

# 6

## Natural Resource Development

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### Agriculture

The Government of Tuvalu's (the Government) main role in agriculture is to maintain and, where feasible, increase productivity in the subsistence subsector which accounts for 6.2% of GDP compared with a market production contribution of 1.7% (Table 6.1).

**Table 6.1: Contributions to GDP of Crops and Livestock, 1998**  
(1988 prices)

	Market Production		Nonmarket Production	
	\$'000	% of GDP	\$'000	% of GDP
Crops	17.7	0.3	548.4	3.5
Livestock	82.0	1.4	430.3	2.7

Source: CSD 1999.

Maintaining productivity depends on excluding pests and diseases, while increased productivity is achieved by extending improved methods of cultivation and testing and multiplying improved plant and animal varieties. The Department of Agriculture focuses its efforts on the outer islands, where most people rely on subsistence production. In Funafuti the population is more often in wage employment, and purchased food-stuffs are consumed at a rate two and a half times greater than on the outer islands (CSD 1998), although coconut production is common and indigenous landowners still cultivate giant swamp taro (pulaka).

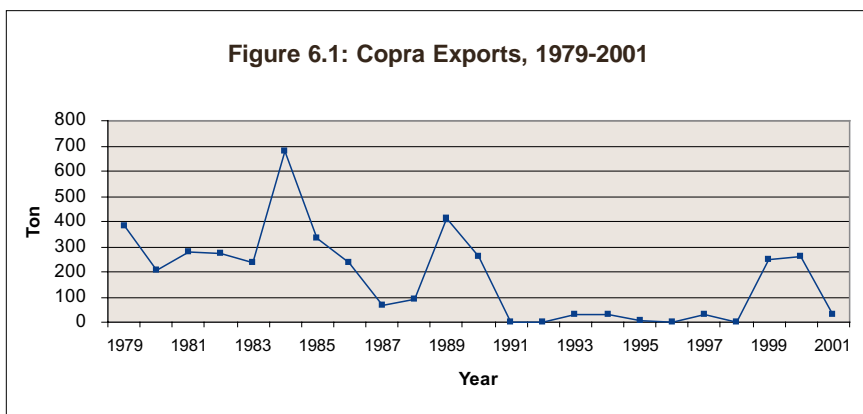
Neighboring island countries harbor damaging pests and diseases that easily could be introduced to Tuvalu in imported produce. For example, Kiribati harbors the taro beetle and Samoa has experienced the devastating taro blight. The Department of Agriculture conducts awareness programs on the quarantine and mandatory declaration of imported agricultural produce. The Secretariat of the Pacific Community's (SPC) Pacific Plant Protection Service provides technical assistance and training support to Tuvalu.

A full-time agricultural extension officer is based on each of Tuvalu's outer islands to disseminate information on the advantages of improved varieties that are multiplied at the agricultural station on Vaitupu. The stations also conserve traditional plant varieties such as breadfruit and pandanus for their potentially valuable characteristics; and promote livestock production through pig and poultry breeding programs and by selling improved breeding stock to the other islands.

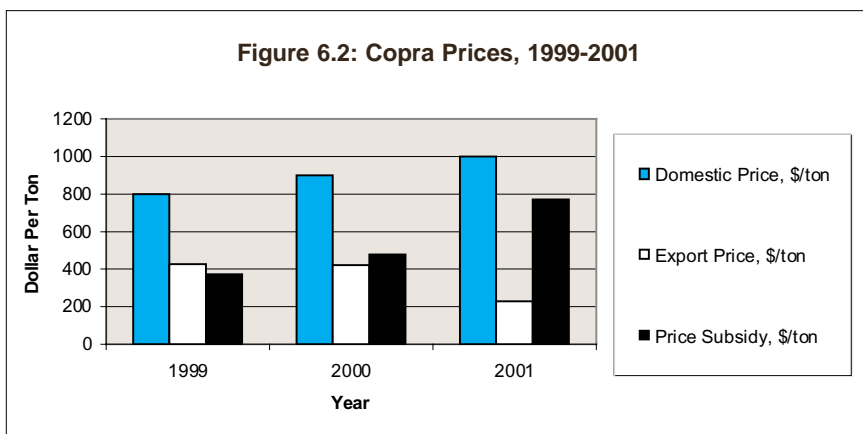
In the outer islands, the cash economy is limited. Nevertheless, food surpluses are marketed through island cooperative stores, while taro, coconuts, and bananas are transported to Funafuti. Further development of the tiny commercial agriculture sector is constrained by limited land availability, poor soil quality, and infrequent interisland transport.

