology of beche-de-mer species" and "consolidate and fine tune turtle culture and rearing technology".[43] Although it is conceivable that in the long-term such research could produce findings that are useful, the technical results of such work are not reported.[44] This causes one to wonder about the value of such research to the Fiji Islands and points to the need for regular review of research priorities and the need for additional oversight of research work.

128. The above observations point to the need for a more finely focused approach to research and aspects of the desired changes to the research focus are explored below. Due to the regional nature of the tuna resources, the great expense of tuna research and the high level of expertise required for data analysis, it is suggested that the Fiji Islands should continue being an active participant in SPC regional tuna research efforts, rather than carrying out tuna research entirely on its own.

129. It is recommended that research become a section within a new Division of Research and Advisory Services (Section VI), thereby emphasizing its role as a service provider, as well as its close links to advisory activities. Research would be based on demand for information and knowledge and some would be outsourced.

130. Currently, there is virtually no capacity for economic or social research, or for policy analysis and development in the DOF. Economic and social research skills are needed in the Research Section. Additionally, the Section should be in a position to support the Executive Director of the proposed National Fisheries Authority (NFA) (Section VI) with

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[42] Gillett, R. 2005. *Aspects of Fisheries Management, Legislation, Research, Development, Extension and Aquaculture in Fij*, Report of the Fisheries Specialist ADB Fisheries Sector Review, January.

[43] These are listed in the Ministry of Fisheries and Forests Annual Corporate Plan 2004.

[44] This should not be construed as indicating that work on turtles and beche-de-mer is unimportant. It does suggest that the more pure or speculative research should be done by global and regional research bodies and universities, rather than as a priority of the DOF.

policy analysis and development through the preparation of policy papers and other research activities.

131. To facilitate improved focus of research and greater accountability in the allocation of research funds a RAC be established. Membership of the RAC would include senior research personnel from the Research and Advisory Section, along with independent members, perhaps from USP and the private sector. Selected personnel from FFA and SPC might also be invited to become 'visiting members' who attend RAC meetings whenever possible. The RAC would work closely with the Research Section to identify research needs and priorities, ensure adequate consultation with industry in developing research priorities, assist in seeking research funds, and monitor research activities. The RAC should review each research program annually, thereby ensuring its ongoing relevance as well as its appropriate focus.

132. In addition, emphasis should be firmly placed on use of fisheries research to support fisheries management and development objectives The requirement for fisheries management plans for each of the major commercial fisheries in the Fiji Islands (Section III) could be a powerful tool for improving fisheries research in the country. Such plans require staff to articulate objectives, strategies for attaining the objectives, and any information necessary in this process. Quite simply, the obtaining of that necessary information should be considered the priority research for the fishery concerned.

Recommendation 18. To promote the above activities it is strongly recommended that a Research Advisory Committee (RAC) be established to better prioritize research, provide the necessary degree of technical oversight, and assure that the results of research are adequately reported.

Recommendation 19. Emphasis should be firmly placed on use of fisheries research to support fisheries management and development objectives. This is to be achieved by explicitly recognizing, and establishing, direct linkages between research and management plans.

VI. INSTITUTIONAL SETTINGS

A. Key Institutional Issues

133. Three major institutional issues confront the development and management of the Fiji Islands' fisheries resources:

(i) the urgent need to review and revise the Fisheries Act;[45]

(ii) the need to place the offshore fishing sector on a sustainable and profitable basis through the design and implementation of an appropriate, **transparent** management and licensing regime; and

(iii) the need to modernize the DOF to enable it to assume the role of a contemporary fisheries management agency, focused on the core functions of fisheries management and conservation, as distinct from the production orientation that typifies much of its present activity.

[45] MFF has advised (pers. comm. Miit Baleivanualala, CEO MFF) that a review of the Fisheries Act is in progress and the intent is to implement a revised Fisheries Act in 2006.

134. There are, clearly, overlaps between these matters and it is important that they are considered concurrently. Similarly, several related activities are occurring in policy and legislative development in other government departments and economic sectors that impact on fisheries management. The design of new management and operational systems must also take those into account.

135. The core institutional recommendations, discussed below, are as follows:

(i) Review and revise the existing Fisheries Act as a matter of urgency.

(ii) Introduce other important legislation relating to the management of fisheries, and implement management plans.

(iii) Modernize the DOF as a National Fisheries Authority.

136. It is also recommended to seek support for a capacity building program. The above recommendations should be addressed in the capacity building program, along with support for associated matters such as relevant training.

B. The Institutional Setting

137. The institutional setting refers to the policies, formal and traditional laws, regulations, attitudes and cultural norms and beliefs that guide an economic sector and its development. Institutional structures are sometimes referred to as the "rules of the game". Consequently, they relate closely to the enabling environment for the management and development of the sector in question.

138. The key aspects of the institutional setting in which the DOF operates are summarized in Appendix 4. (Reference to Appendix 4 shows that the institutional setting is relatively complex as it includes a range of diverse organizations, laws, regulations, roles and responsibilities.)

139. The DOF is one of the two departments of the MFF. The organizational structure and staff numbers are illustrated in Appendix 5, where it is shown that there are currently 117 established staff positions, 44 non-established permanent positions, and 82 temporary non-established staff (at the end of 2004).

140. A number of stakeholder groups are involved in fisheries development and management. The DOF is the lead government agency, although agencies responsible for matters as diverse as environmental management, tourism, planning, taxation, foreign investment, customs and quarantine, women's affairs, Fijian Affairs, and affirmative action also have an active interest in the sector. Institutions such as the Native Land Trust Board—which is responsible for the leasing of customary land—and the FDB are also involved, as are official schedules like the Register of Native Customary Rights in which the rights of Indigenous Fijians are defined.

141. Customary fishing areas, qoliqoli, are an extremely important component of the institutional setting. The Fiji Islands are divided into 14 provinces, 189 Tikina (sub-provincial areas) and 1169 villages. There are 410 qoliqoli. A village community is made up of clans and sub-clans called Tokatoka, Mataqali or Yasuva. Resources are normally managed as common property. Both land and qoliqoli boundaries are surveyed and clan membership recorded at the Native Lands and Fisheries Commission.[46]

[46] Bogiva, A. 2003, "Customary Marine Tenure: Implications on Community-Based Fisheries Management in Fiji", SPC regional meeting on coastal fisheries management, Nadi 17-21 March.

142. Non-government stakeholders include the commercial fishers and fishing companies; artisanal and subsistence fishers; research organizations like the USP; NGOs such as the WWF, the Wildlife Conservation Society (WCS), and FLMMA; and regional organizations, particularly the FFA and the SPC. Multilateral and bilateral development agencies are also important stakeholders in relation to fisheries development. Organizations such as the Marine Aquarium Council, which is focused on sustainable management of the aquarium fish trade, and which certifies cultured products, also play a role.

143. Industry associations are normally an important component of the fisheries sector. Such organizations have not proven to be effective in the Fiji Islands, with a general lack of cooperation amongst participants in various sub-sectors.

C. Government Policy Stance

144. The principles that guide the roles and activities of government and its agencies and, therefore, its institutional structures, were summarized by the ADB and AusAID (1999, p.15)[47] who emphasized:

(i) placing the highest priority on performing the **core functions** of government well (emphasis added);

(ii) limiting interventions to those that target disadvantaged groups or correct market failures, but only when it is clear that the benefits outweigh the costs; and

(iii) ensuring that interventions are implemented in a way that makes the maximum contribution to poverty reduction and sustainable development.

145. A further principle is based on experience in the Fiji Islands where it has been evident that the nation can capitalize on emerging opportunities. The offshore tuna fishery provides an example of the private sector identifying and developing an opportunity. The ADB and AusAID (1999, p. 14) noted that, "In these circumstances it makes little sense for officials or advisers to attempt to 'pick winners'."

146. Various policies that relate specifically to fisheries are discussed below. Two policy guidelines that apply across government, and that reflect acceptance of the principles outlined above are, however, particularly important. These are:

(i) to provide a sound enabling environment for private sector activity. In its own Corporate Plan, MFF notes that its approach is "to create and provide wherever possible the social and economic environment in which the private sector can flourish"; [48]and

(ii) to intervene only where market failure occurs or where the private sector should not be involved.

147. Again, MFF states that its policy is to be "selective and relates only to areas where private enterprise should not or cannot invest".[3]

[47] Asian Development Bank and AusAID, 1999. *Fiji Islands 1999 Economic Report.*

[48] Deloitte Touche, Tohmatsu, 2003. *Feasibility Study: Report on the Establishment of the National Fishing Corporation*. Ministry of Fisheries and Forests, Fiji, p. 14.

D. Corporate Objectives

148. In its Annual Corporate Plan 2004, Fisheries states its broad management objectives as: (i) to promote marine environment biodiversity and conservation of fish resources; and (ii) to promote and improve food security through availability and accessibility. In relation to the tuna fisheries, the management objectives are outlined in the Tuna Management and Development Plan that was adopted by the government in 2002, where it is stated that "the objectives of the Plan are to provide for maximum sustainable benefits to the Fiji Islands from the resource."

149. Yet the DOF often does not, or is unable to (because of political pressures) follow its own Act, objectives or policy guidelines. This may be partly due to lack of professional capacity on the part of the staff. There is a substantial focus on increasing fisheries production from inshore areas, many of which are known to already be over-exploited, rather than on sustainable management of those resources and food security.

150. Furthermore, The DOF is involved in commercial activity (and plans to become even further involved in such activity), has a substantial focus on inshore production and product development, intervenes even when market failure does not occur, does not weigh up the benefits and costs of intervention, and often pursues strategies—such as the RFSCs—that have a very poor track record throughout the region and which may conflict with food security and sustainability objectives. These problems are compounded by political pressures, along with weaknesses in management, economic and social analysis, and policy development.

151. In the tuna fisheries a common complaint from industry is that the DOF regularly violates the Tuna Management and Development Plan. Additionally, there is no effective mechanism for dealing with grievances and facilitating communication between the DOF and industry.

E. Laws of the Fiji

152. The laws governing marine resource use are laid out in Chapters 158 and 158A of the Laws of Fiji. Chapter 158 is also known as the Fisheries Act. The Fisheries Act emphasizes the role of Fisheries Officers as the custodians of marine resources: the importance of management, conservation and sustainable use of those resources is the central focus of the Act. A number of regulations have been promulgated under the Act. These were consolidated into the Fisheries Regulations 1992. They cover licenses/registration, fees, prohibited fishing methods, prohibitions on the taking of certain marine species, mesh limitations, size limits, and exemptions. The regulations were modified twice in 1997.

153. In accordance with most such legislation the Fisheries Act is focused on regulatory matters, including licensing, as well as on the powers of the Minister for Fisheries.

154. Also relevant is Chapter 158A of the Laws of Fiji, which comprises the Marine Spaces Act 1978. This Act establishes the archipelagic waters and EEZ of the Fiji Islands, and a 12 nautical mile territorial sea. Formal declaration of the archipelagic waters and the EEZ is contained in the Marine Spaces (Archipelagic Baselines and exclusive economic zone) Order.

F. Revision of the Act

155. The present Fisheries Act dates from 1942 and, despite amendments and additional regulations, is outdated. Similarly, the Marine Spaces Act is 25 years old. Since their

introduction, the Law of the Sea has been advanced in a number of ways, including the UN Fish Stocks Agreement and, as of 19 June, 2004, the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Fisheries, to which the Fiji Islands is a signatory.

156. The Convention established the WCPFC, of which the Fiji Islands is a full member. Participation means that the DOF will be required to furnish data and other information to the Commission. This is neither allowed for in the present Fisheries Act nor the work plans of the DOF. These are matters that must be dealt with in the near future, with particular attention to the capacity of the DOF to meet the Fiji Islands' responsibilities to the Commission, while continuing with domestic management of the tuna industry.

157. The Social Justice Act 2001, the Customary Fisheries Bill 2004, and the Environment Management Bill 2004 are also important to the management and development of the fisheries sector. The Social justice Act gives effect to the 20–Year Development Plan (2001–2020), which is the cornerstone of the government's affirmative action program. For example, in fisheries, 50% of offshore, EEZ and processing licenses are to be allocated to ethnic Fijians and Rotumans under the Act.

158. The Customary Fisheries Bill is destined to become law in 2006 The Bill, when passed into law, will repeal Sections 13-20 of the Fisheries Act. The transfer of ownership of the qoliqoli, from the state to the customary owners, is the basis of the Bill and this will need also to be reflected in the Fisheries Act.

159. The Environment Management Bill 2004 is also set to become law in 2005. The Bill enshrines the requirement for environmental impact assessments into law. It binds the government to meet the requirements of the legislation, rather than allowing discretion to meet those requirements. Additionally, the environment legislation will take precedence over other legislation, such as the Fisheries Act. In the case of commercial fisheries, environmental approval will be required as a component of the granting of licenses.

160. Clearly, events have overtaken the existing Fisheries Act and, particularly with the passing of the Customary Fisheries Act, it will become largely irrelevant. There is, consequently, an urgent need to review and revise the Fisheries Act (see Appendix 6 for comments on the proposed Fisheries Management Bill).

Recommendation 20. The Fisheries Act should be reviewed and revised or repealed. There is an urgent need to review and revise the Fisheries Act to take account of major developments that have taken place since the existing Act was introduced (see above discussion). There is also a need to include provisions such as those for aquaculture, management of artisanal fisheries, property rights considerations, the work of the Tuna Commission, proposed restructuring of the DOF (discussed below) and post-harvest handling.

G. Modernizing the Model for Fisheries Management

161. The premise for a revised approach to fisheries management in the Fiji Islands is that it should be based on a 'triple bottom line' approach. That is, fisheries management should take account of not only the economic outcomes, but also environmental and social performance. This is the approach now pursued by fisheries and other resource management agencies around the world. The model is also based on the need for the DOF to move from a production orientation to a resource management, conservation and service orientation.

