

Governance of the South Pacific tuna fishery

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The South Pacific tuna fishery is the largest and most valuable tuna fishery worldwide. There are two major concerns with current governance of the fishery: the Pacific island countries are not deriving as much benefit from its exploitation as they could; and current management strategies will not ensure long-term sustainability of the resource. These concerns are addressed by highlighting key opportunities for sustainable economic development. These opportunities include regional cooperation in determining a total allowable catch for the region and how it is allocated among individual island states; setting the total allowable catch on the grounds of sustainability and maximisation of economic rents; and the auctioning of entitlements among individual fishers. Concerns regarding fishery policy in many Pacific island countries are also presented with suggestions for policy reform.

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Most Pacific island countries have a narrow resource base and small domestic markets, resulting in heavy dependence on a small number of export commodities. Economic growth for the Pacific islands region as a whole has been slow due to insecure and poorly defined institutional structures. The South Pacific tuna fishery is the Pacific islands' main natural resource. A United Nations Economic and Social Commission for Asia and the Pacific (UNESCAP) seminar on promoting exports of fish and fishery

products in developing countries held in 1996 concluded that tuna stocks have the greatest potential for the expansion of exports from Pacific island countries (Sawhney 1996). The dependence on tuna is already unmatched elsewhere in the world and is likely to increase, causing the ownership of tuna and the right to harvest it to be sensitive political issues in the Pacific island countries.

There are two major concerns with current governance of the fishery. The first is



that the Pacific island nations are not deriving as much benefit from its exploitation as they could. The annual average tuna harvest from the region is currently about 1 million metric tonnes with a landed value close to US\$1.7 billion (Tarte 1999). Approximately 90 per cent of this yield is harvested by distant-water fishing nations who pay access fees of approximately 4 per cent of their gross revenue. Bertignac et al. (2001) argued that the economic rent (the difference between the value of the catch and the economic cost of the fishing effort) potential is currently around 13 per cent of gross revenue and, with a change in fleet structure, could be up to 40 per cent.

The second major concern with the governance of the South Pacific tuna fishery is that current management strategies will not ensure long-term sustainability of the resource. Unlike most other tuna fisheries worldwide, this fishery is not being overexploited. In fact, three out of the four major species in the fishery could sustainably endure higher catch rates (Hampton et al. 1999). There are very few differences between the South Pacific tuna fishery and other tuna fisheries of the world. The main reason it has not been over-fished to date is its remoteness from many distant-water fishing nations. However, interest in the Pacific islands region by international fishing companies is increasing. Institutional structures currently in place cannot ensure that future exploitation will not lead to harvest rates greater than the natural rate of regeneration. It is imperative that the governance of the South Pacific tuna fishery is strengthened now before over-fishing takes place.

The aim of this paper is to address these concerns by highlighting key opportunities for sustainable economic development of the industry and by drawing attention to weaknesses in government policy in many Pacific island countries.

The South Pacific tuna fishery

Within the Pacific islands region, there are 200 high islands and 2,500 low islands and atolls that comprise the 22 countries and territories of the Pacific islands. The negotiations of the United Nations Convention on the Law of the Sea in 1982 (which was not ratified until 1994) gave coastal nations rights to resource use over the sea area within 200 miles of their coastline, an area known as the exclusive economic zone (United Nations 1994). Several of the Pacific island countries and territories have considerable amounts of ocean in their control with ocean area exceeding landmass by an average factor of 300 to 1 (Figure 1) (World Bank 2000b).

The Pacific islands are the most important fishing region in the world. The region supplies an estimated one-third of all landed tuna, 40–60 per cent of total supply to tuna canneries, and 30 per cent of tuna to the valuable Japanese *sashimi* (raw fish) market (Gillett et al. 2000; Secretariat of the Pacific Community 2000). The annual average tuna harvest from the Pacific islands region is currently about 1 million metric tonnes with a landed value close to US\$1.7 billion (Tarte 1999).