Copra is easily grown, stored, and transported, and continues as Tuvalu's principal agricultural product. About 70%, or 2,100 hectares of the cultivatable land, mainly on the outer islands, is estimated to be under coconuts (ADB 1998). The Department of Agriculture's role has been to increase copra production for export through research, for example, on dwarfs and hybrids, and through development and extension. However, world prices for copra have fluctuated and resulted in variable production, trending downwards (Figure 6.1). In the early 1990s, copra production was virtually abandoned after cyclone damage to trees and island infrastructure; but copra subsidies were introduced, and production picked up in 1999 and 2000.

Subsidies have had the twin objectives of maintaining production and effecting an income transfer to the outer islands. From 1999 to 2001,



Source: Tuvalu Coconut Traders' Cooperative.



Source: Tuvalu Coconut Traders' Cooperative.

the copra price subsidy rose rapidly from just under \$400 a ton to almost \$800 a ton (Figure 6.2). Despite the high subsidy, production fell to a historic low in 2001.

The large disparity between free on board (FOB) export prices obtained by the Tuvalu Coconut Traders' Cooperative (TCTC) and the prices paid to the grower are reflected in TCTC's total income broken into trading income, Stabex transfers, and government subsidies (Table 6.2).

Table 6.2: Financial Summary TCTC, 1990-2000  
\$(000)

Year	Trading Income	Stabex Transfers	Government Subsidy	Total Income	Expenses	Net Revenue
1990	101	39		140	246	(106)
1991	27		144	171	131	40
1992	6			6	29	(23)
1993	2	44		46	102	(56)
1994	139,909	25,570		165,479	160,012	5,467
1995	60,277			60,277	97,159	(36,882)
1996	18,966	16,574		35,540	40,144	(4,604)
1997	35,980		72,000	107,980	64,406	43,574
1998	14,823			14,823	23,928	(9,105)
1999	39,944		135,660	175,604	168,318	7,286
2000	117,526		367,050	484,576	453,214	31,362

Sources: ADB 1998; Tuvalu Coconut Traders' Cooperative.

Note: 2000 is provisional.

Injecting outside funds has been necessary to maintain TCTC's financial viability although trading income has been exceeded by expenditure in each of the last 11 years. In 1999 and 2000, the disparity between income and expenses was exacerbated by the high domestic price paid for copra relative to export prices received (Appendix 3, Table A6.1).

Between 1997 and 2000, the government subsidy paid a total of \$575,000 to copra growers, and in 2000 subsidies reached an annual level of \$367,050. The subsidy is failing to promote a volume of production sufficient to justify TCTC infrastructure and administration, while the income transfer to the islands is uneven. The subsidy granted is based on the amount of copra cut, so that Nanumaga and Nanumea together have received 37% of the subsidy, while Nui and Nukufetau together have received only 5%. Moreover, agricultural activities contribute only about 1% of household cash income in outer islands (CSD 1998).

While the future of copra export and TCTC is doubtful, coconuts are still important for drinking, food, and livestock feed. In the early

1980s a coconut oil extraction and soap-making factory was established at Vaimoana Cooperative, Vaitupu. Import duties on oil and soap were raised to protect this domestic production. Despite the failure of this venture, there is still interest in oil extraction for consumption. It is unlikely, however, that the economics of substituting imported vegetable oils for the outer islands with in-situ coconut oil has changed since the 1980s. In addition, anecdotal evidence suggests that people prefer the imported product.

Opportunities for developing agriculture and forestry are constrained by limited land area and poor soils.

## The Development Bank of Tuvalu

The role of credit in private sector development in agriculture and in other small business is important, and the Government has attempted to boost credit provision through its Development Bank of Tuvalu (DBT). However, in 1998, DBT's board stopped new lending because of mismanagement and poor performance, as reflected in the volume of nonperforming assets. Policy then focused on recovering loans. Lending was confined to approved existing clients and was made possible by injecting government funds: \$250,000 in 1998, \$295,000 in 1999, and \$81,000 in 2000 (Table 6.3). The more aggressive loan recovery policies include court actions by DBT, with the Attorney General's Department helping to recover nonperforming loans from the personal guarantors of defaulting borrowers. However, the effectiveness of court action is limited by lower courts being confined to dealing with outstanding loans of less than \$5,000. Larger cases are forced to the High Court.

DBT's provision for bad debts or unrecoverable loans in 2000 and 2001 was not available, but was \$950,000 at the end of 1999. Bad debts therefore probably represent about 50% of outstanding loans. The interest and principal foregone from almost \$1 million of bad debts is considerable. It is income that could have been lent to new clients and may have made government contributions to DBT unnecessary.