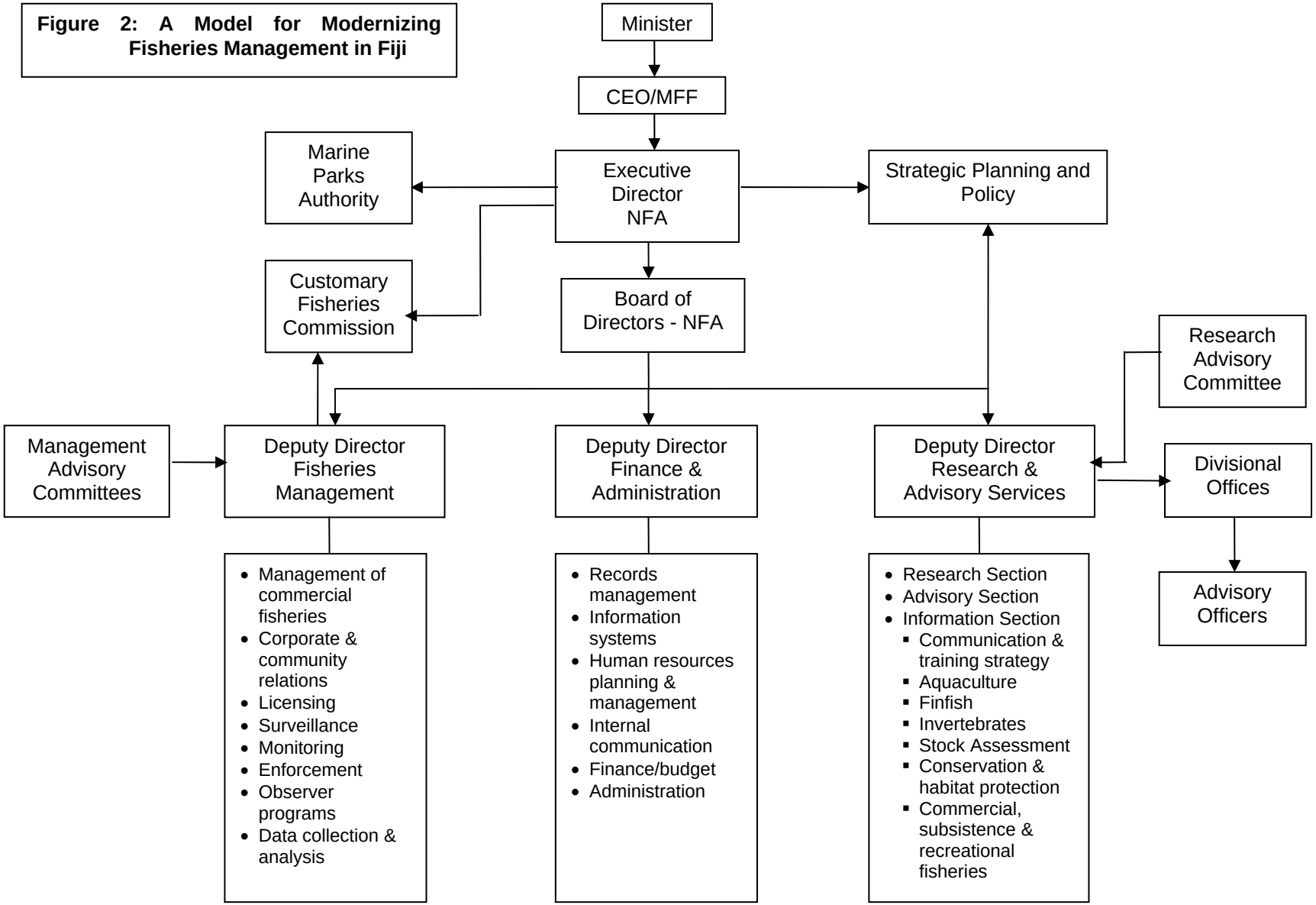
162. Any model for fisheries management is, necessarily, based also on existing policies, legislation and the structure of the sector. Furthermore, it is guided by attention to the core functions of fisheries management and the DOF.

163. With support from the FFA, a Fisheries Management Bill was drafted in 2002. The Bill included provisions to repeal the existing Fisheries Act and, subsequently, to bring fisheries legislation up-to-date. The central feature of the Bill was the proposal to establish a NFA, although that proposal was restricted to a NFA that manages the tuna fisheries. The recommendation outlined below, however, is that the NFA should replace the entire DOF and encompass the management of all fisheries in the Fiji Islands.

164. The proposed, revised model for fisheries management is shown in Figure 2, which is based on adoption and implementation of a NFA model for management. This approach is consistent with government policy, which emphasizes the reorganization of the public sector to make it more efficient, transparent and accountable, and which also places focus on promoting private sector activity, with government bodies focusing on their core functions. Revisions to the structure and activities of the DOF provide a real opportunity for the CEO and Director of Fisheries to take a proactive stance, a stance that renders the DOF more efficient and effective.

165. The major feature of the NFA is that it is not controlled by a single public servant, but rather by a board made up of a variety of stakeholders, including representatives of the tuna industry, inshore fishers, relevant Ministries and the NGO community. As the Authority is responsible to the Board, the work of the Authority will become more aligned to wishes of the members of the board, instead of the often adversarial relationship that exists now between the staff of the DOF and fishery stakeholders. This change will promote greater relevancy of the work program, increased transparency, and a higher degree of accountability—features that are desperately needed at present. Although the transition to an NFA-type arrangement would represent a major step for the government, such bold action is required to address the main problems associated with the DOF. The move to an Authority should certainly be supported, but in a form somewhat different than that proposed in the Fisheries Management Bill. As presently formulated, the scope of the Authority is limited to the management of tuna fisheries. The NFA's responsibilities should be expanded to encompass the management of all fisheries (inshore/offshore, aquaculture, mariculture, conservation, live aquarium fish & corals etc.) in Fiji.

Figure 2: A Model for Modernizing Fisheries Management in Fiji



166. The policy of the Government to commercialize, reorganize or privatize its 24 ministries is relevant here. The Ministry of Public Enterprises and Public Sector Reform (MPEPSR) is responsible for this policy and its implementation (Box 2). Currently, MFF is given a priority of "Early to Medium" for commercialization. The first step is for Cabinet to declare a ministry as a "reorganization entity under the Public Enterprise Act." When a Ministry is declared for reorganization, MPEPSR prepares—or has prepared—a charter that spells out the required actions and the timetable for reorganization.

Box 2: Reform Role of Ministry of Public Enterprises and Public Sector Reform

> In Cabinet Decision No. 522 of 15/10/2004, Cabinet (i) noted the benefits of having a central coordinating Ministry to implement the Public Sector Reform Programme; (ii) agreed that the Ministry of Public Enterprises and Public Sector Reform be the Ministry responsible for the implementation of the Public Enterprises and Public Sector Reform; (iii) agreed that the Ministry of Public Enterprises and Public Sector Reform be part of the Central Agency network of Government; and (iv) directed that all Ministries and Departments are to fully cooperate and assist in the reform program, initiatives and actions pursued by the Ministry of Public Enterprises and Public Sector Reform.

167. At present, the DOF is poorly focused in terms of core functions. Furthermore, the weak linkages between various sections of the DOF hinder its functionality. There is an urgent need to reorganize and modernize the DOF, preferably through the process laid out by MPEPSR.

168. The proposed model for fisheries management is focused on resource management, as emphasized in the Fisheries Act, rather than on production activities. It would emphasize the DOF' role to facilitate rather than prescribe industry development. The model endorses increased cooperation between the private and public sectors, particularly through initiatives such as the establishment of Management Advisory Committees. Additionally, it is based on government policies that: (i) endorse a greater role for the private sector and government intervention only where private sector activity is inappropriate or unlikely; (ii) promote sustainable use of the natural resources of the Fiji Islands; and (iii) encourage transparent management systems.

Recommendation 21. The Government should support modernization of the DOF, leading to the establishment of the NFA, with a Board comprised of a mix of stakeholders. The NFA should facilitate industry involvement in fisheries management through the formation of Management Advisory Committees (MACs) for each fishery. The successful approach adopted in Papua New Guinea could be used as a model on which to establish the NFA. The NFA would have three Divisions: (i) Finance and Administration; (ii) Management Services; and (iii) Research and Advisory Services. Each would be headed by a Deputy Director[49].

169. The establishment of the NFA would require revision of the Fisheries Act, and this should be the first step in the reorganization process. A timetable for the phased reorganization of the DOF into a NFA should also be developed, a task that can be facilitated by MPEPSR.

[49] This proposed structure will need to be reviewed and refined in consultation between the Department of Fisheries and MPEPSR. This would be best undertaken during the proposed capacity building TA (see Section 6.J below).

170. In the initial stages of implementation the NFA would concentrate on improving efficiency, implementing internal management and control systems, and establishing transparent procedures and processes. Its statutory management functions of licensing, surveillance, enforcement, data collection and monitoring would continue from the current DOF, while its other functions would be established and replace existing DOF structures and approaches.

1. Finance and Administration

171. The Finance and Administration Division would have responsibility for budgeting, financial management and staffing, including human resource planning, management and development. It would develop an internal communication strategy and ensure strong and appropriate linkages between the different Divisions in the organization. Finance and Administration would also play an important role in servicing the Board of NFA and the Customary Fisheries Commission, providing a secretariat service to these bodies. It is recommended that the Fleet and Technical Services section of the existing DOF be incorporated into Finance and Administration, but that a timetable is established to phase out fleet and technical services.

2. Management Services

172. This is a core function for the DOF, currently undertaken by the Management and Technical Services section. It would be given greater prominence in the NFA. The Board of NFA would be responsible for the licensing of offshore fisheries, although the actual services, along with the observer program and monitoring would be carried out by the Division of Management Services. The Division would also collect, collate and analyze data for all fisheries. These data will be of value to the Board and to policy makers for developing policies and management strategies that support the sustainable management of the country's fisheries.

173. As noted previously, management plans need to be developed for each major commercial fishery, with Management Advisory Committees (MACs) established for each of those fisheries. The management plans relate closely to licensing, so the MACs will need to develop a strong working relationship with the Management Division of the DOF.

174. Management Services would also provide professional support to the Customary Fisheries Commission, which will be charged with the responsibility for licensing inshore commercial fishing activities under the Customary Fisheries Act.

3. Research and Advisory Services

175. Currently, the DOF devotes around 63% of its budget to supporting two extension sections: Capture Development and Extension, and Aquaculture Development. Staff members in these sections are heavily involved in production-oriented activities and attempts to develop new industries. They are also involved in the subsidized operation of the RFSCs, a shrimp hatchery, development of tilapia farming, a pilot pearl farm, and a range of other activities. Staff members are also responsible for the subsidy program of the DOF.

176. There has been some move towards greater involvement in resource management activities in recent years, particularly through cooperation with NGOs such as FLMMA, and in 2005 the DOF takes over the role of coordinator of FLMMA.

177. Nonetheless, as discussed in Section III, there remains an overwhelming need to refocus the work of extension service personnel away from production focused activities to activities where information, advice and local training are provided to assist fishers to make

decisions about their activities. The facilitation role of advisory officers would be emphasized. Their activities should be much more closely aligned with the current management and conservation objectives of the DOF.

Recommendation 22. The existing Capture Development and Extension, and Aquaculture Development sections should be brought together into one Advisory Section within the Research and Advisory Division. The existing Training and Education Section should also be brought into advisory services as an Information Section.

178. The existing Training and Education Section would become an enlarged 'Information Section' within Advisory and Research Services. It would have responsibility for train-the-trainer activities, as well as for developing advisory materials in a format suitable for widespread public use. These materials might include posters, brochures, videos, radio broadcasts, and so on. They would also be supported by local-level field days and training activities.

179. The Information Section will need to be resourced at a sufficient level to allow it to effectively meet its responsibilities. A priority activity for this section will be the preparation of a communication strategy for the NFA. This section would also be the main link with the National Fisheries Training Center—discussed below—if such a Center is established.

180. The preferred approach taken by Advisory Officers to their revised roles is that of participatory learning and action.[50] Furthermore, their activities can be enhanced by forming collaborative partnerships with NGOs, other organizations, and fishers.

H. Other Proposed Initiatives

181. Two other initiatives proposed by the Ministry of Fisheries and Forestry should be dealt with briefly.

182. The first initiative is the NFC. A major concern with this proposal is that, as the country's fisheries are approaching a stage of full development, any commercial opportunities pursued by NFC would inevitably involve crowding out the private sector. It is naïve to assume that the NFC could "operate complementary to existing commercial activities". It also seems unrealistic that unspecified "strategic relationships" will somehow enable the NFC to fulfill its objectives.

183. It is recognized that one of the aims of the NFC is the promotion of indigenous Fijian participation in the fisheries sector. Considering the past disastrous experience with government fishing companies in the Pacific Islands (including the Fiji Islands), the large cost of such undertakings, and the possibility of crowding out the private sector (which may represent the most sustainable avenue for indigenous participation), the conclusion that NFC could be an effective tool for affirmative action seems unwarranted.

184. Of relevance to the establishment of NFC is the general subject of government involvement in fishing, which was explored in a study in 2002 by the FFA. The report stated: "There appeared to be a remarkable change in attitude by fisheries officers towards government commercial involvement. Learning from past difficulties, most of the fisheries officers encountered expressed the sentiment that the government should refrain from commercial involvement and focus on improving the policy environment. With respect to actual commitment, it appears that in many countries, efforts have largely changed from

[50] This method is described by Langi, Qauqau and Korvulavula (2001) in *Enhancing the Management of the I Qoliqoli: A Manual for Fisheries Officers in Fiji*. FAO report to the Department of Fisheries.

promoting state enterprises to encouraging domestic private sector fishing and, secondarily, foreign involvement in other aspects of the tuna industry."

Recommendation 23. It is strongly recommended that the proposal to establish a National Fisheries Corporation (NFC) be strenuously opposed. The proposal is clearly at odds with stated government policy on private sector facilitation and development, runs counter to the very poor experience with government activity in the commercial aspects of fisheries both regionally and within the Fiji Islands, is outside the core functions of a modern fisheries management agency, will almost certainly crowd out the private sector in most aspects of fisheries, and is not based on a genuine need to overcome market failure or inappropriate private sector activity.

185. The second initiative is that of the establishment of a National Fisheries Training Center (NFTC). A feasibility study was undertaken in respect of this proposal by USP and the Fiji Institute of Maritime Studies in 2004.[51]

186. Amongst the key findings of the feasibility study were: (i) a NFTC is both feasible and desirable; (ii) the NFTC should be allied to, but independent of government; (iii) there should be strong linkages to the DOF and to other government ministries and departments, possibly as a corporation or statutory authority; (iv) there should be strong linkages to the fishing industry through board membership and advisory committees; and (v) the NFTC should be managed by an independent board. It is also noted that a new facility is not required, but, rather, there are existing underutilized buildings available for use.

