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Kiribati

Population: 93,100
Land area: 811 km²
Sea area: 3,550,000 km²

Kiribati is made up of 33 main islands in three groups: the Gilbert Group, the Phoenix Group and the Line Islands. Along with what is now Tuvalu, these islands were part of the British colonial territory Gilbert and Ellice Islands. The Gilbert, Phoenix and Line Islands groups are spread across 5,000km of the Pacific Ocean from just east of Nauru to south of Hawai'i, separated by stretches of international waters and the Exclusive Economic Zones (EEZs) of other countries. The ratio of land to water surface area in Kiribati is 1:4,377. Most of the islands are low lying, about one metre above sea level, with limited possibilities for agriculture and no topographically generated precipitation. Fresh water comes from groundwater lenses and captured rainwater. Kiribati's geography means a limited range of land-based economic activity is possible. Money from phosphate mining in the colonial period was put into a trust fund, which now produces dividends to contribute to Kiribati's revenue. Apart from that, overseas aid and distant water fisheries access make up the bulk of government revenue, with small amounts being contributed by other schemes such as the sale of passports.

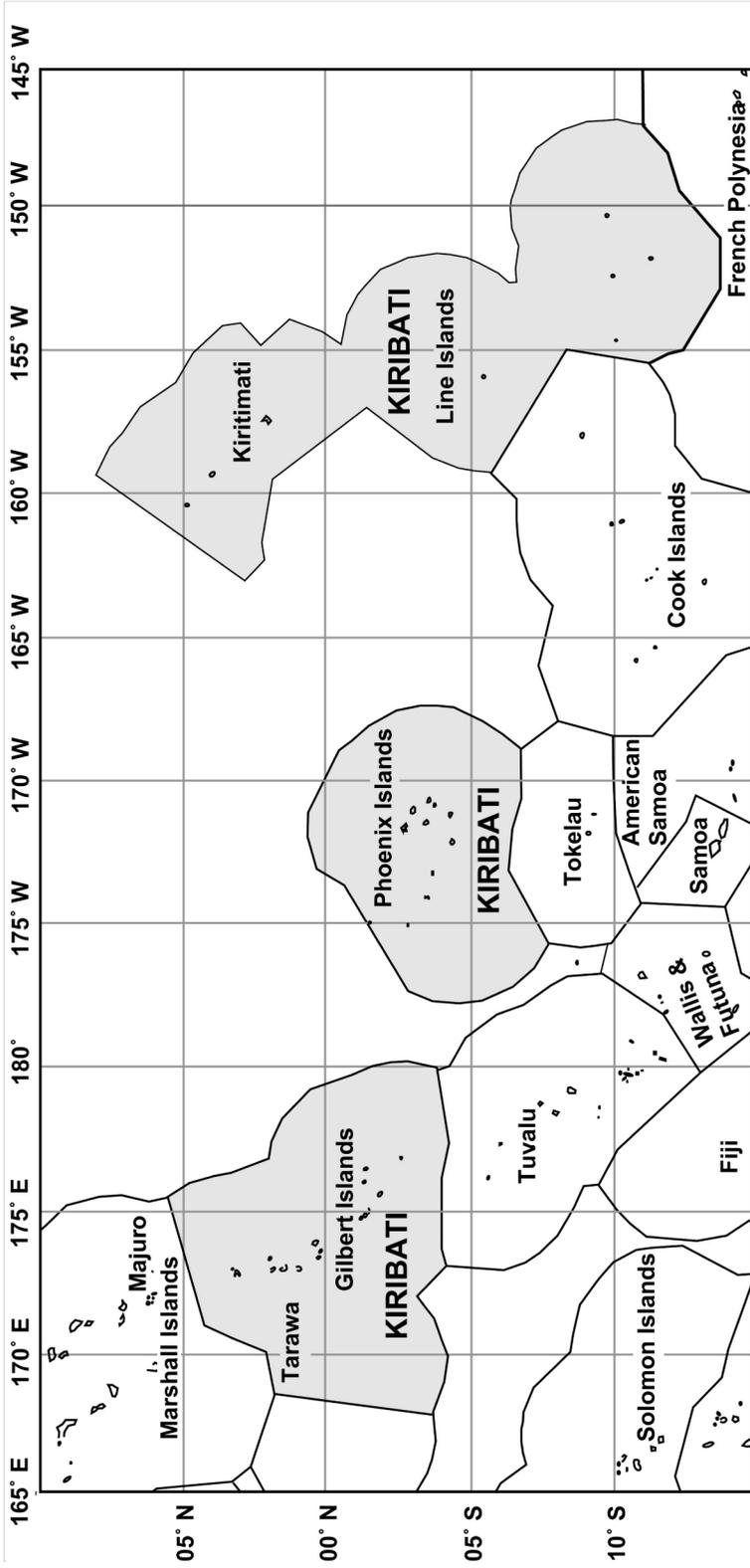
Potential of tuna fisheries

Kiribati's tuna resources are excellent, with a huge EEZ containing some of the richest skipjack fishing areas in the region. Longline fishing is good around the Line Islands in the east. The small size of Kiribati's economy, however, its distance from major trade routes and shortages of land and fresh water probably mean that shore-based processing developments will be so high cost as to be uncompetitive.