**Table 6.3: Development Bank of Tuvalu: New Lending and Outstanding Loans, 1997-2001**

Year	New Lending (\$)	Outstanding Loans at End of Year (\$)
1997	150,269	1,338,025
1998	281,420	1,377,878
1999	5,000	1,596,272
2000	—	1,480,159
2001	321,944	1,740,490

Source: Development Bank of Tuvalu.

In 2000, better management of nonperforming loans generated some liquidity, and in 2001 almost \$300,000 of new lending was possible to 50 new clients, in addition to \$40,000 of lending to existing approved clients. To avoid the high levels of default that previously characterized DBT's portfolio, new lending proposals are scrutinized under strict criteria. Approvals by the general manager are limited to loans of less than \$5000, the DBT board approving larger loans.

Small businesses that have benefited from loans in 2001 include book retailing, white goods importing, audio-visual production, commercial photography, and small-scale fishing. Vehicle loans are limited to trucks and taxis, the latter being limited to around three a year to maintain the taxi industry's commercial viability.

There are three portfolios with separate lending policies:

- (i) one is DBT's, which accounts for about \$344,000 of outstanding loans;
- (ii) one is associated with a European Investment Bank (EIB) loan, which accounts for \$344,000; and
- (iii) one is associated with New Zealand Government grants, of which \$34,000 is outstanding.

While DBT and EIB portfolios include small business generally, the latter precludes housing. The New Zealand portfolio favors small loans to the outer islands.

Although external assistance exists to help revive DBT as a viable contributor to private sector development, the prospects are gloomy. In 1998, an external assessment concluded that DBT should merge with NBT. This recommendation was rejected by an incoming administration, but should now be revisited, to create an appropriate development banking and microfinance division within NBT.

## Marine Resources

Tuvalu's fish stock is its most valuable resource and is renewable if managed correctly. There are two main ways in which the resource is exploited. The first is by Tuvaluans fishing mainly inshore waters for subsistence or sale locally. The second is by allowing other nations' fishing fleets to exploit the oceanic fish stocks in the country's 900,000 square kilometre (km<sup>2</sup>) Exclusive Economic Zone (EEZ). The Government should control the exploitation and ensure that benefits from the resource are maximized.

**Subsistence fishing** involves many outer islanders. Nonmarket fish production contributed 5.5% to GDP in 1998, compared with 0.2% from market production of fish (CSD 1999).

The introduction of fishing nets and outboard motors has increased fishing pressure on lagoons, and made maintaining lagoon fish stocks an important issue. Establishing closed areas in lagoons or regulating fishing methods would allow island communities to ensure the health of local fish stocks. The Government, through the Fisheries Department, advises communities on conservation strategies. Conserving lagoon stocks is dealt with in more detail below.

**The National Fishing Corporation Of Tuvalu** (NAFICOT), the Government's commercial fisheries arm, makes fresh fish available to

Funafutians through two retail outlets it leases. The retail fish sales inject cash into the economies of the outer islands and Funafuti. Fish prices NAFICOT pays vary with species but average \$2 per kilogram (kg). Retail prices at NAFICOT outlets are about \$0.80 per kg more than buying prices. The fresh fish retail price competes well with retail prices of canned fish at \$4.80 per kg, and corned beef at \$9-12 per kg. On Funafuti purchasing fresh fish is practical with 75% of households with refrigerators (Nimmo-Bell 2001). Such purchases comprise about 10% of household food expenditure, although household expenditure on meat is more than twice that on fish (CSD 1998).

NAFICOT has received donor support, predominantly from the Japanese Overseas Fishery Corporation Foundation, to operate three nine-meter fishing vessels and to refurbish and maintain cold storage, a blast freezer, and ice-making equipment. It also operates a boat motor repair workshop and sells ice and fishing gear. Ventures such as exporting fish to the Marshall Islands in the mid-1990s were undertaken, but developing commercial operations is constrained by the lack of freight capacity in Air Fiji aircraft that operate the Funafuti-Suva service.

From the early 1980s to the mid-1990s, NAFICOT operated a longliner vessel, the *Tautai*, in the waters of Tuvalu, the Fiji Islands, and the Solomon Islands. The catch was sold to canneries at Levuka in Fiji and Noro in the Solomons. After years of unprofitable operation, the ship was anchored in Funafuti lagoon and eventually sank in 1997. Also in the 1980s attempts to backload freezer containers with fish cargo for Australia proved commercially unsuccessful because of erratic production and irregular shipping.

Leasing NAFICOT facilities to private operators and selling its fishing vessels has been recommended (ADB 1998). This recommendation is reiterated as private individuals can fish, repair motors, and sell gear. NAFICOT should continue supporting private fishers with ice making, cold storage, and marketing services.