187. The conclusions of the USP/Institute of Marine Studies are supported. However, there are more pressing matters confronting the DOF—revising the Fisheries Act, licensing in the tuna fisheries, and modernizing the DOF—that should be given greater priority than the establishment of a NFTC.

188. It is also relevant to note that during workshops with DOF staff a common grievance of graduate policy officers was the difficulty in receiving feedback from supervisors. In some instances, the level of motivation and drive of graduate recruits greatly exceeded that of their superiors. Team building exercises may be required to address problems of this kind. A real concern is that some of the more talented recent recruits will be lost to higher paying jobs in the private sector if they are not presented with a more invigorating and dynamic work environment and provided with suitable direction.

I. Marine Parks Authority

189. In keeping with the increased focus on conservation and management activities, the DOF has become more involved with organizations such as FLMMA. The drive for a system of MPAs has come largely from communities and NGOs, with active support from the Environment Department. The DOF also has significant expertise to assist the development of protected areas. More coordination is, however, needed in this area.

190. The Government should investigate the potential to establish a Marine Parks Authority or Marine Protected Areas Authority. The Authority would preferably involve a partnership between the DOF, the Department of Environment, and NGOs. The actual Authority might comprise only three to five members, and be chaired by either the Executive Director of the NFA or the Director of the Environment Department. The Authority would make decisions on work programs and the establishment of a network of MPAs, and would

[51] USP Marine Studies Programme, and School of Maritime Studies, Fiji Institute of Technology (2004), *Feasibility Study for the Establishment of a National Fisheries Training Center in the Fiji Islands*. Submitted to MFF, October 2004.

also apportion the technical work between Fisheries and Environment staff on an agreed basis. Such an approach to the management of MPAs has been implemented successfully in other international jurisdictions. For example, this approach is adopted in New South Wales, although there is a statutory requirement for the Executive Director of the Department of Premier and Cabinet to head the Marine Parks Authority, and secretariat support is jointly provided by the Department of Primary Industries (Fisheries), and the Department of Environment and Heritage.

191. One of the reasons for the trend away from Marine Parks management being solely governed by fisheries departments is that this does not create an even balance between environment and development objectives. Also, many of the central policy issues relating to marine park management cut across the fisheries and environment portfolios. In summary, priority should be given to examining the Marine Parks Authority model, but, in terms of reform sequencing it would seem appropriate to introduce the NFA first, and then examine options for establishing a MPA.

J. Capacity Building

192. The major needs facing the DOF are reorganization and capacity development, including all the elements of such development: institutional, organizational and human resources development. The focus should be on transforming the DOF into a modern fisheries management agency. The need for reorganization and capacity development arises also from the many changes that are presently being implemented in the Fiji Islands, such as the Customary Fisheries Bill, and the pressing need to develop and implement an efficient licensing system for the offshore fisheries. It is also worth mentioning that there is a paucity of well worked policy papers to assess management options and this is a direct reflection of the limited capacity within the DOF.

Recommendation 24. It is strongly recommended that the DOF seeks Capacity Building Technical Assistance (TA) from a donor organization. The TA would support restructuring of the DOF, its refocusing as a modern conservation and management agency, revision of the Fisheries Act, a revised approach to tuna management and licensing, and strengthening of human resource capabilities through targeted training. Three specialists are required: one economist, one fisheries policy specialist, and one expert in community-based fisheries management. The duration of the program, given the large-scale reform requirements, should be for a period of two years.

193. To be effective in instilling the necessary reforms any donor' support of such a TA should be conditional upon the following requirements being met:

(i) agreement by the government to reorganize the DOF, preferably under the reorganization process facilitated by MPEPSR;

(ii) abandoning the NFC proposal;

(iii) commitment to reorienting the focus of fisheries research and extension activities to resource management and service provision, rather than production and product development;

(iv) formulation and implementation of a plan and timetable to review the DOF's commercial activities, with a view to appropriate divestment, including its Fleet and Technical Services;

(v) agreement to make greater use of outsourcing of technical services, research and education (eg., using a mechanism such as the RAC);

(vi) formal commitment to adhere to the Tuna Management and Development Plan, including application of a firm policy on license limits for the offshore fishery;

(vii) commissioning of a rigorous cost benefit study of the proposed regional service centre—this study, for which it is recommended that funding be provided by the ADB, would be undertaken by an independent entity with no direction placed on the consultants in respect of the report findings; and

(viii) adoption of a more rigorous process for program evaluation.

194. Consideration should also be given to requesting a loan (or grant from FDB if less than $1 million and for management purposes) from a donor organization to support redundancy packages, if required, in a reorganized the DOF. This would support a process of making all key positions contestable so that new positions within the NFA are filled on a merit basis. The Government's loan commitments to support the redundancy packages would be more than offset by improvements in the efficiency of fisheries if this successfully promotes a strong move in the direction of best practice.

195. Other elements of the capacity building TA would include: (i) training for extension officers in communication skills, advisory methods, financial analysis, and the formulation of conservation and management programs; (ii) a skills audit, leading to other training deemed necessary, such as training in economic analysis, environmental management, and policy analysis and development; (iii) attachments to fisheries management agencies in other nations; and (iv) strengthening of the training and education section and supporting its conversion to an effective Information Service.

196. Clearly, an important role for the TA would be to support greater coordination amongst the many activities underway or required of the DOF. For example, revision of the Fisheries Act needs to be harmonized with the review of the Tuna Management and Development Plan, the development of the Customary Fisheries Act and the Environment Management Act, development and implementation of a new licensing system for commercial fisheries, and the reorganization of the DOF into the NFA.

197. In addition to developing its own economics capacity, the Ministry should be encouraged to draw on the availability of world-class natural resource specialists in the region. Contracting out of key economic and social assessment studies to agencies such as the Australian Bureau of Agricultural and Resource Economics and other research entities and consulting firms is standard practice for most natural resource managers in Australia. It would seem logical for Fiji to adopt a similar approach (albeit in a manner that is coordinated with the efforts of regional research entities such as SPC and FFA).

198. Finally, it may also be appropriate for certain fisheries activities to be considered for inclusion in the proposed Outer Island Development Project to be supported by ADB. This might include infrastructure needed to support various fisheries activities. It might also include investment in new port facilities in Suva to reduce the overcrowding currently experienced by fishing vessels.

VII. SECTOR GROWTH

199. MFF has set down a F$258 million investment program to stimulate sector growth and, as mentioned, has set down a growth target of F$500 million for the sector. The investment program needs to be critically examined, as does the sector growth target. Appropriate interventions need to be identified to enable the Government to establish an effective policy approach to sector growth.

200. Moreover, it is apparent that the Government is looking for ways to stimulate the fisheries sector in order to meet its growth targets. However, inefficient investments and inappropriate interventions will not improve the sector's performance and a rigorous framework for promoting growth in an economically efficient and environmentally sustainable fashion is clearly needed.

A. Assessment of the Department of Fisheries' View

201. For this review a workshop was held with DOF officers to consider growth prospects for key fisheries sectors. In addition information about the DOF's view on growth prospects can be gleaned from its fishery development programs and its planned investment program (Appendix 7).

202. The principal fisheries considered to have growth potential (not all Government Policy because some of the growth prospects were identified during the workshop) include:

(i) various aquaculture sectors such as black pearl, shrimp, seaweed and tilapia;

(ii) the small-scale tuna fishery;

(iii) the marine aquarium fishery;

(iv) the deepwater snapper fishery; and

(v) the LRFF fishery.

203. The DOF is evaluating the option of investing up to F$150 million in developing a regional service centre to attract foreign vessels to use Fiji as a hub for maintenance and provisioning of fishing vessels The CEO of MFF, Miti Baleivanualala, advised that unless there is private sector interest Government will not be involved directly in development of a regional service cener. Development of outer island fisheries is also being promoted through the establishment of RFSCs. (Again this has to be evaluated for economic viability and contrasted with the alternative which is development of a mobile RFSC rather than fixed centers).

204. In addition, the DOF is also seeking to increase value-adding through its HACCP compliance program which will improve access of loins and fillets into European markets. The Forum Secretariat has also commissioned profiles of economic and technical feasibility for 14 small-scale value-added activities including processing of fresh and frozen pelagic steaks, smoked tilapia fillets, seaweed processing, and collection of marine natural products for medical research. The key focus here is on the establishment of templates of protocols for exports and quarantine and inspection which are the roles of DOF including training of industry personnel.

1. Regional Service Centre

205. In 2004 Walu Bay port in Suva received more than 300 visits from foreign fishing vessels and over 500 in the preceding year. In response MFF is evaluating the potential for development of a regional service centre. The cost of developing the Rokobili site in Walu

Bay is estimated at between F$50 million and F$150 million, depending on the capacity and configuration of the development. Other sites may be also be considered as the options for development to avoid congestion in Suva Port (eg., Lami, Lautoka and Savusavu - ie., with the completion of a new international airport.)

206. While it is beyond the scope of this study to conduct of full economic appraisal of the RSC we do hold a number of reservations about the viability of the projects. These reservations include the following:

(i) the lack of scope for an increase in vessel visits. Industry analysts have observed that only fresh fish longliners fishing in Solomon Islands, Vanuatu and the Fiji Islands and wishing to air freight fresh fish are likely to consistently select the Fiji Islands as a destination port. Other vessels (ie., vessels with super freezers) will elect to either transship at sea (although this is prohibited under the new Tuna Commission) or minimize costs by steaming direct to Pago Pago or Japan for offloading rather than spend around US$720/per container on ex-Suva transshipments (Pers. Comm. Russell Durham, business development manager, Fiji Fish);

(ii) the period of time and resources required to develop engineering expertise to service foreign vessels. This is likely to be a major hurdle as it would create lags in the development of RSC business activity thus reducing the project returns immensely;

(iii) the negative impact on demand of the new JICA funded jetty currently being developed at Lami. If this facility—which is to service local tuna boats, smaller snapper fishers and other artisanal fisheries—alleviates congestion at Walu Bay then, clearly, benefits from developing the Rokobli site are lower; and

(iv) the economic cost on the domestic tuna fishery resulting from increased competition for air cargo space. If there is increased demand for air cargo space this is likely to force up the freight charge, thus reducing profits for the domestic fishery and reducing resource rent attached to the Fiji Islands' fish resource. In a more extreme scenario, if fish caught by the domestic fleet cannot be exported during periods of peak demand for air cargo space, then the loss in the value of fishing the country's tuna resource would be even greater.

207. The pre-feasibility study of the Rokobili development recently undertaken for MFF[52] showed very high returns on investment. However, the study is seriously flawed because it included all expenditure as benefit items without attributing the relevant costs (eg., fuel sales and crew expenditure are counted as benefits but not the associated costs of supply). Furthermore, direct and indirect benefits were not clearly distinguished in the study. Cost benefit analyses should be divided into two parts—(i) an assessment of the rate of return on investment focusing solely on costs and benefits directly linked to the specific services provided by the regional services centre; and (ii) an, as a secondary consideration, an assessment of the economic flow-on effects (eg. crew expenditure in the local economy).[53]

[52] NETTS Planning & Infrastructure. 2004, Fiji International Fishing Port-pre-feasibility study, Report prepared for the Ministry of Fisheries and Forests, December, Suva.

[53] Economic flow-ons, or indirect benefits should not be added to the direct benefits as they are measures of economic activity and not measure economic gains attributable to an investment. The significance of indirect items in cost benefit studies is poorly understood and often given too much weighting. The weight attached to indirect benefits should in fact be quite low because a large proportion, if not all, of such flow-ons would not be lost to the economy under an alternative investment scenario. Furthermore, if instead of investing in the RSC

This enables the economic value component and economic activity components to be separately assessed which is extremely important when conducting cost benefit studies.

208. On balance it is considered that the likelihood of a RSC meeting core investment criteria is extremely low, and the above discussion highlights the key concerns held about the potential viability of the RSC and hence the dependence on subsidies. In addition, there are also concerns about negative social and environmental impacts that would need to be comprehensively evaluated if the initiative is to be further examined.

2. Value Adding

209. There is some evidence that value-adding activity could increase, including:

(i) Solander (Pacific) LTD indicated that, despite higher labor costs than many canneries, it had some initial success in supplying loins to countries in Europe and Asia. Solander overcame the labor cost problem, by focusing on the supply of loins to canneries located in countries with high labor costs and high duty on canned fish, as the loins do not attract duty;

(ii) large supermarket chains in Germany and other EU countries have also expressed interest in purchasing large quantities of tuna steaks from the Pacific region. However, the indication is that they would need guarantees of large continuous supplies before entering into long-term purchasing arrangements. To offset the effects of seasonality and other contributors to low supply volumes, this would require coordination from countries within the region (possibly Fiji, Vanuatu, and the Solomon Islands). Further investment in processing facilities would be required to support this activity, but the Government's role should only be in the form of coordinating the initial scoping of market opportunities and coordination activities;

(iii) there has been interest from hotels in increasing the use of locally-caught reef fish and tuna by-catch. The tourism industry has become one of the largest sectors of the economy in the Fiji Islands and there are indications that it will continue to grow. According to Ministry of Tourism officials, 70% to 80% of all food served in the tourism industry is imported, and the relative amount of imported seafood is even greater. The Fisheries Sector Specialist for this review indicated that: "It seems that there is an opportunity to encourage the hotel industry to make use of the wide variety of domestic seafoods. Such encouragement should be in the form of awareness/facilitation rather than product development, involvement in commercial marketing, or taxing imports''. (However, the difficulty in increasing the amount of locally-caught fish supplied to hotels and resorts is that they require levels of supply reliability and quality that the domestic operators have not been able to meet); and

(iv) small-scale valued-adding activities identified in the 14 "profile studies" recently commissioned by the Forum Secretariat. Each of the profile studies show exceptionally high returns on investment. However, more rigorous assessment of the proposed value-added activities is needed before the Government invests in them. One of the concerns is that the profiles indicate extremely high levels of profitability that are unlikely to be reflective of the true economic potential for the value-adding activities. This is usually symptomatic

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the Government decided to lower taxes then this would induce economy-wide growth with associated flow-on benefits.

of flawed modeling assumptions, and hence the assumptions should be re-examined and more thoroughly tested.

