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The Pacific tuna fishery

The Western and Central Pacific Ocean (WCPO) is home to the largest tuna fishery in the world, representing a vital economic resource for Pacific island countries.[1] This book is intended for readers interested in the development[2] and management[3] of the region's tuna resources. It adds to debates on how best to achieve aspirations for development of the tuna industry without compromising ecological sustainability.

Research for this book consists of interviews with stakeholders conducted during 2005 in six Pacific island countries: Papua New Guinea, Solomon Islands, Marshall Islands, Kiribati, Cook Islands and Fiji (Map 1.1).[4] It also draws on the plethora of previous reports written by fisheries management and development experts on similar topics and discussions with a range of specialists, including those at the Pacific Islands Forum Fisheries Agency (FFA).

To better understand Pacific island countries' aspirations for economic and human development based on their tuna resources, we sought the views of Pacific islander interviewees on a range of issues, including: the current use of tuna resources in the region; the benefits being realised; and whether existing tuna industries look like achieving Pacific islanders' development aspirations. In addition, we obtained interviewees' preferred strategies for future tuna management and development.

The most prominent desire expressed was to capture more of the wealth generated by regional tuna industries in their domestic economies, sustainably and according to principles of social equity. The main ways to capture more wealth propounded by Pacific island governments are by encouraging domestic tuna industry development and maximising returns from distant water fleets. The two approaches are not necessarily mutually exclusive. The ability of Pacific island countries to safeguard their tuna resources relies on their capacity to successfully assert their position within the Western and Central Pacific Fisheries Commission (WCPFC),[5] whose membership includes many of the world's largest and wealthiest states.

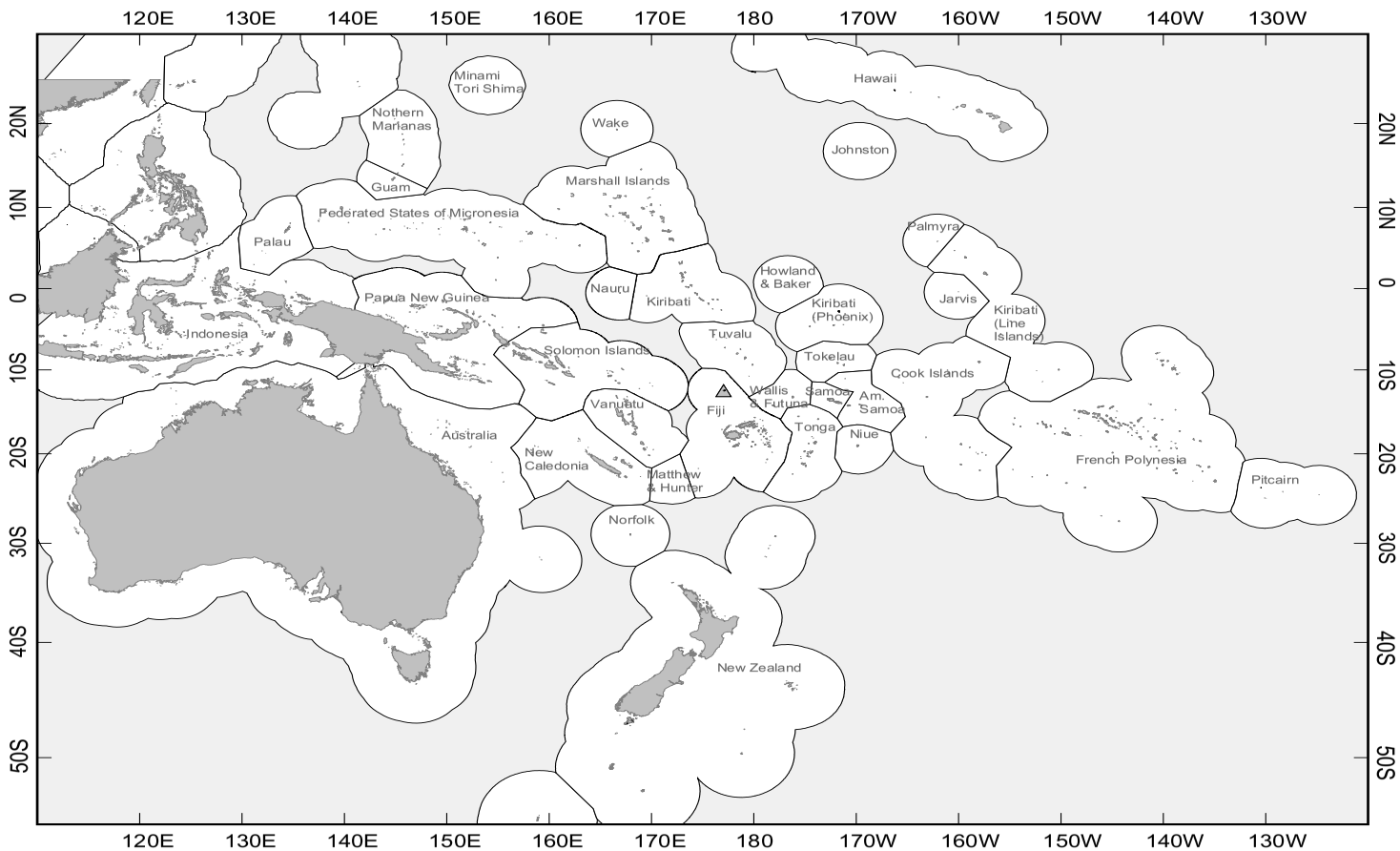
The first section of this book is a synthesis of the research conducted in each country about how Pacific island countries can better realise their aspirations for this unique global resource. One of the disturbing findings of the study is that there is a lack of clearly thought out and articulated vision for the future in fisheries management and development in most of the countries researched. Interviewees' hopes for the future were rarely coordinated with each other or the general economic direction of the country, and there was little strategic planning for how to achieve those hopes, or a sense of how what was being done now would contribute. Lack of a clear vision for the future and strategies for how to achieve that vision can lead to short-term, unrealistic, reactive policies and are likely to be a major constraint on the management of and development from tuna resources.

Nevertheless, four of the countries visited have made considerable progress towards increasing the benefits from their tuna resources. Papua New Guinea, Cook Islands and Fiji have moved away from simple access agreements and have various forms of licensing that favour domestic involvement and onshore investment. Marshall Islands, while still having extensive access agreements, has also attracted substantial trans-shipment activity, with flow-on economic benefits. Kiribati, with challenging geographical and socioeconomic environments, has yet to move beyond standard access agreement arrangements. Solomon Islands' fishing industry was one of a number of economic casualties of the social and political upheaval of 2000–03, and is struggling with governance, business confidence and capacity issues to regain previous levels of benefits from tuna.

