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The future of Pacific Island fisheries

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This report is a relatively short summary of the major issues related to the future of Pacific Island fisheries, and is aimed at senior decision makers in Pacific Island governments. Two additional documents have also been produced: One is a short summary of only main points (for Forum Leaders and for wider circulation); the second is a set of technical annexes (for people interested in technical aspects or justification for the conclusions reached).

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No one can foresee all the opportunities and forces, or their relative importance, for the future is not a simple projection of the present. New factors keep emerging, but the more we explore the possibilities and act on the best options, the better the futures are likely to be.

Source: Crocombe 2008

Abbreviations

ADB	Asian Development Bank
DWFNs	distant-water fishing nations
EEZ	exclusive economic zone
FAD	fish aggregating device
FSM	Federated States of Micronesia
FFA	Pacific Islands Forum Fisheries Agency
GDP	gross domestic product
IUU	illegal, unreported and unregulated
MCS	monitoring, control and surveillance
MDG	Millennium Development Goal
MPA	marine protected area
NGO	non-governmental organisation
PICTs	Pacific Island countries and territories
PNA	Parties to the Nauru Agreement
PNG	Papua New Guinea
SPC	Secretariat of the Pacific Community
USP	University of the South Pacific
WCPFC	Western and Central Pacific Fisheries Commission
WCPO	western and central Pacific Oceans

1. Introduction

Fisheries are the most significant renewable resource that Pacific Island countries and territories (PICTs) have for food security, livelihoods and economic growth. As Pacific Island populations grow, the future benefits that these resources can provide will depend on how well we are able to balance the increasing demands on fisheries with the capacity of oceanic, coastal and freshwater fish stocks to sustain those harvests. Aquaculture's role in supplementing wild fisheries production is also a consideration.

This report considers the future of fisheries over a 25-year timeframe (2010–2035). It is intended to provide the basis for long-term strategic approaches to developing and managing fisheries at national and regional levels. The first part of the report provides a brief overview of the status of and trends in the region's fisheries, the major issues and challenges, and gaps that need to be addressed. The second part examines ways in which the contribution of national and regional institutions can be enhanced, and regional cooperation strengthened, to provide countries with the capacity and adaptability they need to address emerging needs and priorities.

While it is impossible to accurately predict what Pacific Island fisheries will be like in 2035, this study identifies and briefly describes the most likely significant factors driving change in fisheries, and their possible impacts. These factors were identified through discussions with Pacific Island fishery stakeholders and global specialists, and a review of the fisheries literature. Scenarios (Box 1) were developed and scrutinised to provide insight into the future of fisheries.

Box 1: What is a scenario?

Scenarios are plausible, provocative, and relevant stories about how the future might unfold. They can be told in both words and numbers. Scenarios are not forecasts, projections, predictions, or recommendations, though model projections may be used to quantify some aspects of the scenarios. The process of building scenarios is intended to widen perspectives and illuminate key issues that might otherwise be either missed or dismissed. By offering insight into uncertainties and the consequences of current and possible future actions, scenarios support more informed and rational decision-making in situations of uncertainty.

Source: Carpenter 2005

In this report:

- 'Fishing' and 'fisheries' refer to the harvesting of aquatic animals and plants, and includes aquaculture, unless otherwise stated.
- 'Fish' includes shellfish and other invertebrates such as sea cucumbers.
- The term 'Pacific Island countries and territories' and 'PICTs' refers to the region's 14 independent countries and the 8 territories.

2. Current status and general trends

2.1 Past trends: Fishery and non-fishery

It is informative to consider the likely future of fisheries in light of past experience by considering desirable and undesirable trends. Important trends in the Pacific Islands outside the fisheries sector include changes in demographics, governance, and business conditions. In general, most PICTs are experiencing declining fertility, but this reduction is lower than in most developing countries, resulting in relatively large population increases. A second significant demographic trend is increasing urbanisation. Government instability is also emerging as an important trend, especially in Melanesia. With respect to business conditions, there is increasing – but not yet full – acceptance of the private sector as an important factor in stimulating economic growth. Many PICTs have experienced improvements in their investment climate and openness to outside investment. There is also a renewed determination to secure greater tangible benefits from offshore resources (e.g. tuna) by exerting management and economic influence at a regional and sub-regional level.

The most influential trends in fishing and aquaculture (apart from resource status) include the:

- demise of government fishing companies;
- lack of success in fulfilling the development promise of offshore fisheries;
- decline of pole-and-line fishing and the rise and decline of locally based longlining effort;
- decline of the United States purse-seine fleet, steadiness in the Japanese purse-seine fleet, and the rise of the non-Japanese Asian purse-seine fleet;
- decline in bottomfish fisheries;
- emergence of new fisheries for aquarium fish and live reef food fish;
- increasing relative cost of fuel in fishing operations;
- continuing success of the fish aggregating device (FAD) as one of the few mechanisms that enable small-scale fishers to access offshore resources;
- lack of major success in government-led aquaculture development efforts; and
- success of black pearl culture.

Some important recent trends in tuna fisheries of eight independent Pacific Island countries were documented in a study by the Pacific Islands Forum Fisheries Agency (FFA), and are outlined in Table 1.

Some overall generalisations can be made about past trends in Pacific Island fisheries. While changes in fisheries were formerly driven by the initiatives put forward by national governments and donors, more recent fisheries trends have resulted from economic realities (e.g. in bottomfish, aquaculture, boatbuilding, and small-scale tuna fishing). There has been an increase in wealth in the sector, much of which is due to an increasing global scarcity of fishery resources. A shift from small-scale producers to medium-scale producers has taken place in several fisheries (longlining, bottomfish, aquaculture) in order to take advantage of economies of scale.

Table 1: The evolution of the Pacific Islands tuna industry development 2002–2008

	2002	2006	2008
Purse-seine vessels (locally based)	40 vessels	55 vessels	56 vessels
Longliners (locally based)	377 vessels	316 vessels	269 vessels
Pole-and-line vessels (locally based)	14 vessels	12 vessels	2 vessels
Tuna canning and/or loining facilities	4 factories	5 factories	6 factories
Local jobs on tuna vessels	2,959 jobs	797 jobs	1,169 jobs
Local jobs in tuna canning and/or loining facilities	5,555 jobs	6,935 jobs	11,116 jobs

2.2 Fishery resources

The region's fishery resources can be divided into four categories: offshore (or oceanic), coastal (or inshore), freshwater (or inland), and aquaculture.

- **Offshore resources** include tunas, billfish and allied species. These resources are found in open-water habitats, and generally move extensively across exclusive economic zones and high seas areas. A few, well-studied species form the basis of the region's industrial tuna fisheries, which are managed through national, regional and international frameworks. Although oceanic in habit, some of the important species in this category are also found in coastal waters, where in some cases they form resident populations. In general, offshore resources are in relatively good condition, with the exception of bigeye tuna and to a lesser extent, yellowfin tuna.

- **Coastal resources** include a very diverse range of finfish and invertebrates, many species of which are poorly understood. These include demersal (bottom dwelling) species, and those that inhabit shallow water habitats, and whose individual movements are generally restricted to coastal areas. Management is undertaken on national and community levels. Because of their relative accessibility, these resources form the basis of most of the region's small-scale fisheries. In general, coastal fishery resources are heavily used, often showing signs of overfishing; These resources are targeted by both commercial and subsistence fishers.

- **Freshwater resources** include both fish and invertebrates (e.g. freshwater shrimps and clams). In the Pacific Islands region, freshwater resources are most important in the larger islands of Melanesia, but are of some significance in all areas, except atolls and tiny islands. Many of the important species are introduced, such as tilapia. Most fishing effort for freshwater resources is subsistence based. Freshwater fisheries issues and/or problems and their solutions are generally closely linked with freshwater quality.

- **Aquaculture** in the region centres on a small number of resources: black-lip pearl oyster, penaeid shrimp, tilapia, milkfish, giant clam and seaweed. In terms of value, aquaculture in the region is overwhelmingly dominated by French Polynesia (black pearl) and New Caledonia (shrimp), with 95.5% of the value of aquaculture in the region's 22 PICTs coming from these two French territories.