History of development

In the 1960s and early 1970s, Japanese, Taiwanese and Korean distant water longline and pole-and-line fleets operated in what is now Kiribati's EEZ. They fished year round and caught between 1,000 and 25,000 metric tonnes annually (Chapman 2003). When Kiribati

Map 5.1 Kiribati



Source: Youngmi Choi, Secretariat of the Pacific Community, Noumea, New Caledonia.

declared its EEZ in 1978, it was therefore known that the huge area of ocean had great potential for development of tuna industries. Distant water fleets remained active in Kiribati waters after independence and the total amount of access fees they paid increased to make up one-third or more of the government's annual revenue. Tuna fees replaced the money from phosphate mining, which had been the country's economic mainstay (Tables 5.1 and 5.2).

In order to establish a locally based fishery, several fishing and bait-fishing surveys were conducted during the 1970s by a range of organisations, including the Teikaraoi Fishing Company, the Secretariat of the Pacific Community (SPC), Japanese fishing companies and the Japan International Cooperation Agency (JICA). All of these surveys reported problems securing an adequate supply of bait (Rawlinson et al. 1992; Chapman 2003). Bait fish have been supplied by a long-running milkfish aquaculture pond system near the airport on Tarawa (Chapman 2003), but have not been used consistently for industrial tuna fishing.

Te Mautari, a government-owned company that began in pole-and-line fishing in 1979, had the first cold stores, blast freezer and ice machines in Kiribati. These were built in 1981 when the aim was to produce frozen tuna for export to canneries. Japanese aid funded an extension to the facility in 1984 and a further upgrade in 1989 at the same time as the building of a jetty complex. In 1988, the US government provided a new office complex for Te Mautari. The cold stores were refurbished with Japanese aid in 1992–93, then fell into disuse. Another round of Japanese aid refurbished the facilities again (1999–2003), this time reorienting them for fresh fish for the local market and export in conjunction with the Outer Islands Fisheries Program (Chapman 2003).

Table 5.1 **Kiribati: indicators of domestic development, 2001**

	Locally based vessels active	Cannery/ loining facilities	Sashimi packing and other value-adding facilities	Kiribati nationals jobs on vessels	Kiribati nationals jobs on shore	Frozen tuna exports (mt)	Fresh tuna exports (mt)	Processed exports (mt)
Central Pacific producers	1 LL	0	1	15	40	0	-	0
Fisheries Division	1 LL	0	0	4	-	0	-	0
Kao	1 PS	0	0	0	-	0	-	0
Teikabuti	-	0	1	0	8	0	-	0.6 (jerky)
Total	2 LL 1 PS	0	2	19	48	0	-	0.6 (jerky)

Notes: LL: longline; PS: purse-seine

Source: Gillett, R., 2003. *Domestic tuna industry development in the Pacific islands. The current situation and considerations for future development assistance*, FFA Report 03/01, Pacific Islands Forum Fisheries Agency, Honiara, Solomon Islands:176-77.

Table 5.2 Kiribati: distant water fleets (2005) and catches (2004)

Flag country	Purse-seine vessels	Longline vessels	Purse-seine catch (mt)	Longline catch (mt)
China	6	0	0	0
Spain	4	5	625	-
Federated States of Micronesia	1	0	689	-
Japan	34	7	4,169	685
Korea	26	121	750	5,029
New Zealand	1	0	4,869	-
Philippines	1	0	0	-
Taiwan	18	27	17,394	559
United States of America	2	0	19,299	-
Vanuatu	6	2	-	-
Totals	99	162	47,795	6,273

Source: Riinga, T., 2005. Kiribati fisheries report, First Meeting of the Scientific Committee of the Western and Central Pacific Fisheries Commission, Noumea, New Caledonia.

In 2001, a Cabinet decision consolidated the three government-owned fisheries companies—Te Mautari, Kiritimati Marine Exports Limited (KMEL) and the Outer Islands Fisheries Project (OIFP)—into Central Pacific Producers Limited (CPP). Te Mautari's office, jetty facilities and cold store became CPP's main base. When CPP started, the company took on all the staff from the previous companies, totalling 104, including fishers from Te Mautari, which by then had no functioning fishing vessels (CPP c.2003). In the next few years these fishers were relocated when CPP's agency business found them jobs on distant water fleets (Onorio, pers. comm.). Te Mautari's carrier vessel, the *Moamoa*, had been chartered to foreign fleets to use as a mothership to take their fish to canneries at Pago Pago and Levuka. CPP decided this was not a good use of the vessel so brought it back to Tarawa, where it was used mainly for carrying reefer and dry cargo and fuel between Tarawa, Majuro and Kiritimati. There was a shortage of cargo freight between the islands so this was quite a lucrative business for CPP.