210. In summary, while there may be some potential for increases in economic benefits from the sector through value-added activities, in many ways it would be premature to factor these benefits into growth forecasts. Furthermore, we would caution against over-zealous promotion of value-added activities. The experience with PAFCO in the Fiji Islands and Solomon Taiyo in the Solomon Islands is that the dependence on subsidies of fish processing companies effectively means that they can become a significant burden on the economy.

3. Aquaculture

211. An examination of the general advantages and disadvantages of aquaculture in the Fiji Islands is contained in Pickering and Forbes[54]. The SPC Aquaculture Portal (website WWW.SPC.INT) has information on the constraints of aquaculture in the Fiji Islands.

212. Specifically with respect to exports, there are some advantages/disadvantages common to all aquaculture exports, while some are applicable to only specific products. The general advantages enjoyed by most aquaculture exports are:

(i) the government is generally supportive of the aquaculture industry; and

(ii) good water quality.

213. The general disadvantages are:

(i) high production costs, including labor and feed;

(ii) high transport costs; and

(iii) periodic cyclones.

214. Some advantages/disadvantages of Fiji aquaculture products in international trade are specific to certain products and are relative to competing countries. Commodities that are presently exported in significant quantities, or for which there is considerable export enthusiasm, include seaweed, black pearls, marine shrimp, and tilapia.

215. Transport has been blamed for the poor performance of seaweed farming, but the low farm-gate price of 50c/kg is the main cause of the problems. The current negotiated price is barely adequate to cover labor and production costs and has resulted in a loss of interest and frustration among farmers, causing them to venture into other alternative sources of income. However, in distant and remote islands, especially in the Southern Lau Group, as in the case of Ono-i-Lau, seaweed is the only source of income available. Hence there is some on-going production from these areas which appears less dependent on continued subsidization. The DOF's aquaculture specialist maintains that if dry seaweed production achieves 80 to 100 mt per month (dry weight), then the price will increase to around 75c/kg (as the international buyer can pass on some of the benefit from consistency of supply). The DOF also has plans to consult with Kiribati and other Pacific Islands producing countries to form a Regional Cooperation in the setting up of a seaweed processing factory, but it is generally accepted that seaweed companies have elected not to invest in processing plant in the region due to poor economic viability compared with the

[54] Pickering, T. and A. Forbes 2002. *The Progress of Aquaculture Development in Fiji*. Technical Report 2002/1, Marine Studies Programme, University of the South Pacific.

Philippines and Indonesia. Overall, the experience with seaweed has been quite poor despite high levels of subsidization and the indication is that the production level will only increase if transport and marketing activities are subsidized. Hence we do not factor in growth of seaweed mariculture.

216. On balance, we do not envisage any rapid growth in freshwater aquaculture simply because the evidence to date is that production is heavily reliant on Government subsidies. For example, Tilapia has been more successful production wise, but is not yet economically viable in its own right. Hence, the DOF is getting a little ahead of itself in planning for rapid growth of the sector.

217. There is, however, firm evidence that shrimp farming and black peal farming can be economically viable. But given the risk factors involved, particularly for shrimp farming, which has had large difficulties in building up production levels (due primarily to problems in building up production of post larvae and reliance on expensive imported feed), we have only factored in modest growth in these sectors in our sector growth forecasts (albeit large percentage increases as they are both at low current levels of production).

4. Capture Fisheries

218. There is some potential for increases in profitability/resource rent from capture fisheries, but, not surprisingly, limited scope for expansion and, in fact, contraction of fishing effort in some fisheries (Section 7.B.4 below) would enhance profitability.

219. The small scale-tuna fishery may experience a resurgence, as there were some 30 small scale tuna boats assisted into the fishery before the demise of the FAD program, but following the failure to redeploy FADs the number of boats declined to just six. Some growth in this fishery is likely if the FAD program can be rejuvenated.

220. The LRFF trade became active over the 1999-2002 period[55] but while producing good returns while fishing takes place—fishers can earn between F$300 and F$700 per week—fishing cannot last long because the target species (ie., coral trout and coral cod) are very slow growing. Hence the focus of the LRFF should be on sustainable management of the resource rather than fishery development. The live reef fishery is intermittent and as the stock is slow growing the yield is low. It is therefore unlikely that this fishery will grow beyond the current level (ie., around F$450,000 p.a.)

221. Industry specialists hold the view that the deepwater snapper fishery is marginal at best due to low prices (the price has not moved from US$4/pound for the past 10 years). This is the reason that the number of deepwater snapper boats has declined to the point where there are just one or two remaining in the fishery. Accordingly, there has been a rapid reduction in vessel numbers. For this reason we have not factored in any growth in the fishery, and would recommend that the DOF review its current policy of trying to re-build this fishery.

222. Our assessment of the main competitors and factors affecting competitiveness for each of the key fisheries that the DOF is looking to for future growth are shown below (Table 7.1). (Additional information on domestic markets for aquaculture, and reviews of relevant economic feasibility studies are provided in Appendixes 8 and 9).

[55] Department of Fisheries, 2004, LRFF Overview Report, Report Complied by the LRFF Project Officer, November, Suva.

B. Additional Impacts on Growth

1. Exploratory Fishing

223. Exploratory fishing in the offshore fishery could lead to sector growth. Offshore longline operators have indicated that there is a strong likelihood of developing an economically viable swordfish fishery but exploratory fishing would be required to determine the suitable fishing areas and to test catch rates. The cost of exploratory fishing is not measured in terms of the vessel operating costs alone, but also includes the forgone revenue from fishing the usual target species (tuna).

224. Private operators cannot generally justify this type of activity due to the “free rider” problem (ie., other operators benefit from the activity) and, therefore, not all of the benefits can be returned to the entity investing in the activity. Industry participants have also located deepwater stocks on depth sounders—exploratory fishing could also be undertaken to determine the species and whether there is a commercially viable fishery. This may require investment in more powerful depth sounders than currently used by industry.

225. Further work would be required to determine whether the Government should invest in exploratory fishing and, if so, how much it should invest. A workshop with specialists in this area from SPC would be a suitable first step in further investigating the merit of funding exploratory fishing.

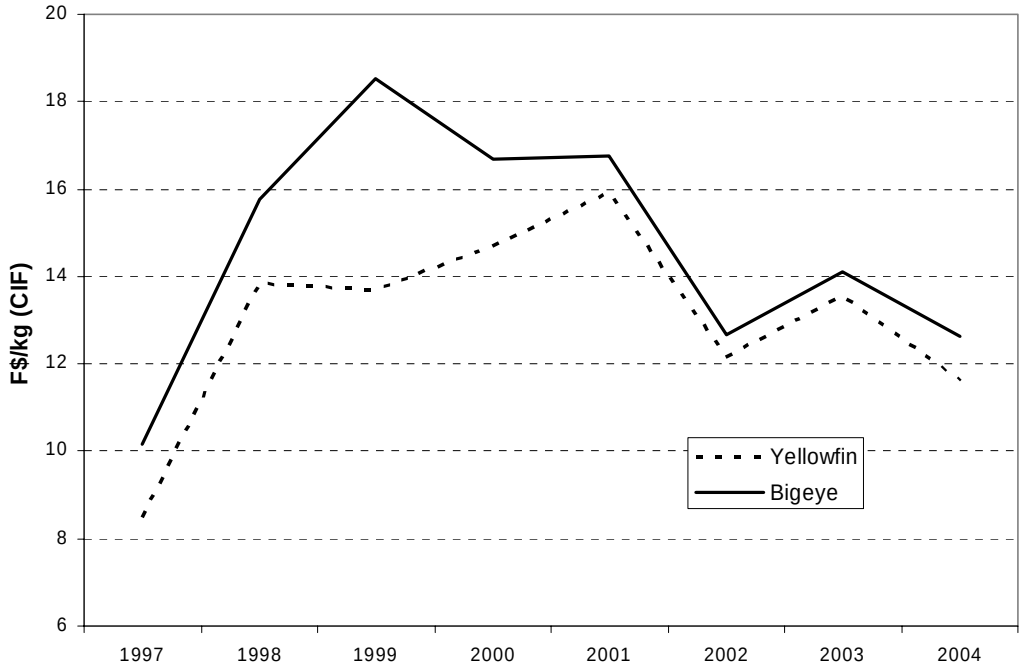
Table 7.1: Assessment of Comparative Advantage for Aquaculture Commodities

Commodity	Main Competitors	Advantage of Fiji Islands	Disadvantage of Fiji Islands
Seaweed	Indonesia Philippines	Overseas buyers willing to offer forward supply/price agreements. Low opportunity costs of some communities.	High labor costs. High transport costs to world market. Less economy of scale. Erratic transport to some growing areas. Presently driven by the public sector. Low labor productivity. Current farmgate price is below reserve wage for villagers
Black Pearls	French Polynesia Cook Islands	Low labor costs. Existence of alternative domestic market. Production of larger pearls of lighter color. Growout to harvest stage in The Fiji Islands only takes 18 months compared to 2 years in the Cook Islands and Tahiti. Village involvement in spat collection	Short experience in industry. Less economies of scale. Less market discipline. Indigenous participation schemes promoting inefficient farm size.
Marine shrimps	New Caledonia China Indonesia Thailand	Two crops per year of Stylirostris possible (only one in New Caledonia). Existence of alternative domestic market. Existence of niche markets in neighboring Pacific Island countries.	High labor costs. High transport costs to world market. Less economy of scale. Small vulnerable producers. Fiji Islands product is relatively unknown in the international market.
Tilapia	Taiwan China Latin America Indonesia Thailand	Positive perception of The Fiji Islands in some markets as an unspoiled paradise. Good availability of land	High labor and feed costs High transport costs to world market Less economies of scale Weak land tenure.
Deepwater Snapper	Tonga United States	Reef slopes contain good stocks of deepwater snapper	Need larger vessels to reach reefs in comparison to Tonga. Cost of fishing is higher than in Tonga as reef slopes are closer to shore. Price in main market (US) has not moved in nominal terms in 10 years, hence real price has been declining Efficient operators report very low profitability (ie. insufficient to warrant further investment)
Live Reef Food Fish	South China Sea	Level of interest from villages is high because can earn significant income in short period (albeit only for a short period of time!) Possibility of developing aquaculture in LRFF	High transport costs to main market (Hong Kong) Low growth rates of target species (Grouper) Only profitable if price is high.

2. Price and Exchange Rate Impacts

226. The largest drivers of changes in the economic performance of the offshore longline fishery are (i) catch rates and (ii) tuna prices in, and exchange rates for, the US and Japan. The price[56] paid in Japan for imports of fresh bigeye from the Fiji Islands fell from F$16.75 in 2001 to F$12.67 per kg in 2004 and over the same period the yellowfin price fell from F$15.90 per kg to F$11.93 per kg (FFA). 2004 prices were the lowest since 1997 (Figure 3). This price reduction has been largely attributed to the 20% depreciation in the Yen against the Fiji dollar over the 2001-2004 period.

Figure 3: Japanese Import Prices for Fresh Bigeye and Yellowfin, 1997-2004



Source: FFA

227. In addition, the US dollar has depreciated by some 25% against the Fiji dollar over the past three years which has also contributed to reduced prices for exports to the US with the fresh yellowfin price falling from F$7.13 per kg to F$5.76 per kg, the fresh bigeye price from F$6.97 kg to F$6.53 per kg and the fresh albacore price falling from F$6.82 kg to F$4.71 per kg.

228. Consequently, the value of catch exported to Japan and the US (75% of total fresh exports) has declined significantly. Coupled with declining catch rates and increase world oil prices, the price falls and exchange rate depreciations have contributed to financial difficulty for many of the offshore longline operators.

3. Crowding Out of the Private Sector

229. Generally, the DOF is not so much crowding out the private sector but, rather, becoming involved in uneconomic activities which the private sector does not appear interested (eg., development of six tilapia markets, marketing of seaweed). The exception would be fish marketing in some outer island areas already serviced by private markets

[56] All prices are inclusive of cost insurance and freight (CIF).

which could be crowding out the private sector. While this has a detrimental effect on private sector operators in the affected areas, it is not highly relevant in terms of overall sector growth. As discussed in Section VI, however, if the DOF proceeded with plans to establish a NFC then crowding out issues would become prominent and damaging to the performance of the sector.

230. A related issue is distortions to the operation of markets created by inefficient policies. Some of the aquaculture policies related to farm size, location and configuration represent decisions best made by the private sector and could reduce the potential for sector growth (Section III).

231. It should also be noted that shrimp farmers maintain that the Government's shrimp hatchery has crowded out the private sector, and this point may be valid. Further examination of the costs and benefits of the Government's shrimp hatchery is required to determine whether it is appropriate to continue to fund the hatchery. MFF has acted on this issue, and has leased its shrimp hatchery to a private sector entity. (Details of the lease arrangement were not known at the time of finalizing this report, and hence the effectiveness of these arrangements in overcoming the hatchery problems may need to be reviewed).

4. Increasing Efficiency of Fisheries

232. There are a number of ways in which the efficiency of Fiji Islands Fisheries can be improved, with potential for substantial economic gains. Reform of the system for indigenous participation is likely to be associated with increased fishery efficiency, and could facilitate growth in key sectors such as pearl oyster farming. In the inshore and offshore longline fisheries increasing the efficiency and yield through improved management, and, in many cases, reduction in fishing effort is likely to significantly increase profitability and resource rent. For example, FFA/SPC[57] recently estimated that resource rent could be increased by F$6 million to F$9 million p.a. through fleet rationalization.[58] If, in addition, the efficiency of inshore fisheries could be increased by even 10% this would equate to F$2.8 million in benefits each year. Annual economic benefits, in terms of resource rent, from improved management of Fiji Islands' fisheries could therefore be more than F$10 million.

5. Additional Marketing Activities

233. Both pearl oyster farmers and marine aquarium operators identified the need for "buy Fiji" marketing campaigns. This initiative would help support prices if supply increases, but should be coordinated through peak industry bodies. The DOF could provide assistance through provision of secretariat support to assist in the development of active industry associations.

C. Impediments to Growth

1. Aquaculture

a. Land and Water Tenure Issues

234. Generally, development of aquaculture is not hampered by the availability of suitable sites with the main criteria being the availability of clean water, natural flushing of the water systems (ie., in brackishwater and mariculture fish farms), and natural protection from

[57] FFA/SPC. 2004. *An Economic Analysis of the Fiji Longline Fishery*, Report to the Fiji Islands Government, October, Honiara.