Funafuti Lagoon is NAFICOT's and Funafuti's main source of fish. Maintaining the Lagoon's productivity may be helped by excluding fishing from the 33 km<sup>2</sup> Funafuti Conservation Area, which includes the

islands and reefs on the lagoon's western side. If public awareness, surveillance, and prosecutions are sufficient to exclude fishing in the conservation area, it will act as a breeding sanctuary, particularly for the targeted commercial species. Stocks in the conserved area will build up and eventually spill over into adjacent fished areas. Area closures are a traditional method of managing inshore fish stocks, common throughout the Pacific, and there seems to be strong support among private fishers and in the Fisheries Department. Traditional, self-regulated methods of conserving fish stocks are practised on all islands, usually by bans on catching specific species at certain times of the year.

The increase in catch in Funafuti Lagoon in 2000 cannot be attributed to its closure in mid-1997 (Table 6.4). Fish production in 2001 was the lowest recorded in 5 years and, as Kaly (1999) has emphasized, it will take years for the effects of conservation to become apparent even within the conservation area. Future data from continually monitoring catches is likely to justify the closure.

Increased fish production is not the only potential benefit from the Funafuti Conservation Area. A modest ecotourism industry, based on the conservation values of reefs and islands, is a possibility discussed below. The local councils (kaupule) of Nukufetau, Nukulaelae, and Nui are interested in developing marine conservation areas on their islands. Expert advice on the size and location of the reserves and their administration would probably be welcomed.

**Table 6.4: Fish Production, Funafuti Lagoon, 1997-2001**  
(kg)

Year	Weight
1997	44723
1998	44858
1999	44474
2000	58168
2001	44262

Source: NAFICOT.

**Community fisheries centers** (CFCs) have been established with donor assistance. They are equipped with fish processing, cold storage, and sun drying facilities on each outer island. Much of the centers' production is purchased and consumed by islanders themselves, but 7.1 tons of fresh fish and 1 ton of dried fish were supplied to NAFICOT in Funafuti in 2001 via the fisheries vessel *Manau*. CFC managers appointed by the Fisheries Department draw salaries and between three and five other staff are employed during periods of fish supply.

All the centers operated at loss in 2001 (Table 6.5). The small margin between fish purchases and fish sales is inadequate to cover the costs of operations, of which wages is the largest component. In five of the seven centers, wage costs exceeded fish sales. For CFCs to operate, the Government makes losses: \$79,443 in 2001. There are also substantial hidden costs to consider when assessing CFC performance. For example, the cost of the *Manau* would be considerable, and the salary costs of fisheries extension and development officers engaged in overseeing the centers from Funafuti should also be considered.

CFCs cannot be justified as meeting fish demand on Funafuti when Funafuti Lagoon generates between 40 and 50 tons of fish annually through NAFICOT (Table 6.4), or about six times the centers' combined contribution to NAFICOT. Additionally, fish are sold directly to consumers. Presently the *Manau* collects fish from the centers for NAFICOT, making around four to eight calls a year to each island (Nimmo-Bell 2001). A new interisland vessel to be commissioned in 2002 will have a fish storage capacity of 40 tons. However, it is unlikely that more frequent visits by this vessel will induce very much higher fish production by the islands, because surpluses can already be stored at the centers to await collection. It is also doubtful whether the centers can be justified as generating fish supplies on the islands. The centers' cold storage facilities certainly make fish accessible to islanders all year round, but about half of all island households now have refrigerators (Nimmo-Bell 2001). In any case, it is reasonable to assume that selling and storing fish would be taken up by private retailers if the

centers closed. Fishers would be paid by retailers instead of by the centers and the price of fish would be more likely to reflect supply and demand. Higher prices would stimulate production. Moreover, the argument that the subsidy to CFCs is necessary to transfer income to the outer islands is weak, because a large proportion of the subsidy pays a few individuals' wages.

**Table 6.5: The Financial Performance of Community Fisheries Centers, 2001**  
(\$)

Item	Nanumea	Nanumaga	Niutao	Nukulaelae	Vaitupu	Nui	Nukufetau
<b>Income</b>							
Fish sales	7,234	7,046	4,886	16,092	42,701	3,955	10,188
Other	6,704	326	689	439	1,512	65	1,129
Total income	13,938	7,372	5,575	16,531	44,213	4,020	11,317
<b>Expenditure</b>							
Fish purchases	7,666	7,844	6,106	10,091	29,313	6,275	9,263
Wages	13,555	8,574	9,558	9,381	14,156	8,754	11,144
Total expenditure	29,941	21,169	19,832	25,150	50,743	18,744	16,830
Operating profit (loss)	(16,003)	(13,797)	(14,257)	(8,619)	(6,530)	(14,724)	(5,513)

Source: Fisheries Department.