Pole-and-line

The government-owned Te Mautari Limited started off with two pole-and-line vessels, one donated in 1979 by the United Kingdom (the *Nei Manganibuka*) and one by Japan in 1980 (the *Nei Arintetongo*). In 1983, Te Mautari acquired two new pole-and-line vessels, the *Nei Kaneati* and the *Nei Tiaroa*. In 1987, it was given two more vessels built in Fiji, funded by the European Economic Commission. By 1988, one of the first two vessels was decommissioned due to increasing maintenance costs as the vessel aged. The second of the first two vessels followed suit in 1990, bringing the fleet back to four vessels. Te Mautari's catch rates fluctuated from a low of 434mt with four vessels in 1987, to a high of 2,273mt with five vessels in 1989. Te Mautari exported frozen fish by container to Hawai'i via

Marshall Islands. In 1990, the company attempted to fish from Solomon Islands, but it lost money, leading to a suspension of operations. Fishing restarted with three vessels and continued until 1992–93. Difficulties with transporting the catch to market and storage capacity limited the company’s production rates, as did persistent maintenance problems (Chapman 2003). On top of this, prices for the main catch, skipjack, were declining, from \$1,000 per metric tonne when the company started to a low of \$600/mt in the 1990s. Te Mautari’s fleet dwindled to nothing by the early 2000s, when the remaining two vessels sank at the wharf.

Longline

One of the options investigated for Kiribati’s tuna industry development potential was the development of a small to medium-scale domestic longline fishery. A vessel that was suitable for local conditions and which could be constructed and repaired locally was developed by UN Food and Agriculture Organisation (FAO) designer Oyvind Gulbrandsen and built by FAO boat-builder Mike Savins at Betiraoi Boatbuilding in Betio, with technical assistance from the SPC, under a Japanese aid program in the late 1990s (Beverly 2004). Based roughly on an outrigger canoe style, with a platform joining the two hulls, this multipurpose vessel was trialled for longlining. It was about 13 metres long and supported a crew of up to eight. The *Tekokona* vessels cost about \$150,000 to build, so they were considered feasible in terms of price and catching capacity for small-scale fishing. Joe Stanley, an FAO consultant who had been working on the review of CPP, was investigating Samoa’s super-*alia* model as another possibility (Onorio, pers. comm.).

The Fisheries Division periodically used *Tekokona II* for trial fishing and training in longlining methods around Tarawa. Staff said that apart from continuing problems with the hydraulics for the reel, the vessel was good for fishing (Temwaang, pers. comm.). There were no established market routes to export longline product to sashimi markets, so the trials were not seriously aiming at developing an export fishery around Tarawa. The catch was distributed to staff or sold to CPP (Tioti, pers. comm.). In 2005, there was no solution to the problem of market access for Kiribati sashimi exports (Tioti, pers. comm.).

One purpose the *Tekokona II* trials were fulfilling was to give locals who thought they would like to work on distant water vessels some training. This training, in conjunction with the International Maritime Organisation (IMO) accredited Standards for the Training and Certification of Watchkeepers (STCW) safety course offered through the Maritime Training Centre, meant they could be employed by distant water vessels. The Fisheries Training Centre trained crew specifically for the Japanese fleet and had quite high educational requirements (high school graduate), so the Fisheries Division training was aimed at village fishermen who had not finished school and who might work on the Korean or Taiwanese fleets (Tioti, pers. comm.).

Though the *Tekokona II* had various structural limitations, many of these problems were fixed in the *Tekokona III* (Chapman 2003). In 2005, the *Tekokona III* was being used by CPP in Kiritimati for fishing trials and training. It was intended that the *Tekokona III* would be in commercial use for export markets by then (Beverly 2004), but the lack of reliable

airfreight—among other problems, such as a lack of trained and experienced skippers and engineers (Chapman 2003)—meant that an export-oriented commercial longline fishery had not yet taken off in Kiritimati.

Kiritimati seemed the logical place to have a tuna industry because it was relatively close to the market in Hawai'i. Unfortunately, the small population (about 3,000) and its distance from any other population centre meant it was a difficult location from which to run a longline fishery.

Ministry of Fisheries and Marine Resource Development (hereafter referred to as the Ministry of Fisheries) official David Yeeting spent six years in the 1990s based in Kiritimati working for CPP's predecessor, KMEL. During that time he saw many privately owned Hawaiian medium-scale fishing vessels come through Kiritimati and it made him wonder how Kiribati could develop the same kind of industry. He also thought Kiribati could learn from the Maldives experience in small-scale longline fishing.¹ Yeeting also wanted to learn from innovations in small-scale tuna longlining he had heard about in the Philippines. He was confident that the *Tekokona* type of vessel could work in future when the fishery was ready to expand (Yeeting, pers. comm.).

Since Kiritimati is close to Hawai'i, and is known in Hawai'i as a good place for fish, it always seemed that Kiritimati would be the natural location for fisheries exports, but the lack of freight capacity is a major inhibitor. Aloha Air was chartered by the Kiribati government for flights between Kiritimati and Honolulu during the late 1980s and 1990s. The main customer for these flights was a Japanese satellite program. The flights used a Boeing 727, a DC8 and a Boeing 727 Combi that was split between passengers and cargo. These planes were useful for exporting fish and, for several years, the government-owned KMEL was making good money sending a substantial tonnage of chilled reef fish, crayfish and occasionally tuna to Honolulu. The priorities and budget of the Japanese space program changed in the mid 1990s and the flights became less reliable. There were no flights for a while, then the route used a Lear jet, with no significant space for cargo. Eventually, the terms of the contract with Aloha were renegotiated and a 737 was used again, but under the new terms various businesspeople on Kiritimati were competing for cargo space and things went badly for KMEL. In 2002, there were plans for an Air Pacific flight from Nadi to Honolulu stopping at Kiritimati (Chapman 2003), but that route did not become established until October 2005. With the new flight, there was hope that fisheries export businesses in Kiritimati would revive.

