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Fisheries

Introduction

The people of Samoa have traditionally relied on the sea for most of their dietary protein (Zann, 1999). World Bank (1997) noted that, even “though more than a million fishing trips are made each year, three quarters of the catch is used for subsistence consumption.” Samoans harvest, consume, and market a wide range of marine products, including fin fish, crustaceans (crabs, etc), bivalves (giant clams, cockles), other (such as octopus and turbo shell), and other invertebrates such as jellyfish, sea cucumbers, and sea urchins.

The more than 360 coastal villages of Samoa will continue to rely on fishing for both subsistence and the earning of cash income. It has also been suggested that many villagers turned to fishing for income when taro blight destroyed the taro crop in 1993. According to studies by Zann (1991) and Mulipola (1997) (cited in Fisheries Division 1999), between 35 and 40 percent of households in Samoa are classified as subsistence fishers. In contrast, only 12 percent are “primary” fishers, those who rely on fishing as their primary source of income. The remaining fishers are involved in both the subsistence and commercial subsectors.

The fisheries sector in Samoa can be divided into subsistence fisheries and commercial/artisanal fisheries (Fisheries Division, 1999). The commercial/artisanal fisheries are further divided into inshore fish (such as parrotfish), bottom fish (mainly deepwater snappers, groupers, emperors, and so on), pelagic nontuna (like marlin and dolphin fish), and tuna (albacore, skipjack, yellowfin, bigeye). The latter two categories are also referred to as the offshore fishery.

The recent, highly successful development of the long-line industry in Samoa has changed both the structure and the economic status of the fisheries sector enormously. There are ongoing concerns about the health of inshore resource stocks; these concerns are discussed below.

In contrast, the catches of pelagic fish have increased dramatically as a result of a shift to long-lining for the export market. Reference to Figure 8.2 shows that, as a percentage of total GDP, fishing's contribution grew from 4 percent in 1995 to 8 percent in 1999. At market prices this means that the contribution of fisheries to GDP grew from SAT\$20.5 million in 1994 to more than SAT\$43 million in 1999 (the Treasury Statistician forecasts that the final 1999 figure will be SAT\$48.9 million). GDP from fisheries is forecast to grow to around SAT\$81.5 million by 2002, comprising approximately 10 percent of total value added in the economy (this may be a conservative estimate). Exports of fish have grown from zero prior to 1993, and from SAT\$150,000 in that year, to more than SAT\$28 million in 1998 (Table 9.1). According to private-sector sources, exports for 1999 are expected to be on the order of SAT\$45 million, and to keep increasing, possibly to around SAT\$100 million in the next two to three years.

Table 9.1 **Fisheries Exports, 1990–1999**

	Unit	1990–92	1993	1994	1995	1996	1997	1998	1999 ^a
Volume	metric ton				212	1,180	2,977	4,408	1,287
Value	Tala million	0.00	0.15	0.26	0.43	2.25	12.33	28.40	14.24
Unit value	Tala/ton				2,050	1,938	4,141	6,443	10,627 ^b

Notes: a. First and second quarters of 1999 only.

b. Average price for the first two quarters (unweighted).

Source: Central Bank of Samoa.

While the growth in exports has come from long-lining, and predominantly from tuna, there are also substantial exports of other species. Exports are categorized into commercial, which are fishery products exported for commercial purposes or reselling; and *faaso*, which are private exports for family consumption or as gifts for relatives and families overseas (Fisheries Division 1999). Exports of the various categories of fish in 1998–99 are shown in Table 9.2. Reference to the table shows the overwhelming importance of tuna and other pelagic species, the species harvested by long-lining. Of the tunas, albacore comprise about 88 percent of total exports by weight, with yellowfin and bigeye constituting about 10 percent and 2 percent, respectively (Table 9.3). The latter two varieties are preferred in the higher-priced sashimi markets, while albacore is primarily exported to the two canneries in American Samoa. Most exports go to the US market, with only minor amounts exported to Australia and New Zealand.