[58] Currently there is economic overfishing as there are more vessels in the offshore fishery than required to maximize economic performance. This is in contrast to biological overfishing which is the scenario whereby the number of vessels, or level of fishing effort, exceeds that required to achieve maximum sustainable yield.

cyclones.[59] However, land tenure issues remain a potential impediment given the nature of the legislation regarding leases of native land (93% of the Fiji Islands land) and crown land (important as it relates to mangrove areas where brackishwater shrimp is farmed).

235. Maximum lease terms are set down under The Fiji Land Act and under the Agricultural Land and Tenant Act. Currently, there are no formal water leases permitted (ie., areas below the high water mark). However, this is to change under proposed legislative reforms which would enable the securing of leases for a period of up to 15 years. However, there are two remaining problems even following this reform. First, this period is too short to offer a sufficient time to earn a commercial rate of return on invested capital—a period of 30 years is required to ensure that benefit of future cash flows is fully taken into account by investors in making investment decisions. Second, for lease periods longer than 5 years, approvals will be required from the Great Council of Chiefs, representing an additional layer of approvals/administration for investors to go through.

236. Another issue that needs to be resolved is that native Fijians are unable to use land as collateral for obtaining finance. This could limit the start up of aquaculture businesses. There is also a view that low lease payments provide insufficient incentive for Fijians to mobilize their land assets. This is an issue that could be examined in the proposed "Review of Fisheries Taxation and Benefit Sharing".

b. Exclusive Rights to Take Fish

237. A related issue that could impact growth of aquaculture is the establishment of property rights in the marine and coastal areas where aquaculture occurs. The aquaculture provisions of the Fisheries Management Bill have been reviewed in an SPC publication (Evans et al., 2003). The comments are endorsed by the Fisheries Sector Review: "The proposed Fisheries Management Bill has improved the current arrangement by attempting to adequately define and distinguish aquaculture from capture fisheries. Although untested, it appears to be a relatively effective mechanism insofar as it will put in place a licensing scheme specifically for aquaculture. The Bill, however, falls short of comprehensively addressing the issue of property rights in the marine and coastal areas and the right to exclusively take fish in the farm area, which is needed to foster private sector development. Hence, this may be an additional area of legislative reform that needs to be examined in the future.

c. Other Impediments

238. In respect of aquaculture the DOF has identified lack of infrastructure in rural areas (telecommunications, water supply, power), and lack of technical knowledge for hatchery operation, contributing to inability to establish a consistent supply of seedlings to farmers. Further work is required to evaluate options for overcoming these problems, although the DOF is focusing its efforts on these issues.

239. Another potential impediment to growth is the financing of set-up cost for villages entering into partnerships with marine aquarium companies for the culture of live rock. A lack of a secure legal system means that there is no guarantee the villages will agree to sell the culture rock back to the company that invested in the initial infrastructure and supplied the manufactured rock. This reduces incentives for companies to provide finance for this activity and the DOF, in conjunction with the FDB or other financial institutions, could look at ways of overcoming this problem.

[59] However, potential damage from cyclones and flood events are two significant risk factors for the sector.

2. The Cost of Doing Business in the Fiji Islands

240. The Government should seek to reduce the cost of doing business in the Fiji Islands, by adopting the strategies set out in the ADB's forthcoming study into impediments for private sector development in the Fiji Islands.[60] This study identifies the following deficiencies in the structure of the business environment in the Fiji Islands: political uncertainty, burdensome regulation, weak property rights, ineffective state involvement in the economy, ineffective legal system for business, and poorly functioning finance markets. Resolving property rights issues is particularly important in respect of the aquaculture fishery as operators are unlikely to invest if there is no protection over exclusive rights to harvest mature fish stocks.

241. For this review, we conducted a survey of fishing industry operators with the focus mainly on processors and vertically integrated processing/fishing companies. The results of the survey are reported in Appendix 10. Importantly, the issues of most concern to companies are: the tax on fuel and other inputs, excessive red tape in dealing with DOF and other Government agencies, and difficulty in finding skilled/productive staff. The results of this survey are potentially extremely beneficial to the Government in examining ways to improve sector performance and should be given due consideration by the Government.

3. Infrastructure Constraints

242. Compared to most Pacific Island Countries the Fiji Islands is quite well serviced in terms of infrastructure. Nonetheless, there are some infrastructure issues that warrant further examination. These include overcoming the problems of overcrowding at Walu Bay and assessing the net benefits associated with regional infrastructure developments including the RFSCs.

243. The Government should commission a study into the requirements for servicing vessels using the Walu Bay port. This study should base demand forecasts on the proportion of vessels fishing in Solomon Islands, Vanuatu and the Fiji Islands that are expected to choose Fiji Island's ports. (This is in contrast to the regional service centre concept which anticipates that a new facility will be able to attract significant numbers of additional fishing boats to Suva.)

244. There is also some consideration of developing a new port at Labasa. However, the DOF will need to apply stringent application of rigorous cost benefit techniques in respect of Labasa and all other large-scale infrastructure developments and to do so it will need to improve its capability in the field of economic analysis (this is required even when outsourcing economic studies).

4. Natural Impediments

245. It is important to recognize natural impediments to growth that Government policy and interventions cannot resolve—at least not in a way that is beneficial to the economy. Examples of natural impediments include:

(i) *Air cargo space*. Leading fish processors based in the Fiji Islands maintain that operation of charter flights has been examined in detail and found to be uneconomic. Moreover, processors have indicated that the reason that there is a fresh tuna industry in the Fiji Islands and not elsewhere in the Pacific (at least not to the same extent) is because of the air cargo space available on

[60] The Enterprise Research Unit. 2004, *Fiji Islands: A Private Sector Assessment – Promise Unfulfilled, Draft Report Prepared for the Asian Development Bank*, September.

flights servicing the tourist market. A potential change that could increase air cargo space would be to reform regulations of air space to encourage more flights into the Fiji Islands. The FFA regional airfreight study, in contrast to the assessment of industry participants, noted that it may be possible to increase airfreight capacity by using dedicated freighter services and combined-services (where freight is carried on the passenger deck). The FFA also noted that carrying freight via Auckland and Sydney is a viable option when direct flights to the US and Japan have no spare capacity (and in fact this option is widely used by industry). While it is beyond the scope of this study to explore the issue of air cargo capacity in more detail, it may be appropriate to commission further research on this issue given the dependence of the offshore fishery and marine aquarium fishery on the availability of air cargo space.

(ii) *Carrying capacity of the resource*. There are a number of cases documented in this report where the Government has pursued fishery development in the absence of due concern for the productivity of the resource. Pushing a fishery beyond its natural limits will lead to a lowering of resource rent (ie., value of the resource) with potential for serious economic losses.

(iii) *Cost structure for competing countries*. If other countries have a comparative advantage in production then the Fiji Islands may not be able to compete in a particular industry. Providing subsidizes and tax breaks and other assistance can lead to short-term increases in exports. However, these strategies generate a net cost on the economy and, therefore, are difficult to justify.

D. Growth Projections

246. In essence there are three key drivers of sector growth. The first is the price of tuna (driven by demand in US and Japan and the strength of the US dollar and Japanese Yen). Current prices for fresh fish are between 6% and 44% lower than in 2001. Recognizing that fresh fish exports make up 37% of export volumes and 55% of total ex-vessel revenues, it considered reasonable to include in an upper-bound projection an overall 10% increase in prices for offshore catch, and a 5% increase under a base-case scenario. The second key growth driver is the degree of success of the DOF in improving the efficiency of offshore and inshore fisheries we factor in growth projections consistent with the estimates provided in Section 7.B.4. The third key growth driver is the expected growth in marine aquarium exports. Currently exports of marine aquarium are valued at F$14 million p.a. and this could double within 10 years under a base-case scenario. An upper-bound scenario would see marine aquarium exports increasing to three times the current level—ie., F$42 million p.a.[61] Hence, the marine aquarium fishery—which requires relatively little input from the Government, other than establishing sound management regimes, represents possibly the best growth prospect in the Fiji Islands.

247. Other second-tier potential contributors to growth (or efficiency improvement) include introduction of the HACCP and European Union compliant food handling systems, as this will provide greater access to European markets. Addressing problems of overcrowding at Walu Bay will improve the efficiency of the offshore fleet which may provide some economic benefits. These benefits, however, are difficult to quantify given the available information and high levels of uncertainty. In addition, at this stage there is too much uncertainty over the

[61] Industry sources have indicated that production could increase by between three and five times the existing levels in the medium term. However, these projections have been moderated to account for uncertainty, the impacts of management regime which may place restrictions over exploitation levels, and price effects.

potential benefits from new value-added activities and exploratory fishing to factor them into forecasts even under an upper-bound scenario.

248. From the discussion above, we would also expect at least some growth in pearl oyster farming and shrimp farming. The current pearl oyster production is in the order of F$2 million (for 2004), the upper-bound scenario incorporates a three-fold increase in production, and a base-case scenario incorporates a 50% increase. Under the upper-bound scenario shrimp production increases to 10 mt valued at F$300,000 and under the base-case scenario it recovers to its previous record level of 6 mt each year valued at F$180,000.

Table 7.2: Indicative Projections of Medium-Term Fisheries Sector Growth
(F$ millions)

Category	Base-case		Upper-bound		Lower-bound	
	Revenue effects	Value-added	Revenue effects	Value-added	Revenue effects	Value-added
Offshore longline – price effects	2.5	2.5	5	5	0	0
Offshore longline – efficiency improvements	na	4.5	na	9	na	0
Inshore fisheries – efficiency improvements	na	1.5	na	3	na	0
Marine Aquarium - expansion	14	2.8	28	5.6	0	0
Pearl oyster – expansion	1	0.45	4	1.8	0	0
Shrimp - expansion	0.2	0.09	0.3	0.2	0	0
Total Increase	**17.7**	**11.8**	**37.3**	**24.6**	**0**	**0**
% Increase over current levels of sector output	**9.3%**	**12.9%**	**19.6%**	**26.8%**	**0%**	**0%**

249. Overall, under an upper bound scenario the above forecasts indicate there could be an increase in fisheries revenue of some F$37 million (20% increase over current revenue) and an increase in contribution to GDP (value-added) of F$25 million (27% increase). Under a base-case scenario revenue is projected to increase by F$32 million and contribution to GDP by F$14.6 million. These projections are based on a very high level assessment of future potential for Fiji Islands' fisheries and a high degree of uncertainty is attached to these forecasts. These caveats should be noted in any reference to these forecasts.

E. Recommendations

Recommendation 25. A number of recommendations flow from the above assessment of growth potential for the sector. These recommendations are as follows:

(i) The Government should seek to increase efficiency of the offshore fishery by commissioning further research into the economic performance of the fishery, and taking the research results into account in establishing the license cap.

(ii) The Government should accelerate the process of introducing management plans for inshore fisheries as this will also increase economic benefits from these fisheries.

(iii) The Government should actively seek to lower the cost of doing business in the Fiji Islands. This will require vigorously pursuing reform to address the following structural problems: political uncertainty, weak property rights, costly telecommunications, inefficient taxes, burdensome regulation, an ineffective legal system for business, and poorly functioning finance markets.

(iii) Rigorous economic, social and environmental evaluation studies are required of the RSC option, if the Government is to continue to pursue this option.

(iv) The Government needs to consider options for addressing overcrowding problems at Walu Bay dock and berthing facility.

(vi) Reforms are required to improve land and marine tenure as this will affect incentives to invest in aquaculture and marine aquarium fisheries (ie., culture of live rock in qoliqoli). Issues to examine include introduction of legislation to support water leases, increasing maximum lease terms to 30 years (for land and water leases) and overcoming inefficiencies within the Native Fisheries Commission (within NLTB).

(vi) To secure growth in the marine aquarium fishery the Government should consider further consolidation of the existing management structure, and further encourage operators to develop management plans for their collection areas.

(vii) Another measure which could promote growth in the marine aquarium fishery is financing set-up costs for villages entering into partnerships with marine aquarium companies for the culture of live rock. A lack of a secure legal system to enforce contracts reduces incentives for companies to provide this finance.

VIII. CONCLUDING COMMENTS

250. In many ways a fresh start is needed to revitalize the operations of the DOF. There are many areas where reform is urgently needed and it is imperative that the Fiji Islands Government actively pursues establishment of a comprehensive capacity building program to activate the reform process.

251. While this review is designed to critique and challenge the existing policies and institutional framework, it must be recognized that there are many capable staff within the DOF who are eager to increase the effectiveness of fisheries management. It must also be recognized that great progress has been made in a number of key areas such as management of the offshore fishery and initiating the qoliqoli surveying/management plan development process under the FLMMA/Fisheries partnership. Establishing a robust structure for management of the marine aquarium fishery has been another important achievement (although further progress needs to be made to fully utilize this framework).

What is lacking, however, is the real impetus to challenge the existing way of going about fisheries management and to modernize the operations of the DOF.

252. The key to future success of the sector is to harness the capacities within the DOF, and embark upon the recommended reform program. To assist in this regard we have developed a roadmap for reform which outlines the appropriate sequencing of reforms and important milestones (Appendix 1). This roadmap represents one way of achieving the reform objectives. The Government may elect to adapt the roadmap for various reasons, but it should seek to maintain the integrity of the reform process that is encompassed within the roadmap we have presented. It must be stressed that a systematic and disciplined approach to the reform process is essential if Fiji is to move strongly in the direction of best practice in respect of fisheries management.