Infrequent sea freight runs meant it was difficult and expensive to buy any supplies in Kiritimati. All sea freight had been going via Tarawa. Goods were expensive to begin with in Tarawa because of its remoteness and the lack of an economy of scale. Once goods spent another couple of weeks being shipped from Tarawa to Kiritimati, they became prohibitively expensive (Onorio, pers. comm.). CPP began using the *Moamoa* for cargo runs between Kiritimati and Tarawa to supply the Kiritimati CPP fishing base and earn income with paid cargo. Kiritimati is much closer to Hawai'i than to Tarawa, so it would make sense to have sea freight runs between Kiritimati and Honolulu. For a longline industry Kiritimati really needed a dedicated freight run, so CPP was working with the

Ministry of Communications and Transport to have a regular sea freight connection to Honolulu established (Onorio, pers. comm.).

Another reason why the Kiritimati longline operation had not started by 2005 was that the fishing system was still not fully developed. *Tekokona III* was an improvement on *Tekokona II* but the model still needed work (Onorio, pers. comm.; Beverly 2004). It was not yet clear whether the tuna resources around Kiritimati Islands were suitable. From SPC records, it seems that foreign longline vessels operate north and south of the Kiritimati area because Kiritimati itself is in a fishing 'shadow'. If this is so, CPP vessels would need to steam further south or north to fish on more productive grounds. The *Tekokona* vessels might not be large enough to make trips of that length (Onorio, pers. comm.; Beverly 2004).

Purse-seine

Kiribati has never had a locally based purse-seine fishery. Purse-seine activity by the distant water fleet expanded greatly in 1990 and has stayed high since then, reaching more than 250,000mt in 2001 (Government of Kiribati 2003). In 1994, the Kiribati government signed a joint venture with the Japanese Kao Fishing company to own a purse-seine vessel, which was flagged in Kiribati but fished in Kiribati's EEZ only occasionally (Chapman 2003). For the first four to five years, the Kao vessel went well and was profitable. Then the profitability declined. Since 2002, the Kiribati Government has had difficulty maintaining contact with its Japanese counterpart.

Distant water fleets

Before independence, fleets from several different countries had fished the waters around the groups of islands that became Kiribati. After 1978, they had to negotiate access to the EEZ as distant water fishing states. Japan was the first country to do this, with a two-year agreement in 1978–80 to pay US\$600,000 for several pole-and-line and longline vessels. In 1979, Korea signed a contract for US\$185,000 for several longline vessels to catch up to a certain daily limit for one year. Japan did not renew the access agreement in 1980 because it wanted to reduce the fee and Kiribati refused. Fisheries aid from Japan also stopped for a year, then in late 1981 a new fisheries agreement and bilateral aid program was negotiated. In 1984–85, fleets from Japan, Korea, the United States and the Soviet Union worked the Kiribati EEZ, paying combined access fees of US\$4 million. The core of the distant water fleet operating in Kiribati's EEZ in the late 1980s and early 1990s was Japan, Korea, and the United States. Total access fees rose to A\$12.3 million in 1991 and \$12.9 million in 1992, largely because of increased US purse-seine activity in Kiribati waters under the US multilateral treaty. In 2001, access fees reached A\$47 million (Government of Kiribati c.2003). Taiwanese purse-seiners made up an increasingly large proportion of the distant water fleet from the mid 1990s, with the Korean proportion also expanding, and the Japanese proportion shrinking. The main problem with distant water access fees as a contribution to government revenue was the volatility due to oceanographic climate cycles reducing catches significantly every few years.

In 2000 and 2001, eight and 11 purse-seine vessels, respectively, from a Spanish company joined the distant water fleet licensed to operate in Kiribati (Chapman 2003). The vessels mostly did not fish in the Kiribati EEZ. Some of the vessels were flagged in Latin American countries. Other Pacific island countries were annoyed that Kiribati licensed these vessels because the Pacific island countries had agreed as a group not to license any vessels from the European Union until further negotiations for a partnership agreement were completed.² After the partnership agreement was signed, Spanish vessels could fish in Kiribati as part of the EU fleet, but the vessels owned by the Spanish company flagged outside the European Union could not. In 2005, there were four purse-seine vessels and five longline vessels from the European Union licensed to fish by Kiribati (Tumoa, pers. comm.).

Kiribati received generous amounts of aid from Japan as a distant water fishing state, and in recent years also from Taiwan. Additionally, distant water companies agreed to employ a certain number of Kiribati nationals on their vessels.

I-Kiribati crews

Kiribati was unusual among Pacific island countries in that it trained and recruited I-Kiribati to work on foreign fleets. This started as an offshoot from the Maritime Training Centre (MTC), which had trained and recruited I-Kiribati for the German merchant marine since the 1960s (Hughes, pers. comm.). The industry organisation Japan Tuna noted the positive effects of the MTC on employment for I-Kiribati, and was also looking for a source of cheaper crews, so decided to set up something similar for training fishers. This became the Fisheries Training Centre (FTC), established in 1989.