There are few reliable data about subsistence catches, although various surveys were undertaken in the 1990s. The Director of the Samoa Fish-

Table 9.2 Fisheries Exports, 1998–1999

	Commercial			Faaso (private exports)		
	Quantity	Value	By weight	Quantity	Value	By weight
	tons	SAT\$'000	%	tons	SAT\$'000	%
Deepwater	55.5	483.6	1.1	0.2	1.2	4
Inshore	8.2	130.5	0.2	1.5	9.4	32
Pelagics	117.0	1,002.5	2.3	0.4	2.4	9
Tunas	4,756.6	32,935.0	94.6	2.3	7.9	48
Other	88.7	592.0	1.8	0.3	0.9	6
Total	5,026.0	35,143.6		4.7	21.8	

Source: Fisheries Division.

Table 9.3 Tuna Exports, 1998–1999

Species	Quantity	Value	% by weight
	tonnes	SAT\$'000	%
Yellowfin (<i>Asiasi</i>)	492.7	5,492.5	10.4
Skipjack (<i>Atu</i>)	8.4	130.0	0.2
Bigeye (<i>Pikiai</i>)	79.0	150.5	1.7
Albacore (<i>Apakoa</i>)	4,176.6	25,807.4	87.8

Source: Fisheries Division.

eries Project, Dr. Michael King, undertook surveys in 1990 and 1997, and estimates subsistence landings to be of the order of 4,600 tons per year (around 27 kg for each resident Samoan). Subsistence landings were thus exceeded by commercial catches for the first time in 1998–99, yet the subsistence subsector is still very significant, hence the pressure on inshore fisheries, as discussed below.

Subsistence Fisheries and Inshore Resource Management

Catches of fish and other marine species have been declining in the inshore reefs and lagoons of Samoa for many years (King and Faasili 1999; Zann 1999). Loss of fisheries habitat, increased fishing pressure, and more efficient (and often destructive) fishing technologies are cited by Zann as the key reasons for the decline. Both natural and human-induced environmental disturbances have contributed to the problems experienced with inshore fisheries. Cyclones and storms, which often destroy large areas of reef, are a part of the normal cycle of events in the tropics. But as noted by King and Faasili, decline in fish catches has also resulted from the destruction of fish nursery areas, including mangroves, for reclamation and road construction; and from poor land management practices, resulting in erosion and siltation of lagoons.

In other words, serious externalities are being imposed upon subsistence and semicommercial inshore fishers and the communities in which they live. These externalities arise because those exploiting land, mangrove, and other resources are not meeting the full costs, including the environmental costs, of such activities. Consequently, government action to redress this form of market failure is required. In cases such as inappropriate upstream land uses and destruction of mangroves, environmental controls need to be developed and implemented, including EIA for certain categories of development, an issue discussed later in this chapter.

The question of improved management of inshore fishing areas by fishing communities does, however, present a different situation. The problem is not one of externalities, because fishers are generally exploiting fishing grounds that are in community ownership. Traditionally, and when population pressures were lower, practices such as defining sea tenure rights, conditional fishing rights, and taboos on certain places, species, and fishing techniques were employed to protect stocks. The resources were, and are, managed as common property, but with well-specified property rights, for the good of all in the community. This is the basis of the AusAID/Samoa Fisheries Division Extension and Training Project, the first phase of which was completed in August 1998. The second four-year phase began in February 1999, again with AusAID support. The second phase is known as the Samoa Fisheries Project. The project was designed to promote the involvement of village communities in the management of their own marine resources. According to the Fisheries Division, it has achieved its medium-term goal of preventing further decline in near-shore fisheries resources, at least in those communities where management plans have been implemented.

The Samoa Fisheries Project includes three elements: the village extension program, aquaculture development, and aspects of management of the tuna fishery. The first two of these overlap and are important in the village extension process. The principal outcome of the process is the development of village fisheries management plans in those communities that participate. In addition, however, alternative sources of seafood are being developed through the aquaculture component of the project. The extension process that has been developed is becoming an accepted model, not only in Samoa, but in other island nations of the world where there is common property tenure over marine resources. The critical component of the process is that it gives "ownership" of management needs to the community and in this way overcomes any market failure that arises through poor information that, in turn, leads to inappropriate fishing practices.