To end government subsidies that do not appear to perform a compelling social function, it is recommended that the councils take over the CFCs or they be leased to private operators. However, it is clear that achieving profitability in the centers by reducing wage costs and increasing margins will be difficult.

**Tuna fishing** offers revenue to Tuvalu through its jurisdiction over its EEZ conferred by the ratification of the United Nations Convention of the Law of the Sea of 1994. The Government licenses Distant Water Fishing Nations' (DWFN) tuna fishing vessels that operate within

its EEZ and, as a condition of licences, extracts resource rent as an access fee or as a royalty based on the value of foreign fishing fleets' catches.

The Western Central Pacific Ocean (WCPO) accounts for almost half of the purse seine fleets' global catch, most of which is canned in Asia or, for the catch of the United States fleet, at Pago Pago, American Samoa. Longliners take a smaller but equally valuable proportion of the tuna catch from WCPO for the fresh or frozen markets of Japan, Korea, Hawaii, and the United States. With its EEZ situated in WCPO and blessed with substantial tuna stocks, Tuvalu benefits considerably from licensing distant water fleets and neighboring countries' fleets.

Traditionally, each Pacific island government with substantial tuna stocks negotiates a 1-year fishing agreement directly with DWFN fleets. For Tuvalu the Government charges a licence fee per vessel. The arrangement varies slightly between Korea's and Japan's fleets, but for purse seine vessels it may be US\$10,000 per trip, paid in advance. The licence fee is later deducted from the royalty payments due from the distant water fleets. The royalty is based on the weight of the previous year's tuna catch by that fleet or vessel and on canning tuna prices advised by the Forum Fisheries Agency in Honiara.

This arrangement is varied for the US purse seine fleet, which operates under the only multilateral agreement in force in the Pacific. An agreed percentage of the value of the US fleet catch is apportioned to Pacific island countries by weight and value of catch. Smaller islands or those of higher latitudes that may not benefit from actual visits by the US fleet also receive supplementary financial benefits from the agreement. In 2001 the Government licensed 75 purse seine vessels, of which 30 were under the US treaty, and 83 were longliners. Tuvalu received \$9.7 million in licence fees under the US treaty in 2001, or 82% of \$11.8 million in total license fees received.

The formula for the overall licence fee (initial fee plus royalty) stipulated by the Government is 5% of the actual US dollar value of the catch, or a minimum initial fee of US\$10,000 if 5% of the value of the catch is less than this amount. The rate of 5% reflects the rate charged

by other countries in the region. Except for US and Japanese purse seine fleets, the value of catch of distant water vessels in 2001 was not greater than the initial payment of US\$10,000 per entry to Tuvalu's EEZ. The initial payment thus stood as the license fee.

The value of licensing revenue has increased in absolute and relative terms, reaching a historic high in 2001 (Table 6.6). The rise reflects a more favourable US treaty, together with depreciation of the Australian dollar against the US dollar, in which all licence fees are paid. World tuna prices recently fell to historically low levels at which it was uneconomical for the US fleet to operate. There is no guarantee that tuna fishing by the US fleet will remain profitable, even with the large US government subsidy that it enjoys (and which may be removed under World Trade Organization rules). This suggests the Government should conservatively assess the sustainability of recent licence fee levels from that source.

**Table 6.6: Revenue from Licensing Distant Water Fishing Nations, 1990-2001**  
(\$'000)

Year	Licensing Revenue	Government Recurrent Revenue	Licenses as % of Revenue
1990	438.6	5,300.5	8.3
1991	482.3	5,454.7	8.8
1992	428.8	8,620.2	5.0
1993	3,460.6	8,002.7	43.0
1994	1,038.3	8,617.9	12.0
1995	2,141.4	8,318.8	12.0
1996	921.5	9,190.0	10.0
1997	3,567.6	15,528.6	23.0
1998	6,516.0	27,351.5	23.8
1999	9,690.9	22,245.8	43.6
2000	9,480.1	47,949.3	19.8
2001	11,795.4	23,440.1	50.3

Sources: ADB 1998; Treasury Division; Fisheries Department.

Where major benefits from tuna stocks are in licence fees from distant water fleets, there is bound to be interest in how the Government might help establish domestic tuna fishing enterprises to earn foreign exchange and create employment. The Government has tested involvement in pole and line and purse seine fishing but found the economics unfavourable because of the large capital investment for such ventures, their high risk, and the difficulty of managing them in Tuvalu's remoteness.