In 2005, there were about 325 I-Kiribati crew contracted to the Japanese fleet, and 100–200 more contracted to the Korean and Taiwanese fleets (Bauro, pers. comm.; Tekaata, pers. comm.). Remittances from seamen including fishermen were listed along with dividends from the government's reserve fund (the trust fund from phosphate mining in previous decades), EEZ fishery access fees and sales of passports to foreigners as 'crucially underpin[ning] current levels of public and private disposable income, which in turn yield domestic tax revenues' (Government of Kiribati c.2003).

At the FTC, Japan Tuna funded the salaries of two Japanese instructors, two local instructors and the costs of running the longline training vessel, *Tiakawa*, including the crew (Bauro, pers. comm.). Japan Tuna channelled resources for the FTC and recruited graduates from its fleet via a business called the Kiribati Fisherman's Service, with an office in Bairiki also staffed and funded by Japan Tuna (Bauro, pers. comm.). The FTC was under government obligation to train at least 72 young men between the ages of 18 and 30 each year, and usually trained only this many because Japan Tuna paid for the training and did not want to train more crew than it needed. As a result, all of the trainees had a job to go to on graduation and the course was popular among young Kiribati men because of chronic unemployment problems in Tarawa (Kabure, pers. comm.).

The FTC conducted two courses a year, each with 36 trainees, which lasted between eight and nine months. Usually about one-third of each cohort left before graduation. The college then ran a second round of recruitment for a special fast-track, intensive course for replacement

trainees, so that the right number would graduate on time ready to work on the Japanese fleet. The economic contribution made by this opportunity for I-Kiribati to work on the Japanese fleet was significant. About 325 I-Kiribati were employed on the Japanese fleet in 2004 and earned a total of A\$1,695,230 for the year (an average of \$5,281 per person). A similar number were employed in 2005 (Kabure, pers. comm.).

The business of providing crew for foreign fishing fleets was becoming more and more competitive. Kiribati fishermen competed against Indonesian and Vietnamese fishermen on Japan's distant water tuna fleets, and there was talk that China would also like to start supplying crews for the Japanese fleet (Bauro, pers. comm.). In the distant water fleet as a whole there was also competition from Filipinos and Taiwanese (Kabure, pers. comm.). In light of this, it was important that Kiribati crew proved themselves as productive as crews from any other country.

Working on distant water vessels bought economic benefits, however, the scheme also entailed some social costs. Crews were away from home most of the year, returning for perhaps only one or two weeks (a normal holiday length for Japan). This was hard for single men, but for married men it was particularly difficult. There were sometimes problems with wives of crew working on foreign vessels leaving their husbands because of their long periods of absence (Bauro, pers. comm.). Some crew also developed long-term alcohol abuse problems, or picked up a sexually transmitted infection (STI) from sexual liaisons overseas, both of which caused marital problems at home.

The Japanese tuna fleet was in severe economic trouble by the mid 2000s and needed to maximise productivity while keeping costs down. In the past decade, the Kiribati Fisherman's Service had to redeploy crew from at least three Japanese vessels that went bankrupt (Bauro, pers. comm.). Another new direction was that Japan Tuna was organising with the FTC and the Kiribati Fisherman's Service to train and recruit officers. Until 2005, they had only ever recruited ordinary crew from Kiribati. This move was probably a response to declining interest in going to sea among young Japanese, as well as the prohibitive cost of employing Japanese crew, and meant a significant increase in the type of opportunity the FTC could offer young Kiribati men (Bauro, pers. comm.; Kabure, pers. comm.).

In 2005, CPP was recruiting Kiribati fishermen to work on foreign fleets other than the Japanese fleet (served exclusively by the Kiribati Fisherman's Service). In the past, CPP had supplied crew to fleets from Korea and New Zealand, and British fleets operating from Africa. In 2005, for the first time, they supplied 60 fishermen to the Taiwanese tuna-boat owners' association. Negotiations were almost complete in October 2005, with some of the Kiribati fishermen having signed their contracts while another group was holding out for better pay.

The FTC was thinking about expanding its operations, for example, into training crew for the Taiwanese distant water fleet. It was hoped that they could be trained along with the Japanese crew, but this plan had yet to be confirmed with Japan Tuna, which funded the FTC. Japan Tuna was apparently happy for the FTC to be used to train recruits for other distant water fleets, as long as Japan Tuna resources were used only to train students that worked on its fleet (Bauro, pers. comm.).