The four major tuna species that inhabit the South Pacific fishery are skipjack (*Katsuwonus pelamis*), yellowfin (*Thunnus albacares*), bigeye (*Thunnus obesus*) and albacore (*Thunnus alalunga*). According to Hampton et al. (1999), although there are significant variations among harvests of skipjack (67 per cent of total catch), yellowfin (19 per cent of total catch) and albacore (3 per cent of total catch), fishing is having little impact on stock levels of these species. In fact, these species could sustain higher catch rates (Hampton et al. 1999). However, bigeye tuna (5 per cent of total catch) is slower growing and longer lived than the other species, and is therefore less effective at regenerating after fishing. The decline in adult



biomass of bigeye tuna since the 1970s has raised concern that harvest rates of this species have already reached unsustainable levels.

There are three main forms of harvesting tuna

- purse-seining, targeting skipjack and yellowfin
- pole-and-lining, targeting skipjack and, to a smaller extent, yellowfin
- longlining, targeting yellowfin, bigeye and albacore.

Longlining is the traditional harvest form. Pole-and-line fishing became popular in the 1970s to early 1980s but has since waned with the introduction of purse-seining, which now accounts for approximately 75 per cent of total tuna catch. The purse-seine fishery developed rapidly in response to improved technological ability to fish the deeper thermocline found in the South Pacific tuna fishery; poor fishing conditions in the eastern Pacific Ocean and the emergence of the Korean, Taiwanese and Japanese purse-seine fleets.

The share of the South Pacific harvest taken by Pacific island countries is extremely modest, at around 10 per cent. The remaining 90 per cent of the value of the catch is taken by distant-water fishing nations, mainly Japan, Taiwan (Province of China), the Republic of Korea and the United States (Secretariat of the Pacific Community 2000). The distant-water fishing nations pay access fees to the Pacific island countries for the right to fish in their waters. These revenues are increasing. For example, in 1999 fees amounted to US\$60.3 million, 403 per cent greater than that reported by Clarke (1983). These licence fees contribute significantly to the public revenue of many Pacific island countries such as Kiribati, Tuvalu, the Federated States of Micronesia and the Marshall Islands (Table 1). Fish products dominate export activities in the Marshall Islands, Federated States of Micronesia and Kiribati, which have established local tuna-

fishing activities through joint ventures with distant-water fishing nation firms. However, fishing as a share of GDP is likely to be underestimated in the Pacific island countries where marine products play a large role in domestic food consumption in their primarily subsistence economies.

Opportunities for sustainable economic development of the South Pacific tuna industry