Nearly all interviews and documents examined for the study showed that Pacific islanders' major aspiration was to capture more wealth from regional tuna fisheries in a sustainable manner. The 2005 meeting of the WCPFC Scientific Committee highlighted overfishing on two of the four main target species of tuna (yellowfin and bigeye), particularly in the most productive areas of the region, and recommended reducing fishing mortality. Decisions taken by the WCPFC in 2005, however, seem to allow for an increase on 2001–03 levels, against the recommendations of the Scientific Committee.

It is clear that the WCPFC must take further effective action to address overfishing. The issue for Pacific island countries is the form that action will take. Recent research has suggested that the sorts of management measures that could appear on the WCPFC table have the potential to result in very different impacts across Pacific island countries and distant water fishing nations (DWFNs),[6] in Exclusive Economic Zones (EEZs) and on the high seas. Means to address these impacts must be incorporated in management measures if agreement is to be reached in a timely manner. While the effects of expanding or reducing fishing pressure are complex, one clear lesson from other fisheries is that failure to manage the fishery will be disastrous for the prospects of capturing wealth from tuna in the long term.

Map 1.1 **Western and Central Pacific Ocean**



Source: Colin Millar, Secretariat of the Pacific Community, Noumea, New Caledonia.

Western and Central Pacific Ocean tuna fisheries

The resource

The Western and Central Pacific oceanic tuna fishery[7] is based on four key species: skipjack, yellowfin, bigeye and albacore tuna. The resource is of global significance; in 2004, it produced 51 per cent of the world's tuna catch (SPC 2004b). The Western and Central Pacific Ocean tropical tuna species are more productive than the more temperate tuna, including the heavily overfished Pacific bluefin and southern bluefin. The most productive area for tuna lies in the equatorial zone (10ºN–10ºS), where about 80 per cent of all tuna from the WCPO are caught. Skipjack and small yellowfin and bigeye tuna school (frequently together) on the ocean surface and are commonly found in the tropical and subtropical waters of the WCPO. Larger yellowfin and bigeye are generally found in deeper water, where they are more widespread, although some larger yellowfin (two to three years) are also caught in free-swimming schools. In contrast with skipjack and yellowfin tuna, albacore concentrate in temperate areas where food is abundant.

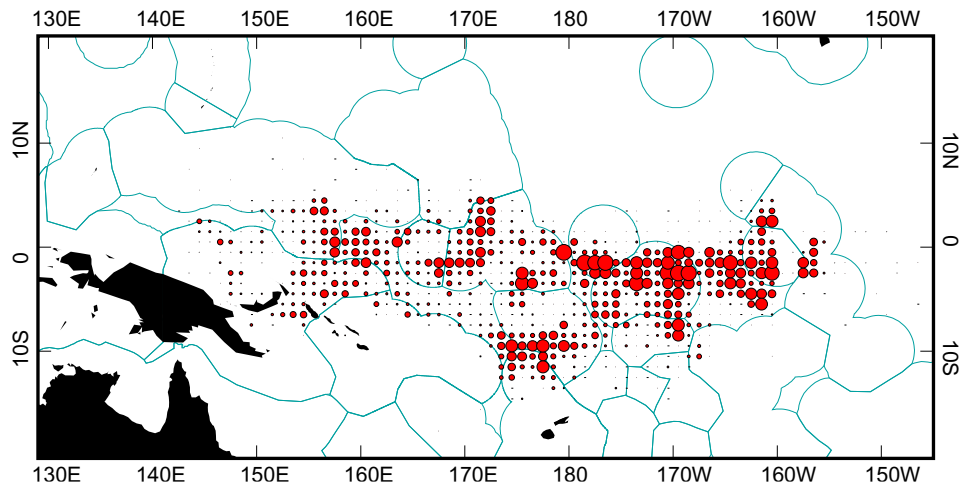
The oceanic environment

Climate fluctuations have direct impacts on the productivity of the WCPO and the associated tuna fisheries. The most dominant effect is the development of El Niño (and La Niña) or ENSO events,[8] which have direct effects on the distribution of tuna, associated fisheries and industry activity, and on levels of revenue that Pacific island countries can expect to derive on an annual basis from their fisheries. For example, purse-seine effort and catches are generally displaced eastwards during El Niño conditions and westwards during La Niña, indicating a spatial shift in the distribution of surface-swimming (predominantly skipjack) tuna (Figures 1.1 and 1.2), which respond to changes in the availability of food in the surface layers of the ocean. The implications for management are also clear in terms of the overarching need for arrangements that manage the impacts of fishing throughout the range of the stock, including in EEZs[9] and on the high seas.

The highly mobile distant water fleets, subject to negotiating access agreements in EEZs, are able to follow the fish and take advantage of areas of high-catch rates as ENSO conditions dominate. Domestically based fleets using smaller vessels, such as the Pacific island country longline fleets, are less able to do this, so are frequently faced with environmentally driven 'boom and bust' cycles. Processing plants and service and supply industries are also inevitably impacted by these changes.

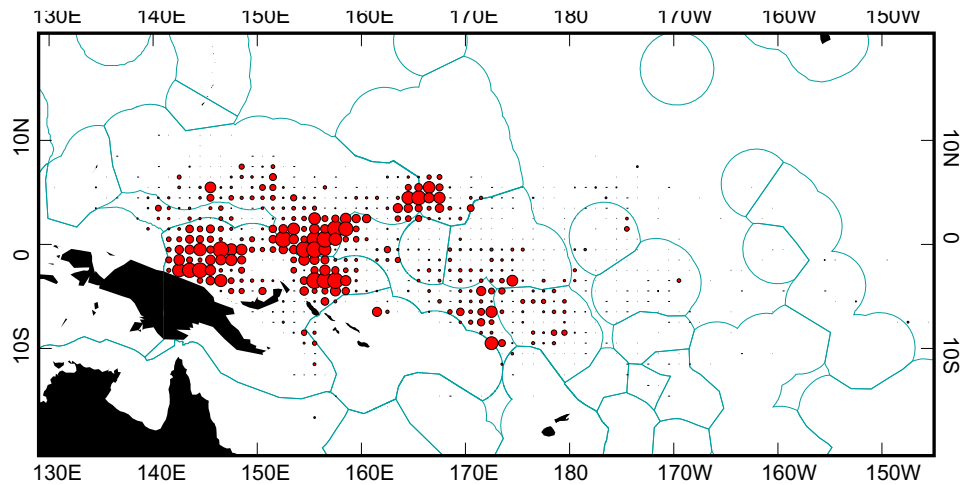
The Secretariat of the Pacific Community Oceanic Fisheries Program has developed a model for predicting the distribution of skipjack across the region, which could be useful in developing policies in countries such as Marshall Islands, where the availability of the skipjack resource fluctuates (Langley 2004). If, as some scientists fear, global climate change means a more or less permanent El Niño effect, this could have a dramatic effect on the economic potential of the tuna resources for countries such as Marshall Islands, which lose skipjack stocks under these conditions.[10]