Bait fishery

Consistent findings from fishing trials that bait-fish stocks were insufficient to support a pole-and-line commercial tuna fishery in Kiribati led to the establishment of a bait-fish project funded by the United Kingdom and implemented by the FAO and the UN Development Program in 1971. This pilot project led to the establishment of the Temaiku fish farm on Tarawa in 1975, also funded by the United Kingdom. The ponds used milkfish, some of which were purchased as fry, and some of which were recruited naturally. Since pole-and-line fishing under Te Mautari did not develop to a point where it needed large amounts of bait fish on a continuing basis, the ponds also produced fish as food for the local market, and small amounts of bait. During an extension to the Temaiku ponds in the 1980s, a sluice gate was opened to let in milkfish fry from Tarawa Lagoon. Tilapia that were already present in brackish ponds contaminated the newly built ponds and led to predation on the incoming milkfish fry and fingerlings. Milkfish production was inhibited by the tilapia in waves in the 1980s, with some years being better than others. Since 1998, Japan Tuna has been involved in providing technical advice for the fish farm, introducing integrated farming methods with pigs and chickens to increase algae levels in the ponds and thus help the milkfish to grow faster. They were trying to eliminate tilapia from the ponds. One option considered was to have Japan Tuna run the ponds commercially. Under government management, the ponds had not reached full productivity potential (Chapman 2003).

Fisheries Division officers who conducted training on the *Tekokona II* for longline fishing said that the milkfish from the aquaculture ponds on Tarawa were sometimes not the right size to target large tuna, so they wanted a source of wild bait fish as well. The last time a bait-fish project had been conducted was on the Australian Council for International Agricultural Research project in the 1990s (Rawlinson et al. 1992), and Fisheries Division coastal fisheries staff thought it was time for another bait-fish project, so were planning to apply for funding (Tioti, pers. comm.).

There is the potential for the bait fishery to be developed further for export for longline or pole-and-line fisheries. If Tarawa was to attract longline or pole-and-line vessels for trans-shipment and servicing of these vessels, there would be a market for bait fish. If domestic pole-and-line or longline fisheries were to be further developed they could use local bait, either live or frozen. There were ponds on Kiritimati that could be adapted for commercial bait-fish production but this potential had not been explored (Chapman 2003). As well as the farmed milkfish, wild bait fish could be harvested from Tarawa and Kiritimati Lagoons (Chapman 2003). If the longline fishery were to take off on Kiritimati, a local supply of bait fish, or a supply from Tarawa, could be cheaper than the source CPP intended to use: carrier vessels selling to distant water fleets in the region.

Fish aggregating devices (FADs)

FADs were used by distant water fleets offshore. In addition, there had been several schemes for small FADs in near-shore areas to support small-scale coastal tuna fisheries. FADs were considered to be important for the outer islands, where people fished in very

small vessels such as canoes paddled by hand, so they needed to be able to fish close to the shore. FADs had worked well for coastal fisheries in Nuie and Nauru, and so would probably work well in Kiribati too (Tioti, pers. comm.). Fisheries Division trials with various methods of small-scale tuna fishing in the mid 1990s found that FADs would greatly enhance the productivity of small-scale tuna fisheries (Chapman 2003). There had been several donor-funded projects to install FADs for small-scale fisheries since the 1980s, but because Fisheries Division projects tended to be donor funded rather than funded by the government, there had never been a continuing government-funded program to maintain FADs (Tioti, pers. comm.).

Twelve FADs for the small-scale fishery were deployed in 1988 around Tarawa and neighbouring islands. They were all lost soon after deployment. Eight FADs were deployed in the Line Islands from 1989 to 1993, and all but one of these also disappeared soon after being deployed. The one that survived was productive and used by local fishers for four years before it disintegrated. Economic development fund money administered by the FFA from the US multilateral treaty was used to deploy 20 FADs around the outer islands in 1994. Fourteen of these were lost in the first week, with the remaining six lost soon after, so the project was put on hold (Chapman 2003).

The last FAD program was a New Zealand government-funded project during the 1990s. All of the FADs deployed during that project were lost. Fisheries Division staff were planning to make an application for funding for a new coastal FAD project in 2006, based on lessons learned from failed FAD projects in the past (Tioti, pers. comm.).

Game fishing

As of 2002, there were between five and 10 game-fishing vessels engaging in monthly tournaments around Tarawa (Chapman 2003). There was an active international sports-fishing tourist industry in Kiritimati. Anglers for fly-fishing came from the United States via Hawai'i, mostly to fish for bonefish and trevally in the lagoons of the Line Islands (Chapman 2003). There could be potential to attract international game fishers to Kiritimati for tuna and billfish via the same route.

Small-scale fisheries

There have been various projects to support small-scale fisheries around Kiribati.

In 1979, a Marine Exports Division was established on Kiritimati for the Kiribati government using Japanese aid money. This comprised a six-metre aluminium boat, ice plant, blast freezer and cold storage for buying lobster and reef fish from local fishers, and tuna when available. The Marine Exports Division exported milkfish and a small amount of tuna to Hawai'i, the US west coast and Nauru. During the 1980s, exports fluctuated with freight, supply and marketing problems, then collapsed in 1991 when the flights from Kiritimati stopped. The company was renamed Kiritimati Marine Exports Limited (KMEL) and exports started again in 1992 with a new air service. Business continued, with supply problems caused by lack of fishermen and limits on exports of crayfish. In 1997, 2001 and 2002, Japanese aid money upgraded the ice-making and cold-storage facilities on Kiritimati.