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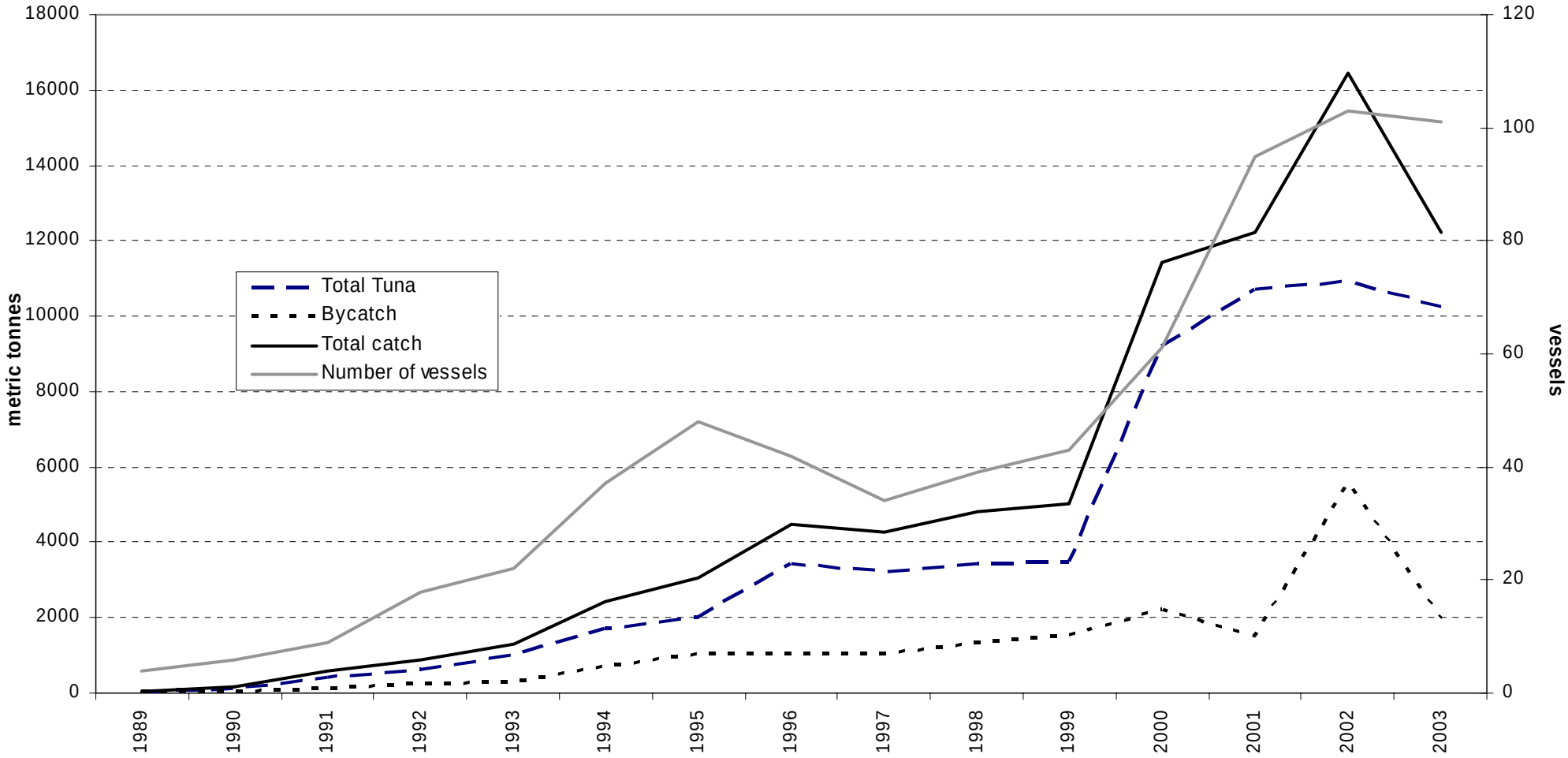
APPENDIX 1: ROADMAP FOR REFORM

Item	Components
STAGE 1—Mar. 2005 to Dec. 2005	
1. Establish two year TA program	3 specialists are required: (i) an economist, (ii) fisheries policy specialist, and (iii) local community fisheries management specialist.
2. Establish firm timetable/actions for review, revision and introduction of new legislation	Customary Fisheries Bill and Fisheries Management Bill critical. Urgent need to revise existing Fisheries Act. Diagnostic assessment of factors causing previous delays in introducing legislation. (MFF has informed the review that work is currently being done in this area. However, further examination of the legislative reforms is likely to be needed.)
3. Initiate process for establishment of NFA	Map out required processes with Finance and Planning, Solicitor Generals, and other government agencies. Include matters such as MPA.
4. Develop policy on transparency	Develop and distribute "zero tolerance" policy to all DOF staff.
5. Apply recommendations flowing from 2005 review of the Tuna Management and Development Plan.	Adjust regulations and internal processes as required. Ensure protocols are established preventing future deviations from the Tuna Management and Development Plan.
6. Draft white paper on "Fisheries Management in Fiji.	White paper to set out all key goals & objectives, processes for developing management plans, processes for stakeholder liaison, and techniques for policy evaluation. Discuss draft white paper with all key stakeholders (NGOs, industry, other Government agencies, donor agencies, community groups, etc)
7. Establish firm timetable for introduction of management plans	Management plans for trochus, beche-de-mer, inshore fisheries, marine aquarium fishery, aquaculture all need to be developed and put in place. (Although it is acknowledged that some fishery plans are being developed.)
8. Commence process for establishing Research Advisory Committee	MFF to develop funding mechanisms in conjunction with Finance. Potential Committee members to be approached.
9. Initiate processes for retraining of extension staff	This will involve a series of workshops and development of training manuals to identify key tasks and priorities for extension officers.
10. Conduct a staff satisfaction survey	Identify satisfaction levels, goals and aspirations and opinions on the reform process.
STAGE 2—Jan. 2006 to Dec. 2006	
1. Finalize establishment of NFA	Ensure all necessary legislation is enacted. Ensure staff fully on new roles and structures.
2. Finalize white paper	Have a formal launch of the policy document to ensure it is widely distributed.
3. Establish NFA website	Include hyperlinks to: Tuna Management and Development Plan; fisheries white paper; management plans; current issues; draft policy papers; and all key fishery statistics.
4. Robust policy &	Establish protocols for all future design and appraisal of fishery programs

Item	Components
program evaluation process to be established	(eg. evaluation to be undertaken by an officer not involved in the program directly).
5. Finalize establishment of the Research Advisory Committee	Appointments to the Committee to be finalized. Funding instruments to be established.
6. Review approach for surveying qoliqoli	Target at risk qoliqoli first. Used targeted survey techniques to extract only that information required to support management.
7. Commission fisheries taxation review	Review to incorporate cost recovery, access fees, and payments for access/use of qoliqoli.
8. Review inshore fisheries data collection method.	Use more recent inshore fisheries survey data and nutrition surveys to revise the DOF' current approach of reporting subsistence catch using results from a now outdated 1977 inshore fisheries survey.
9. Review indigenous participation schemes	Commission external consultants to conduct major review of all programs and policies used to promote indigenous participation
10 Establish a panel of consultants and research agencies to advise on social and economic policy matters	Establish annual consultancy budget. Look into approaches used by Fisheries Departments in other countries
11. Review the fish warden system to allow for renewed effort in countering various forms of illegal fishing	Assess the budget and activities of fish wardens. Conduct workshops to train wardens on current management issues.
12. Conduct a review of aquaculture management	Ensure appropriate environmental regulations and quarantine regulations are in place
STAGE 3—Jan. 2007 to Jun. 2007	
1. Conduct an audit of the progress in establishing all necessary legislation.	Ensure that no key gaps in legislative reform process.
2. Conduct an audit of the progress in establishing management plans	Ensure that management plan for marine aquarium fishery is in place. Ensure that management plans for qoliqoli are being established at a rate of at least 20 per annum.
3. Commission external review of the NFA	Determine whether the structure meeting expectations? What are the main successes and shortcomings? Compare outcomes of the NFA with core objectives
4. Conduct a staff satisfaction survey to assess morale	Compare and contrast with survey undertaken in stage 1.

APPENDIX 2: OFFSHORE LONGLINE FISHERY, 1989-2003



APPENDIX 3: GOVERNMENT SUPPORT OF AQUACULTURE PROGRAMS

1973 – Ponds were constructed at Raviravi and culture trials began on rabbitfish, mullet, milkfish, and tilapia to demonstrate commercial viability

1975 – Fiji Government began construction of grass carp facilities at Nadruloulou for river weed control which was a success; the facility was expanded to 2.6 ha in 1977 for other species; and a freshwater prawn hatchery was opened.

1962 – The Inland Fisheries Programme that included aquaculture began targeting protein and food source.

1968 – Five Peace Corps volunteers were assigned Fisheries Division aquaculture activities

1970 – Five year aquaculture program commenced with the aim of producing mollusks for the local and tourist market.

1974 – Aquaculture Development Project initiated by Government of Fiji as follow up an SPC project, with the goal of developing fish and oyster culture in the country

1974 – Joint Fij/USP project was started to determine the aquaculture potential of *Batisssa* ("kai"); A joint SPC/USP project to determine the aquaculture potential of turtles also began

1979 – Detailed feasibility studies for baitfish and freshwater prawn culture were undertaken

1981 – In the 8th Development Plan, program #4 dealt with fish farming: rural fish farming, grass carp production, and shrimp production, and various aspects of fish and prawn farming (Aquaculture Extension Program).

1982 – Japanese aquaculture assistance to Fiji began.

1982 – Fisheries Division Aquaculture Development Program commenced

1989 – Mariculture of giant clam and trochus commenced on Makogai with support from Australia

1993 – Mariculture of clams and trochus entered a new phase with work focusing on establishment of small farms, reef restocking, and improving the production capability.

1997 – The Commodity Development Framework (CDF) and its aquaculture component began. The commodities covered include saltwater shrimp, milkfish, giant clams, pearl oyster, trochus, seaweed, tilapia, ornamental fish, turtles, coral sponges, freshwater shrimp, and polyculture. A total of F$650,000 was approved under CDF for aquaculture development

1998 - The Pearl Oyster Project was started through the technical assistance of the Australian Center of International Agricultural Research (ACIAR), and some Fiji government funding assistance.

It should be noted that since the mid-1990s less information appears to be available on specific aquaculture projects, possibly because of a tendency to include the aquaculture work in the regular work program of the DOF, rather than "projectizing" the activities]

In 1999 with a new government in power in Fiji, the CDF was modified to the Agriculture Diversification Programme (ADP) with a new focus: to guarantee food security, to provide

marketing services to rural people, and to promote sustainable development with emphasis on export-oriented fisheries commodities. Under the ADP F$1,004,514 was spent in 2000 by the Fisheries Division for aquaculture development. No information is available in the 2001 annual report on ADF aquaculture spending or the success of its activities.

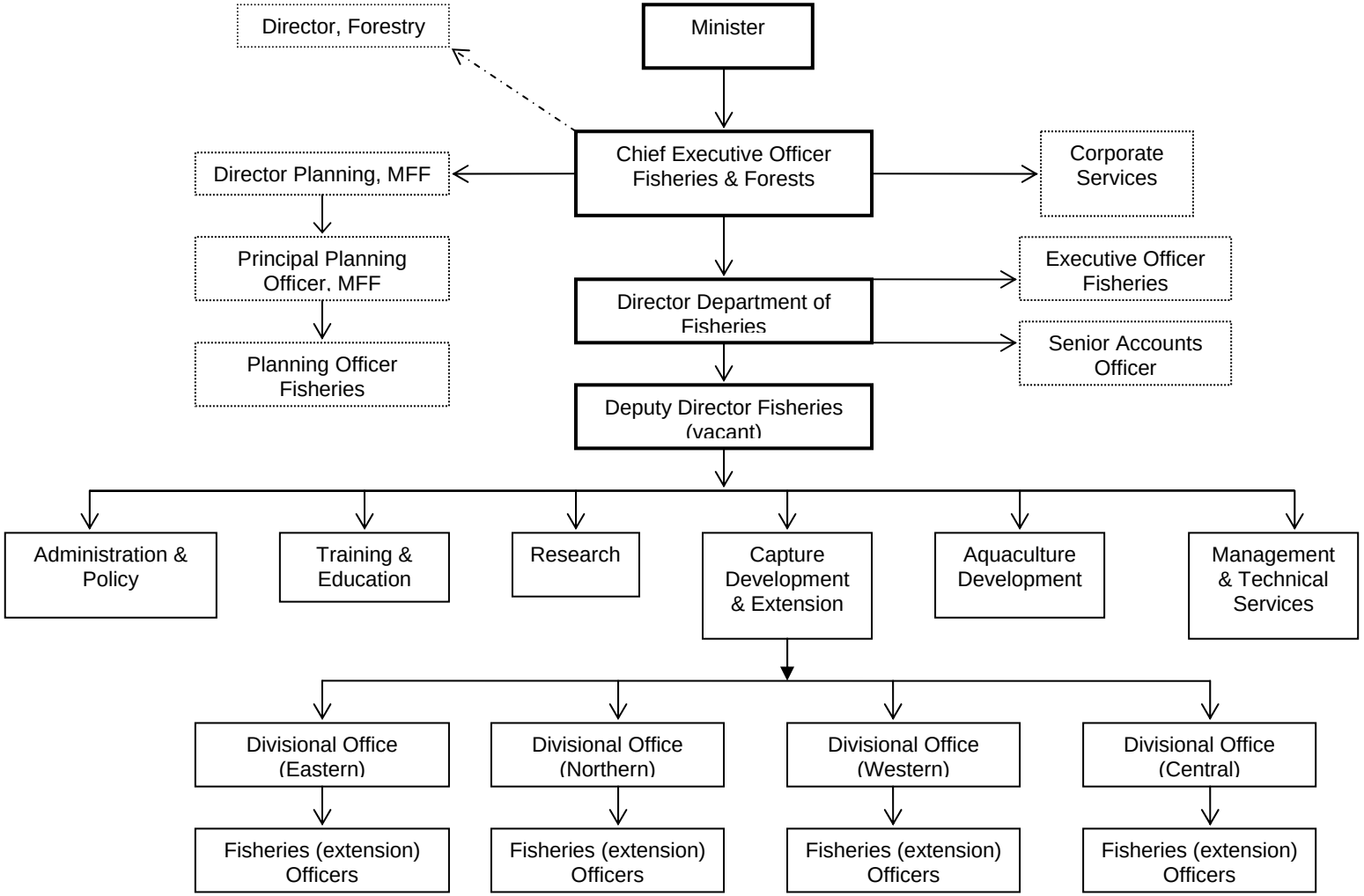
The current budget states that actual or planned spending on “extension aquaculture” in the five-year period 2003 to 2007 is F$7.1 million. (MMF plans to revise the extension aquaculture budget in 2006 (pers. comm. Miti Baleivanualala, CEO MFF)). In addition, each year there are provisions for “mariculture” in the fisheries research budget (F$200,000 for 2005). According to the DOF’s aquaculture staff, there are 21 established positions in aquaculture, which represents 21% of all established staff in the DOF.