Figure 1.1 **Distribution of US purse-seine catches in a typical El Niño year, 1994**



Source: Secretariat of the Pacific Community as presented in Asian Development Bank (ADB), 2003. *On or Beyond the Horizon: a discussion paper on options for improving economic outcomes from the Western and Central Pacific Tuna Fishery*, ADB TA 6128-REG 226, Technical Assistance for Alternative Negotiating Arrangements to Increase Fisheries Revenues in the Pacific, Asian Development Bank, Manila.

Figure 1.2 **Distribution of US purse-seine catches in a typical La Niña year, 1995**



Source: Secretariat of the Pacific Community as presented in Asian Development Bank (ADB), 2003. *On or Beyond the Horizon: a discussion paper on options for improving economic outcomes from the Western and Central Pacific Tuna Fishery*, ADB TA 6128-REG 226, Technical Assistance for Alternative Negotiating Arrangements to Increase Fisheries Revenues in the Pacific, Asian Development Bank, Manila.

The fisheries

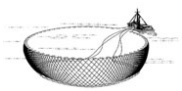
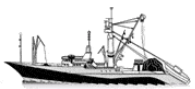
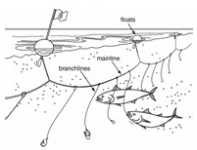
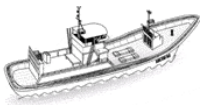
There are three major components to the WCPO tuna fishery, each associated with a particular fish behaviour. In order of importance these are purse-seine, longline and pole-and-line. Table 1.1 provides a summary of these components.

Purse-seine. The provisional 2004 purse-seine catch of about 1.2 million metric tonnes was the highest on record and the catch has been around this high level for the past three years (Williams and Reid 2005). Purse-seine vessels target primarily skipjack, with associated catches of small yellowfin and bigeye. The operation is highly mechanised and technology and capital intensive, with modern vessels costing in excess of US$25 million. Despite these barriers to entry, some Pacific island countries still seek national involvement in the ownership and operation of these vessels, because of the significance of purse-seining to the overall WCPO tuna fishery. While the DWFNs of Korea, Taiwan, Japan and the United States still account for about 75 per cent of the purse-seine catch, vessels based in Pacific island countries fishing under the FSM Arrangement[11] and Philippines vessels catch the balance (Williams and Reid 2005). This reflects an increasing involvement of these vessels in Pacific island country economies, particularly in the case of Papua New Guinea, where the bulk of the FSM Arrangement fleet is based, and where there is a correlation between shore-based investment and access.

The fishery is high volume with relatively low value (per tonne). In recent decades, most fleets have suffered from a profitability squeeze with increasing fuel and other costs, and oversupply has depressed prices. While prices have trended upwards in recent years, and the catches per unit of fishing effort (CPUE—a measure of efficiency) have increased substantially for some fleets, the fact that the fuel price has increased by about 300 per cent since 2002 (Krampe 2006) has tended to offset these gains. The substantial increase in the Taiwanese fleet during this period can be considered an indication of relatively profitable operations and confidence in the future. It would be useful to understand more about the price structure of this fleet, including any possible hidden subsidies that might apply. The high-cost US fleet has been hit particularly hard and has reduced in numbers from about 50 vessels when the US multilateral access treaty was first signed in the 1980s to less than 20 vessels in 2005. Overall, in real terms, the value of tuna fisheries has shrunk by half since the early 1980s (ADB 2003).

Longline. The longline fishery continues to account for about 10–12 per cent of the total WCPO catch (about 220,000 metric tonnes in 2004), but is about the same in value as the larger purse-seine catch, reflecting its uses for premium sashimi and other higher (than canning) value products (Williams and Reid 2005). The method targets fewer, larger, deeper-swimming tuna using hooks set over a minimum of tens of kilometres of ocean. Longline vessels in the WCPO are of two main types: large distant water freezer vessels and smaller (less than 100 gross registered tonnage [GRT]) offshore vessels specialising in chilled fish. This latter class is based locally and has formed the backbone of Pacific island country efforts to expand domestic fishing operations, particularly in more southern countries.

Table 1.1 **Main industrial gear types used in Western and Central Pacific Ocean tuna fisheries**

Gear type	Catch	Typical vessel that uses gear	Notes
Purse-seine 	Mainly skipjack and small yellowfin, with an incidental catch of small bigeye. Most catch is for canning		About 60 per cent of the tuna catch in the WCPO region is by purse-seine gear: about 1.2 million tonnes in 2003. Most of the purse-seine catch is taken within five degrees of the equator. These are high-technology and expensive vessels, so few are based domestically in the Pacific. Most are run by DWFNs.
Longline 	Mainly large-size yellowfin, bigeye and albacore. The prime yellowfin and bigeye are often exported chilled to overseas markets. Most of the albacore is for canning.		About 11 per cent of the tuna catch in the WCPO region is by longline gear: about 213,000 tonnes .in 2003. There are two major types of longliners: 1) relatively large vessels with mechanical freezing equipment (often based outside the Pacific islands), and 2) smaller vessels that use mostly ice to preserve fish and are typically based at a port in the Pacific islands. Small and medium-scale longline vessels have been favoured in domestic industry development schemes since the 1990s.
Pole-and-line	Mainly skipjack and small yellowfin. Most catch is for canning, katsuobushi or the Japanese fresh skipjack market		About 15 per cent of the tuna catch in the WCPO region is by pole-and-line gear: about 295,000 tonnes in 2003. In the 1980s, several Pacific island countries had fleets of these vessels, but most no longer operate due to competition with the more productive purse-seine gear. The Japanese distant water, larger scale pole-and-line fleet, however, remains active in the region.

Source: Gillett, R., 2005. 'Tuna for tomorrow? Some of the science behind an important fishery in the Pacific islands', in RETA 6128: alternative negotiating arrangements to increase fisheries revenues in the Pacific, Asian Development Bank, Manila.