2.3 Production and economic contribution

Note: Annual production by value for 2007

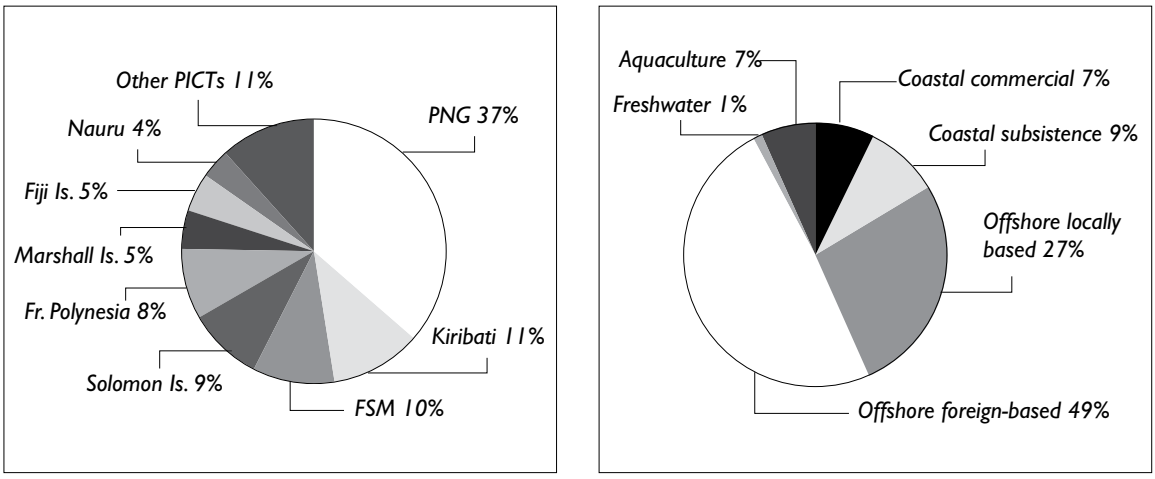


Figure 1: Production from fisheries and aquaculture by country and category

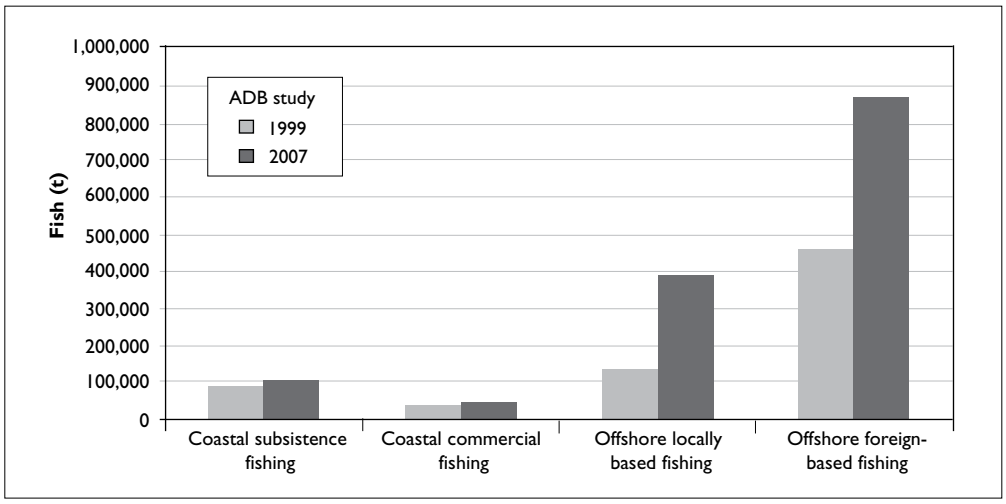
Offshore, foreign-based fishing is responsible for about half of the value of the region's fisheries, offshore locally based fishing for about one-quarter, with coastal commercial, coastal subsistence, and aquaculture together accounting for the remaining one-quarter. Papua New Guinea (PNG) – which has three canning and loining plants, three-quarters of all locally based purse-seine vessels, and vast freshwater and coastal fisheries – was responsible for about 40% of all fishery production in the region (by value) in 2007. The ranking of countries by total fisheries production is strongly influenced by the level of tuna catches, and there is a general pattern of decreasing total national catches from west to east across the region, and from equatorial to higher latitudes.

The region's fishing sector contributes up to 10% of gross domestic product (GDP), but these contributions exclude postharvest activities (as per international convention). Fishing sector GDP estimates for countries with fish processing and trans-shipment activities are likely to substantially underestimate the economic importance of the broader fisheries sector.

Exports of fisheries products are very important to PICTs, and represent a majority of the exports in about half of the countries and territories. In six PICTs, the export value of fishery products accounts for about 80% or more of all exports.

Most of the benefits from fisheries that directly affect Pacific Islanders – such as nutrition and jobs – come from coastal resources. The less tangible and more abstract benefits (e.g. contribution to GDP, exports, and government revenue) tend to come disproportionately from offshore resources.

A very important trend in recent regional fishery production is that offshore fisheries are expanding substantially, while coastal fisheries are not. Although the poor state of coastal fisheries statistics in the region normally makes it difficult to demonstrate this point, two comparable studies by the Asian Development Bank (ADB) show the trend.



(Source: Gilett and Lightfoot 2001; Gilett 2009)

Figure 2: Fishery production trends

The observation that coastal fishery production is not increasing is quite consistent with a recent policy paper by the Secretariat of the Pacific Community (SPC), which notes that coastal fisheries are 'mature' in fishery development terms, and that the main focus of reef fisheries should be on consolidation and protection of current benefits. It asserts that any attempt to extract additional benefits should focus on tourism and other non−extractive uses.

2.4 National, regional and multilateral fishery management arrangements

National fisheries agencies face many challenges in dealing with contemporary fisheries management issues, and numerous studies have identified these as key barriers to achieving fishery goals. Some of the main issues related to national fisheries agencies are that they:

- face increasing workloads and responsibilities with shrinking budgets and limited human capacity;
- often have limited connections with fishery stakeholders;
- have increasing regional responsibilities or activities associated with offshore fisheries, which has tended to divert attention and resources away from coastal fisheries;
- have been the focus of targeted institutional strengthening projects in recent years, the results of which are yet to be fully determined; and
- lack good planning procedures that are implemented and monitored in a structured way.

With respect to regional fishery arrangements, the Pacific Islands are served by two regional fisheries institutions, SPC and FFA. There has been an increasing focus on developing regional programmes that are implemented nationally, and heightened awareness of the need to ensure adequate in-country capacity is available to implement these regional programmes.

At the multilateral level, the Western and Central Pacific Fisheries Commission (WCPFC) has begun to address problems in managing tuna and related stocks of the western and central Pacific Ocean (WCPO) throughout their range, and particularly on the high seas. By adopting a range of conservation and management measures, WCPFC seeks to provide management arrangements for key tuna stocks, while also protecting other species caught in association with those stocks, including bycatch species. This has not been a smooth process, with strong disagreements between FFA members and distant-water fishing nations (DWFNs) regarding the jurisdiction of WCPFC over exclusive economic zones (EEZs) and archipelagic waters. Relative to other regional tuna fisheries management organisations, coastal states can drive the WCPO process to a greater extent, because they control a greater proportion of resources in this region, and there is generally more solidarity among PICTs than among coastal states in other regions. WCPFC's effectiveness, in terms of conserving and managing fish stocks and providing 'good' outcomes for PICTs with regard to securing what they perceive as appropriate control of the resource, has been increasingly questioned by FFA member countries

3. Key drivers of change

A list of the major factors driving change in Pacific Island fisheries are listed below, followed by a summary of the probable impacts on Pacific Island fisheries of the predicted changes arising from each of these factors.

- Population growth and urbanisation
- Patterns of economic development
- The status of fisheries resources and developments in other oceans
- Governance and political stability
- Climate change
- Limits to domestic fishery production
- Markets and trade
- Other factors (e.g. fuel costs, technology and innovation, foreign aid).

Population growth and urbanisation: The rate of overall population growth and urbanisation will remain high. Population will increase from 9.8 million in 2010 to 15.0 million in 2035, with growth especially high in Melanesia. Continuing urbanisation will result in about one-third of the population of Melanesia, one-half of that in Polynesia, and three-quarters of that in Micronesia living in urban areas by 2035.

There will be a growing gap between coastal fisheries production and the demand for fish from coastal fisheries. The amount of fishery products originating from coastal fisheries that is accessible to urban residents will decline sharply due to overexploitation and habitat destruction. A growing proportion of the population will not be able to catch sufficient fish to provide for household consumption, and purchased fish will become relatively expensive. Food security issues will grow tremendously in importance as the need increases to obtain additional sources of fish to cover shortfalls.

National economic development: PICTs appear to be falling seriously short of achieving the targets associated with the Millennium Development Goals (MDGs). Poverty in the region is on the rise, with about one-third of the people in the Pacific Islands living below national poverty lines. Governments (many with a short political horizon) have limited ability and incentives to translate MDGs into national initiatives and outcomes. Current trends suggest that the economies of most PICTs will not be in very good condition in the future.

There will be large negative impacts on coastal fisheries: greater numbers of people without jobs will be seeking income and food security from harvesting coastal resources, and will be willing to compromise future sustainability for immediate food or money. Limited public revenues will reduce the ability of governments to provide basic fisheries-related management services and infrastructure.

Global patterns of economic development: Global economic development trends suggest that in 25 years there will be increasing prosperity in countries that serve as markets for the region's fish, accompanied by decreasing barriers to international commerce, increasing consolidation in industries that involve international commerce, increasing relative costs of energy, and movement by labour-intensive industries to low-wage countries.

Several of these trends will contribute to higher prices for fishery products. This will bring greater benefits to those PICTs that actively pursue development objectives within the limits of sustainability, using strong fishery institutions and resilient fishery regulatory schemes. Higher prices for those countries with poor overall governance structure and weak regulatory schemes could have negative consequences, including a devastating impact on the supply of fish for domestic consumption. Higher prices for fishery products could easily be a double-edge sword for the Pacific Islands region – much like the 'resource curse' in some African countries that have abundant diamonds or oil, but have achieved little in the way of development. Non-fishing activities will have growing impacts, which will also need to be addressed.

The status of fisheries resources and developments in other oceans: Most of the world's fisheries are fully- or over-exploited (FAO 2009),[1] and are increasingly subject to tight regulatory controls. This has created a 'push/pull' situation, in which fishers are discouraged from operating in certain regions and/or are attracted by perceptions of opportunity in other areas.

As populations and demand grow and marine resources continue to decline in Southeast Asia and China, coastal marine resources in the Pacific Islands will likely become increasingly attractive and highly valued. Overfishing of tuna in other regions will probably result in the Pacific Islands region becoming increasingly attractive to global-roaming tuna fleets, thereby increasing the value of fisheries access and/or presenting opportunities for leveraging development of domestic fisheries. On the other hand, illegal, unreported and unregulated (IUU) fishing is likely to increase, along with management costs

Governance and political stability: Common features that emerge from analyses of fisheries governance are that many national fisheries agencies have low capacity, a lack of qualified personnel at all levels, increasingly complex issues to contend with, low levels of funding, and few staff incentives for performance in support of good governance.

The future is likely to bring an increase in the scarcity of fisheries resources, and the pressure on fishery decision-makers to satisfy stakeholders with differing interests will increase, testing governance structures. However, where good governance exists, large gains in benefits should occur. Those countries that currently have poor governance structures and fisheries agencies that perform inadequately will probably suffer major or magnified negative consequences in the future. Fisheries governance can be expected to change, at least marginally, with any improvement or decline in general governance in the region.

Climate change: The build-up of carbon dioxide and other greenhouse gases in the atmosphere due to human activities is acting in two major ways that will ultimately affect fisheries: through global warming and ocean acidification.

In offshore fisheries, initial modelling indicates that the concentrations of skipjack and bigeye tunas, and the associated benefits, may be located farther to the east. Projections indicate that cyclones will become progressively more intense, which will increase the risk to shore-based facilities, fleets, and processing operations in countries located within the cyclone belt. Coastal fisheries are eventually expected to be less productive due to the degradation of coral reefs caused by the projected synergistic effects of more frequent bleaching, lower levels of carbonate, increased cyclone intensity and greater turbidity of coastal waters. Aquaculture is likely to suffer problems related to floods, increased acidification, and higher temperatures.