More than 60 villages have developed management plans under the extension process, with continued demand from other communities to become involved. The plans developed contain a range of community undertakings designed to conserve and rebuild fish stocks and protect the marine environment. The most common undertakings are

- banning the use of dynamite and chemicals to harvest fish;
- banning smashing of coral to catch sheltering fish;
- imposing minimum size limits on fish;
- banning underwater torches for spear fishing at night;
- collecting crown of thorns starfish (which destroy reefs);
- banning removal of beach sand and dumping of rubbish; and
- establishing fish reserves. (Fisheries Division 1999).

Aquaculture is supported under the Samoa Fisheries project as a means of developing alternative food sources, as well as possible new sources of income. Activities include the introduction of the ubiquitous and fast-growing Nile Tilapia into freshwater sites such as lakes, restocking reefs with giant clam, and releasing the (introduced) green snail on suitable reefs. Trial plantings of *Euchema* seaweed have also commenced at three selected sites. The Fisheries Division supports these activities with ongoing training and assistance with management. These research and development activities are an important role of Government. For example, giant clam, a popular food for Samoans, was over-fished, suffers high mortality rates, and is relatively slow growing. Consequently, without support, communities are unlikely to reintroduce and attempt to manage giant clam stocks. Further, an AusAID-funded fisheries specialist has provided training in outer reef slope fishing in several villages, again with an objective of diversifying food- and income-generating sources for fishers and their families.

Other Fisheries Division Activities

The Fisheries Division is involved in a range of other activities that support both inshore and offshore fishing in Samoa. Certain activities have also been discontinued as a result of the Government's reform process. For example, the Fisheries Division previously issued permits to locally registered fishers for the government fuel subsidy scheme, but this scheme was cancelled in the 1998 budget.

The Fisheries Division has established the "Fishermen Safety at Sea Radio Communication Network" in recent years, mainly as a result of the growth in the fishing fleet and the rapid expansion of offshore fishing.

This is, as the name suggests, an important safety service, provided free by the division. Consideration should, however, be given to the introduction of a licensing fee for users of the network, a fee that should at least cover operation and maintenance costs. An alternative approach, discussed below, is to incorporate the costs of this service into the package of changes recommended for the offshore fishery.

The Fisheries Division also manages the Apia Fish Market, involving the management and maintenance of the market for the general public to buy and sell fisheries commodities. Tasks performed by the manager and other staff are rent collection, cleaning, maintenance and ensuring hygienic conditions, and enforcing fish and invertebrate size limits. Total rentals collected in 1998/99 were SAT\$76,087. The question arises, given the Government's reform process, whether the Fisheries Division should continue to manage the market. Because there is just the one market that serves the needs of local producers and consumers, ownership should remain in the hands of the Government. In terms of general management, maintenance and rent collection, however, there is no apparent market failure that requires a government agent to undertake these tasks. This is a matter that might be reviewed, with the possibility of placing market operation under a management contract with performance requirements imposed. Conversely, the enforcement of size limits is an area where the Fisheries Division has a clear regulatory role.

Finally, the Fisheries Division operates the Mechanic Workshop, which provides services in outboard repairs. All services, no matter the magnitude or nature of the task, cost SAT\$20. As noted by the Fisheries Division (1999), this service is mainly supporting commercial fishers. It is, therefore, a direct subsidy to those who use it. At least two private agencies sell and service outboard motors in Apia, but the market is being distorted by the operation of a subsidized service. This service should be provided by the private sector, and it is recommended that the Fisheries Division divest itself of the Mechanic Workshop, perhaps by auctioning its equipment, fixtures, and fittings.

Offshore Fisheries

The growth in offshore commercial fisheries in recent years constitutes a spectacular success story in Samoa's history of economic development. As shown in Tables 9.1 and 9.2, fisheries exports grew from just over 200 tons in 1995 to more than 5,000 tons in 1998–99. Most of this growth occurred as a result of successful long-line fishing for tuna, with by-catch of other pelagic species suitable for export accompanying the

tuna catch. As previously discussed, tunas accounted for almost 95 percent of the total weight of export fish.