Donor assistance to aquaculture has also been substantial. Only records for the late 1990s are available from the Ministry of Finance, but those show the Japanese assistance: seaweed study (F$2.4 million), beche-de-mer breeding techniques (F$2.4 million), and mariculture projects (F$175,000). Australia has been generous with aquaculture assistance to Fiji, especially dealing with giant clam, pearls, and tilapia. Seaweed farming has been assisted by New Zealand. Adams (1990) indicates that in the 1980s, Fiji received F$1.99 million from aid donors for government infrastructure for aquaculture.

APPENDIX 4: KEY INSTITUTIONAL MATTERS THAT AFFECT FISHERIES MANAGEMENT IN FIJI

Institutional Aspect	Role or Effect
Legislation, Policies & Regulations	
Fisheries Act Rev.1985 (Chapter 158, Laws of Fiji)	Defines laws governing the exploitation of marine resources
Marine Spaces Act, 1978 (Chapter 158A, Laws of Fiji)	Establishes the archipelagic waters and Exclusive Economic Zone (EEZ) of the Fiji Islands, and a 12 nautical mile territorial sea
Social Justice Act 2001	Gives effect to the 20-Year Development Plan
Customary Fisheries Bill 2004	Draft Act that will repeal sections 13-20 of the Fisheries Act; establish Customary Fisheries Commission; transfer ownership of qoliqoli from the state to customary owners
Tuna Management and Development Plan 2002	Addresses all aspects of the management and development of tuna resources, including licensing, for a period of 2 years
Fisheries Management Bill 2002	Draft Bill featuring proposal to establish a National Fisheries Authority
Environment Management Bill 2004	Likely to become law in February 2005; legislation to require focus on sustainable use of resources; will take precedence over other legislation
20–Year Development Plan (2001–2020)	Affirmative Action Plan for enhancing the participation of Indigenous Fijians and Rotumans in the social and economic development of Fiji
Rivers and Streams Act	Defines the waters within the internal waters or streams in respect of traditional rights of any mataqali, or other divisions of indigenous Fijians
Marine Act	Registration of vessels
Endangered Protected Species Act 2003	Regulations gazetted in November 2003; relates particularly to CITES requirements and the aquarium fish trade
Public Enterprise Act 1996	Provides for reorganization of nominated government entities
Fish Export Permits	Monthly permits required for the export of fish and fish products
Social/cultural & other stakeholders	
Qoliqoli (Customary fishing right areas)	410 such areas; cover most inshore fishing areas and rivers and streams; important for indigenous development.
Register of Native Customary Rights	Defines rights of indigenous Fijians in all areas, including fisheries
Non-government organizations (e.g. WWF, WCS, FLMMA)	Involved in fisheries activities, particularly support for subsistence fisheries and establishment of MPAs
Industry associations & organizations	Lobby government and represent industry; organizations such as the Marine Aquarium Council assist sustainable management by certifying cultured products
International/regional	
Membership of SPC	Research and management support for fisheries
Membership of FFA	FFA provides support for tuna management and in areas such as legal advice/preparation of legislation
University of the South Pacific	Research and education services for fisheries
Tuna Commission	New international organization to manage and monitor tuna fishing on the high seas
International conventions	E.g. CITES; Wellington Convention for the Prohibition of Fishing with Long Driftnet in the South Pacific, Law of the Sea, COFI proceedings & Agreements on migratory and straddling fish stocks.
International Treaties	E.g. Monitoring, Control and Surveillance Treaty for targeted offshore species
Preferential trading arrangements	With EU and Pacific nations, including Australia and New Zealand; gradually diminishing in most cases.

APPENDIX 5: THE ORGANIZATIONAL STRUCTURE OF THE DEPARTMENT OF FISHERIES, 2004



APPENDIX 6: ASSESSMENT OF THE FISHERIES MANAGEMENT BILL[62]

1. With assistance from the FFA, a Fisheries Management Bill was drafted in 2002. The Bill was discussed with various stakeholders at a meeting in September 2002 and recommendations for modifying the Bill were made. According to officials of the Office of the Solicitor General, the Bill has not yet been presented to Cabinet. Procedurally, the Office of the Solicitor General does not begin its work on a Bill until it has received Cabinet approval. The Fisheries Management Bill appears to have been with the Ministry of Fisheries and Forests for quite some time awaiting action. Discussion with Ministry officials suggest that at least some senior fisheries officers are uncomfortable with the new Bill and would prefer amendments to the present Fisheries Act, rather than a new Act.

2. The principal reasons for supporting the new Fisheries Management Bill are as follows:

(i) The present Fisheries Act dates from 1942 and, according to Adams (1993), it arose out of ordinances put in place in the 1890s with additions over the years. Quite simply, the Fisheries Act is outdated. The Marine Spaces Act is 25 years old and since that time the Law of the Sea Convention (which is its primary underpinning) has been advanced by the UN Fish Stocks Agreement, the FAO Code of Conduct, and other international legal instruments. Many of these set new benchmarks for the way fisheries should be managed, and Fiji is a party to all of these arrangements.

(ii) The present Fisheries Act is confined to the "regulation of fishing" and the conservation/management of fish stocks. Post-harvest aspects of fisheries, including quality control, are not covered by the Act. Similarly, the regulation of exports is not covered by the Act, but such regulation is presently carried out by the DOF without a legal basis. (However a new Food Safety Bill has been proposed that would provide this authority).

(iii) The Western and Central Pacific Fisheries Convention, to which Fiji is a signatory, makes demands on Fiji that must be reflected in the fisheries legislation. These include legal provisions for high seas fishing, port state controls, flag state controls, and implementing WCPFC regulations.

(iv) The Western and Central Pacific Fisheries Convention, to which Fiji is a signatory, makes demands on Fiji that must be reflected in the fisheries legislation. These include legal provisions for high seas fishing, port state controls, flag state controls, and implementing WCPFC regulations.

(v) The establishment of the National Fisheries Authority is a major feature of the Fisheries Management Bill. The bold move in establishing the NFA could assist in mitigating many of the chronic problems that plague the DOF and should be supported.

(vi) Other legislative events are over-taking the development of the Fisheries Management Bill. The Customary Fisheries Bill is likely to be enacted in mid-2005. If enacted in the current form, it would have a major impact on the present Fisheries Act (repealing sections 13 to 20) and the DOF—a Customary Fisheries Commission is to be established that will be

[62] This Appendix is an extract from: Gillette, R. 2005. *Aspects of Fisheries Management, Legislation, Research, Development, Extension and Aquaculture in Fiji*, Report of the Fisheries Specialist ADB Fisheries Sector Review, January.

"responsible for the control and administration of the commercial use and exploitation of all customary fisheries resources within customary fishing areas". According to officials of the Environment Department, the Environment Management Bill is likely to be enacted in 2005. If enacted in the present form, it would have a major impact on the activities of the DOF. The Bill establishes requirements for environmental impact assessments for 26 types of developments, (including several that would affect fisheries developments) and empowers the Environment Department to formulate a National Resource Management Plan.

3. Many features in the above two Bills are positive and should be supported. However several questions arise as to institutional jurisdiction – for example, is the board established under the Customary Fisheries Bill the best entity to manage Fiji's commercial inshore fisheries? If the Ministry does not focus a substantial amount of attention on fisheries legislation in the very near future, there is some possibility that any eventual change in fisheries legislation will have to fit into gaps left over from new customary fisheries and environment legislation.

4. Although the Fisheries Management Bill should be supported, a number of modifications to the present version should be considered.

5. The Bill establishes a National Fisheries Authority. The major feature of the Authority is that it is not controlled by a single public servant, but rather by a board made up of a variety of stakeholders, including representatives of the tuna industry, inshore fishers, relevant Ministries and the NGO community. As the Authority is responsible to the Board, the work of the Authority will become more aligned to wishes of the members of the board, instead of the often adversarial relationship that exists now between the staff of the DOF and fishery stakeholders[63]. This change will promote greater relevancy of the work program, increased transparency, and a higher degree of accountability – features that are desperately needed at present. Although the transition to an NFA-type arrangement would represent a major step for the government, such bold action is required to address the main problems associated with the DOF. The move to an Authority should certainly be supported, but in a form somewhat different than that proposed in the Fisheries Management Bill. As presently formulated, the scope of the Authority is limited to the management of tuna fisheries. The NFA's responsibilities should be expanded to encompass the management of all fisheries (inshore/offshore) in Fiji.

6. Other modifications to the Bill that should be considered are:

(vii) The major commercial fisheries (inshore and offshore) should be managed by the use of management plans (Section III). Doing so could address many of the weaknesses in fishery management in Fiji. Although the present version of the Bill recognizes the value of such plans, the requirement to formulate plans is at the discretion of the Minister. Experience from other countries indicates that, in the absence of a firm legal requirement, the very desirable scheme of fisheries management being guided by plans often does not get implemented. The Bill should specifically state that fisheries management plans are compulsory for all major commercial fisheries in Fiji and there should be mechanisms to assure adherence to the plans.

(viii) The aquaculture provisions of the Bill have been reviewed in an SPC publication (Evans et al., 2003). The comments are endorsed by the Fisheries

[63] As an example, with a representative of small-scale fishers on the NFA board, the FAD programme probably would not have come to a halt as was the case in 2004.

Sector Review: “The proposed Fisheries Management Bill has improved the current arrangement by attempting to adequately define and distinguish aquaculture from capture fisheries. Although untested, it appears to be a relatively effective mechanism insofar as it will put in place a licensing scheme specifically for aquaculture. The Bill, however, falls short of comprehensively addressing the issue of property rights in the marine and coastal areas and the right to exclusively take fish in the farm area, which is needed to foster private sector development.”

(ix) As mentioned above, one of the weak provisions of the present Fisheries Act is that all fishing licenses expire on December 31 of each year. This results in a licensing period that is too short. The present form of the Bill states that a license “remains in force, until the day on which it expires in accordance with the period approved by the Board from time to time for the class of license to which it belongs”. Although the flexibility given to the board on license periods is desirable, the bill should specifically state that the license period should be established taking into consideration investment/credit issues.

(x) The inshore fisheries management provisions in the Bill must be reconciled with those in the Customary Fisheries Act and the Environment Management Act, bearing in mind the management expertise in the various agencies.

(xi) Regardless of which agency undertakes inshore fisheries management duties, attention needs to be focused on the issue of how local bans in customary fishing areas can be nationally recognized.

7. Fish wardens are a major feature of the Fisheries Act, but receive only very small mention in the new Bill: “The Minister shall by notice published in the gazette, appoint a Director of Fisheries and such other fisheries officers and fish wardens”. There needs to be a provision in the bill to allow for regulations covering fish wardens and addressing the present difficulties (compensation, up-to-date list of wardens, duties, obligations, de-commissioning).

APPENDIX 7: FIJI GOVERNMENT'S FISHERIES INVESTMENT PROGRAM, 2004-06

(F$ millions)

Category	Total
National Fisheries Authority	4.0
Fisheries Training Centre	2.85
National Fisheries Corporation	3.0
Rural Fisheries Service Centres	7.0
National Inshore Fisheries Resource Inventory	1.75
Pearl Oyster Project	2.8
Shrimp Project	3.15
Fresh Water Aquaculture	3.3
Reef Reseeding and Inshore Resource Assessment	3.8
Aquarium Project	4.2
Institutional strengthening of the Fisheries Department	0.5
Product Development & Utilization	5.0
International Fishing Service Terminal	150.0
Live Food Fish Project	4.0
Seaweed Development	2.0
River Weed Control and Resource Enhancement	2.0
Fishing Industry and Aquaculture Legislation	0.35
Fisheries Management Information Systems	0.7
Fisheries Research/Training Vessels	1.75
Business Development and Marketing Research	2.0
Fisheries Research Centre	7.5
Inshore Fisheries Legislation Development & Management Plan	3.5
Marine Protected Area	2.5
Lami Fishing Port	25.0
Labasa Fishing Port	16.0
TOTAL	**258.7**

* To be revised in 2006.

Source: Ministry of Fisheries and Forests Strategic Development Plan 2004-2006.

APPENDIX 8: NOTES ON THE ECONOMIC FEASIBILITY OF AQUACULTURE IN FIJI

1. Limited research has been undertaken on the economic feasibility of aquaculture activities in Fiji. The available information to the Fisheries Sector Review included:

(i) Some financial information was provided to the Fisheries Sector Review by a pearl farmer and by a shrimp farmer. Both sets of information show high potential rates of return on investment (assuming no disease problems, and no problems in production of post larvae and spat).

(ii) Some feasibility analysis for tilapia export was done in Costa-Pierce (1997). He concluded that shipping and feed costs were too expensive to make money on a scheme to export tilapia to markets in the mainland US.

(iii) Luxton (2002) commented on viability of the seaweed farming in the Lau Islands. He stated that viability is no longer dependent on identifying suitable sites but rather on the way that development and the business of trading are managed.

(iv) The economics of tilapia production are explored in Nandlal (1997). He concluded that the internal rate of return of ten 1,000 sq m backyard tilapia ponds was 40.9%.

(v) The report of a workshop on the economics of aquaculture in Fiji (Johnstone and Pickering, 2003) contains some analysis. The results are given in Table A8.1.

Table A8.1 The Results of a Workshop on the Economics of Aquaculture in Fiji[64]

	Farm Area (hectares)	**Annual Yield** (metric tons)	**Cost** (F$)	**Margin** (F$)	**Rate of Return** (%)
Tilapia	1.0	26.3/ha	2,490/mt	39,785	41.4
Freshwater prawns	0.45	3.5/ha	11,130/mt	6,100	32.3
Shrimp	7.0	2.9/ha	13,950/ha	27,052	16.5
Seaweed (commercial)	510 km of line	2.5/km	640/mt	300,717	78.0
Seaweed (semi-commercial)	12 km of line	4.0/km	490/mt	296	10.8

2. In examining the general subject of aquaculture feasibility in Fiji, some features become apparent:

(i) Some of the work on economic feasibility could have benefited from a scrutiny of the methodology used. For example, at least some of the studies ignore the opportunity costs of labor.

(ii) The high rate of return for seaweed is inconsistent with the level of private sector interest shown in buying and selling seaweed, and even the DOF information about the sector (ie., low interest in seaweed farming from villages in outer islands due to payments being too low despite assistance to almost 400 individuals in the purchase of punts and outboards)

[64] These results are as listed in the report of the workshop. It is not known whether they were produced using rigorous data or if they are merely hypothetical examples.