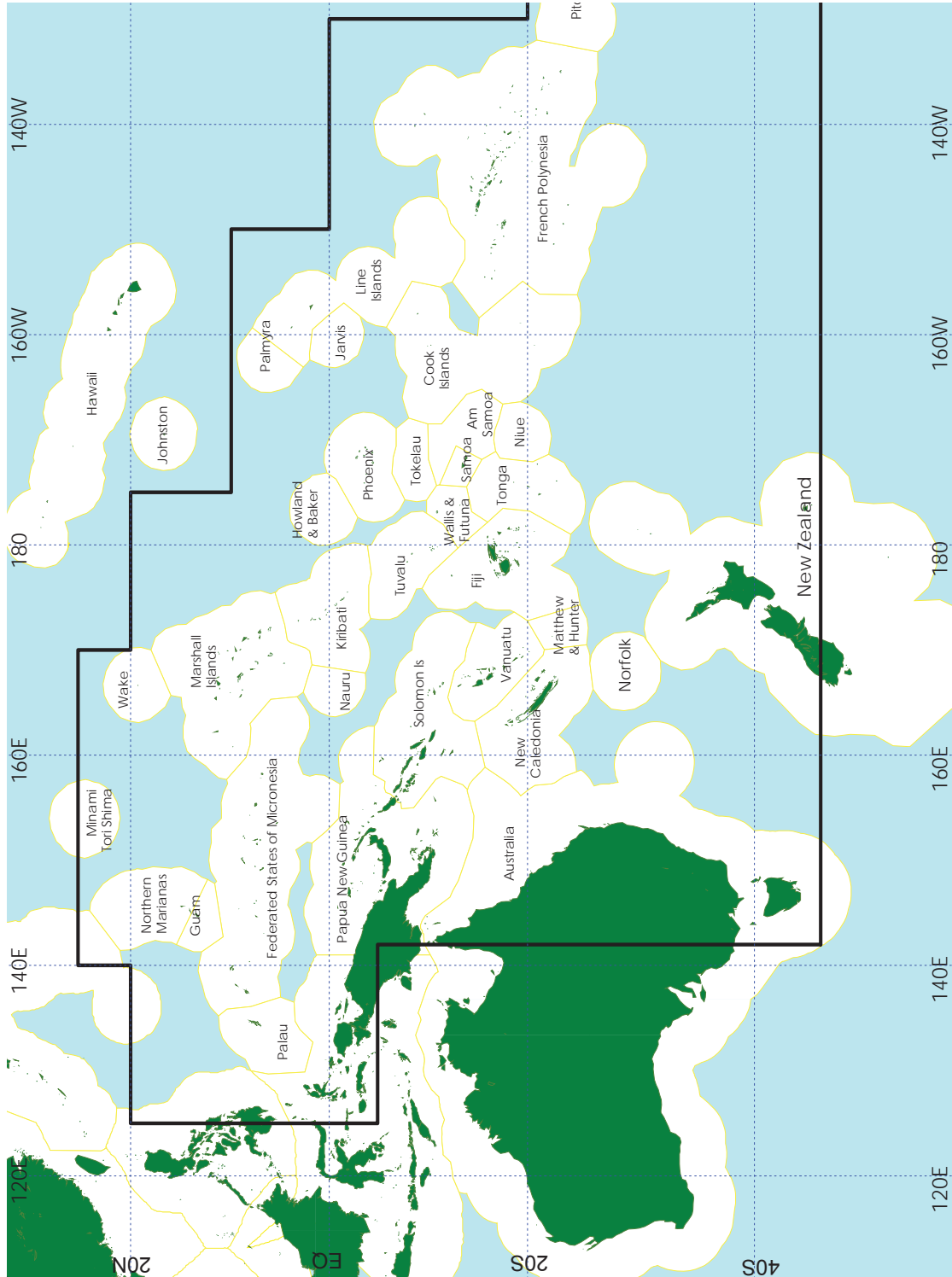
There are two major concerns with current governance of the South Pacific tuna fishery: the Pacific island countries are not deriving as much benefit from its exploitation as they could; and current management strategies will not ensure long-term sustainability of the resource. Three key areas are highlighted in this paper as opportunities for sustainable economic development: regional tuna management, restricting the total allowable catch and the auctioning of resource entitlements.

Regional tuna management

Prior to the 1980s, all deep-sea fish stocks were subject to open access, and typical problems arising from such open-access arrangements were widespread. This 'tragedy of the commons' was partly resolved with the negotiation of the United Nations Convention on the Law of the Sea that gave state-property rights to coastal states over their exclusive economic zones. The individual Pacific island states have exercised weak governance over their regions of jurisdiction. Little control has been placed on fishing effort, and institutional structures are weak and often established on a temporary basis in reaction to particular circumstances. Unlike most tuna stocks in the world, the South Pacific tuna fishery remains healthy (with the exception of bigeye tuna). However, there is only one significant difference between South Pacific tuna stocks



Figure 1 The South Pacific region: exclusive economic zones



Source: Secretariat for the Pacific Community (reproduced with permission).



and those elsewhere—it is more isolated from many distant water fishing nations and hence has taken longer to exploit. The South Pacific tuna fishery is now the focus of a growing number of fishing nations.

Many commentators argue the benefits of a strong common-property regime where Pacific island countries and territories make collective decisions on the governance of the fishery (for example, Maxwell and Owen 1994; van Santen and Muller 2000; World Bank 2000b). However, Petersen (2001) argued that the most cost-effective institutional structure is one that keeps collective decision making to a minimum for various reasons

- a perception that multilateral agreements compromise a country's sovereign rights
- the lack of supporting institutions that could compel or impose an agreement
- the benefits and costs of implementing new institutions are unevenly

distributed among Pacific island countries

- the fear that multilateral negotiations may result in a reduction in bilateral aid.

Because of the migratory nature of fish stocks, placing controls on catch size is necessarily a regional issue. The setting of the total allowable catch for the region is the only decision that must be made at the collective level. To minimise transaction costs, all other decisions should be made at the state level.