The Government is continuing to explore how to foster domestic development based on tuna and advances some options in its *Draft National Tuna Development and Management Plan* (Government of Tuvalu, 2001). The options include

- (i) improving infrastructure;
- (ii) encouraging the use of new fishing methods;
- (iii) developing export markets;
- (iv) enhancing the skills of Tuvaluans;
- (v) improving the domestic development benefits from foreign vessels; and
- (vi) other methods.

For options (i) and (ii) the need for improved wharfage, anchorage, and backup facilities for small private vessels depends on developing an export market, which in turn is subject to transport constraints. The success of new fishing methods (longlining for tuna to supply fresh fish markets is envisaged) also depends on developing transport links.

Successful chilled tuna export ventures in the Pacific require regular flights of large aircraft to Japan and other northern markets. The most successful exporter in the region has been Fiji Fish Ltd of Suva, which has had the benefit of being able to freight chilled fish on Air Pacific flights direct to Japan or via ports to the north. For Tuvalu, an airfield capable of taking at least a Boeing 737 is a precondition for

chilled exports. The common denominator is developing a tourism market large enough to warrant larger aircraft. However, this type of operation deteriorates significantly if aircraft must be chartered. Investing in infrastructure that would promote longlining or even new small-scale fishing on fish aggregating devices for export must be questioned.

The same transport constraint applies to option (iii): export market development. The Draft Plan acknowledges the need for improved air freight services, and a study is proposed of the feasibility of upgrading airstrips at Funafuti, Nukufetau, or Nanumea. However, the study should not just be on the feasibility of upgrading the airstrips, but on the economics of upgrading the airstrips together with the economics of exporting fresh fish in chartered aircraft.

Under export market development, larger scale value-added processing is suggested as a strategy. However, the economic track record of canneries in Melanesia does not encourage the economic viability of a cannery in Tuvalu. Asian competition in the canned tuna market is fierce, and even the future of the large and profitable canneries on American Samoa are uncertain. Semiprocessed tuna loins, unlike canned tuna, can enter the US duty free and may therefore be more profitable. (The PAFCO cannery in the Fiji Islands is now mainly dedicated to loining under management of Bumble Bee.) An advantage of loins is that they can be frozen and transported by sea. This option for domestic tuna development warrants a feasibility study.

Under 'other methods' there is a proposal to increase licence fees on foreign vessels by US\$1,000 per vessel to support a Domestic Development Trust Fund. Once again the Government's first priority is to establish the economic feasibility of domestic development. Only then can necessary infrastructure investment by Government, that will attract private enterprise, be justified. It is proposed to move CFCs towards financial sustainability by reducing contracted staff and seeking more community involvement. However, given the large losses sustained by CFCs and a lack of obvious social benefits, it is recommended that the centers be leased to private operators or transferred to councils.

The government subsidy would be better spent on observers and port sampling as part of a tuna management program.

**Tuna management** of the vast migratory tuna stocks in WCPO needs to be coordinated by Pacific island governments through the Forum Fisheries Agency (FFA) and SPC. FFA mainly coordinates and advises Forum member countries on exploitation and management of tuna stocks. SPC, a complementary organization, researches the sustainability of the level of catches of the principal commercial species: skipjack, big eye and yellowfin tunas, and albacore. It also assesses stocks and total allowable catches (TACs) for EEZs at the request of countries in the region.

Overlaying regional arrangements for management are the UN Fish Stocks Agreement and the Western Central Pacific Tuna Convention. The importance of the former is that it establishes a regime to control fishing on the high seas as well as in waters under national jurisdiction. The latter Convention is aimed at

- (i) achieving compatibility between management measures in the high seas and in EEZs;
- (ii) setting limits to TACs or fishing effort; and
- (iii) allocating catch or effort quotas.

A new commission will be established for tuna management, and Tuvalu aims to be an active member.

The level of tuna catches in the EEZs of all WCPO countries is of course important in determining the sustainable level of catches in a particular EEZ, and therefore the need for regional management arrangements. The SPC has nevertheless estimated that the sustainable annual yield of tuna from Tuvalu waters is about 45,000 to 50,000 tons. Total catch levels have been approaching this limit; over 45,000 tons being caught in 1999. In future it is likely that TACs for Pacific countries will be predicated for individual tuna species rather than tuna as a whole. How such limits will be organized and enforced is something for the new

Convention to ponder. Associated with such arrangements, Tuvalu will need to decide how it will allocate its limited tuna resources between competing users. The *Draft National Tuna Development and Management Plan* flags some of the allocative strategies that may be adopted.