(iii) Similarly, questions should be asked as to why, with the 300+ tilapia farmers and extensive subsidies there is low level of commercial tilapia markets. Do these farmers really have no knowledge of the returns available from selling tilapia at markets?

3. Considering the large investment in aquaculture in the country, the paucity of rigorous feasibility studies is surprising. As with the marketing studies above, some of the feasibility efforts could be considered "aquaculture promotion", rather than an objective examination of feasibility. The process of determining feasibility of an aquaculture activity should be distanced from the zeal to obtain funds for development of that activity.

(i) Another general aspect of aquaculture feasibility in Fiji concerns minimum farm sizes to achieve viability. There is the sentiment in the aquaculture industry and regional/international aquaculture advisors that, for some of the commercially-oriented types of aquaculture, economies of scale are required to achieve profitability. This has been expressed in a variety of ways:

(ii) A large pearl farmer in Fiji has stated that a farm needs to implant 50,000 pearl oysters each year to be viable.

(iii) A tour of Fiji aquaculture facilities in mid-2004 by notable aquaculture specialists from regional and international institutions (SPC 2004) concluded: "it was probably not financially viable for small pearl farms to operate."

(iv) The SPC/ACIAR Black Pearl Culture Workshop in Kiribati carried out economic modeling and concluded "a small private sector (5,000 oysters) integrated operation, culturing round pearls is relatively high risk.

(v) Experience in French Polynesia suggests that the small pearl farms are non-viable.

(vi) In dealing with another aquaculture commodity, marine shrimps, an established farmer in Fiji states that a minimum farm size of 10 to 12 hectares is required for viability.

4. Considering this experience, the DOF should reconsider its stated intentions of encouraging small pearl farms as stated in the 10 year development plan, and promoting small marine shrimp farms as indicated by some fisheries officers.

5. The above observations reinforce the need for objective economic feasibility studies. Otherwise, there is the possibility that an ironic situation could result—the DOF could be encouraging non-economic activities and promoting small marine shrimp farms as indicated by some fisheries officers.

Views on Potential for Aquaculture in Fiji

Villaluz (1972): "Of all the Pacific Islands Fiji has the greatest potential for Aquaculture"

SPC (1970): "Fish culture is a very promising industry in Fiji"

MAF (1978): "Five and a half years of development work towards fish farming on mangrove reclamations at the Raviravi Fish Farm has been completed and the project is to be taken to the commercial phase by a private company in joint venture with the National Marketing Authority in March 1978"

MAFF (1981): "A number of projects involving the propagation and/or growing-on of freshwater and marine organisms have been identified as being probably suitable to conditions in Fiji".
Kunatuba (1993): "The future looks bright for aquaculture in Fiji".
Richards (1994): "The Rural Aquaculture Programme shows great promise"

MAFF (1996): "The government is trying to promote aquaculture and expectations for a major breakthrough is anticipated in the not too distant future".

Nandlal (1997): "Fish farming has the potential to provide high quality protein to rural Fiji and to generate significant income within a short period of time relative to other crops"
Fisheries Division Annual Report 1998: "The commercial development of aquaculture and mariculture commodities are still in the infancy stages. Nevertheless, positive results obtained during the year have encouraged expansion of the project".

Deloitte Touche Tohmatsu and Bruce Shallard and Associates (2003). "The aquaculture sector has significant potential and there is a range of commercial opportunities for the NFC to consider, both immediately and in the long term."

Evans et al. (2003): "with the range of additional projects and the government's research focus on diversification into additional species, aquaculture production is expected to increase dramatically"

6. With regard to the success of aquaculture in Fiji, the results have been mixed:

   (i) Tilapia has been cited as a success. Indeed the number of farms and associated production have increased considerably in recent years. A USP report (Pickering and Forbes, 2002) states that tilapia farming was the first form of aquaculture in Fiji to make the leap from technical success to economic success and really take root in Fiji's private sector. It should be noted, however, that the small-scale inland tilapia farms have been, and remain, heavily subsidized by the government - from the provision of fry to transporting the adult fish to market.

   (ii) At least one of the large-scale pearl oyster farms seems to be entering a profitable phase.

   (iii) The culture of most of the items listed in Table A8.1 above has been discontinued and cannot be considered a success.

   (iv) With the possible exception of some freshwater prawn farming, other examples of sustained success in private sector aquaculture in Fiji are more difficult to identify.

7. The above comments on the success of aquaculture in Fiji are consistent with that of a recent review of aquaculture in the country: "Despite attempts over three decades, aquaculture remains poorly developed" [65](USP and Fiji Institute of Technology, 2004).

[65] USP Marine Studies Programme and School of Maritime Studies, Fiji Institute of Technology. 2004. *Feasibility Study for the Establishment of a National Fisheries Training Center in the Fiji Islands*. Submitted to MFF, October 2004.

8. From the above information it can be concluded that there has been considerable aquaculture work in Fiji (marine, brackishwater, freshwater) stretching over a long period and covering large variety of species. Additionally, the Fiji Government and donors have made a substantial investment in aquaculture, and there is much enthusiasm for the future of aquaculture in the country. The reality is, however, that aquaculture remains poorly developed in Fiji. This carries some suggestion that either:

(v) The potential and opportunities provided by aquaculture in the country have been over-estimated; or

(vi) Past aquaculture development work has been inappropriate; or

(vii) There are governance issues that negatively affect aquaculture; or

(viii) There is still need to remove impediments to growth (see Section VII)

APPENDIX 9: DOMESTIC MARKETS FOR AQUACULTURE PRODUCTS

1. The information available to the Fisheries Sector Review on domestic markets for Fiji aquaculture products was limited to:

(i) the Tilapia Industry Production and Marketing Study (Costa-Pierce, 1997);

(ii) observations and notions in the various reviews of aquaculture in Fiji;

(iii) opinions of fisheries officers and aquaculture industry participants;

(iv) Customs Department import statistics;

(v) 2004 Census of Fiji freshwater aquaculture industry;

(vi) views of seafood retailers; and

(vii) data on existing commodity production

2. Domestic marketing information from these sources has been used to construct Table A9.1.

Table A9.1: Domestic Marketing Information on the Main Aquaculture Products

Commodity	Information on Domestic Markets	Comment
Tilapia*	Costa-Pierce (1997) using the "replacement series" concept, estimated that the market demand on Viti Levu was 66 to 324 mt per year. The 2004 census of Fiji freshwater aquaculture industry stated that "30 mt of tilapia valued at F$125 thousand were produced". Billings (2004) estimates 2003 tilapia production was 123 mt valued at F$610,000. An important Suva fish retailer (Cakaudrove Fish) indicates that (a) demand for tilapia drops off when the price rises above F$3.50/kg, (b) low budget consumers generally prefer the cheaper tuna by-catch, (c) high budget consumers generally prefer fish such as snapper; Extrapolating from just information received from a single live tilapia retailer in the Nausori market, it appears about 13 mt of tilapia passes through that market annually. Fisheries officials indicate that Nausori is one of the two main markets.	The tilapia study did not take into consideration the effect that low cost by-catch from tuna longlining (2,000 mt in 2003) would have on demand for tilapia; The tilapia study assumed the same demand for tilapia as for "reef fish and mullet"
Shrimps (marine and freshwater)	One marine shrimp farmer stated that the domestic market for all shrimps (50% tourists, 50% residents) is about 500 mt/yr The DOF estimates the local market is about 600 mt (cited in Pickering and Forbes, 2002) Fiji currently produces about 100 mt of shrimp by farms and capture fisheries Customs data indicates that 37.3 mt of "shrimps and prawns" were imported in 2003; 36.6 mt in 2002	The current consumption of shrimps and prawns in Fiji (local and imported) appears to be about 137 mt Fiji prawn farmers claim the local market is being flooded by product from Thailand, Taiwan and Australia and that duty on imported raw prawns has been reduced from 25 to 15% China has commenced producing very large quantities of *Litopenaeus vanna*mei at a current export price of US$2 to 3 per kg

Giant clams	The main domestic "market" for cultured giant clams are the MPAs that receive clams free of charge from the government's Makogai facility. According to DOF data, 462 clams were passed out in 2004, 386 in 2003, and 374 in 2002.	At the current price, the domestic market for clams appears to be quite large.
Black Pearls	The largest commercial producer of black pearls in Fiji has indicated that he sells about 1/6 of his production (total of 20,000 pearls produced in 2004) in the Fiji domestic market;	Little domestic market information available; Fiji has a much larger tourism industry than the other Pacific Island countries where pearl farming is successful

* In addition, the FAO is currently undertaking a study on the Tilapia market.

3. Using the above and other information from the Fisheries Sector Study, the following observations can be made on the domestic markets for aquaculture products:

(i) For tilapia, the market has changed considerably in the seven years since the study, especially concerning the competing tuna by-catch. The projected production of tilapia (2,000 mt in the Freshwater Aquaculture Sector Plan for 2006) seems large relative to the present production and size of the tilapia market estimated in Costa-Pierce (1997).

(ii) For shrimp, the way in which the size of the local market is calculated is not readily apparent and appears much larger than present consumption.

4. Some of the estimates of market size that have been done (by both government staff and aquaculture industry participants) could be considered "aquaculture promotion", rather than an objective examination of markets. It is suggested that future marketing studies (especially those used for policy decisions) be carried out by individuals who are detached from the results.

5. There have been few detailed marketing studies for Fiji aquaculture products. It is likely that if such studies were to be carried out, some myths would be dispelled and opportunities could be identified.

APPENDIX 10: Survey of Commercial Fishing Operators

1. A survey of Fiji Fishing businesses was undertaken for the review to determine first hand the problems that operators found most detrimental to profits and growth potential. Survey participants were asked to rank impediments from 1 to 10 (with a rank of 1 indicating the greatest negative impact on profits and growth). The results of the survey were extremely revealing and should be closely evaluated by the Government.
A10.1).

Table A10.1: Results of industry participant survey to identify growth impediments & negative impacts on profits

Category	Average rating (rating of 1 to 10; 1=worst)	% ranked 1 or 2	Overall rating (1=worst)
High fuel taxes/taxes on other inputs	3	69	1
Long waiting times for loading/offloading at port	5	0	7
Limited air cargo space	5	13	5
Land transport problems (ie. High cost of transport or low standard of roads)	6	0	10
Unnecessary red tape in dealing with Fisheries/other Government agencies	4	25	3
Difficulty in finding skilled/productive staff	3	50	2
Telecommunications costs or problems (eg. slow internet connections)	5	19	6
Difficulty in obtaining loans from banks and other financial institutions	4	19	4
Competition from low cost producers in other countries	6	6	=8
Problems related to land tenure	6	6	=8

2. High fuel taxes and taxes on other inputs was easily the most significant negative impact for operators, which points to the importance of tax reform in Fiji. The second most significant problem was the difficulty in finding skilled/productive staff, indicating that training is a priority need. Ranked third in terms of negative impact was unnecessary red tape in dealing with Fisheries and other government agencies.[66] Time taken to offload at port was not as important as may have been expected, nor were problems related to land tenure. However, it is important to stress that uncertainty related to customary tenure of marine areas was a major concern for game and charter boat operators, with one respondent noting that this was “hindering expansion plans at present”. During the course of the review we received similar comments from aquaculture operators.

3. Respondents were given the opportunity to note other “additional” impediments to growth and noted the following:

[66] MFF responded to this criticism by noting that this problem prevails as the Department Officers want control rather than facilitating, and this is reflected in: (i) the lack of published procedures about export protocols; (ii) “old fashioned” permit issues per shipment (even though they deal with the same exporters); and (iii) shifting demands due to no written guidelines. Online services, which are currently being set up, would address many of these shortcomings.

(i) the high cost of electricity and fuel, with one respondent noting that the Lami Industrial estate has power supply problems;

(ii) delays from government agencies in providing start up approvals and work permits, especially the Fiji Trade and Investment Board and Immigration; and

(iii) slipway facilities – "even though in Fiji we have this facility it is not managed properly. The monopoly status spoils the management's attitude which is damaging its business and affecting our profits."

4. One respondent also queried the DOF stand on smoked fish (CO2 treated) noting that:

> The Department has not clarified whether this process is allowed or not. During my recent (Jan '05) visit to Los Angeles I found that this product has a lucrative market and the USFDA has no problems with the product. Other countries are legally exporting CO2 treated products to USA. Currently we export whole fish fetching USD2.20/lb-USD2.50/lb for grade 2 & 2+, whereas grade 3 treated fish earn much higher returns than what we are doing now also creating more jobs and activity locally.
>
> If this could be looked into and proper procedures and approval systems developed to take advantage of the process this would be economically beneficial for the companies and the nation.

5. MFF responded to the above criticism by noting that the proposed smoked fish process (CO2 treated) is illegal in some markets and its use needs to be accompanied by histamine certification. In addition, this is a product that is only imported from approved markets.

6. Respondents were also asked to comment on negative aspects of their dealings with the DOF, and some of the comments (note these are not the views of the review authors, but are merely presented to inform the Government about industry concerns) were as follows:

(i) fishing license terms are too short creating uncertainty about investment decisions … license application should be considered for a minimum of five years;

(ii) unstable management of fisheries;

(iii) fish license processing time takes too long;

(iv) the license vetting should be streamlined, based on history of vessels and their operations. The selection of vetting officers and licensing committee members should not be restricted to only members of statutory bodies but should also include industry stakeholders;

(v) involvement of too many government agencies in fishing operations, usually duplicating each other's work, eg., 2 sets of officers from Fisheries and Customs (boarding and discharging), Immigration, Health, Quarantine, and FIMSA. This respondent added that: "on the one hand the Government's resources are wasted on so many civil servants involved in one job and on

the other it costs us loss of time and money, we have to pay overtime, attendance fee and meal and transport allowance to so many officers.";

(vi) time to respond to correspondence and queries;

(vii) lack of commercial and private sector understanding and experience;

(viii) lack of resources to undertake economic analysis; and

(ix) no provision of offshore tuna licenses to processors (which used to be the approach).

7. It is suggested that the above comments and insights be taken into account by the Government in assessing ways of increasing the efficiency of the fishing industry. It is recognized, however, that some of the above assessments are not consistent with sound governance and fisheries management. For example, there are no real economic efficiency benefits associated with allocating licenses to processors, and the Fisheries Act does not allow licenses for processing plants but for fishing vessels. In addition, the separation of legislators and industry is necessary for governance to prevail and consequently industry involvement in license allocation processes should be avoided.