Following successful trials by the Fisheries Division, the offshore fisheries industry has developed primarily as a result of private-sector initiative and risk-taking. While there had been interest in the potential of an offshore fishery and a number of previous efforts had been made to begin the industry, the first container of tuna was shipped to American Samoa in December 1994. This shipment resulted from the introduction and operation, by an expatriate, of a vessel suitable for long-line fishing. Other fishers, including those operating the small *alia* vessels, quickly moved into the industry, contributing to its rapid development. The Government's reform process improved the prospects of the industry, particularly through reducing tariffs and adopting a more open stance on foreign investment.

Table 9.3 shows that albacore accounted for about 88 percent of the total tuna export in 1998–99. Yellowfin and bigeye comprised around 10 percent and 2 percent, respectively. Virtually all the albacore is frozen in export plants in Apia (larger vessels also generally have blast freezing facilities on board), packed, containerized, and shipped to one of the two canneries in Pago Pago, American Samoa. The canneries in American Samoa have substantial excess capacity and will accept all the product that Samoa can ship. The presence of canneries in American Samoa, established originally to service the US fishing fleet in the South Pacific, provide Samoa with an unplanned yet important comparative advantage, namely close access (approximately 130 nautical miles) to canning facilities with excess capacity and access to the extremely large US market.

Fresh chilled tuna are also air-freighted from Samoa, predominantly to the US, for the high-value sashimi markets. The preferred species for this market are yellowfin and bigeye, which are packed in ice for export. Export is mostly by Air New Zealand, using a 767 aircraft that flies from Samoa to the west coast of the US. Some exporters have expressed concern about air-freight capacity, believing this to be a constraint on the industry, particularly as it is the high-value end of the market that is affected. Shipments of fresh chilled tuna have also been made to Japan but, at this stage, with little success. This is, however, an important sashimi market, typified by high prices, and one that Samoan exporters will almost certainly develop.

An apparent by-product of the growth of the offshore fishery is that export services now exist to support other Samoan fisheries. For example, approximately 55.5 metric tons of mixed bottom fish, valued at SAT\$483,600, were exported in 1998–99, mostly as fresh chilled fish

to the US. The Fisheries Division (1999) noted that this is a considerable increase over previous years. This increase may have occurred because of the marketing and transport infrastructure established by the various private fish exporters.

Infrastructure Needs of the Offshore Fishery

The rapid and unexpected growth of the long-line offshore fishery has given rise to certain infrastructure needs that must now be addressed as a matter of some urgency. This is an important role for the Government: to facilitate the development of infrastructure that supports economic activity and the growth of important industries in the nation. The infrastructure most needed consists of a wharf and marina complex, including refueling facilities.

Onshore facilities to support the industry have developed in a piecemeal fashion. As the catch grew, exporters moved as quickly as possible to install freezing and packing facilities to service the increase. However, further expansion is already constrained by lack of wharf space and of berthing facilities. The Government has included, in its draft *Public Sector Investment Program (PSIP): 2000/01–2002/03*, a project called “Establishment of a Marina for Fishing Vessels.” This project, however, constitutes more than simply a marina and includes a new wharf and associated facilities. There is a current proposal to the Japan International Cooperation Agency (JICA) for the construction of a \$US12 million marina for fishing vessels to be built at Mulinuu Port. New wharf and berthing facilities are urgently needed to support the burgeoning offshore fishery and it is recommended that Government accord this project a high priority. (A separate project listed in the PSIP is “Establishment of a Marina for Yachts and Game Fishing,” at an estimated cost of SAT\$10 million. It will almost certainly make sense to consider both these projects at the same time, as there may be important synergies between them.) The location of the industry, very close to central Apia, should also be reviewed as part of the development of supporting infrastructure for the industry. There may be a case for moving the whole industry to another, more suitable site. This serves also to emphasize that the industry must be involved in the planning of supporting infrastructure.

While it is a government responsibility to facilitate development of wharf, berthing, and associated facilities, it is not necessarily a government responsibility to manage those facilities. The wharf complex could be developed by using a bilateral grant¹, or by a loan from a multilat-

¹ It is likely that representatives of a Japanese company will be in Samoa in the near future to undertake an assessment of a new wharf and marina complex.

eral agency such as ADB. However, while the facilities will remain the property of the Government, they should be managed on a user-pays basis, ensuring that sufficient revenue is returned to cover maintenance and depreciation, and also to provide some return on the capital invested. It is recommended that the management, as distinct from the ownership, of the complex be tendered to the private sector. Those who tender, including foreign bidders, should be required to establish their experience in managing such a facility, while performance criteria should also be built into the management contract.