Domestic longline opportunities were opened up by the introduction of medium-scale longliners of less than 60GRT using monofilament gear in the mid to late 1980s. Until then the major fleets from Taiwan, Japan and China had been using 200–500GRT vessels. The first domestic medium-scale longline fleet emerged entirely from the private sector in Fiji in the late 1980s. A fleet emerged in Papua New Guinea in 1995. Successes in these countries meant other Pacific island countries became interested, and regional fisheries development advisors pushed the idea. All six of the countries covered here have had some form of domestic longline development. After a promising start, most Pacific island country-based longline fisheries were stagnating by 2005. Table 1.2 provides a summary of the progress of the expansion of tuna longline fishing in Pacific island country waters, highlighting in most cases a rush to enter the fishery, a period of relatively stable catches and profitability, followed by severe declines due to falling catch rates, rising costs of inputs including fuel and air freight, and other logistical difficulties.

Pole-and-line. Catches by pole-and-line vessels in the WCPO have been about 270–300,000mt in recent years. Most (more than 90 per cent) is taken by the Indonesian and Japanese fleets, with very little being caught in Pacific island country EEZs, with the exception of Solomon Islands. Since pole-and-line fisheries target the same species as purse-seiners (skipjack), the overall efficiency of purse-seining has resulted in a marked decline in the number of pole-and-line vessels in the WCPO. The medium-scale shore-based pole-and-line fisheries that have been based in Pacific island countries (as opposed to the larger Japanese distant water vessels) have much higher costs per tonnage of fish than the purse-seine method. Fisheries formerly operating in Palau, Papua New Guinea and Kiribati are no longer active, only one vessel is now operating (seasonally) in Fiji and fishing activities are only now starting to improve after problems in the Solomon Islands fishery in recent years (Williams and Reid 2005).

For the pole-and-line method to be economically viable, therefore, it needs markets that will pay a premium price for its product. Solomon Islands' pole-and-line fishery had such a market in the United Kingdom until 2000, which was one of the reasons why the company kept its head above water for so long (as well as because of the Cotonou Agreement's 24 per cent tariff advantage over competitor countries in Southeast Asia). The loss of this market is one of the reasons why the Solomon Islands fishery has had financial trouble since 2000.[12]

Downstream processing

Fiji and Solomon Islands have had the longest running canneries among the countries covered by this study, both starting in the early 1970s with Japanese investment.[13] The next large-scale cannery was opened by the Philippines-based company RD in Papua New Guinea in 1997. The RD initiative was part of a PNG domestication policy to entice distant water fishing companies to establish shore bases by tying fisheries access to the building of processing facilities and offloading a proportion of their catch each year. After the success of RD, several other large-scale plants have been initiated. Marshall Islands also had a loining plant for about five years in the early 2000s.

Table 1.2 **Domestic longline development by country, 1995–2005**

Country	Fishery type	Fishery status 1995	Fishery status 2002	Fishery status 2005
Cook Islands	Small to medium scale targeting sashimi tuna in the south,larger scale catching albacore for canneries in the north	A couple of distant water fleet vessels operating in the south; no domestic players	Domestic southern and northern fisheries experienced a boom (to 19 vessels from 3 in 2001)	CPUE decline and lack of profitability led to stagnation in southern fishery; many who entered fishery in 2002 left in 2004–05 Northern fishery continuing strong
Fiji	Small to medium scale targeting tuna for sashimi markets	Private-sector companies Fiji Fish and Solander started in the 1980s, picked up momentum, joined by Chinese companies (total 90 vessels)	Boom of late 1990s continued (peaked at more than 100 vessels)	CPUE decline and lack of profitability led to stagnation Domestic private-sector veterans hanging on, new entrants dropping out (60 vessels active)
Kiribati	Small scale targeting sashimi tuna	One government-owned pole-and-line vessel converted to longline	Specially designed, locally constructed small-scale vessels being developed under an aid project	Two locally built vessels being trialled by government, not yet exporting
Marshall Islands	Medium scale targeting sashimi tuna	Government and aid-sponsored medium-scale vessels (5) Ting Hong distant water vessels based locally (peaked at more than 100)	Government and aid-sponsored vessels failed Ting Hong replaced by MIFV Chinese vessels (49) based locally	No domestically owned vessels, MIFV vessels (38) based locally
Papua New Guinea	Medium scale targeting tuna for sashimi markets, and shark	Beginning of private-sector driven domestic medium-scale fleet	Booming, with 40 vessels at several centres around the country	Freight costs and logistical difficulties, and CPUE decline, led to stagnation; all centres but Port Moresby closed down; all but one company wound back operation
Solomon Islands	Medium scale targeting tuna for sashimi markets	One foreign-owned, locally based operation in Honiara (Solgreen)	Solgreen continuing (about 10 vessels)	Solgreen closed. New company Global in Tulagi (31 vessels)

Other kinds of commercial tuna processing conducted in the Pacific include: packing and preparing chilled and/or frozen tuna into loins or steaks for fresh-fish markets; smoke-drying skipjack for *katsuobushi* (a commonly used stock flavouring and condiment in Japanese cuisine);[14] and in recent years small-scale factories have started up in several countries producing various kinds of gourmet processed fish—cold smoked tuna ham and tuna jerky.

While large-scale fish processing in the form of canneries and loining plants has generated employment and spin-off benefits in Fiji, Solomon Islands and more recently in Papua New Guinea, uncompetitively high-cost production environments mean almost all of these developments have relied on government revenue in one way or another. They are also vulnerable to erosion of trade preferences under the Cotonou Agreement. Processing of fresh chilled and frozen fish connected to longline fisheries in Papua New Guinea and Fiji—as purely private-sector ventures—has been more economically sound, but is currently suffering from falling CPUE in the fishery and the high costs of freight. Small-scale gourmet processing plants are a new initiative that might prove to be well suited to Pacific island country conditions.

Effects of trade barriers on domestic processing industries

The European Union and the United States have tariffs on imports of canned tuna, to protect their domestic canning industries. For this reason, Fiji's Pafco exports loins rather than cans to the United States. As former European colonies in Africa, the Caribbean and the Pacific (ACP), Papua New Guinea, Solomon Islands and Fiji are exempt from the 24 per cent tariff under the Cotonou Agreement. The EU tariff thus gives processed tuna from these countries a trade advantage in lucrative EU markets over more competitive industries in Southeast Asia, although with quotas this has begun to change. Under the EU Economic Partnership with Pacific island countries, it is possible that the complex Rules of Origin for fisheries products will be simplified and relaxed to also allow fish processed in Pacific island countries but caught by vessels owned in other countries to be included in the definition of 'ACP' (Rodwell, pers. comm.).[15] For the first few years of operations, the RD cannery in Papua New Guinea relied mostly on US markets, but in 2005 the managing director said that without the trade advantage in the European Union the cannery would 'close tomorrow' because the high costs of processing in Papua New Guinea meant that it could not compete against Southeast Asian producers (Celso, pers. comm.). Pacific island country developments in tuna processing are therefore vulnerable to erosion of EU trade preferences.