It is advocated here that a total allowable catch should be determined for the whole Pacific islands region; then individual country quotas of the total allowable catch should be allocated through a negotiated formula based on tuna concentrations in the exclusive economic zones and current catches from the high seas. Individual countries should then be responsible for allocating and adjusting quota entitlements

Table 1 The importance of the fishing industry for selected Pacific island countries

	Government revenue (per cent)	Exports (per cent of total value)	GDP (per cent)
Cook Islands	..	41 (1999)	..
Fiji	..	7 (1997)	1.4 (1998)
FSM	29 (1998)	92 (1997)	15.5 (1990)
Kiribati	61 (1998)	53 (1993)	9.5 (1993)
Marshall Islands	25 (1993)	94 (1997)	..
New Caledonia	..	27 (1996)	..
Palau	5 (1993)	-	..
Papua New Guinea	2 (1999)	0.6 (1999)	..
Samoa	6.2 (1999)
Solomon Islands	approx. 5 (1993)	20 (1993)	9.0 (1993)
Tonga	..	18 (1998)	..
Tuvalu	approx. 35 (1993)	-	5.0 (1993)
Vanuatu	-	<1 (1993)	..

Sources: TISES, 1996. *New Caledonia Facts and Figures*, Territorial Institute for Statistics and Economic Studies, Noumea; Duncan, R. and Temu, I., 1997. 'Trade, investment and sustainable development of natural resources in the Pacific: the case of fish and timber', in *Enhancing Cooperation in Trade and Investment between Pacific Island Countries and Economies of East and South-East Asia*, UNESCAP, New York, Volume 1:175–211; Bank of Papua New Guinea (2000). *Quarterly Economic Bulletin*, Bank of Papua New Guinea, Port Moresby; ESCAP, 2000 and 2001. *Statistical Yearbook for Asia and the Pacific*. UNESCAP, Bangkok; World Bank, 2000a. *Cities, Seas, and Storms: managing change in Pacific island economies*, Vol. I, Summary Report, World Bank, Washington, DC.



among individual fishers (the auctioning of vessel licences is advocated later in this paper).¹

This raises the question of who should set the regional total allowable catch and how it is allocated among the Pacific island countries. With the September 2000 signing of the Multilateral High Level Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western and Central Pacific Ocean (MHLC 2000) the time is ripe for discussing this issue. All coastal and distant-water fishing nations and territories (except Japan) signed the Convention, which requires the establishment of a Commission responsible for promoting cooperation and coordination among members to ensure the conservation of fish stocks. The Commission does not have an organisational structure as yet, and due to the time needed for ratification, it is not expected to come into force until at least 2003. Careful consideration must be given to how it is constituted due to the political sensitivity of the issue and the potential benefits that can be derived from strong institutional structures for governance.

The Convention does not necessitate nor preclude the Commission from setting the total allowable catch for the fishery. The question of whether the total allowable catch should be established by the Commission (which includes distant-water fishing nations) or by the Pacific island countries alone should be debated. It is argued here that this decision is a concern for Pacific island countries alone and, unless the voting process of the Commission gives appropriate weight to Pacific island countries, it is therefore an issue that is outside the Commission's jurisdiction. A regional body encapsulating all Pacific island countries should decide on the level of the total allowable catch, and how this catch is allocated among Pacific island countries. The body that currently represents the largest number of Pacific island nations on fisheries

matters is the Forum Fisheries Agency that includes the 16 independent or self-governing countries of the region.² However, the eight territories should also be party to this decision.³ The enforcement of a total allowable catch for the region is an issue that should be given top priority by the Pacific island countries. Without rectifying this issue, the sustainability of the tuna resource remains at risk.

Restricting the total allowable catch

Economists term the maximum economic yield as the level of fishing effort where the difference between total revenue and total cost is the greatest. For harvest rates beyond the maximum economic yield, any increase in effort has a diminished return and profit is decreased. Biologists term the maximum sustainable yield as the maximum sustainable level of fishing effort that leaves the resource under no threat of depletion. Generally, the maximum economic yield is less than the maximum sustainable yield. Hence, limiting fishing effort by more than what the resource can sustainably maintain leads to an increase in revenue derived from the industry.