A key issue raised in the Draft Plan is distant water vessels underreporting tuna catches. The reported tuna catch levels, along with price, determine the amount of licence fees the Government receives. The plan foreshadows introducing national observer and port sampling programs, which together would complement the FFA and SPC programs and strengthen disincentives for underreporting. These initiatives could well generate a high economic rate of return and should attract government funding.

## Tourism Development

The Government recognized the potential economic importance of tourism to the economy by endorsing the Tuvalu Tourism Development Plan of 1992 (Tourism Council of the South Pacific 1992). Subsequent to the Schuller Pearsum Review (1995) it took responsibility for tourism development by incorporating tourism in the Ministry of Tourism, Trade and Commerce. The later Dawson Report (Dawson and Brown 1997) analyzed the constraints on tourism, the principal ones being

- (i) high air fares and poor air services;
- (ii) low quality hotel accommodation and standards;
- (iii) undeveloped ecotourism operations;
- (iv) insufficient visitor information;
- (v) poor urban environmental management; and
- (vi) poorly staffed and situated Ministry offices.

The Dawson Report also detailed recommendations to overcome some of these constraints, including

- (i) revamping the hotel to make the most of its attractive situation;
- (ii) locating a tourist information office adjacent to the airport terminal;
- (iii) developing reef ecotourism; and
- (iv) strengthening and developing human resources.

Many of the constraints remain. Tuvalu does not possess any special attractions not present in other parts of the region, except that it is one of the smallest nations in the world. Tourists have no special reason to pay the costly fare to reach Funafuti on the twice-weekly Air Fiji service from Suva. On arrival, visitors are not readily informed of options and prices for activities or accommodation. Most tourists initially gravitate to the relatively expensive Government-owned Vaiaku Lagi Hotel, which has problems and potential that governments have not addressed.

Visitor numbers seem to have been severely affected by the difficulties experienced with the air link in 1999. However, total non-resident arrivals increased quite dramatically in 2000 and 2001 (Table 6.7). Large Japanese contingents boosted nontourist numbers (in transit) in 2000 and 2001, and tourist numbers from all destinations were up in 2001 (Appendix 3, Table A6.2). However, the number of actual holidaying visitors fell well short of targets set in the Dawson and Brown 1997 Report. This is not surprising given the continuation of the constraints summarized above.

While the tourism sector is small, it nevertheless can stimulate the economy. The Tuvalu visitor survey of 1994 suggested that average expenditure per visit of holidaymakers was \$409, compared with \$572 for business visitors and \$232 for those visiting friends and relatives (Schuller *tot Persum*, 1995).

Funafuti Lagoon is the natural attraction that could stimulate modest growth in tourism. The Funafuti Conservation Area became operational in June 1997 assisted by South Pacific Regional Environment

Table 6.7: Nonresident Arrivals, 1997-2001

Year	Holiday Vacation	Business Official	Friends Relatives	Transit Stopover	Other Purpose	Total
1997	164	483	218	101	72	1038
1998	213	475	192	36	90	1006
1999	83	252	159	9	26	529
2000	139	460	178	354	147	1278
2001	435	1187	529	399	263	2813

Source: CSD database.

Program (SPREP) funding. The Funafuti Town Council (Kaupule) administers the Area jointly with the traditional owners through the Conservation Coordinating Committee and conducts boat tours on request. Fishing, hunting, and the cutting or burning of trees are prohibited in the 33 km<sup>2</sup> zone. Attractions of the Area are the small islands ringed with sandy beaches and harboring abundant bird life. Snorkelling the reefs, and swimming in the clear waters are also assets.

The current rate of tourist visits to the conservation area is only about 30 a year. SPREP's (2001) *Ecotourism for the Funafuti Conservation Area* assessment recommended

- (i) purchasing a new boat for management and for tourism trips to the area (it has been purchased);
- (ii) carrying life jackets and a first aid kit on board at all times;
- (iii) establishing professional half-day tours on set days and at regular times;
- (iv) training conservation area staff and selected community members in tour guiding, first aid, safety, and small business management;
- (v) clarifying which organization (community, Conservation Coordinating Committee, or kaupule) is to manage the ecotourism operation; and

- (vi) providing information on the conservation area and tours at the airport, Vaiaku Lagi Hotel, and Tourist Office.

To this list could be added using boat patrols to ensure that the conservation area regulations are not being breached.

Developing ecotourism in the Conservation Area is contingent upon protecting and developing the area's conservation values. However, there is no indication of such protection. Kaly (1999) reported that it was likely that heavy fishing was still occurring. The boundary of the conservation area on the lagoon side needs to be marked by buoys to deter fishing and aid policing. The western or ocean boundary of the area is the second reef (tafalua). This boundary would be difficult to mark by buoys, but is apparently well recognized by local fishers.