1 FAO (2009) states: 'In 2007, about 28 percent of stocks were either over-exploited (19 percent), depleted (8 percent) or recovering from depletion (1 percent) and thus yielding less than their maximum potential owing to excess fishing pressure. A further 52 percent of stocks were fully exploited and, therefore, producing catches that were at or close to their maximum sustainable limits with no room for further expansion.'

Limits to domestic fishery production: The total coastal fisheries production of many PICTs does not appear to have expanded in recent years, despite increasing effort. Many species have reached or exceeded sustainable production limits, and this trend is expected to continue across all fisheries. Coastal fisheries production is not expected to grow significantly in the future in most PICTs. In offshore fisheries, some tuna species are approaching (or surpassing) sustainable production levels, while others can support increased catches, but that potential is certainly not infinite. It is likely that most future industrial fisheries development will be based on skipjack. The nature and production of coastal and offshore fisheries in the long term will be determined, at least in part, by how fisheries managers respond when sustainable production levels are reached. Fisheries management will include economic objectives, rather than consisting simply of biological targets or limits.

Markets and trade

- **Subsidies:** Many governments in the region currently use subsidies as a fisheries development tool, while some major fishing nations continue to subsidise their fleets. The practice of subsidising domestic fisheries in the region is likely to be reduced in the future due to the a) decreasing ability for Pacific Island governments to pay for such subsidies, b) increasingly overexploited condition of coastal resources, c) shift in donor priorities toward promoting conservation efforts (donor supported many past subsidy programmes), and d) poor experience in the region with the use of subsidies as a fisheries development tool. Subsidies for distant-water fleets will most likely decline as World Trade Organization measures take effect.

- **Eco-certification:** The process of certifying that specific fishery products come from fisheries that are 'sustainable' is currently growing in importance. Proof of sustainability will be very important in future markets for the region's offshore fisheries. The impact of certification schemes on Pacific Island coastal fisheries and aquaculture is less certain. The carbon inputs into fisheries production will come under increasing scrutiny.

- **Preferential access:** Many of the region's tuna processing plants currently rely heavily on preferential market access to the European Commission. With an anticipated increase in free trade arrangements, it can be expected that these preferences will not be available in 25 years. The region must adjust to this reality and endeavour to improve the economic efficiency of processing so it can compete with suppliers in Southeast Asia. On the positive side, new markets for tuna should emerge.

Other drivers

- **Fuel costs:** Tuna longline fisheries will experience difficulty in the future, while purse-seine fisheries will have relatively fewer difficulties resulting from fuel price increases, as they are able to use increasingly effective and fuel-efficient fishing techniques. In coastal fishing, the strategy of responding to lower catch rates by extending the area fished will become less viable, while non-motorised fishing techniques will enjoy some advantages.

- **Technology improvements:** It is inevitable that Pacific Island fishers will become more efficient, which has implications for effort control and stock assessments. Changes will be both incremental and in leaps. Not all changes will be negative and improvements can be expected, including in the ways fisheries are assessed and managed, alternative fuel or energy saving technologies, fish preservation and storage, and processing methods.

- **Foreign aid:** With the budgets of many national fisheries agencies evolving to support staff costs at the expense of operations andactivities, donor support will be increasingly important for any

projects or activities, but priorities may be different from those of the host government. Non-governmental organisations (NGOs) will also grow in significance, and may attract donor funding.

- **Political profile:** Where there is high-level government interest in fisheries, positive changes will be more likely to occur. A major unknown will be whether governments will be interested in and committed to approaches that consolidate current benefits and add value to existing catches, rather than seeking development through increased catches.

4. Forming an impression of the future

4.1 An exploration of challenges, threats and opportunities

Various future challenges will threaten the flow of benefits from fisheries in the Pacific Islands, and there will be opportunities to overcome these difficulties and/or produce additional benefits from the fisheries. An exhaustive listing of all challenges and opportunities would be very long and not applicable to all countries in the region. Table 2 attempts to present only those factors that are especially important or are common to many countries. Particularly serious threats are posed by excess fishing effort in both coastal and offshore fisheries, declines in bigeye and yellowfin tunas, and the direct and indirect impacts on coastal fisheries associated with a rapidly rising population.

Some of the other issues highlighted in Table 2 deserve additional attention. Many of the likely future challenges to all categories of fisheries in the region will be related to governance issues, especially the effectiveness of government fisheries agencies. Conversely, taking advantage of future fisheries opportunities will be extremely difficult if the performance of fisheries agencies does not improve.

Other important features of Table 2 are:

- Challenges facing fisheries will be considerably more complex in the future, but many may be magnifications of current challenges, and may not involve new or markedly different issues. Challenges will exist both inside the fisheries sector (where they can be addressed through fisheries management) and beyond (in which case they must be addressed through a higher level or multisectoral approach).

- For offshore fisheries, regional solidarity among PICTs will be central to mitigating most of the challenges listed, as well as for taking advantage of most of the opportunities.

- Regional approaches will need to recognise differing national circumstances, priorities and aspirations, particularly in developing fisheries management arrangements for tuna fisheries.

- Dealing with challenges will often involve the difficult act of balancing very different types of considerations, both inside and outside the fisheries sector.

In addition to the challenges and threats listed in Table 2 that are applicable to all countries, some countries and parts of countries have extra difficulties as a result of their remote locations, which reduces opportunities, especially with respect to perishable products.

Table 2: Challenges and opportunities in Pacific Island fisheries

	Main challenges	Opportunities
Offshore	• **Overfishing**: Overall levels of fishing effort are too high. Two of the four important species of tuna in the region cannot support increasing catches – biological limits are being approached and/or surpassed. Of special concern are the overfishing on bigeye and yellowfin stocks and the overfished status of bigeye. Currently, catches of yellowfin/bigeye are being maintained by above average recruitment; a return to long-term average recruitment (the likelihood of which is unknown) would accelerate declines in yellowfin and bigeye. Given the poor state of knowledge of the pelagic ecosystem, there is some concern about the irreversibility of the bigeye decline. Even the potential of skipjack, thought to be the largest fishery resource of the region, is not infinite. Indonesia and the Philippines, which share stocks with PICTs, have even more difficulty controlling overfishing. • **Ineffective management processes:** The pace of management interventions is likely to continue to be slower than stock declines. There may be great difficulty in balancing bigeye and yellowfin management measures with development aspirations (e.g. the impact of those measures on the skipjack purse-seine fishery). There are also problems in balancing the need for regional solidarity with respect to biological and economic management objectives with widely differing country circumstances (in terms of resource endowment, time horizon, and development aspirations). Additional problems include the failure to arrive at mutually beneficial arrangements between DWFNs and PICTs, dissipation of rent through high management costs, and IUU fishing. • **National fisheries governance**: National fisheries agencies often have low levels of capacity, transparency and effectiveness. The lack of clear fisheries management objectives and systems of adherence and accountability to progress towards achievingf those objectives is especially troublesome. Many PICTs lack a high-level government focus on fisheries. WCPFC places additional burdens on agencies. • **Development challenges:** Fledgling local operators are unable to compete with multi-national, vertically integrated companies in what are often difficult investment environments. It can be difficult to balance the benefits obtained by licensing foreign fishing vessels with the net benefits of having a domestic tuna industry, as these involve different types of benefits, incentives, and beneficiaries. There are large challenges associated with coastal communities deriving benefits from oceanic fisheries. PICTs are unable to compete with low-wage countries in processing.	• Promote high, stable catch rates, lower fishing costs, and increased value of access by maintaining healthy tuna resources. • PICTs can control the region's tuna fisheries; WCPO is the only major tuna fishery where most of the resource lies in waters of coastal states with common interests. • Development of the domestic industry can bring increased benefits to PICTs, including revenue and employment . • There is an increased desire to fish and/or invest in PICTs, which is created by the scarcity of fishing opportunities resulting from licensing arrangements. • Quality purse-seine skipjack (at industrial prices) and bycatch or rejects can make a substantial contribution to domestic fish supplies. • There is a growing demand for Innovative alternative products and traceable ecocertified products.

	Main challenges	Opportunities
	• **Regional-level issues:** In recent years there has been some breakdown of regional solidarity due to differing interests and time-horizons, and this is likely to increase in the future. In the WCPFC the types and timing of management action are tending toward the lowest common denominator.	
Coastal	• **Overfishing:** PICTs are unable to control fishing effort, especially on high-value species and those close to urban areas. • **Population and urbanisation:** With a population increase of over 5 million people in the next 25 years, there is likely to be a growing gap between what coastal fisheries can produce and the demand for production from coastal fisheries. Even coastal fisheries that are well-managed cannot keep up with the demand generated by the much larger Pacific Island population, and this will be exacerbated by ongoing urbanisation. • **Other challenges/threats outside the fisheries sector:** Habitat destruction, pollution, siltation, and logging and mining in some PICTs are challenges outside the fishing sector. There is increased pressure to reduce the negative impacts of fisheries on tourism, and more problems resulting from the effects of climate change will arise in the future. • **Ineffective management processes:** Centrally based management of most coastal resources is ineffective, while lower level management often suffers from a lack of technical knowledge and/or legal foundation. Situations where massive overfishing occurs near urban areas are often not amenable to fisheries management solutions. The demand from rapidly growing Asian economies for inshore commodities is nearly insatiable, and is often matched by the absence of a conservation ethic, leading to depletion of key species. • **Fisheries governance:** The challenges with respect to coastal fisheries governance are similar to those facing offshore fisheries, but are given lower priority. In general, the quality of offshore fisheries management (and recent improvements to that management) is far better than coastal fisheries management. • **Development challenges**: Many governments view coastal fisheries as having significant potential for economic development, whereas in reality available resources are limited. Most coastal resources are unable to support fisheries for domestic consumption and export. Development activities could lead to local area depletions and threaten the supply of marine foods to adjacent villages.	• There are advantages to controlling scarce resources in what is increasingly a buyers market. • There is a potential for effective community–based initiatives with fisheries agencies providing information and support. Multiple management tools can be used at the community level, rather than relying only on marine protected areas (MPAs) or the exclusion of outsiders. • Supplies from remote areas can be matched with demand from population centres by creating transport links, possibly through linkages with agriculture transport infrastructure • Non-extractive uses for resources include tourism and ecosystem services. • The supply of fish can be increased through the use of FADs.