In 2002, the company was amalgamated with the other government-owned fishing companies in CPP (Chapman 2003). In 2005, the Kiritimati cold store was being upgraded with Japanese aid once more, as part of an upgrade of the whole Kiritimati CPP base. It was still unclear whether small-scale fisheries from Kiribati could be economically viable.

In 1988, the Outer Islands Fisheries Project (OIFP), funded by the United Kingdom, was established on Abemama and Butaritari in the outer islands of the Gilbert Group. The aim of the project was to extend the government fishing company, Te Mautari's, fish-buying services to small-scale fishermen in the outer islands. Tuna was intended to be one of the target species but fishers tended to focus on reef fish instead. The financial break-even point for the centres was 180mt a year but the highest achieved was 120mt in 1989. The centres operated at a loss and were closed down in 1992. Even while these centres were closing, other fishery centres were started on Abaiang, Maiana, Kuria and Aranuka. There were difficulties with maintaining equipment and getting product to market in Tarawa from the outset. Furthermore, there were problems with poor processing facilities in Tarawa and administration of payments to fishers. Until 1999, the project continued operating at a loss despite attempts to solve transport difficulties by filleting fish on the islands before sending it to Tarawa and with islands managing their own transport. Then the United Kingdom's funding ceased.

Japanese funding for the project began in 2000 as part of an integrated project that included upgrades to the Te Mautari processing and cold-storage facilities in Betio. Under the Japanese project, production increased and transportation improved. During the Japanese project, OIFP became part of CPP (Chapman 2003). As well as establishing the processing plant and cold-storage facility in Betio, the Japanese project refurbished four outer-islands fisheries centres with ice-making machines and cold storage, and provided fishing vessels in those locations. The Japanese team developed a system for collecting fish from the outer islands, processing and reselling it in the Tarawa market (Onorio, pers. comm.). Fifteen or so canoes were supplied by the Japanese aid project to fishermen in the areas where each of the four outer-islands fisheries centres were established.

Under CPP, fish from the three closer fisheries centres was brought to Tarawa several times a week by boat. The outer-islands project produced some tuna for CPP, but the main focus was crayfish and reef fish. Outer-islands fishers were paid about \$1 a kilogram, and CPP sold it on for \$2/kg.³ For this mark up, CPP covered all the operating costs of the fisheries centres and transportation. The fourth fishery centre, which was further away, was filleting the fish and sending it by airfreight to Tarawa.

Sometimes outer-islands fishers chose not to fish full time. Recently, when copra prices boomed, many villages put their energy into copra for a while, and fishing dropped off. It picked up again when copra prices went back down. There was a plan for more fisheries centres further south in the Gilbert Group of islands. There was potential for this plan because people in those southern islands tended to be more focused on fishing than people closer to Tarawa, who had a wider range of economic options. There would, however, be problems working out a viable collection system because of the distance (Onorio, pers. comm.).

One of the options that had been considered was that outer-islands people could process the fish in the outer islands. They could then store a large amount of preserved fish for large freight runs, making the runs more cost effective. It would also reduce the space and weight of the freight and add value. Outer-islands production of tuna jerky had been trialled but had not progressed since 2004.

The ministry saw the support of small-scale fisheries in the outer islands as a priority. There were plans to construct more fish centres in outer islands that did not yet have them to provide income for those communities. The viability of these projects, however, would rest on finding a way to get products to market in Tarawa or overseas in a cost-efficient manner.

In 2005, Tarawa's small-scale tuna troll and pearl-shell pole fishery was still working well. The SPC *Development Options Report* cited this as the only successful private-sector tuna initiative in Kiribati (Chapman 2003). Since 1983, the FAO had been involved in developing various craft for small-scale fisheries around Tarawa, most based on adaptations of the outrigger canoe. The project employed several boat builders with assistants and labourers at Betio and produced more than 550 vessels to 1992 (Chapman 2003).

There were about 1,000 small-vessel owners operating from Tarawa in 2005. Fisheries Division coastal fisheries staff said that some of the small-scale fishers had made quite good money so more people entered the fishery, to the point that by 2005 the fishery was 'quite crowded'.

The Tarawa Fishermen's Cooperative imported fishing gear for small-scale fishers and sold it on to them. It also sold fuel and ice. The cooperative was established by the government in 1994 using Japanese aid money to provide the building, some cold-storage facilities, an ice machine, some marine outboard motors, a standby generator and a displacing pump for fuel. The Tarawa Cooperative had not received continuing funding or any grant aid since its inception. It continued by covering its costs through sales of gear, ice and fuel (Baiteke, pers. comm.; Baree, pers. comm.).

The majority of the small-scale catch from around Tarawa was sold by women at roadside stalls. Small-scale fishers knew more in 2005 than they did in the past about fish quality and the importance of gutting and icing fish. Because ice was expensive, however, they still tended to hold off on using ice unless they thought they would not be able to sell the fish before it started to deteriorate visibly (Tioti, pers. comm.).

The SPC report into development options and constraints recommended that the government support the existing small-scale trolling and poling fisheries by setting up a FAD program and providing training for small-scale tuna fishing techniques. It was suggested that this could be funded through taking a small percentage of distant water access fees as a 'development fee' (Chapman 2003). This had not occurred by 2005.