At present, berthing fees are not charged in Samoa, yet such fees need to be implemented so as to ensure that infrastructure is maintained and, where needed, replaced. Such fees could best be introduced with the commencement of operations of the new wharf and marina facility. As noted above, it is recommended that Government attach a high priority to this project and move as quickly as possible to seek funding and to commence planning for its implementation.

One other pressing need relates to the lack of refueling facilities at the present wharf area. Because there are no proper fuel pumping facilities at the wharf, fishers carry their own fuel, in drums, to their vessels. This constitutes both a danger to human life and an environmental hazard. There are also increased concerns about contamination of fish because of the manner in which vessels are refueled. While the Fisheries Division has been following this matter up, there appears to be no solution in sight. Normally, such a facility would be provided by the private sector. However, in Samoa, the supply of oil products was previously put out to tender and is in the hands of one company (Mobil). The company has about three years left on its contract, at which time it will be required to retender. Consequently, the company is loath to install facilities that will not pay for themselves in the short time frame, without guarantees that it will be suitably compensated for facilities it might have to leave behind. This is an important issue and one that should be addressed immediately.

Property Rights and Economic Rent

Most deepwater marine natural resources are in "public ownership," that is, they are seen as belonging to the whole community. Where government agencies are involved in their management, they are normally expected to do so in the interests of the community. The 200-mile Exclusive Economic Zone (EEZ), established after the "cod wars" between Britain and Iceland in the mid-1970s, defines the sovereignty of individual nations over areas of ocean. Nations may then manage fish-

ing rights, both of national and international fleets, within their EEZ. In Samoa, as in many other countries, the offshore area of the EEZ is the common property of all Samoans. In other words, the property rights for activities such as fishing are poorly specified; any Samoan vessel may fish anywhere in these waters and take as much of any species as it can collect. This is the classic commons situation, where no fishers have any incentive to limit their activities, because if one exercises constraint, others will simply harvest that individual's "share" of the resource. Davis and Tisdell (1996) noted that this supports the adage that the property of all becomes the responsibility of none.

A related matter in Samoa is that, as primary producers, fishers pay no income tax. VAGST on fishing inputs is also zero-rated, so that fishers can claim back each quarter the VAGST they have paid on inputs. Further, fishers pay no resource rental tax on the resource they are harvesting. While zero-rating of VAGST is appropriate, the nonpayment of either income tax or resource rental must be questioned on both equity and economic efficiency grounds. These issues were previously addressed, in relation to income tax, in the discussion of commercial agriculture. But the bigger issue in respect of the offshore fishery is that of economic rent (see Box 9.1). In Samoa, the rents from exploitation of offshore fisheries resources have been captured and retained by the fishers, with little return to the wider Samoan community, which is the actual resource owner.

Box 9.1 **Economic Rent**

Economic rent, according to the Pareto definition, is the payment to a factor in excess of what is necessary to keep it in its present employment. In sectors such as fisheries and forestry, rent is the economic surplus over and above normal profits earned from the exploitation of those resources. The opportunity to appropriate rents is a significant factor in attracting fishers and other resource users into various industries.

Several questions are relevant to the appropriation of rents from the exploitation of natural resources in Samoa. These relate principally to the ownership of the fish resources. Presently, the rents generated are appropriated by the resource-users, the fishers. When access to such resources is open, as in Samoa, economic theory concludes that the availability of rent will lead to overexploitation and, eventually, dissipation of rent as more and more users move into the industry and compete for the available rent. So open access results in an inefficient use of the

resource in question, as well as its possible biological devastation. Because the fishery is based on migratory species, little concern has been raised in Samoa about overexploitation. The prevailing view seems to be that other nations are fishing for the same species and will not reduce their catches just because Samoa does. This issue is revisited below. Whether or not resource stocks are seen as an issue of concern, Samoan fishers will also certainly face diminished rents as more and more fishers move into the industry, as fishing effort increases, and as catch per unit effort begins to decline. (Samoa's catch per unit effort actually declined in the latter half of 1999, although this might have been a result of environmental or other factors.)