While evidence suggests that tuna in the South Pacific is not being over-exploited biologically (that is, fish harvests are not beyond the maximum sustainable yield), evidence suggests that it is being over-exploited economically (that is, fish harvests are beyond the maximum economic yield). Currently, there is excess capacity in both fishing vessels and canneries, at least for surface tuna such as skipjack. Van Santen and Muller (2000) argued that this excess capacity is a result of the large expansion in catches and canned tuna production, industry consolidation, protected market blocs in Europe and the United States (which stimulate over-investment), improvements in technology and expansion of fishing grounds in the Western Pacific and Indian Oceans. Van Santen and Muller (2000) also argued



that the excess capacity has resulted in a decline in raw material prices by some 50 per cent in real terms over the last two decades. While demand for tuna is linked to other substitutes such as pork and chicken, tuna prices have historically shown large swings due to changes in supply. Furthermore, with the region servicing 40–60 per cent of tuna for canneries, a reduction in tuna supply would almost certainly lead to an increase in price. Bertignac et al. (2001) estimated the demand elasticity for raw tuna supplied to the canning markets by purse-seine and pole-and-line fleets in the South Pacific to be 1.55, and that of the fresh and frozen tuna supplied by longline fleets to be 2.53.

Bertignac et al. (2001) also argued that the overall level of effort of the fishery is sub-optimal. They used a tuna population dynamics model (spatially disaggregated, multi-gear, multi-species simulation model) interfaced with a simplex optimisation algorithm to attempt to locate an optimal level and mix of technologies given the objective of maximising economic rents in the long run. The current access fee structure of 4 per cent of the gross revenue of the distant-water fishing nations was assumed. It was found that maximised annual economic rents could be more than doubled by reducing the effort of all fleet technologies. Furthermore, when they relaxed the assumption of access fees being 4 per cent of total catch value, they found that the true economic rent could be around 13 per cent of revenue at 1996 levels of effort, and 40 per cent with reduced fishing effort (although these figures differ across harvest technologies).

While fish stocks themselves are not in jeopardy, reducing fishing effort is likely to lead to an increase in fishing revenue by fishing companies and hence, an increase in potential access fees derived by the Pacific island countries. It is understood that immediate reduction in fishing effort may have significant political ramifications.

However, a gradual decrease is likely to be rewarding. Such increased restrictions on fishing effort would allow the Pacific island nations to exercise more strongly the precautionary principle in an industry that is notoriously difficult to govern due to the dynamics in fishery size and the long-term nature of investments.

Allocation and transfer of resource entitlements

Currently, entitlements are allocated through the licensing of vessels. Very few restrictions are placed on the number of vessels, hence licensing acts as a mechanism for monitoring fishing activity. Licence fees are based on the estimated value of the catch, assessed in advance on the basis of catch taken in previous years. It is no surprise that under-reporting is evident. The Forum Fisheries Agency estimated that 45 per cent of catch was not reported in 1992 (Gillett et al. 2000). Duncan and Temu (1997) state that under-reporting is particularly common by vessels from Taiwan (Province of China) and the Republic of Korea. If true, the Pacific islands countries are losing a considerable amount of resource revenue and the sustainability of the industry is in jeopardy.

Vessel licences are allocated and transferred among resource users through international treaties. As these are negotiated by resource managers, there is no guarantee that the negotiated access fees reflect the true value of the economic rent. Bilateral aid is often given in exchange for cheaper access, as well as the offer of side payments to resource managers. These international treaties are not transparent, give incentives to underreport and do not ensure the most efficient are allocated the access rights. Alternative mechanisms for allocating and transferring entitlements need to be considered.

The mechanism recommended here is market allocation and adjustment through



the auctioning of vessel licences. One attraction of an auction system is that it taxes the full economic rent without having to know its true value. Bertignac et al. (2001) estimated these economic rents to be about 13 per cent (assuming 1996 levels of fishing effort) compared with the current 4 per cent. The true value of the economic rent is highly uncertain as it depends on the value of the fish caught and the cost of fishing effort. Hence, the auctioning of fishing rights allows the resource manager to maximise the economic rent while only needing to know enough detail on the dynamics of the industry to be able to set a reserve price for each licence. The uncertainty associated with the dynamics of the system is transferred to the fishing companies (although at a price as the bids will be discounted to reflect this uncertainty). Licence auctions should be held regularly so that entitlements can be bought and sold at market price. Duncan and Temu (1997) also recommend the auctioning of fishing entitlements in the South Pacific.

The assumption that the auctioning of entitlements ensures that the most efficient firm receives the entitlement depends on a few market requirements. The first requirement is that the transaction costs associated with market allocation are less than the efficiency gains. However, there can be little doubt that the potential efficiency gains derived from extracting the full economic rents in licence fees and the decrease in corrupt practices and rent-seeking at the political level will be substantial.