(Table 2 continued)

	Main challenges	Opportunities
Aqua-culture	• **Development challenges**: The viability of Pacific Island aquaculture is reduced by competition from efficient overseas producers in export markets, and by competition with capture fisheries in those domestic markets with healthy wild stocks. The government-led development model (with which the region's fisheries agencies are comfortable) has had very limited success. Subsidies are used as a catalyst, but aquaculture often declines when they are withdrawn.	• Aquaculture has the potential to fill gaps in domestic fish supplies. • Increased focus in the development process on the private sector, objective economic analysis, and comparative advantages.
	• **National fisheries governance issues:** Fishery agency staff have acquired considerable capacity to culture aquatic organisms, but are lacking in skills and incentives to promote aquaculture industries. In addition, government support services required for viable aquaculture industries (e.g. hatcheries and quarantine services) often do not match the sector's needs. • **Environmental concerns:** The introduced species often used in aquaculture can become invasive species.	• Restocking for non-extractive uses • Developing cost-effective production models
Fresh-water	• **Environmental degradation**: Environmental influences (rather than fisheries activities) are the factors resulting in change in freshwater fisheries, and climate change (and its effects on water supply) and massive ecosystem change are huge threats. • **National fisheries governance:** Freshwater fisheries receive insufficient management attention and attention. • **Development challenges:** There is a need to balance the benefits of introduced species with the negative impacts of potentially invasive species. Uses for non-preferred species need to be found to reduce their impact on valued species.	• Problems/solutions of fresh water in general run in parallel with freshwater fisheries, so interventions to improve water quality are likely to improve freshwater fisheries.

The role of national administrations – and fisheries managers in particular – will gain in importance. Future managers will face daunting issues that will require experience in many disciplines, including biology, economics, political science, and organisational management. The future of fisheries will be determined in part by how well communities understand the need for – and support – various fisheries management actions, even though many of these will be unpopular and require controls on individuals and firms. Significant financial resources will be needed to support fisheries development and management, and securing this funding will require political will.

Climate change will impact fisheries, and this is discussed further in Section 3 above and in a technical annex to this report. Despite enormous recent research on climate change, there is still considerable uncertainty as to the precise fisheries-related changes, and their location and timing. Even where there is general agreement on broad changes across the region, there is considerable uncertainty regarding the effects at the island scale Attempts to mitigate the effects of climate change at the fisheries level are likely to be futile. Adaption to changes will be the key to maintaining the flow of benefits from fisheries.

4.2 Future changes to benefits from fisheries

The previous section explored future challenges and opportunities by type of fishery. This analysis is useful, especially in terms of the changing role of government and fisheries management. Another way of looking at future changes in fisheries is by the various categories of benefits, partitioned by the types of environments or ecosystems that produce these benefits. This type of analysis deals with actual benefits, and is more oriented toward the interface between fisheries and people, than the analysis of challenges and opportunities.

To some extent the fishery categories used in this study can also be thought of as production systems, which loosely correspond to very different ecosystems, each of which is capable of producing a range of direct and indirect benefits. Table 3 examines how those production systems or ecosystems and their fishery benefits may change over the long term. It should be noted that forecasting 'likely changes' is done by the unrealistically simple process of projecting current trends.

Bearing in mind the limitations of this analysis, the information in Table 3 indicates that future benefits from fisheries in the offshore zone will probably increase greatly in many countries. Benefits in the coastal zone and freshwater systems will probably decrease, albeit for different reasons. The changes in benefits from aquaculture are more uncertain. While it is almost inevitable that there will be increases in aquaculture for domestic consumption, it is unclear how export-oriented aquaculture will fare. The future of subsidies in aquaculture (in some respects, the opposite of government revenue) is also uncertain.

The results suggest that interventions in the offshore zone will be oriented toward increasing benefits, whereas management actions in coastal and freshwater zones will increasingly focus on preventing benefit declines. This has implications for the approach used (promotion of development vs placing controls on fisheries or habitats), political will (attractive incentives vs. unpopular restrictions), and the skills required for these very different tasks.

Table 3: Changes in direct fishery-related benefits by production system

Production system →	Offshore	Coastal	Aquaculture	Freshwater
Contribution to GDP	Will increase greatly in countries where domestic industry development occurs.	Likely to decrease somewhat with overexploitation and habitat destruction.	Likely to increase due to aquaculture for domestic markets.	Likely to decrease if main threats occur.
Contribution to exports	Will increase greatly in countries where domestic industry development occurs.	Will decrease in countries that restrict food-fish exports; some increase in value of non-food exports.	Degree to which aquaculture can compete internationally is uncertain.	Very little now, and not likely to increase.
Contribution to direct govt revenue	Fees for foreign fleet will decrease; revenue from licensing domestic vessels and various processing taxes could compensate.	Very little	Very little, negative if subsidies are considered.	Very little now, and not likely to increase.

(Table 3 continued)

Production system →	Offshore	Coastal	Aquaculture	Freshwater
Contribution to employment	Will increase greatly in countries particularly where domestic industry development occurs (especially processing) and where there are large observer programs.	Likely to decrease with overexploitation, population growth, habitat destruction and urbanisation.	Likely to increase due to aquaculture for domestic markets.	Likely to decrease should the main threats eventuate.
Contribution to food security	Could increase greatly in countries that have purse- seine activity. Some increase in other countries (longlining & FADs).	Likely to decrease with overexploitation, habitat destruction population growth, and urbanisation.	Likely to increase	Likely to decrease should the main threats eventuate.
Non-extractive	Little benefits at present and no increase foreseen.	Likely to increase with increasing tourism.	Some increase conceivable.	Some increase conceivable.

4.3 The condition of offshore fishery resources in the future

In the purse-seine fishery, there will be continued pressure to admit additional vessels to the region to fish as foreign, locally based or domestic vessels, and older vessels will be gradually replaced by new, more efficient and generally larger vessels. These developments will result in increased and more efficient purse-seine effort. Skipjack tuna are likely to be able to accommodate such increases, although the standing stock will probably be decreased, thus reducing catch rates. Impacts of the purse-seine fishery on yellowfin and bigeye tuna stocks will depend on the management of how, when and where the purse-seine fishery operates. There will be pressure for the increased use of FADs to counter rising fuel prices, and, in the absence of technical or logistical solutions to manage the associated juvenile yellowfin and bigeye catches, pressure on these species will continue to increase. Such an increase would be expected to have negative impacts on the longline and non-FAD purse-seine fisheries that target them at a larger size and may negatively impact the overall status of stocks. As capacity expands and if efforts to limit catches or fishing are effective, the scarcity of fishing opportunities will drive the incentive for both foreign and domestic fleets to fish illegally. Effective and well coordinated monitoring, control and surveillance (MCS) measures, including data sharing will be necessary to ensure the integrity of management arrangements.

Higher exploitation pressure by purse seiners on juvenile yellowfin and bigeye tuna combined with longline fishing impacts at current levels will further reduce the abundance of adult fish. In the absence of measures to address these and other impacts, such as rising fuel costs, the longline fishery targeting these species will likely become unprofitable. There will also be negative impacts on the profitability of the locally based longline fisheries targeting albacore tuna in the South Pacific, as yellowfin and bigeye tuna are important secondary targets of this fishery. In the absence of significantly increased prices for longline-caught albacore, effort in this fishery is unlikely to increase, and may in fact contract. The status of albacore stocks is therefore not likely to become a concern, unless there is an unforeseen rise in the efficiency of longlining, or a dramatic increase in the catch of juvenile albacore tuna.

Swordfish in the South Pacific are increasingly being fished by Spanish and some locally based Pacific Island longline vessels. This may represent a development opportunity for some PICTs, but the current status of the stock in the south-central Pacific is unknown. Without careful management, this resource could be quickly depleted if experience elsewhere is a guide.

It is likely that bycatch in the tuna fisheries will come under increasing scrutiny. At least initially, this will come about by pressure from developed country import requirements.

4.4 The condition of coastal fishery resources in the future

In the future, these resources will be subject to increased fishing pressure and stress from other sources. Many of the factors driving change in Pacific Island fisheries (presented in Section 3) will cause the condition of coastal resources to change. Factors that are likely to be particularly important in the next 25 years in determining the condition of coastal resources are population increases, urbanisation, governance, and especially, reaching the limits to fisheries production.

It is likely that current coastal resource condition trends will continue into the future, but there will be great differences between individual PICTs. Although such projections are quite speculative, some insight may be obtained by projecting three of the major current trends into the future: 1) overexploitation near urban areas, 2) overexploitation of export invertebrates, and 3) reduction in abundance of resources due to degradation of coastal habitat.

The degree of exploitation of coastal finfish and edible invertebrates is generally related to the distance to urban areas, or more precisely the range of vessels that feed into urban markets. Coastal areas around cities where coastal fishery resources for domestic consumption are in a degraded condition will expand, both as a result of a) the evolution of small towns into urban areas, and b) because higher prices and improved technology will allow fishing vessels to range farther. Such areas will be characterised by:

- Falling catch per unit of effort, and smaller individual fish as biological limits for target species are approached. As biological limits are surpassed, total production will fall.

- Larger and more sought-after species will decline to the point of local extinction (this has already occurred with some species, such as the humphead wrasse and some giant clam species). The impending disappearance of some of the larger iconic species has implications for recreational dive tourism.

- While coastal commercial fisheries can range farther afield, the fisheries resources available to the relatively sedentary urban subsistence fishers will fall remarkably in terms of catches and desirability of species. Catches are increasingly likely to be dominated by herbivorous species as coral reefs are degraded by more intense land use and climate change.

- The decline in the condition of species used for domestic purposes will be exacerbated where exports of those same species occur.

Much of the commercial invertebrate fishery harvest consists of non-perishable exports (e.g. beche-de-mer, trochus). The non-perishable nature of the products dictates that not even remote areas are insulated from overfishing. Extensive field research by SPC shows that most sites surveyed in the Pacific Islands are currently 'seriously depleted of commercial invertebrate resources' (SPC 2008). There are indications that this trend will continue and the abundance of these resources will decline further, with some local extinctions possible.

- Many of the invertebrate exports are in high demand from Asia, especially China. In normal circumstances economics compel fishermen to switch gear or locations before the resource population nears local extinction. In the future, an increasingly high export value will be placed on many coastal resources by Asian economies, which will encourage fishing effort, often after the targeted species is too rare to sustain a viable reproductive population (Birkeland 1997).