The question therefore arises as to whether Samoan long-liners should return some portion of the rent to the wider community and, if so, by what mechanism. Clearly, a portion of the rent should be returned to the Samoan people. As common-property owners of the resources being exploited, they are entitled to a return on that exploitation. In Alaska, the government captures some of the rent from fishing via a fisheries landing tax and distributes this share directly to all taxpayers each year, in a manner similar to the payment of dividends to corporate shareholders. This is a clear recognition of community ownership of the state's natural resources.

Given that Samoan long-line fishers pay neither income tax nor a resource rental tax, both economic efficiency and equity questions arise. In the matter of efficiency, there is a strong incentive to divert resources into the fishing industry from other sectors where taxes are paid. From an equity viewpoint it is clear that it is inequitable to tax the wages of employees in the fishing industry but not to tax those who make a profit from the resource. If the Government were, for example, to collect resource rentals and redistribute these through the provision of community services, particularly to those areas and sectors most in need, then distribution and equity problems would be addressed.

While offshore fisheries management is primarily a regional matter, Samoa should still be concerned about the sustainability of the catch in its waters. Concerns do arise throughout the South Pacific region about the sustainable level of the tuna catch, not only regionally, but also within the EEZs of individual countries. The Secretariat of the South Pacific Community (SPC) undertakes confidential tuna stock assessments in the waters of Community nations, including Samoa, and makes recommendations on the level of sustainable catch in the waters of those countries. For example, the recommendation made to Tongan fisheries officials in 1999 was that the sustainable tuna yield was approximately 4,000 tons per year in their waters (this is not a fixed upper level, but

an approximation that is kept under review as the fishery develops). Given that the catch in Samoa approached 5,000 tons in 1998–99, there should be an urgent review of the approximate sustainable harvest. As noted above, continued open entry to the industry will result in increased effort and reduced rents and is likely to also lead to the overexploitation of stocks.

Because the fishery is not capped by a total allowable catch, quotas are not relevant and, therefore, auctioning fishing rights, as happens in some fisheries, is also not relevant because the good being auctioned is difficult to define unequivocally. Consequently, the simplest approach to garnering a portion of the rent is to charge a landing fee (as is done in Alaska), perhaps called a “resource rental fee.” The first step will be to estimate the rent being earned and to implement an administrative system that allows that estimate to be updated regularly as prices and costs change and as catch per unit effort changes (if it does so). At the same time, the approximate sustainable harvest level should be agreed upon with SPC and used to guide the management of the fishery. The Forum Fisheries Agency may be able to provide assistance in establishing the rent and in developing a system to review the rent on a regular basis. Fishers would then pay the fee on each kilogram of fish they land. The dictates of equity might also require that the resource rental fee be arranged on a progressive scale, similar to income tax scales. Consequently, small (mainly local) fishers might pay a lower fee per kilogram, while the operators of larger vessels would pay a higher fee per kilogram. The relevant cutoff point(s) between “small” and “large” would need to be calculated, as would the different fee rates to apply. In this context, determination of size should not be based on vessel size, but on the total catch landed each year (e.g., fishers might enter a higher fee bracket once they land more than 100 tons of fish for export). Where licensing is based on boat length, there are incentives to build wider boats with length just short of the cutoff. Licensing based on onboard storage capacity on a sliding scale would be preferable.

Such a system would require careful planning, and would also need to be supported by appropriate policing to prevent, for example, the transfer of fish at sea. A requirement to install vessel monitoring systems (VMS)—run by the Forum Fisheries Agency—on all vessels operating outside 50 nautical miles would substantially assist monitoring and policing. VMS equipment is located in the Police Department in Samoa, but there is no requirement that VMS be fitted to commercial fishing vessels. There has been resistance to the use of VMS in Samoa, but to properly manage the fishery and prevent activities such as transferring

fish at sea, it is recommended that the government require the installation and use of VMS in the long-line fishery. A side benefit of VMS is that it supports safety at sea, as vessels in distress are easily located.