The second requirement for the efficient auctioning of entitlements is that bidding is competitive. With 1,300 vessels from ten different countries fishing in the region and the likelihood that market allocation will encourage more entrants into the industry, auctions will almost certainly be competitive (Duncan and Temu 1997). However, auction design will be important and must be given due attention. Country cooperatives must be

banned from participating in the auction with only distant-water fishing firms being allowed to bid. Further, zero-auctions could be introduced in line with the New South Wales fishery whereby a proportion of each existing fisher's rights are put to auction, with the ability of the fisher to buy back their share in a competitive market. If the fisher buys back their quota, no revenue changes hands. If the quota is sold, the holder of the right receives full market price. The purposes of the zero-auction are three-fold: to create a mature market as quickly as possible, to guarantee new entrants into the industry, and to reduce the ease with which people can form and maintain local monopolies and/or oligopolies (Young 1995).

Other advantages of the auction system are that they encourage self-monitoring and self-enforcing. Making monitoring and enforcement a matter of self-interest is crucial, given the extensive area of ocean through which the tuna migrate, and the fiscal constraints of the Pacific island countries. The auction system significantly lessens the likelihood of under-reporting compared with the present system where access fees are related to catch size. Additionally, if by-catch is retained, the accuracy of reporting will be improved further. Self-enforcement is encouraged as licence-holders themselves will monitor illegal fishing activity. Excess fishing would decrease the value of the fishery, jeopardising the security of the licence-holder's investment. At present, the licence fees are reportedly well below the true economic rent, giving little incentive to report illegal activity.

An auction system also provides flexibility and an investment guarantee for investors. At the end of the life of the licence (say 10 years), the system can be reviewed and necessary changes can be implemented before auctioning the licences for a further term. In this way, investors know when the review is due to take place and are prepared for change. This strategic approach provides



secure entitlement to fishers for a period, to provide strong incentive to manage fish stocks rationally. Moreover, the auction system means that the fishing revenue of the Pacific island country is known in advance and is stable over the specified licence period. This increased fiscal stability would aid budgetary planning and obviates the need for revenue-stabilising mechanisms where fish revenue is a large component of total revenue. The fishing firm bears all the price and output risk (although at a discounted price).

Other options on this proposal could be debated. For example, if distant-water fishing nations resent bearing the revenue risk (associated with price and catch fluctuations), a risk-sharing alternative could be considered where the licence fee is not only dependent on the successful bid but on something correlated with the true value of the resource (that is, tuna price), as is achieved by royalties. An alternative with extra investment security could also be considered. A proportion (say 60 per cent of rights) could be issued in perpetuity with compulsory return of the remaining proportion. Users still have the option of selling their proportion that was issued in perpetuity via auction. This system provides investment security while still allowing new entrants into the market.

This proposal for auctioning fishing entitlements should be the focus of further research. Lessons from the auctioning of television or mobile phone spectrum, another common-property natural resource, could be used in this research. The design of the auction system will be of utmost importance to ensure they are competitive and efficient.

The opportunities highlighted have focused on potential institutional and policy changes at the regional level. However, there is cause for concern that other government policies in the Pacific island countries are not ensuring the maximum benefits are derived from the industry in the long term.

Government policy

Many of the region's governments have invested many millions of dollars of aid funds or public revenues into the tuna industry. These investments have been made with the government as sole owner and operator, or in joint ventures with foreign countries (predominantly Japan and the United States). No government has entered into a major joint venture with its own private sector (Asian Development Bank 1997). Unfortunately, all the investments that have been operating for more than two years, with only a few minor exceptions, have been unprofitable and have required additional massive injections of public funds. Most government tuna ventures have failed, some repeatedly. Furthermore, Doulman (1989) remarked that while in the past joint ventures have been considered to be the most appropriate means of promoting industrial fisheries development in the Pacific islands region, their benefits have been far below expectations, with difficulties arising in revenue raising, management and control. There is no reason for this kind of government involvement, as may be necessary in land-based business activities where property rights to land may need government backing of some kind. Property rights to the exclusive economic zones are owned by the government and it can pass them on to quota holders, knowing that there will not be claims for future compensation by landholders.