- Given the probable declining state of the economies of many countries of the region, in the future there will be greater numbers of people without jobs or access to remittances who will be seeking income and food security from harvesting coastal resources. Unlike the situation for coastal finfish, increasing pressure on non-perishable resources and subsequent declines will occur throughout the country or territory.

A third major trend affecting the condition of coastal fishery resources is the reduction of their abundance due to degradation of coastal habitats. This occurs as a result of destructive fishing practices, pollution, siltation from mining, logging and agriculture, and competing uses of the coastal zone. The resulting problems will be exacerbated by climate change, particularly where coastal fisheries depend heavily on coral reefs.

Present indications are that major trends affecting the condition of coastal resources will continue, with the likely scenario for most PICTs that in 25 years there will be very low abundance of edible resources in the vicinity of urban areas and low abundance of export invertebrates throughout the country or territory.

Trends in freshwater fishery resources will probably mirror that of coastal resources, especially overexploitation near urban areas and reduction in abundance due to habitat degradation.

4.5 Three scenarios for 2035

What will fisheries in the Pacific Islands be like in 25 years? Projecting current patterns of change into the future are inevitably highly uncertain, and it is to be expected that many unforeseen events will occur. Nevertheless, there is considerable value in speculating on what may occur in the future and then using this exercise to inform planning for, and adaptations to, those changes that are especially likely. In addition, outlining even crude scenarios may encourage others to formulate a more refined picture of the future, and to update these predictions over time.

Three broad scenarios are developed below. These have been formulated by taking into consideration current trends, factors that are expected to be drivers of future change in the fisheries sector, and challenges and opportunities that are considered likely to arise.

The three scenarios focus on changes in the tangible benefits from fisheries, especially the impacts on food, employment, government revenue and exports. Portraying the forecast changes to benefits rather than to processes is likely to have a stronger impression on public awareness and political commitment to change.

Box 2: The best case – Securing the future

Offshore fisheries: Cost-effective WCPFC action results in stable stocks at levels that maximise benefits to PICTs. Control by PICTs of the tuna fisheries achieved, including through regional cooperation, asserting sovereign rights, advantageous allocation arrangements and negotiating significantly more beneficial arrangements with DWFNs, including substantial onshore investment. Strong rights-based systems are established at national and sub-regional levels. The WCPFC-associated workload for national fishery officers is reduced significantly. Substantial increase in onshore processing and increase in exports of value-added tuna products leveraged through EEZ control. Catch volume/value increase; biological/economic/social optimisation in favour of PICTs between gear/species agreed upon and implemented. MCS measures are effective and compliance with management measures by all fleets is high. Bycatch interaction problems solved. Domestic fleets and processing plants expand and become internationally competitive. New, profitable markets for alternative tuna products are supplied. Products from PICTs recognised as being fully 'green' and achieve preferential prices. Through domestic industry development in fishing/processing, and other economic opportunities – including monitoring services, FAD ownership, etc. – a substantial increase in employment occurs in many PICTs. Continued demand for traditional and innovative, new, tuna products that require large labour input, which the region supplies on a competitive basis. Offshore fisheries close the gap between the supply and demand for affordable fish for domestic markets and are managed so that coastal pelagic fisheries remain healthy. Bans on discards creates major source of affordable fish. Trade-offs between domestic industry development and license fees for countries with licensed foreign fleets. Domestic license fees generated from resource rent.

Coastal fisheries: Total fisheries production slightly above 2010 level due to areas near cities maintaining production and rural areas increasing production to higher but sustainable levels due to judicious use of transport links. Widespread adoption of effective community-based management initiatives. Climate change impacts are manageable and reefs and associated fisheries adapt to gradual climate change. The value of exported non-food items increases, while the volume is stable; there are some highly controlled exports of valuable coastal food fish. Level of employment rises from that in 2010 due to transport links to remote locations, value-adding, and links to tourism industry (supplying hotels, sport-fishing, diving), and assists in deterring urban drift. Flow of total fish volume to urban areas steady (but declining on a per capita basis). Food supply for coastal communities secured. Selective restrictions on exports of food fish result in virtually all coastal fish used for domestic nutrition while exports for some key marine products increase. Use made of fish from fisheries on previously unexploited resources. Many fishery management activities paid for by the steady revenue from licensing domestic fishing operations and by taxing some types of fishery exports and marine tourism. System of FADs becomes part of national infrastructure and is maintained. Non-fishing impacts, including pollution, habitat degradation and poorly designed development, are managed effectively.

Aquaculture: Real comparative advantages are identified and associated marketing arrangements developed, targeting a small number of key species. Development assistance has been focused on the private sector. Government fishery agencies refrain from 'growing things' but rather focus on mitigating constraints and facilitating investment in the most promising species. Aquaculture production makes a substantial contribution to filling the fish supply gap and producing income opportunities. Employment and exports surge because (for export aquaculture) the comparative advantages cause private sector investment to pour in, and (for domestic aquaculture) capture fish shortages, healthy economies, and growing tourism combine to create strong demand for the products. Increased attention has been paid to environmental sustainability and disease considerations.

Freshwater fisheries: Extensive improvements to water catchment management improve water quality, resulting in rehabilitation of many freshwater fisheries. Production in 2035 is considerably greater than in 2010. Subsistence activities increase; some commercial activity (e.g. barramundi) recommences after rehabilitation of some major rivers. Total freshwater fisheries production is considerably greater in 2035 than in 2010 (but per capita supply does not increase). Biosecurity measures are improved and invasive species impacts lessened through productive use. Stocking of impoundments successful.

Box 3: The worst case – collapse

Offshore fisheries: WCPFC is ineffective and there is failure to agree on effective allocation and management measures between FFA and Parties to the Nauru Agreement members, resulting in inadequate fisheries management. Regional organisations fail to provide adequate support or deliver relevant programmes. DWFNs continue to dictate terms and continue and expand 'divide and conquer' tactics. Yellowfin and bigeye stocks decline dramatically with major economic losses. Purse-seine impacts on yellowfin and bigeye and rising fuel and other costs result in longline fisheries targeting these fish to be non-viable, even for low-cost fleets. Range contraction and/or stock declines of yellowfin and bigeye make most domestic longline fisheries uneconomic. Skipjack fisheries decline in value due to falling catch per unit of effort and smaller fish, with an increasing risk of recruitment failure that jeopardises future of skipjack fisheries. Fishing and processing affected by progressively more intense cyclones in some countries. Catch rates of albacore decline – yellowfin and bigeye portion of catch declines, impacting domestic fisheries. MCS measures are ineffective and extensive IUU fishing undermines management measures and stock assessments. Domestic processing sector fails to become competitive after preferential market access removed. The region's cost and productivity disadvantages equate to few opportunities to promote domestic industry development. Population growth is such that employment gains made in any domestic industry development are dissipated. Profits, wages and conditions are all low and are unattractive to nationals of many PICTs, requiring import of labour, creating social problems. Increasing automation and new tuna products developed that do not require large labour inputs in processing. Substantial food for domestic consumption is not generated from offshore fisheries. Although licenses fees are foregone to promote domestic industry development, it does not come close to generating the expected indirect government income. DWFN fleets continue to dominate the tuna fishery. Failure of PICTs to adequately present a united front with respect to license fees allows DWFNs solidarity and forces access fees down. Ecocertification and similar schemes do not curb demand for non-sustainable products.

Coastal fisheries: Community-based management arrangements collapse after donor interventions cease, and poverty and commercialisation destroys conservation ethic. Massive overfishing, particularly in urban areas due to domestic and export demand and failure of management systems; resource abundance driven so low that production of important species drops remarkably below the 2010 level. Declines in employment, and over-reliance on MPAs as a panacea diverts attention from more comprehensive management arrangements, including of non-fishing impacts. Many high-value species are wiped out due to the failure of even simple management. Coral bleaching and other effects of climate change alter species composition and reduce fishery production from reefs. Uncontrolled pollution and poorly designed development degrade habitats. Exports after 2010 surge but subsequent overfishing causes resource and export volume to crash leading to a large decrease in employment in some countries. Tourists repelled by barren reefs. Flows of fish to urban areas crash due to low catch rates in nearby areas, and poor logistics of transporting fish to urban areas. Failed 'development' schemes and habitat destruction have resulted declines in flow of fish to villages. Some food fish exported at the expense of domestic food supplies. Collapsed coastal fisheries accelerate urban drift.

Aquaculture: Aquaculture for export unable to compete with countries that are relatively efficient producers. Energy and feed prices become prohibitive. Subsidised inputs into aquaculture result in no net benefits and detract from other aquatic production initiatives. Aquaculture for domestic use declines due to inability to compete with capture fish, tuna bycatch, imports or alternative sources of food (e.g. chicken). Aquaculture facilities affected by progressively more intense cyclones. Any exports decline with the phasing out of subsidies and government aquaculture operations. With the decrease in production due to problems with export and domestic aquaculture, employment related to aquaculture falls. Demand in inland areas of large islands is not met due to failed models of production. Disease and habitat degradation reduce total aquaculture production.

Freshwater fisheries: Substantially increased logging, mining, agriculture, and other human activities result in significant habitat damage and the fishery production crashes. Changed rainfall patterns have negative impacts in some countries. Spread of invasive species impact native fisheries and degrade habitat.

Box 4: Most likely scenario – missed opportunities

Offshore fisheries: Effectiveness of regional fisheries agencies is mixed. Some improvement in agreements with DWFNs, including provisions for onshore investment or development. The volume of skipjack catches rises substantially but value fails to rise proportionately, at least in the short term. Yellowfin and bigeye stocks stabilise or continue to decline slowly, and higher fuel costs result in unprofitable domestic longline fisheries. For tuna processing, preferential market access removed, resulting in less export value due to competition with efficient producing nations, mitigated somewhat by growing demand and improved technology. MCS measures reduce IUU activities by the DWFN fleet, but there is poor compliance by domestic fleets and on the high seas. There will be a greater volume of high-value purse-seine-caught yellowfin and bigeye. For locally based longlining, production moves to low-cost fleets, reducing exports in PICTs. Domestic industry development continues in two or three countries but is unsuccessful in countries with low infrastructure and/or high production costs. Some growth in jobs related to tuna (observers, crew, officers) continues. Offshore fisheries do not fully close the gap between the supply and demand for affordable fish. Cheap tinned fish becomes less affordable to Pacific Islanders, but supply is augmented by bycatch. Many countries continue to obtain access fees alone. Some success of domestic industry development to compensate for foregone access fees. Domestic industry development fails to deliver expected benefits.