Food safety requirements

Food safety regulations for the European Union and the United States are very strict. Nevertheless, Solomon Taiyo managed to meet interim EU standards in the past, while RD and Pafco currently export to the European Union and the United States. The EU Partnership Agreement includes assistance to Pacific island countries for achieving the technical capacity to test and monitor food safety, and the United Nations Food and Agriculture Organisation (FAO) gives assistance with implementing hazard analysis critical control point (HACCP) systems. These food safety requirements can be seen as

an incentive to develop human resources and facilities capacities, with positive spin-offs for other industries where food safety is important, such as tourism and hospitality, as well as for the health systems of Pacific island countries.

Management of tuna fisheries in the WCPO

In common with many other fisheries worldwide, fisheries management in the WCPO has on the whole been reactive. According to one industry representative, national fisheries managers either have not had the vision to step in and make the hard decisions early enough to avoid 'a big bust after the boom', causing the fishery to settle at a level far below optimal sustainable rates, or have had the vision but not the power to enforce their decisions on unwilling fishing companies (Southwick, pers. comm.). Messages of gradually increasing concern have been delivered by the SPC in the past decade regarding bigeye, and latterly yellowfin. Stocks were, however, generally considered to be healthy enough not to signal the need for strong management action until more recent times.

Ecological sustainability is the basic prerequisite for being able to capture wealth from tuna industries. For governments to be able to deliver on sustainability outcomes, they need to have appropriate and consistent policies at three political scales

- sustainable management at the domestic level
- effective cooperation and coordination and some management at the regional level (FFA and subregional groups such as the Parties to the Nauru Agreement[16] [PNA])
- sustainable management at the international/multilateral level (WCPFC).

The latest stock assessment from the WCPFC First Regular Scientific Committee Meeting held in August 2005 shows that resource sustainability is now a serious issue. The WCPO used to have a buffer of relatively healthy stocks giving it time in which to work out the best regional management measures, but as the stocks have been fished down, these measures have to be decided on and implemented as a matter of urgency for some species (WCPFC 2005). The increasingly worrying scientific advice coming from the SPC contrasts with the lack of concrete action to manage the burgeoning increases in tuna-fishing activity (Greenpeace c.2005).

An interesting point about the WCPO tuna fishery is that the biological and economic components of sustainability are in different relationships with each other in different sectors. Most notably, economic unsustainability for the longline fisheries in the south kicks in long before significant impacts on the stocks as a whole occur. Yet the equatorial purse-seine skipjack fishery could remain economically viable even after the overall yellowfin and bigeye stocks are driven well below sustainable target levels. FFA-wide views and aspirations on tuna management and development vary as a result of this.

It is clear that allocation and effective management measures must be achieved sufficiently quickly to halt and reverse the impacts of fishing on bigeye and yellowfin stocks. If not, the WCPO tuna fishery seems likely to trend towards becoming a high-volume, skipjack-oriented purse-seine fishery, dominated by the low-cost Chinese and Taiwanese fleets, with minimal input from Pacific islanders.

Table 1.3 **A history of constraints identified for development from tuna resources**

ADB report (ADB 1997)	FFA report (Gillett 2003)	This book (2007)
Direct involvement of government in tuna businesses deterring the private sector; protected economies; government-oriented business interests	Widespread belief among fisheries officials that the role of government is to enable private-sector development, although officials without knowledge of the history of failure of state-owned enterprises still favour them	Most interviewees with a fisheries background believe state ownership of vessels or other means of direct involvement in tuna fisheries is a bad idea, but some influential officials still call for state ownership of tuna enterprises.
High-risk, capital-intensive nature of tuna fishing industry; difficult access to markets; high-cost production environments.		Declining profitability of tuna fishing since 1970s; lack of trading/marketing skills a problem; high-cost production environment.
Inadequate and inadequately managed sea and airfreight infrastructure.	Airfreight availability problems; inefficient harbour management.	Diseconomies of scale for air and sea freight in most locations.
Lack of commercial credit	Credit availability problems	Credit availability only a problem for those with no/bad commercial track record
Economies unstable; industry and investment policies unsound; unfriendly environment for foreign investors	Policies unstable; taxation difficult; administration expensive and prone to blockage; poor government–industry dialogue; low attractiveness to investors	General economic environment and policy development polices leading to over-promotion framework not conducive to industrial development; of fishing as an investment opportunity, lack of consultation with industry, in turn creating boom/bust cycle in between government departments, with other stakeholders; tuna fishing
Human resources not competitive on cost/productivity; inadequate pools of skills in some areas (technical, business)	Low levels of entrepreneurial development and industrial fisheries skills	Lack of business experience a problem for indigenous fisheries development; lack of human resource capacities in private and public sectors
Policies unclear and inconsistent	Instability of policies affecting tuna industries	Overarching need for strong, sound domestic policies to promote sustainable development and underpin regional and multilateral negotiating positions

Environmental laws not enforced	Environmental and social/political aspects of fisheries management inadequately addressed, detracting from development benefits and damaging the business environment
Inadequate supplies of fresh water for processing in all but a few Pacific island locations; difficult to access land for commercial purposes	Lack of fresh water and land for commercial development
Heavy reliance on preferential trade access likely to be eroded in future	Heavy reliance on preferential trade access likely to be eroded in future

Sources: Asian Development Bank (ADB), 1997. *The Pacific's Tuna: the challenge of investing in growth*, *Pacific Studies Series*, Asian Development Bank, Office of Pacific Operations, Manila. Gillett, R., 2003. *Domestic tuna industry development in the Pacific islands. The current situation and considerations for future development assistance*, FFA Report 03/01, Pacific Islands Forum Fisheries Agency, Honiara, Solomon Islands.

The FFA's Economics and Marketing Manager, Len Rodwell, considers that one major key to addressing the bigeye (and to a lesser extent the yellowfin) issues is to regulate the catches of purse-seiners. In addition, improving observer and port-sampling programs would more accurately differentiate between bigeye and yellowfin catches and assist with the regulation and accuracy of stock assessments. While there are some limits on purse seine fishing effort imposed through the PNA-based Palau Arrangement and its replacement, the much-anticipated Vessel Days Scheme (VDS), these are insufficient to halt the current trend towards overfishing and stock decline.