Public sector tuna ventures may be seen to have economic importance as a source of employment and foreign exchange. For these reasons, some public sector vested interests have sustained their operation despite their financial losses. The Asian Development Bank (1997) advanced the following determinants of this lack of profitability: inadequate management, weak direction at the board level (usually composed of civil servants), inappropriate government-



operating procedures, deteriorating prices, low labour productivity, shortages of fish and comparatively high-cost operations.

Private investment in tuna ventures has been scarce compared to public investment. However, some cases have proved successful. Private ventures in Fiji, the Cook Islands, Tonga and Kiribati show promise, and the domestic commercial fishing fleets in Papua New Guinea and Samoa are growing due to certain improved economic conditions. Improved economic conditions in Samoa resulting from the government's attempts to improve the economic environment for private sector profitability, among other things, have led to the growth of domestic fishing fleets. This is evidence that fishing industries can develop with little support, provided markets can be found. Pollard (1995) and Asian Development Bank (1997) argued that the lack of private investment in tuna ventures is due to the lack of resource rights; the comparatively high-cost, high-risk and high-skill requirements of the industry; as well as the evidence of consistent government failure in the industries. In addition, the protected and internationally non-competitive nature of the Pacific island economies deter investment and competition.

Government policy can proceed in a number of ways. The regional governments could maintain their direct ownership and operation. However, this is likely to result in continued financial losses at the expense of foregone opportunities for the private sector. Doulman (1989) concluded that public investment is unlikely to be the most satisfactory and financially rewarding means of developing a locally based tuna industry. McCoy and Gillett (1997) noted that, at 1997 fish prices, only the Japanese and US purse-seine operators in the South Pacific were profitable; Taiwan (Province of China) was just breaking even, and the Republic of Korea was incurring net losses in their operations. It is not appropriate that governments or aid agencies should be

investing in such high-risk commercial ventures.

Most Pacific island governments have provided cheap access to fishing rights for foreign fishers in exchange for them setting up local industrial activity. However, such a policy commits the cardinal policy sin of trying to achieve two objectives with the one policy instrument (Tinbergen 1952). The two objectives are to maximise economic rent and to establish domestic-based industry. Subsidising resource access in exchange for local activity achieves neither goal well. The amount of the effective public subsidies paid out in the form of low-cost access and in exemptions from taxes is unknown. Experience has shown that as few local activities have been financial successes, these subsidies have been dissipated to create a few, likely short-term, jobs. If it is considered beneficial to subsidise foreign firms to invest locally, subsidies should be explicit, rather than provided in non-transparent ways as at present.

Direct encouragement of locally based foreign direct investment also exists in the Federated States of Micronesia agreement, which aims to encourage foreign vessels and operators to relocate to the Pacific islands region through preferential licensing. Moreover, the Forum Fisheries Agency member countries banned trans-shipment at sea in June 1993. Not surprisingly, port activity at trans-shipment points increased markedly with the ban, and evidence suggests that the ban decreased under-reporting of catches (SPC 1994). However, compulsory port trans-shipment is a very high-cost way of encouraging local economic activity and monitoring fish mortality. It leads to only a limited domestication of activities. Furthermore, the willingness to pay for licence fees by distant-water fishing nations will decrease to cover these increased transaction costs. Duncan and Temu (1997) noted that the Pacific island countries are effectively paying for trans-



shipment through a public subsidy. The proposed auction system ensures greater self-enforcement and negates the need for banning trans-shipment by sea.

Government policy could proceed by stimulating the domestic private sector to invest in the industry. While, historically, private ventures have had greater success than public ventures, this policy assumes that such investment is of greater social benefit than had the funds been spent elsewhere in the economy. This assumption is not sensible, especially given that most of the key constraints to domestication given by Asian Development Bank (1997) highlight problems outside the fisheries sector, that is, infrastructure and transport (seaports, airports, air transport and land tenure), appropriate governance and institutional structures (law and order), and unsustainable economic policy (economic instability, failed state capitalism and poor human resources). It cannot and should not be assumed that government revenue from the fisheries sector is best spent directly stimulating private investment in the industry. Duncan et al. (1999) noted that

...comparative advantage is too fluid and too complex for governments to impose a decree in favour of the development of certain industries, but that governments have an overwhelmingly important role in creating an environment where private agents use information efficiently to search out areas of comparative advantage (1999:98).