Coastal fisheries: Production of valuable species (in economic and food security terms) falls significantly below 2010 level due to uncontrollable fishing effort, pollution, siltation, landfill, and habitat destruction, especially near urban areas. Coastal production fails to meet the food gap. Community-based management is effective in some areas. Some transport of fish from rural to urban areas, and some depletion of fish in those rural areas, especially by government-subsidised transport of catches. Coral bleaching and other effects of climate change have some negative effects on reef fishery production. Volume of exported items falls, but rising prices allow trade to continue. Some countries have banned exports of food fish, which helps reduce some fishing pressure, but many bans are 'leaky' due to exemptions and illegal exports. Fishing employment near urban areas tapers off gradually, with decreasing catch rates and profitability, mitigated somewhat by higher prices and technology improvements. Fishers from urban areas range farther, but are constrained by high fuel prices. Benefits from fishing in remote areas tapers off with decline in abundance of non-perishable items. Tourism employment related to the marine environment grows in some countries. Interaction between inshore and offshore fisheries increases. Few countries are able to institutionalise and maintain FAD programmes. Continued reliance on donor support.

Aquaculture: Production for domestic purposes continues to be associated with subsidies, domestic tourist markets, and government or donor projects. Private sector production expands considerably for the fast-growing domestic urban markets with fish shortages. Export aquaculture production declines, except in special cases of exceptional entrepreneurial skill or comparative advantages. Employment oriented at culturing fish for rapidly expanding urban areas increases. Growth of aquaculture in inland areas of large islands varies greatly between countries, depending on subsidies, development models used, and the availability or desirability of alternatives. Substantial amounts of food are produced for fast-growing urban markets that have fish shortages, with variable increases in food production in the inland areas of large islands.

Freshwater fisheries: Some increase in logging, mining, agriculture, and other human activities results in habitat damage and fishery production declines between 2010 and 2035. This results in a decline in total fish production and a sharper decline in per capita supply.

The above scenarios are generally applicable across the Pacific Islands region. Differences can be expected to occur between sub-regions and groups of countries. Some of the more significant geographic variations are:

- Most of the tuna purse-seine catch comes from the EEZs of Pacific Island countries that are Parties to the Nauru Agreement (known as PNA, and including FSM, Kiribati, Marshall Islands, Nauru, Palau, PNG, Solomon Islands and Tuvalu). Therefore, any change in the huge purse-seine fishery (which accounted for 74% of the region's total tuna catch in 2008) will occur largely in the waters of PNA countries. The major change that can be foreseen concerns efforts to exert control over the purse-seine fishery by PNA to secure increased benefits, and – once that control has been achieved – the extent to which effective management by PNA in their own waters can be achieved. Skipjack, which are targeted by purse seining, is one of the largest underexploited fishery resources in the world, and consequently total fishery production will probably expand considerably in those countries that are PNA, but not so in the rest of the region. While more challenging than controlling the purse-seine fishery, PNA will also seek to increase control of the longline fisheries.

- There will also be east–west and north–south differences in impacts. Should any contraction of the range of yellowfin and bigeye tunas be experienced, those countries in the extreme northeast and south of the Pacific Islands region will be the most affected. Should the expected longitudinal shift in areas of skipjack and bigeye concentration occur due to climate change, countries in the west (e.g. PNG, FSM) will be the losers and those in the east (e.g. Tokelau) will be winners.

- The large islands of western Melanesia (e.g. PNG, Solomon Islands) will be subjected to different changes than those affecting the rest of the region, especially the small islands and atolls of Micronesia and Polynesia. The large islands and their major freshwater fisheries are likely to be greatly affected by habitat degradation, alterations in rainfall patterns, and burgeoning inland populations.

- The small islands have a much greater dependence on coral reef fisheries, and are more certain to be affected by climate change. Domestic development opportunities in small islands are more limited.

- The relatively rich territories with their support from metropolitan countries and emigration opportunities are less vulnerable than many of the independent countries of the region.

Another important aspect of all three scenarios is that the evolution of fisheries over the next 25 years will likely have different impacts on men, women, children, youth and the elderly. They are also likely to affect gender and other social relations. For example, as women gain access to education and communication technologies through gender-equity policies in other sectors, their roles in market chains, contributions to household incomes, and decision-making on household investment and expenditure may change.

5. Moving to the best-case scenario: Addressing the challenges and realising opportunities

5.1 Some general observations on attaining the best-case scenario

Two topics, the best-case scenario (Box 2) and the opportunities for the future presented in Table 2, deserve some additional attention. To some degree, the positive features in these two areas represent ambitious goals in the fisheries sector that countries in the region should aspire to. Rather than attempting to predict specific development opportunities, we have addressed the issue conceptually by outlining the general things that must be done to take advantage of opportunities.

Cooperation between PICTs and control over key management decisions, including allocation, at WCPFC is required to secure long-term economic benefits from oceanic fisheries. WCPFC has a widely disparate membership that holds quite different perspectives, and the best-case scenarios for PICTs will not simply develop as a matter of course. Strong regional and sub-regional campaigns will be required. The newly invigorated PNA group has been established with the objective of providing the leadership necessary to substantially increase economic benefits. Robust rights-based management systems, strengthened by national allocations agreed at WCPFC, will substantially increase the economic power and value arising from access to fishing resources. Transparent allocation of these rights between and within PICTs will offer the opportunity to leverage viable investment in domestic tuna fishing and processing operations, and/or increase the value of fishing opportunities granted to DWFNs.

An examination of the best-case scenario and the opportunities shows that the brightest future for fisheries involves dealing with a much wider range of disciplines and subjects than is currently addressed by regional fisheries agencies. Many of the favourable future fisheries outcomes listed in the previous section bridge the boundaries between fisheries and several other sectors: agriculture, environment, legal affairs, health and nutrition, and (especially) tourism.

The government interventions required to achieve the best-case scenario are extremely ambitious. A very large amount of work, delivered consistently over time, is required to achieve almost every favourable outcome. Strong political commitment and support will also be essential in providing the overarching impetus and recurrent funding. Governments will require considerable external assistance, including the long-term input of donors, NGOs and other supporting agencies to realise best scenario outcomes.

Large-scale fisheries development will be capital intensive and few PICTs will have the resources to finance the necessary investment to build domestic industries. Consequently, most development aspirations will require foreign investment if they are to get off the ground. Build confidence among investors and addressing the risk associated with fisheries investments will require the creation of an environment of effective governance and political stability. International financial institutions, regional initiatives to promote trade and investment through the Pacific Islands Forum Secretariat and other sources of assistance will be necessary to promote appropriate, long-term investment.

An even more important issue is the question of who will be directing the necessary changes. Over the past 25 years most of the changes in the fisheries sector were driven by forces external to PICTs; there are few cases in which countries of the region, acting alone, were able to seize opportunities and generate significant positive outcomes. The favourable outcomes in the best-case scenario will require immense proactive effort on the part of both governments and development partners. Ensuring this work is well coordinated and delivered and aligns with national goals and aspirations will be key challenges.

The best-case scenario requires unusually skilled and dedicated people to lead the process Individuals are needed who are knowledgeable in many disciplines and are as energetic/motivated as the 'captains of industry' with whom they will need to work (and in some circumstances, manage). In addition to fisheries skills, those people will need to have considerable empathy for the non-government sector, knowledge of business principles, insight into the fishing industry, sharp analytical expertise, considerable international savvy, sensitivity to community issues, and a host of other attributes.

Other key conclusions regarding the best-case scenarios and the future opportunities include:

- Many favourable outcomes involve the private sector successfully pursuing opportunities in areas where governments generally do not excel (e.g. development of markets and/or products).

- Other opportunities require fishery agency involvement in areas that where PICTs have not previously been involved (e.g. industry promotion, trade policy formulation, and objective economic analysis).

- Many favourable outcomes flow from fisheries agencies and other agencies successfully devising a 'big picture' strategy (e.g. figuring out how offshore fisheries can close the gap between the supply and demand for affordable fish for domestic markets), and then implementing it and measuring progress.

- Governments, faced with short-term political realities, will need to create policies and make decisions that are conducive to long-term outcomes with national and regional benefits.

- There is considerable diversity between countries, so that what will work in one country may not work in another.

In examining some of the requirements for attaining favourable outcomes in specific fishery categories, some general concepts emerge.

- **Offshore fisheries:** Regional cooperation among Pacific Island countries is necessary for almost all of the positive outcomes and effective control over and use of the resource. To achieve the best-case scenario, a high degree of cooperation with, and support for, the private sector will also be required.

- **Coastal fisheries:** The best-case scenario requires that more emphasis be placed on preserving existing benefits (especially relating to food security), rather than on generating additional benefits. It is also evident that fisheries agencies need to acquire greater desire and ability to work with private sector, communities and NGOs.

- **Aquaculture:** Many of the favourable outcomes appear to require a shift in emphasis of government interventions. The identified opportunities suggest that this would involve government fisheries agencies identifying and building comparative advantages and promoting a favourable business and policy environment for aquaculture, with less emphasis on 'growing things'. Additional attention should be paid to biosecurity issues, especially formulating and implementing policies and procedures to reduce risks and safeguard biodiversity.

Despite Forum Leaders having made numerous political statements (e.g. Pacific Plan), the current capability of most fisheries agencies in Pacific Islands countries is far from what is required to provide the support and direction necessary to attain the best-case scenario. This has implications for current staffing and institutional arrangements, including staff incentives, training of future fisheries managers,

development models used, and institutional orientation, responsiveness, and accountability. It also affects the type of assistance that the regional organisations should provide in the future.

Many of the issues highlighted above extend well beyond the fisheries sector. In many cases it is unrealistic to assume that fisheries-focussed interventions can be effective, as progress depends on national policies across all sectors.

The challenges identified above may appear immense or even insurmountable. On the other hand, the value of the fisheries resources of the region is huge (the 2007 fisheries and aquaculture production was worth USD 2 billion) and will grow much larger in the next 25 years. Although the challenges are enormous, PICTs simply cannot afford to miss out on the tremendous opportunity they have to maximise fishery benefits.