Given that the majority of the purse seine fishery in the WCPO (about 65 per cent) is carried out in the waters of FFA countries, and access to their waters by DWFNs is essential for economic operation, the FFA must effectively exert control over the purse seine fishery. The longline fishery is more difficult to control, given that the reverse situation prevails, with most fish taken on the high seas.

Good governance and clear and well-informed national policies on tuna management, strengthened through regional cooperation at the PNA/FFA level, given effect throughout the range of stocks by agreeing suitable measures in the WCPFC, offer the best way forward for the region.

Past recommendations for development from tuna

Tables 1.3 and 1.4 compare constraints and recommendations for developing Pacific tuna resources made close to a decade ago with more recent studies, including this one. The tables show that Pacific island countries have made good ground in some areas. In particular, most governments have come to see the private sector as a more appropriate driver of tuna development than state-owned enterprises. Service and supply industries have been promoted successfully in some Pacific island countries as an alternative to domestic fishing industries, and generally there has been a shift from simply desiring tuna development towards realising tangible results.

It is not easy to determine the precise degree to which tuna industry developments have occurred as a result of previous recommendations and reports, although in some cases (for example, Marshall Islands, Cook Islands), advice and technical assistance from regional organisations and aid donors have had clear results in terms of domestic industry expansion.

Cook Islands

Cook Islands has learnt much from its brief foray into tuna fisheries development, going through a boom–bust cycle in about 10 years. Even at current levels, however, the benefits to the domestic economy far outweigh the meagre access fees (US$5,000 per longline vessel, per annum) that were formerly the only income from offshore tuna resources. Much of this development arose from advice from the FFA and the SPC, and an administration willing to accept that advice. The government was also highly committed to domesticating its fishery. If Cook Islands' tuna industry recovers from the slump it was experiencing in 2005 and develops into an economically sustainable industry, it could be a valuable part of Cook Islands' overall economy, relieving some of the heavy dependence on tourism.

Table 1.4 **A history of recommendations made for development from tuna resources**

ADB report (ADB 1997)	FFA report (Gillett 2003)	This book (2007)
Maximise distant water access fees (rentals)		Distant water access fees are an important source of revenue for some countries, and can be increased but consider alternative approaches:improving governance of negotiations, regional cooperation and by managing fisheries such that profitability is maintained/restored
Concentrate domestic development on service and supply		Service and supply is another way to gain returns from DWFNs, as is supplying crew
Reorient role of government to enable private-sector investment (from state ownership); stimulate domestic private sector to invest; encourage foreign investors to base locally	Create investment-friendly economic climate; tuna management plans help with policy and administration environment; fisheries associations help with industry–government dialogue; revise taxation, especially for fuel; disseminate reports	Improve fisheries management, policymaking and administration for the business environment, and exchange of information in order to capture more wealth from tuna fisheries
	Seek leaders for local, medium to large-scale tuna businesses from business backgrounds, not small-scale fisheries	Develop business training and experience to achieve greater indigenous leadership in tuna industries
	Fish aggregating devices (FADs) are one of the few initiatives in small-scale tuna fisheries that have been successful, but few countries in the region have effective FAD programs	Small-scale fisheries development can be assisted with FAD programs (but likely to require continuing subsidies), greater understanding and protection of coastal marine environments, trust funds from industrial tuna fisheries and improved consultation
	Increase the FFA's role in domestic industry	In addition to the planned provision of development advice for individual countries, the FFA couldcoordinate/promote regional development initiatives
	Scrutinise development schemes (cost–benefit analysis) before committing government money	Ensure projects chosen are most likely to be economically sustainable; match individual country circumstances and those least likely to be a drain on revenue,noting that despite evidence that tuna fishing enterprises often do not generate wealth, countries still wish to develop them

Sources: Asian Development Bank (ADB), 1997. *The Pacific's Tuna: the challenge of investing in growth*, *Pacific Studies Series*, Asian Development Bank, Office of Pacific Operations, Manila. Gillett, R., 2003. *Domestic tuna industry development in the Pacific islands. The current situation and considerations for future development assistance*, FFA Report 03/01, Pacific Islands Forum Fisheries Agency, Honiara, Solomon Islands.

Fiji

The development of Fiji's domestic longlining industry can be considered a success story that emerged purely from the private sector. For a period, Fiji's longline fishery and related fresh-fish processing businesses were clearly financially viable, but they were hit hard in recent years with falling CPUE and rising fuel prices. While domestication has been a success in one sense, in common with other fisheries considered during the study, some of these gains were lost due to the lack of effective management and inadequate licensing. Fiji's large processing company, Pafco, has required large inputs of government revenue, but it has provided jobs and human resource training opportunities for people outside Suva.

The use of fisheries as a tool to address self-determination issues and implement affirmative action polices has been problematic, and has contributed to the downturn of the domestic longline industry. Bringing more indigenous Fijians into ownership and leadership roles in tuna industries is a long-term policy of the government.

Kiribati

Numerous plans and reports have been provided and a management plan completed, which has not been implemented. Most recommendations have pointed to a poor macroeconomic environment, fragile land environment and small economy as almost insurmountable barriers to competitive shore-based tuna development. The government, however, believes that there are good prospects for large-scale processing (a loining plant), apparently backed up by a positive feasibility study. There is also a strongly expressed but ill-defined desire to 'become more involved' in tuna fisheries. A number of failed government-driven small-scale tuna operations have not deterred clear preference by government for continuing involvement in tuna operations. The small-scale domestic fishery selling direct to the public has, however, flourished.

Marshall Islands

Marshall Islands has experienced a number of setbacks and generally overcome them, moving from operational involvement by government in fishing operations to successfully encouraging and supporting private-sector investment. This success was also donor led, through a major ADB institutional strengthening project. Marshall Islands' resource potential, freight and transport connections, and the pragmatic, relatively business-friendly approach of the government means Marshall Islands is in a good position to maintain and increase the wealth it generates from tuna industries. The shortage of local managers, a small labour pool and relatively high wages are constraints to development. These factors are caused at least partly by the ability of Marshallese to go to work in the United States. The social impacts of hosting a busy international port in the lagoon detract from the economic benefits gained from tuna industries, so this is another area in need of policy attention. The fluctuations in the fortunes of the tuna sector are somewhat tied to El Niño cycle-driven resource availability and strategies to smooth (or adapt to) this variation need to be factored into development strategies.