When new fisheries management systems, such as that proposed above, are introduced, existing industry participants will usually argue for a “grandfathering” clause. Normally, the argument put forward is that those who are active in the industry at the time of the change should not be subject to the new rules, but that only new entrants should be required to adhere to them. The approach suggested above militates against such an argument. Nonetheless, and no matter what arguments are advanced, the Government should strenuously resist any suggestions for the grandfathering of fishing rights.

One associated issue is the ability of smaller vessels to survive in the fishery. At present, the alias operate mostly within 50 miles of Apia and Savai'i, while vessels of more than 15 meters in length are required to fish more than 50 nautical miles from land. Such a system is a pragmatic way of catering for smaller operators and should be continued (similar systems are in place in Palau and Kiribati; a similar approach is planned in Tonga). In conjunction with a progressive resource rental fee, this will retain the opportunity for smaller operators to continue in the industry. It also pays due regard to the safety issues that are critical in relation to the operation of small vessels in the open ocean. Consideration might, however, be given to whether such a system should continue to be based on vessel size or on some other basis. For example, a vessel of 14.9 meters would, under existing rules, be allowed inside 50 miles, yet such a vessel might be capable of going to sea for several days and might incorporate sophisticated technology. This issue is taken up again in the section below in discussion of vessel registration and licensing of fishing.

The remaining issue is that of income tax, which fishers, as noted above, do not pay because they are defined as primary producers. There are two options in respect of income tax. The first is to simply apply it under the normal guidelines for the taxing of profits. The second is to “build it into” the resource rental fee, thereby implementing a much simpler approach to recovering some portion of the economic rent. This approach also accords with economic thinking that the taxing of natural resource users should be based on resource throughput (catch), rather than on inputs, labor, or profits.

Registration and Licensing

Vessel registration, previously the responsibility of the Fisheries Division, was transferred to the Ministry of Transport (MOT) at the beginning of 1999. MOT applies safety regulations and also requires that skippers and crew be certified for safety. For registration, vessel owners are required to present safety and seaworthiness certificates and pay a fee of SAT\$200 for vessels less than 15 meters in length and SAT\$5,000 for vessels of more than 15 meters. Vessel registration is a “one-off” requirement, rather than an annual fee. While vessel registration is compulsory, there is little or no policing to ensure that all vessels are adhering to the registration and associated safety and other operating requirements.

An annual licensing fee for fishing is also required and, again, the fees are SAT\$5,000 for vessels of more than 15 meters and SAT\$200 for those below this size. It is, however, anomalous that both the registration and licensing fees increase in such a large step between vessels less than or more than 15 meters long. Apart from issues of equity, this provides a strong incentive for anyone building a new vessel to construct it just short of the 15-meter limit. Registration fees should be tied to the costs of inspection and to policing, rather than to the size of the vessel. If tied to vessel size, then such fees should be on a per-meter or weight basis, rather than a flat basis. The fees for fishing licenses should also be based not on vessel length but on the basis of either weight-per-meter or on-board storage capacity, either of which better reflects the potential economic rent appropriated by the operators of individual vessels. The approach recommended is to base licensing on storage capacity, as this relates closely to matters such as how long a vessel can stay at sea.

Zoning, as previously discussed, should also be based on fish storage capacity, rather than the arbitrary 15-meter vessel size cut-off: vessels with a certain storage capacity, reflecting an ability to fish only for one day at a time, should be allowed to fish within the 50-mile zone; vessels with greater storage capacity—and hence an ability to stay out for more than one day—would be required to fish outside the 50-mile zone.

It is recommended that, in conjunction with introducing a resource rental fee, both registration and licensing fees should be reviewed. As noted above, registration is one-off, although regular follow-up inspections will continue to be required. The costs of registration should cover the costs of administration and not discriminate so overtly against larger vessels. Licensing fees should also be reviewed: it is recommended that

licensing be treated as a way of recording which vessels are involved in the fishery, with fees based on on-board fish storage capacity.