The territories in the Pacific face some different considerations in attaining the best-case scenarios outlined above. Due to the support and opportunities provided by their associated metropolitan countries, the impacts of population growth, food scarcity and similar pressures are not likely to be as great. On the other hand, some territories have little control over policies and activities in their EEZs. In general, greater attention needs to be placed on assuring that the various fisheries programs (often conceived, formulated and implemented from afar) are relevant to the needs of the territories. In this context, there could be considerable value for territorial fisheries agencies in taking a 25-year view of the future, and articulating a long-term vision, with the intention that any various fisheries programs be relevant to and consistent with that vision.

5.2 National fisheries agencies

5.2.1 Challenges

Pressure has increased on fisheries administrations, both to address the increasing level of overfishing of inshore fisheries, including key invertebrate species, and to handle the increasingly complex and time-consuming nature of offshore fisheries management. These and other challenges need to be effectively addressed by PICT fisheries agencies so that best-case scenario outcomes can be achieved.

Although these challenges are not uniform across the region, the following are common, priority challenges:

- The lack of highly competent and appropriately skilled fisheries managers.
- Inadequate communication with, and real input from, stakeholders – particularly from the private sector.
- A lack of clear policy directions and planning in all fisheries; continued optimism (or inertia) that somehow ‘it will all be fine’ with respect to the resource.
- Lack of incentives for fisheries agency achievements outside the fisheries sector; insufficient financial resources.
- A weak legislative base in many countries.

5.2.2 Addressing the challenges facing fisheries agencies

A fundamental improvement in the quality of governance within government fisheries agencies is required.

Institutional arrangements for government fisheries agencies should be modified so that there is increased orientation to proactively take advantage of opportunities, greater motivation to working with the private sector, improved inclination to work with other economic sectors, and enhanced sensitivity to community issues. In addition, the working conditions within agencies should attract and retain motivated younger staff, and include a high degree of accountability for attaining established objectives.

Some arrangements exist that represent an improvement on the traditional bureaucrat-driven governance model currently used in most PICTs (i.e. a fisheries division or department responsible to a permanent secretary who is responsible to a minister, with the two overseers often having no experience in the fisheries sector). The essential component of the improved model is making the fisheries agency responsible to a group of fisheries stakeholders, rather than a single public servant. In PICTs where public and private sector stakeholders have some degree of real control over the fisheries agency (such as PNG and FSM), the quality of national fisheries governance is relatively high. Such changes to the institutional character of national fisheries agencies should be considered a priority in moving towards the best-case scenario..

There would be considerable value in formulating national best-case scenarios, or using some other process that generates an appreciation of the opportunities and what needs to be done to achieve them. Identifying the priority actions that can and cannot be undertaken by national agencies in this regard will be fundamental to success .

Some priority initiatives that deserve consideration include:

- Build on successful past interventions to improve governance, including through the use of fishery management plans, empowering communities to manage adjacent marine resources, and enhancement of fishery associations.
- Create a new cadre of highly competent fisheries managers, and institutional environments that will attract and retain them.
- A change in the emphasis of government fisheries agencies from regulation to management services, in which they provide services to stakeholders.
- Identify new funding models and sources.
- Place greater emphasis on management actions that take account of the value of ecosystem services and non-extractive uses.
- Actively communicate development opportunities (especially the results of objective economic analysis) to potential investors.
- Implement planning processes that include ways of measuring progress against nationally agreed fisheries development and management objectives, including those relating to subsistence fisheries, participation by gender and benefits to the country (e.g. fish consumption and job creation).

- Better integrate fisheries into the development agenda at a whole-of-government and economy level, instead of focussing only on the fisheries sector.

5.3 Regional fisheries agencies

FFA and SPC provide essential fisheries management and development advisory services to their members, many of which are not within the capacity of most national fisheries agencies to deliver. These services include: offshore and coastal stock monitoring and assessment, fisheries management and development advice, legal services, and capacity building. FFA also provides administrative services for fisheries treaties and a range of monitoring, control and surveillance (of foreign fishing vessels) services. Additionally, regional agencies will continue to offer a useful avenue for donor founds to be applied in a way that benefits many countries and promotes harmonisation and coordination. While generally well regarded, FFA and SPC need to address a wide range of challenges if they are to support achievement of the best-case scenario.

5.3.1 Challenges

Regional fisheries agencies in the Pacific face a range of common challenges:

- Ensuring that staff and regional programmes are updated as fisheries and their priorities change and evolve, and that they deliver results that meet country-specific needs and outcomes;
- Balancing headquarter staff and administration costs with funding for in-country work, including short-term specialist consultancy services;
- Balancing the work needed to support WCPFC activities with domestic fishery priorities;
- Managing the large number of regional and international meetings and workshops each year (71 are listed in the 2007 FFA annual report), which detract from the ability of nationals to undertake domestic fisheries management tasks;
- Ensuing adequate oversight of organisational direction and policy setting by member countries, including through meetings of governing bodies;
- Working out how best to deal with the private sector;
- Ensuring the comprehension of, use and benefit from the volume of technical material and advice produced;
- Maintaining substantial funding for core fisheries management activities, given the reality of donor fatigue, which requires the acceleration of cost-recovery approaches;
- Maintaining regional solidarity in the face of differing levels of national resource endowments, interests and demands for services;
- Understanding the basic principles of economic 'overfishing' and overexploitation that represents a need for biological conservation and relating these to sound sustainable development; and
- In the case of FFA, attracting and retaining quality staff.

5.3.2 Addressing the challenges facing regional fisheries agencies

Major changes will inevitably occur in fisheries over the next 25 years, and these will require a shift in the focus of regional agencies to ensure they address emerging priorities and remain relevant to their membership. Around 70 professional fisheries staff work at SPC and FFA, and these organisations will need to regularly review and alter the skills composition of their staff to meet the changing needs of PICTs.

In the past, regional agencies have tended to be measured by their regional outputs and achievements, both in terms of science (e.g. regional stock assessments and advances in the knowledge of tuna biology) and management (e.g. negotiation of the WCPF Convention). However, there is a growing demand and need to substantially increase the focus on in-country activities, including those that encourage long-term capacity building in areas such as fisheries data and stock assessment analysis, and fisheries legislation, trade, and management. Assistance provided by regional organisations will need to change in emphasis, from the current approach based on ad-hoc requests towards a programme-based strategy aimed at assisting countries achieve best-case scenarios. This shift will require a reduction in the size of regional agency headquarters staff, and a greater use of in-country or regional expertise to build support for new initiatives.

An emerging feature that is considered likely to increase in the future is the need for regional agencies to adapt programmes to national circumstances, and address the growth in sub-regional arrangements based on common interests (e.g. the PNA office and the Te Vaka Moana initiative). These have emerged from the view that there is a need for more dynamic action on a range of issues, and that Forum Fisheries Committee and the full FFA membership is unable to agree or react at the speed necessary, or in the best interests of sub-groups. It is uncertain to what degree these arrangements will meet with more success than would be possible by PICTs acting individually, or through a model in which sub-regions are serviced through regional agencies. Costs, duplication, and dilution of funding sources will all need to be considered.

The current pace at which PICTs have been expected to absorb and implement WCPFC and regionally driven initiatives is neither sustainable nor desirable. In the future, FFA and SPC will have to ensure that that the high level of resources devoted to work for the WCPFC under the scientific services agreement and in preparing countries for the annual rounds of meetings will not dominate work programmes at the expense of national work programmes and capacity building.

More needs to be done if the gap between the 'centres of excellence' at FFA and SPC and in-country capacity is not to widen. The University of the South Pacific (USP) has an opportunity to make a substantial contribution towards building high-calibre fisheries managers, but this will take major investments in staff and changes in curriculum. Building formal links between USP, SPC and FFA is necessary in areas such as training and applied research to ensure that training programmes are relevant to country needs. USP staff should directly contribute to SPC and FFA programmes and vice versa.

Developments in fisheries in the next 25 years will be largely based on economically viable, private sector operations, and SPC and FFA will need to seek new and effective ways of increasing links with and delivering direct and indirect assistance to the private sector. The current need to provide a range of advice on economic issues (particularly by SPC) will need to be addressed to ensure there is rigorous and objective economic analysis of fisheries management and development initiatives. A new analytical framework to assess the overall economic benefits of development of domestic tuna fisheries as compared with access fees will be necessary to inform future policy development and decision making. Such a framework will need to consider the economic circumstances of PICTs, including the lack of opportunity cost for labour. Other considerations will be the form of any benefits (direct government revenues vs economic growth, e.g. employment and investment), who the beneficiaries are, and the relative attractiveness of such options to individual governments. The approaches taken are likely to vary between PICTs.

6. Implementation roadmap

This report identifies key strategies and activities. These are expressed at a relatively high level, and it is expected that once Forum Leaders have considered and commented on the report, regional agencies will commence developing more detailed implementation plans. Some of the strategies and activities suggested are already included in, or will be added to, existing regional fisheries strategies to ensure consistency and avoid duplication. The tables below consolidate the main issues and the associated strategies and actions for dealing with the issues, in order to achieve the best-case future scenario. The table is organised in a manner that reflects the current trend in focusing on national priorities in fisheries, with support provided by regional agencies (addressed in the last column). Some observations can be made:

- The strategies and actions required to achieve the best results for the long-tem future are not remarkably different from that required at present.

- Some items are repeated in several places and thus given additional emphasis: the need for incentives for agency staff, for stakeholder input into fisheries agencies, for support to the private sector, and for economic analysis of development and management initiatives.

- An example of an 'incentive for fisheries agency staff' is to have a representative of a fisheries industry association on board that has a role overseeing the fisheries agency, thereby creating an incentive to cater to the needs of the private sector.

- Some of the strategies and actions in Table 4 address new and/or unique situations and effective implementation will require some creativity. Other suggested strategies and actions address well-known situations, for which there is considerable knowledge in terms of effective ways they can be addressed. In the latter case, use should be made of past experience and international best practices.