Finally, government policy could proceed by relying on economic rents and reorienting government spending to indirect support of the investment market. By directing public funds into governance, institutional strengthening, broad policy change and investment in education, an overall economic environment conducive to private investment will be created. Such an environment will indirectly benefit all sectors in the economy, including the fishing sector.

It is important to realise that enhancing capabilities in the fishing sector will take time (Pollard 1995), although such indirect support of the investment market has already had a positive influence on the private domestic tuna fleets in Papua New Guinea and Samoa. Duncan and Temu (1997) commented that domestication of the tuna industry should not be forced. Government should direct spending to the support of the investment market where this spending will deliver the greatest good to the community.

Conclusions

There are two major concerns with current governance of the tuna fishery: the Pacific island countries are not deriving as much benefit from its exploitation as they could; and current management strategies will not ensure long-term sustainability of the resource. Three key opportunities for sustainable economic development of the industry are regional cooperation in determining a total allowable catch and how it is allocated among individual island states, restricting the total allowable catch, and the auctioning of resource entitlements.

The South Pacific tuna fishery is the world's only fishing ground that is not currently over-fished. However, the fishery is now the focus of a growing number of fishing nations, and at present few controls are placed on fishing effort. Sound policies for such control are becoming more important for the sustainability of the resource. Due to the migratory nature of the fish stocks, placing controls on catch size is a regional issue. Total allowable catch should be determined for the whole Pacific islands region, and individual countries given a quota of this total allowable catch based on tuna concentrations in their exclusive economic zones and current catches from the high seas. In September 2000, the Convention on the Conservation and Management of Highly Migratory Fish Stocks in the Western



and Central Pacific Ocean was signed by all Pacific island countries and distant-water fishing nations (except Japan). The Convention does not necessitate nor preclude the resulting Commission from setting the regional total allowable catch. As the issue of setting a total allowable catch should not be a concern for distant-water fishing nations, it should not be determined by the Commission but by a regional body comprising all Pacific island countries. Giving such a body the power to set the total allowable catch is a priority for Pacific island countries to ensure sustainability of the tuna resource.

The second opportunity for sustainable economic development relates to the level at which the regional total allowable catch is set. There is evidence that there is excess capacity in both fishing vessels and canneries. As 40–60 per cent of tuna for canneries globally is serviced by the South Pacific, it is likely that a reduction in tuna supply from the region will increase revenue derived from the industry as a whole. A gradual reduction in total allowable catch will also allow stronger exercising of the precautionary principle in an industry that is notoriously difficult to govern.

The third opportunity for sustainable economic development concerns how Pacific island countries should allocate their share of the total allowable catch among individual fishers. Presently, access rights are negotiated by resource managers through international treaties. These treaties encourage under-reporting, do not ensure the most efficient fishing firms are allocated the resource right, and are not transparent. The auctioning of licences would obviate the incentive for under-reporting and allow the resource managers to maximise the economic rent while needing to know very little about the true rent value. They would also increase transparency (as opportunities for direct dealing with individuals are significantly reduced) and encourage self-monitoring and

self-enforcement. Auction design will be important to ensure the bidding is competitive, and should be the focus of further research.

By directly encouraging foreign direct investment to be based locally, many Pacific island countries are committing the cardinal policy sin of trying to achieve two objectives with the one policy instrument. These objectives are to maximise economic rents and to establish domestic-based industry. Subsidising resource access in exchange for local activities achieves neither goal well. It is argued that government policy should aim to maximise economic rents and then reorient government spending into removing impediments to private sector investment. Such government spending would thus be directed where it will do the greatest good for the community. If direct support of the fisheries industry is considered appropriate, then subsidies should be transparent, and not delivered through low-cost access and tax exemptions.

Notes

- ¹ While it is advocated that an output quota of the regional total allowable catch should be allocated to each individual country, a mixture of output and input controls on entitlements are recommended to be implemented by each state authority.
- ² Forum Fisheries Agency member nations include Australia, Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Nauru, New Zealand, Niue, Republic of the Marshall Islands, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu and Vanuatu.
- ³ The territories include three dependencies of France (French Polynesia, New Caledonia, and Wallis and Futuna), three of the United States (American Samoa, Guam and the Northern Marianas), and one each of Great Britain (Pitcairn Island) and New Zealand (Tokelau).



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