Finally, the approach to annual licensing should also be reviewed. This problem is also related to the urgent need to apply the SPC-recommended sustainable catch level. If an approximate upper level on catches is imposed, the number of fishers allowed into the industry will necessarily be limited. Consequently, licenses will confer important property rights on license holders, again a reason that some portion of the economic rent should be returned to the community via a resource rental fee. However, licenses should be afforded improved tenure by extending them to a minimum of five years. Shorter periods of tenure militate against appropriate investment in the industry by fishers, because of the uncertainty associated with annual licenses. Five-year licenses should also be fully transferable and be subject to a renewal application at the end of the five-year period.

Other Issues

Two other issues of importance are the application of HACCP by importers of fish harvested in Samoan waters, and the refund of VAGST. Discussions with the industry showed that exporters are very aware of HACCP (quality assurance) requirements and most have taken appropriate steps to ensure the quality of their product. Most export buyers in Apia test fish before purchase for temperature, and also undertake sensory tests. The cannery operators in American Samoa also test the fish prior to accepting shipments, with laboratory testing for bacteria added to the tests conducted initially in Apia. Quality and the ability to meet HACCP requirements are not of major concern in Samoa; exporters who are unable, or unwilling, to meet the requirements will soon find themselves out of business. The market will serve to ensure that quality assurance is treated seriously by Samoan exporters.

As to VAGST credits, exporters complain that refunds can take several months and that the amounts of VAGST credits owing can, in some cases, exceed SAT\$100,000. This is an administrative matter, but one of considerable importance to those involved. Because fishery operators are zero-rated for VAGST, the money in credit belongs to them, and large amounts outstanding are important to the operating capital position of those operators. This is an issue that the Government needs to resolve by ensuring that effective administrative systems are in place for the prompt refund of VAGST.

Implementing Changes as a Package

The several issues raised above should not be considered in isolation from one another. Rather, there are important linkages among them and, therefore, they should be considered as a package. For example, the move to introduce a resource rental fee should occur when the Government has provided improved wharf and berthing facilities. The outcome should be an improved, more efficient commercial fishery that is well supported by appropriate infrastructure and that returns an appropriate portion of economic rent to the wider community. In summary, the elements of the package are as follows:

- A wharf, berthing marina, fuel pumping equipment, and associated facilities should be established, with operation on a user-pays basis;
- The infrastructure, while it remains in government ownership, should be managed under contract by an experienced private-sector operator;
- The total sustainable catch, as approximated by SPC, should be considered as a matter of urgency and used as guide to the number of licenses allocated for the fishery;
- Fishers would pay a resource rental fee, based on the quantity of fish landed, with consideration given to placing fees on a progressive scale;
- Consideration should be given to ensuring that operators of small vessels are protected by zoning the offshore area, with only smaller vessels allowed to operate inside a certain limit (50 nautical miles);
- Fees collected from fishers should be used, in part, to support search and rescue and other critical services for the sector;
- Training and skills improvement for local, small operators in fishing techniques, fish handling, quality retention, and safety at sea should be provided;
- The present systems of vessel registration and licensing to fish should be revised and should be based on on-board fish storage capacity;
- Fishers should be afforded greater security by extending the tenure of licenses for at least five years;
- MOT should be afforded the capacity to monitor registration and undertake annual vessel checks for seaworthiness and safety; and
- Matters such as the delays in refunding VAGST credits should be attended to as a matter of urgency.

Concluding Remarks—Fisheries

Fisheries, like agriculture, remain important to Samoa and the Samoan people for both subsistence and the earning of cash income. The sector has, in recent years, been typified by a growing gap between the inshore and offshore fisheries, with the latter targeting tuna. Concerns over declining inshore fish resources remain, but village extension projects are supporting efforts at self-management of customary fishing areas. Market failure and externality arguments support continued government involvement.

A range of issues relating to offshore fisheries was raised above, with the issue of economic rent and its appropriation paramount among them. A package of measures to improve the efficiency of the industry and to ensure that the wider community benefits from its growth is recommended.

The fisheries sector is set to become Samoa's largest export industry. It will make a significant contribution to the social and economic development of the nation if the Government focuses its agencies on servicing and regulatory roles and on ensuring that the needed infrastructure is in place to support the efficient development of the industry.