The roles and responsibilities of SPC and FFA in supporting implementation of the roadmap need not be altered greatly in the future. The present basic arrangements – with FFA responsible for providing assistance related to managing and developing offshore fisheries, and SPC focusing on coastal fisheries, aquaculture, and scientific studies related to offshore fisheries – remains appropriate. Changes in these institutional arrangements will, however, be required in three main areas. First, more attention needs to be given to using regional programmes to achieve measurable and sustainable benefits at the national level (i.e. an increased focus on obtaining specific benefits), especially in the areas of food security and employment. Secondly, a greater degree of joint FFA and SPC cooperation and coordination will be required in areas that transcend the coastal/offshore boundary, including fisheries governance, measurement of change, support to the private sector, and fisheries legislation. Cooperation with the Pacific Islands Forum Secretariat and use of Forum Leaders' meetings to promote fisheries issues and gain high-level political support for future management and other actions should also be pursued. Finally, extended and coordinated efforts by FFA, SPC and USP to build adequate capacity and capability within national fisheries agencies will be essential.

Table 4: The roadmap

Objective *with some comments*	Strategy	Action	Regional agency involvement
1. Reform and build fisheries agencies for better services *Most aspects of the favourable long-term scenario depend on improvements to the performance of the national fisheries agencies.*	• Assess the scenarios that will result in maximised long-term benefits for PICTs. • Use more efficient and effective models of fisheries administration. • Increase real input and influence by fishery stakeholders into policies/operations of fishery agencies. • Create incentives for fisheries agencies to work with private sector and other economic sectors (e.g. trade, environment tourism, health). • Shift away from attempting government micromanagement of coastal fisheries to empowering local communities. • Ensure expenditure on fisheries management is proportional to value. • Improve the capacity of tertiary educational institutions in the region to produce people who have the multi-disciplinary skills to manage fisheries. • Improve the economic scrutiny of fisheries management and development activities. • Structure fisheries agencies as coordinators and facilitators rather than total service providers.	• Undertake a 25-year 'look to the future' exercise in each country, focusing on structured pathways to achieve long-term tangible outcomes and benefits rather than short-term administrative requirements. Create public awareness of the results. • Consider using alternative models for fisheries agencies, especially those that enhance stakeholder input, improve attractiveness to future staff, and that have secure income streams. • Creation of incentives for staff of fisheries agencies to work with the private sector and across sectoral boundaries. • Generate high-level interest in fisheries. • Promote community empowerment and legislative and other support for coastal fisheries. • Promote the use of fishery management plans for offshore and coastal fisheries, with the latter receiving the same substantial support as did the offshore plans. • Strengthen and empower stakeholder associations. • Carry out objective economic appraisal of costs/benefits arising from management systems at regional and national levels. • Encourage NGOs to broaden their activities beyond the current focus on biodiversity conservation and MPAs to a larger array of interventions that encourage maximising long-term sustainable benefits from fishery resources.	• FFA to focus on institutional governance and economic aspects. • SPC to focus on relationships with communities and long-term future. • USP to focus on modifying fisheries-related curriculum to meet the region's evolving needs.

	• Establish merit-based pay and conditions.	• Increase the relevancy and attractiveness of the fisheries-related curriculum of tertiary educational institutions.	
2. Maximise long-term national benefits from offshore resources *Most of the future increases in benefits from fisheries in PICTs will be associated with offshore fisheries.*	• Gain effective control over management of fishery resources. • Use regional cooperation and solidarity to leverage management objectives, uphold sovereign rights, and derive favourable WCPFC outcomes. • Develop rights-based systems where appropriate. • Develop, negotiate and implement a mixture of harvesting strategies and targets that achieve maximum benefits, while maintaining vulnerable species (bigeye, yellowfin) at acceptable levels. • Clearly articulate national aspirations, objectives and positions for offshore fisheries. • Promote effective sub-regional arrangements and cooperation, building on common interests. • Achieve overall catch levels that optimise benefits to all PICTs in an equitable manner.	• Jointly decide who will access the resources. • Move towards rights-based management and recovery of resource rent, including from domestic vessels. • Build on the successes of the tuna management plans. • Regulate effort/catch at levels that create scarcity, influence world market prices and return maximum benefits. • Resist displaced fleets seeking unsustainable fishing opportunities. • Balance foreign licensing benefits against domestic industry development, basing decisions on appropriate analytical frameworks. • Compare economic impacts of alternative fisheries management measures on PICTs, including the trade-offs between purse-seine and longline fisheries. • Develop strategies to attract offshore investment, using Internatiional Finace Corporation and other appropriate financial institutions. • Encourage the concept of accountability in regional agreements, including pre-agreed mechanisms to improve compliance. • Develop national implementation plans supported by the MCS regional strategy.	• Largely supported by FFA with science input from SPC.

(Table 4 continued)

(Table 4 continued)

Objective *with some comments*	Strategy	Action	Regional agency involvement
3. Sustain coastal communities *Inshore fisheries produce most of the food and employment for Pacific Islanders. Resilient inshore fisheries will absorb shocks and continue to deliver these benefits to coastal communities.*	• To achieve the goal of ensuring the optimal and sustainable use of coastal fisheries and their ecosystems by Pacific Island communities, attention should be given to the six guiding principles of the Apia Policy. • Clearly articulate management objectives, processes, accountability, and ways of measuring progress. • Encourage long-term relationships between fishery resources and their exploiters. • Selectively devolve management responsibility to communities, with support from fisheries agencies for technical issues and issues beyond the community level. • Encourage the transition from government-led development of what are often non-existent opportunities to the concept that fisheries agencies, their officers, and communities are guardians of marine resources. • Work across sectoral boundaries to promote non-extractive use of coastal resources. • Formulate, review and update climate change adaptation strategies as impacts evolve and become clearer.	• Develop national coastal fisheries management plans, with substantial support from regional agencies (as was the case for offshore management plans). • Promote and establish policies that recognise the benefits of community-based approaches. • Provide information, assistance, and encouragement to communities for them to address issues within their power. • Create incentives for fisheries officers to be more active and responsive in inshore fisheries management, and to work across sectoral boundaries. • Create an awareness that no single management measure is likely to be effective in addressing all the present and future concerns at a particular site. Avoid dependence on a single type of management measure (i.e. MPAs). • Give special attention to preventing irreversible depletions (e.g. destroying spawning aggregations) and high-risk species. • Take advantage of 'choke points' at the point of export to facilitate the management of export fisheries. • Undertake economic assessments of the national costs of poor coastal fisheries management and failed development projects. • Refine a parallel national regulatory scheme for community-based management (i.e. what to do when it fails) . • Establish a legal basis for community-based management.	• Largely supported by SPC, with involvement of FFA in legal aspects.

4. Feed our growing populations *The Pacific Island population will increase by over 5 million people in the next 25 years; there is likely to be a growing gap between what fisheries can produce and the demand for fisheries products.*	• Nationally, carry out an assessment of future food needs including protein from fisheries and other sources. • Devise a 'big picture' strategy to ensure that the supply of fish from all sources (imports, offshore, inshore, aquaculture and freshwater) is sufficient to meet future estimated demand for affordable fish protein. • Where shortfalls in supply occur, identify possible interventions to mitigate shortages, particularly for growing urban populations. • Consider establishing a national policy stating that in the context of coastal fisheries, managing and developing the flow of fish to villages is of paramount importance.	• Consider various schemes to mitigate fish shortages, including restrictions on the export of coastal food fish, facilitating rural–urban transport of fish, piggybacking on future agriculture transport infrastructure, the use of FADs, schemes to encourage the landing of fish from offshore industrial fisheries, and small pond aquaculture. • Carry out assessments of the long-term economic and practical viability of these interventions. • Work across sectoral boundaries (agriculture, health, and customs) to carry out the above action. • Monitor food security over time, noting that exchange rates, the supply of imported fish and substitute products will have major effects. • Establish national environmental assessment and planning frameworks for aquaculture developments. • Consider the gender implications of the above action.	• Largely supported by SPC. • FFA involvement in the schemes dealing with the offshore industrial fisheries.
5. Support private sector 'winners' *To achieve the best case scenario for fisheries in the future, a high degree of cooperation with, and support for, the private sector will be required.*	• Where applicable, transform the fisheries sector so that government serves people and businesses, rather a situation in which people and businesses serve a government administration. • Define the role of government intervention and subsidies in fisheries. • Conduct an appraisal of domestic industry ventures involving foreign investment, including determination of net benefits accruing to PICTs.	• Increase input of the private sector and other stakeholders into the policies and operations of the fisheries agency. • Enhance private sector organisations. • Create incentives for fisheries agency staff to embrace/ support the private sector. • Identify constraints to operating fishery businesses and move to reduce and remove them. • Assure that any subsidies used in fisheries development are subjected to economic scrutiny, are transparent, and have an exit strategy. • Enhance the capacity for economic analysis within fisheries agencies.	• FFA to focus on institutional, governance and economic aspects, with SPC providing support as per staff experience.

(Table 4 continued)

Objective *with some comments*	Strategy	Action	Regional agency involvement
6. Support from the top *Many favourable outcomes flow from political commitment and support*	• Gain political support by clearly articulating a national vision for the future of fisheries. • Create a vision for the region's offshore fisheries that sees the balance of power shift in a structured manner from DWFNs to PICTs. • Promote activities that focus attention on fisheries – keep fisheries in the headlines.	• Bring to the attention of national leaders the results of a country specific 25-year 'look to the future' exercise that focuses on long-term tangible outcomes and benefits from fisheries. • Identify, quantify and publicise the tangible benefits from the fisheries sector and changes to those benefits. • Highlight positive changes in fisheries governance. • Emphasise the potential benefits of cooperation influencing the structure and profitability of offshore fisheries.	• An SPC/FFA co-operative exercise.
7. Measure the change *In the context of fisheries,* '*what gets measured gets managed*', with the *converse being especially true*	• Promote the importance of quantifying fishery production, its changes, and the impacts of management and development interventions. • Collect gender-disaggregated data and carry out gender analysis and incorporate results into policies. • Create an evidence-based approach to assessing and adapting management and development initiatives, thereby generating political will and support for action when needed. • Maintain an understanding of the status and impact of key factors driving fisheries.	• Develop and use simple and clear reporting structures that give information relevant to identifying trends in benefits and impacts of management and development. • Monitor the impacts of climate change. • Work with other agencies to obtain non-fisheries data in areas relevant to fisheries (e.g. household income and expenditure surveys, censuses). • Develop and use indicators for fisheries management success in community-based fisheries. • Provide incentives for data provision.	• An SPC/FFA co-operative exercise.

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Appendix A

People consulted

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