Papua New Guinea

In terms of the full range of raw materials and infrastructure required for successful domestic industry development, Papua New Guinea is in the best position of any of the Pacific island countries included in this study. In addition, Papua New Guinea's tuna resources are so rich it can make a great deal from distant water fleets. After a major donor-led restructure of national fisheries bodies into the National Fisheries Authority (NFA), substantial gains were made and investment attracted. While some impressive progress has been made, one main factor constraining Papua New Guinea from achieving its development aspirations is the capacity of the government to improve the business environment. Of particular concern to industry and investors has been the uncertainty surrounding governance, especially the politicisation of decision-making at the NFA. The other main factor is implementing sound management of the tuna fishery for its long-term sustainability. The large processing venture RD has been more commercially viable than previous attempts by Pacific island countries to trade access fees for onshore development, proving the domestication model is possible despite a challenging competitive environment.

Solomon Islands

Solomon Islands has a long history of domestic fisheries development. There has been some success with a pole-and-line fleet and a cannery as major contributors to the economy, especially through employment. Lack of capacity in the public fisheries sector and poor governance have been longstanding issues. Immediately before the social and political breakdown of 2000–03, however, the Solomon Islands tuna industry was relatively healthy and its fisheries management was among the best in the region. While the breakdown in law and order and governance in 2000, rampant corruption, escalating costs and loss of confidence destroyed much of the industry, there is proof-of-concept for a viable Solomon Islands domestic tuna industry. The tuna plan, which was reviewed after peace was restored, has yet to be implemented, and the largest domestic company, Soltai, faces an uncertain future.

Despite the progress outlined above, a number of the constraints identified nearly a decade ago in the major ADB study remained in 2005.

Clearly, there is no lack of ideas about how Pacific island countries can achieve more from their tuna resources. Many seem feasible but have yet to be tried by Pacific island governments. In some cases, there has tended to be a cycle of identifying a problem, commissioning a report, failing to act on the report, re-identifying the same problem, commissioning a report, and so on. Indeed, there is a no guarantee that this book will not suffer the same fate.

Given the political, economic, social and cultural background prevailing in Pacific island countries, however, it is perhaps not surprising that progress is slow. Many of the issues that remain to be addressed are deep-seated structural issues that will take time to overcome. While on occasion the problem is a lack of commitment on the part of officials to try recommendations, in other cases the commitment is there but insurmountable obstacles prevent movement. It is one thing for consultants and others to make pronouncements, frequently assuming an open and transparent market economy, and quite another to make

them happen. Much remains to be done, but it is heartening to look at the progress that has been achieved despite governance problems, capacity constraints, stifling bureaucracy and political pressures.

Regional cooperation by Pacific island countries on tuna

There are increasing calls for greater regional cooperation among Pacific island countries from the highest level, as embodied in documents such as the *Pacific Plan* (Eminent Persons' Group 2004; Pacific Islands Forum 2005). Calls for greater regional cooperation in the Pacific have been made for some decades; new factors in such calls include the mounting evidence of the failure of many Pacific island countries to assert 'effective sovereignty' due to lack of government capacity. One study estimates that poor governance has cost US$75 billion in forgone income in Papua New Guinea, Fiji, Solomon Islands and Nauru since independence (Grynberg et al. 2005). Increasing interventionist Australian government policy towards its Pacific islands neighbours since 11 September 2001 is another new factor (Fry 2005).

Regional cooperation in oceanic fisheries has been seen as a 'shining example' of governments working together in the Pacific (Tarte 2004). Due to the migratory nature of the resource, for tuna fisheries management in the WCPO to be effective, it must be managed regionally, multilaterally and nationally. Regional bodies such as the FFA (established in 1979) and the Oceanic Fisheries Program at the SPC (established in 1980) have coordinated and assisted Pacific island countries in various regional initiatives relating to research, management and development of their tuna resources.

One the other hand, there are several significant areas in which Pacific island countries have not achieved cooperation in fisheries. Most notably, they have not shared economic information about tuna industries or aid, or negotiated access/licensing arrangements collaboratively, despite the US multilateral treaty providing evidence that regional negotiation could yield substantial benefits.[17]

With the establishment of the WCPFC, Pacific island countries also have to work with distant water fishing countries, some of whom oppose Pacific island countries on key issues. Japan was a difficult opponent for Pacific island countries in the negotiations leading up to the establishment of the WCPFC.[18] Japan promises to continue to be a strong opponent of Pacific island countries being allocated the tuna resources in their EEZs, arguing that fishing states have at least equal rights to the resources and that highly migratory resources do not 'belong' to the zone in which they are caught. The fact that Japan has fishing relations with some Pacific island countries (mostly PNA states) has tended to create divisions in regional cooperation to achieve recognition for issues such as allocation by fishing zones. In particular, Japan's past practice of engaging with, or paying travel expenses for, only Pacific island countries with which it has fishing agreements has been divisive. Other distant water fishing states/entities in the WCPFC include the United States, Korea, China, Taiwan and the European Union. These states and entities are highly industrialised, with considerable wealth and other resources at their disposal to underpin negotiating strategies. Pacific island countries will need every tool at their disposal to further their interests, the most powerful of which is an ability to win votes through regional cooperation, combined with strategic alliances with like-minded states.

Summary of recommendations

Based on case studies of tuna industries and distant water fleet activities, we specify 10 strategies for working towards the goal of capturing more wealth domestically in a sustainable and socially equitable manner. Specific policies necessarily vary from country to country because each has very different economic, cultural and geographic environments, including different endowments of tuna resources. Some general strategies, however, can be more or less usefully applied across the region.

The most fundamental strategy is effective fisheries management. We suggest that in light of Pacific islanders' aspirations in this context, fisheries management should be understood and applied more broadly than just in terms of conserving the resource. At the same time, fisheries management measures should optimise productivity and hence profitability of fisheries. At a regional level, management measures must be designed to take account of economic factors and the complex interactions between gear and species across EEZs and the high seas. Furthermore, fisheries management is most effective when it takes into consideration the social, cultural and political contexts in which it operates.

Recommendation 1

Place greater emphasis on predicting economic outcomes—particularly across fisheries, gear types and WCPFC members—when designing and determining management measures, including levels of fishing effort by domestic and foreign fleets.

Recommendation 2

Follow up the 2002 FFA Rights-Based Workshop, possibly through a series of in-country seminars, to increase awareness among domestic policymakers and fisheries managers of such approaches.

Recommendation 3

Base tuna management and development on the principles of ecologically sustainable development—balancing economic, environmental and social goals and outcomes.