The SPREP project that funded setting up and administering the Conservation Area ceased in 2002, and Funafuti Council is seeking further financial assistance and advice on managing and developing the Area.

## **Environmental Management**

The National Environmental Management Strategy (NEMS), endorsed by Cabinet in 1997, is the basis for the Government's environmental policy and legislative development (SPREP 1997). The main environmental risks identified in NEMS were

- (i) sea level rise as a result of climate change;
- (ii) high human population growth and densities;
- (iii) decline in traditional resource management;
- (iv) unsustainable use of natural resources; and
- (v) waste management and pollution control.

Kaly and Pratt (2000) also reviewed Tuvalu's vulnerability to environmental risk by comparing Tuvalu, Fiji Islands, Samoa, and Vanuatu

for environmental risk. They ranked Tuvalu as the most vulnerable, largely because of its low relief and small land area.

In response to the concerns raised in the above reports, the Government increased the Environment Unit's staffing within the Ministry of Natural Resources, Environment and Energy (MNREE) from two positions in 1999 to four positions in 2000. Kaly (1999) developed a detailed plan to address the major issues in NEMS by assigning the unit the tasks of

- (i) integrating environmental concerns into economic development;
- (ii) improving environmental awareness and education;
- (iii) assessing issues and taking precautionary steps related to climate change and sea level rise;
- (iv) developing a population policy of balanced development and planned urbanization;
- (v) improving waste management and pollution control;
- (vi) developing and protecting natural resources;
- (vii) monitoring and reporting on the environment; and
- (viii) ratifying international agreements.

While waste management, climate change, and environmental impact assessment are being addressed by dedicated staff, capacity building and institutional strengthening are urgently needed. Training is a vital component of this strengthening and should be in two parts: intensive in-country training, to enable priority tasks to be undertaken, and overseas training to degree level. This human resource development and staffing will be a long-term project that underpins the February 2002 creation of a new Ministry of Environment, Energy and Tourism (MEET) and increases the Environment Unit to five positions.

Waste management has direct implications for Funafuti's environment and for the population's health. Waste is often nonbiodegradable, and may be dangerous to human and ecosystem health unless

collected and disposed of systematically. Change that relies on voluntary compliance tends to be slow, while the opportunities for generating income from recycling waste are limited because of the small quantities of recyclable material generated and high freight costs. However, aluminium cans and green waste (compost) are exceptions. User-pay services for water can encourage conservation and at the same time generate income for administering supply. However, care is needed in imposing user fees for waste services as they can lead to illegal waste disposal unless backed by appropriate preventive legislation (Hunt 1998).

As population density increases on Funafuti, waste management will become even more important, but it is not just a matter of collecting waste and burying it in borrow pits or inserting more septic tanks and flush toilets. An unmanaged approach to waste disposal will lead to

- (i) pollution of lagoon waters, making them potentially hazardous to human health and fresh water lenses;
- (ii) accumulation of waste that encourages vermin and is a latent source of disease; and
- (iii) incineration of waste that itself poses a health risk.

A comprehensive, AusAID-supported Tuvalu Waste Management Project was begun in 1999 and based in MNREE. A mid-term review of the Project (AusAID 2001) identified the most serious problem for implementation as the uncertainty surrounding future institutional responsibility for waste management. The Funafuti Town Council was formerly responsible for waste management and expects it to return to its jurisdiction. Meanwhile, MEET's waste collection service that caters for half the households (250) in Funafuti, has gone ahead with establishing a dedicated waste depository at the northern end of the island. It has begun composting household green waste, and intends to implement projects including regulating pig farming and treating hospital waste.

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The Government, while accepting most of the recommendations of the mid-term review, would prefer the Project to stay within its jurisdiction. Its grounds are that

- (i) the Funafuti Town Council has inadequate financial resources to undertake the Project;
- (ii) the managing of waste now encompasses a wide range of activities beyond traditional household rubbish collection and dumping (dealing with industrial and hazardous wastes for example); and
- (iii) the Council lacks specialist advice that is readily available from the expanded Environment Unit within the Ministry.

The Waste Management Project is innovative and comprehensive and could become a model for other Pacific atolls. Its implementation and successful operation need the issue of institutional responsibility resolved.

In association with the dedication of a waste disposal site at the northern end of Funafuti, adjacent lagoon waters are being monitored for pollution. However, more extensive monitoring of the Lagoon, which is vital both economically and socially, is crucial to a comprehensive strategy to develop environmental indicators. The inventory of indicators would come under Kaly's plan, above, for pollution control. Once again, upgrading the Environment Unit must be accompanied by increased resources to enable it to tackle such priorities.