Another basic strategy for capturing more wealth from tuna is for Pacific island countries to make the most of DWFN companies, especially since access fees from these fleets are the easiest way to capture wealth. The case studies demonstrate than in addition to access fees and fisheries aid, some Pacific island countries have drawn benefits from DWFNs through spin-off supply and service businesses based on fleets trans-shipping in port. Many reports have already been written about how Pacific island countries could increase their level of access fees, so our recommendation for access fees is to follow up on ideas raised in those reports and make a more concerted effort to reform the basis for granting access and the associated fee negotiations.

Recommendation 4

Hold an access-fee summit (hosted by the FFA) including Pacific island fisheries officials, other stakeholders and experts to discuss various ways of licensing DWFN vessels, including improving the existing access fee-based arrangements and alternatives,

such as appropriate rights-based licensing and chartering arrangements. The summit should revisit the many reports on increasing access fees that have been produced over the years and consider seriously which ideas will work in practice.

While other stakeholders, including the community and industry, can use the democratic process to influence public policy, Pacific island governments hold the key to creating an environment to enable private-sector development. Pacific island governments will determine the nature and success of fisheries management measures to protect the resource and investors' rights in the resource, and it is governments that negotiate and agree on distant water access and other licensing agreements.

Based on the case study material, we suggest a range of areas where governments can improve the economic environment, including: more consultative and informed decision making; policy stability; non-discriminatory taxation regimes; effective, efficient government services; developing investment hubs; departmental structures and planning; transparency and accountability; and industrial policy, including human resources development.

Recommendation 5

Pacific island government officials, with industry representatives, review the delivery of government services with industry representatives, to highlight ways of streamlining bureaucratic processes to increase industry efficiency and profitability.

Recommendation 6

Review successes and failures in tuna management and development planning processes to date and base future efforts on lessons learned. Develop tuna management plans such that they are 'owned' by nationals and have agreed, achievable goals and timelines. Plans should have legislative force. Progress needs to be assessed on a regular basis, and goals and strategies revised to ensure alignment with national and regional policies, as well as tuna fisheries and market dynamics.

Recommendation 7

Appoint a professional regional representative (possibly part-time) to represent the interests of Pacific island country tuna industries, working closely with the FFA. The representative should be adequately funded to travel and liaise to improve consultation and inclusion. In particular, the representative should attend regional meetings and set up information networks with industry players.

Recommendation 8

Bring industry, environmental and social/community NGOs into consultative decision-making processes as envisaged in tuna management plans.

Recommendation 9

Sponsor agencies to make consultants' reports publicly available as a general rule. The FFA or the SPC should develop and manage a publicly accessible bibliographic database of publications with relevance to tuna in the region.

Recommendation 10

Build capacity in Pacific island country fisheries departments in the following fields: fisheries management (including working knowledge of stock assessments); economics; business management; and public policy.

The remainder of the strategies are about the possibilities for private-sector regional cooperation in generating wealth, the roles of bodies such as the FFA and the SPC in facilitating industrial fisheries development, and exploring possibilities for generating wealth from small-scale coastal tuna fisheries and recreational fishing.

Notes

[1] For the purposes of this book, Pacific island countries are synonymous with the members of the Pacific Islands Forum Fisheries Agency (FFA).

[2] 'Development' in this book refers to specific fisheries industry development and to general economic development.

[3] 'Management' in this book is used for fisheries resource management and business management, within fisheries bureaucracies and in the private sector.

[4] The tables in the Appendices show some of the statistical similarities and differences between these countries, in terms of their general economy as well as their tuna fisheries.

[5] Fisheries targeting highly migratory species such as tuna cannot be managed effectively by individual countries, so the world's tuna fisheries are managed multilaterally through Regional Fisheries Management Organisations (RFMOs). The WCPFC is to administer the *Convention for the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean* and met for the first time in December 2004. The convention establishing the Commission and laying down the basis for its work entered into force in June 2004. Before the convention was adopted, the negotiations were in the form of a Multilateral High Level Conference (MHLC).

[6] The term distant water fishing *nation* is not a good one because a nation is a subjective construct usually based on feelings of ethnic belonging and historical ties to particular territories. States are the administrative, political and economic units associated with nations. So, strictly speaking, the term should be distant water fishing *states*. This report, however, uses the term DWFN because it will be more familiar to readers than DWFS.

[7] Scientific information used here might not be as up to date as a specialist fisheries management for this region might be able to find.This book, however, aims to go across disciplines, and in that vein the information used is the best the authors were able to find at the time of writing.

[8] The ENSO (El Niño/Southern Oscillation) is an oscillation between a warm (El Niño) and cold (La Niña) state that evolves under the influence of the dynamic interaction between the atmosphere and ocean, with an irregular frequency of two to seven years.

[9] Exclusive Economic Zones (EEZs) are the areas of ocean 200 nautical miles out from coastlines, over which states have sovereign rights.

[10] SPC reports on this include Lehodey et al. 2003 and SPC 2005.

[11] Reciprocal access agreement for Nauru Agreement countries, with priority accorded to local and locally based fleets, signed in the Federated States of Micronesia (FSM).

[12] For further information about the importance of the environmentally aware UK market to the Solomon Islands tuna fishery, see Barclay 2005.

[13] For more information on Solomon Islands' cannery, see Barclay 2000, 2001, 2004, 2005.

[14] During the production phase, loins are often called *arabushi* (literally 'rough loin'), with the final cured product called *katsuobushi* ('skipjack loin').

[15] For further information on the Cotonou Agreement, its predecessor, the Lomé Convention, and the Rules of Origin, see Grynberg 1998 and 2003.

[16] The Parties to the Nauru Agreement (PNA) are a subgroup of the FFA countries whose EEZs encompass most of the equatorial belt of rich skipjack fishing grounds in the region.

[17] Opinions of the 'success' of the US (tuna) treaty vary widely. Some member countries (for example, Kiribati) feel it is inequitable because some countries benefit without having the US fleet fish in their waters, while others feel that such an agreement and fee level would not have been possible without FFA-wide cooperation, and that the regional spirit of the treaty is, of itself, a valuable benefit. These views aside, the treaty was struck under a unique set of circumstances (Anderson 2002; Ram-Bidesi 2004; Tarte 2002, 2003a, 2003b), which cannot be applied simply to other multilateral agreements.

[18] For a history of these negotiations, including the prominent role played by Japan, see Anderson 2002; Ram-Bidesi 2004; Tarte 2002, 2003a, 2003b.