Tarawa's small-scale tuna markets had been damaged by discards from trans-shipping vessels. Discards were collected on the wharf then sold on the roadside in direct competition with the freshly caught fish, for a cheaper price. Consumers could see that the freshly caught fish were much better quality but still bought the discards because they were cheaper, causing the price of fresh fish to drop (Tioti, pers. comm.).

Anecdotally, expatriate recreational fishermen said that over the years their game-fishing efforts had produced less and less catch. They blamed illegal 'pirate' fishing by foreign industrial vessels close to shore for this. Nauan Bauro said that small-scale fishermen had been complaining in recent years that they had to go further out and fish for longer to find big fish, and he had also noticed that the fish for sale in 2005 were smaller than they had been previously (Bauro, pers. comm.). On the other hand, interviewees from the Tarawa Fishermen's Cooperative Society felt that the coastal resources were healthy (Baiteke, pers. comm.; Barea, pers. comm.). The Fisheries Division had no plans to try to manage the fishery because it seemed to them to be self-managing, in that once the numbers of a species decreased or the price in the market decreased, fishers moved on to another species. Fisheries Division staff felt that Kiribati's coastal fisheries, including tuna, were still quite productive, so no management was necessary (Temwaang, pers. comm.; Tioti, pers. comm.).

Smoked processed and other tuna

One processing plant for smoked tuna, Teikabuti, exists in Kiribati. Plant operations were put on hold temporarily when owner, Mike Savins, an expatriate living in Kiribati, left the country in 2005, but there were plans to resume operations in 2006. CPP also produced tuna and clam jerky for the local market.

Trans-shipping, service and supply

Tarawa's lagoon and proximity to the fishing grounds mean it has the potential to be a major trans-shipment hub, especially for purse-seine fleets; however, it suffers from a lack of fresh food and water, and the country's isolated geography and poor transport connections are inhibitors. Tarawa has no access to suitable airfreight to export sashimi or longline fleet catches. Purse-seine vessels could offload to reefer carrier vessels but ships could not buy enough fresh vegetables in Tarawa to ensure a good diet for their crews. Tarawa has only an inadequate supply of locally grown cabbages and bananas. All other fruit and vegetables are imported, and are thus expensive and not always available in large quantities. Fresh water is also a problem. Nevertheless, because of its proximity to the fishing grounds, Tarawa does significant purse-seine trans-shipping business most years.

While trans-shipping represents an economic opportunity for Kiribati, it also brings social costs in the form of influxes of ship crews ready to 'party'. Alcohol abuse and prostitution are common occurrences around trans-shipping fleets. In 2005, Kiribati society was struggling to cope with increasing numbers of women, some extremely young, visiting the vessels moored in port at Betio (ABC 2005b).

The principal of the FTC said that prostitution in the port area was 'really, *really* against our custom' and 'a big national issue', but he felt that conservative Christian mores, especially among older community leaders, were preventing frank and open discussion of the issues (Kabure, pers. comm.). He saw prostitution as a problem that came with modernity for which I-Kiribati would have to work out their own solution.

One cause of prostitution was that young women had virtually no employment possibilities, especially girls who did not finish school. Boys could get work via the MTC or FTC, but options were more limited for girls.

Agencies to represent and act on behalf of distant water fleets are one of the business opportunity spin-offs from trans-shipping. One of the recommendations in the SPC report on options for tuna development was that the government-owned CPP not be involved in the agency business because it had advantages over private-sector businesses and thus discouraged private-sector development (Chapman 2003). There were two private-sector agencies in Betio (Shipping Agency Kiribati and Kiribati Shipping Services) and one in Korobu (Kiribati Maritime Agency), all three handling a much smaller volume of business than CPP (Tumoa, pers. comm.).

Nevertheless, in 2005, CPP was the largest agent in Tarawa for distant water purse-seine fleets, and was possibly favoured because it was under the same ministry that issued fishing licences. Ministry officials said they promoted CPP to vessels contacting them about registration and licence issues because the ministry wanted CPP to learn about the industry. As agents, CPP arranged for pilots for vessels coming into Tarawa Lagoon, port entry formalities, provision of food, fuel and water, trans-shipment licences, repatriation of crews and treatment of sick and injured crew (Tekaata, pers. comm.). Being the legal representatives of vessels in Kiribati, agents were responsible if vessels or crews were involved in crimes or accidents (Tumoa, pers. comm.).

The migratory and seasonal nature of the resource had major effects on the agency business; in the years when the fishing around Tarawa was poor, fleets did not trans-ship in Tarawa. In 2001, CPP acted as agent for about 90 vessels; in 2002, for 120. In 2003, only two vessels and, in 2004, only three vessels trans-shipped in Tarawa (Riinga 2005). The business picked up again in 2005 with about 100 vessels trans-shipping by October. For CPP, this fluctuation was manageable because the company had other businesses, but it would be difficult for a private-sector company to work only as an agent under these conditions (Tekaata, pers. comm.).

Processing

The processing facility at the CPP base on the wharf area at Betio was upgraded with Japanese aid between 1999 and 2003 to enable CPP to loin or fillet fresh fish and freeze it for export. Since government power supplies were unreliable, the plant had its own generators, which were still on hand for back up, although power supplies had improved by 2005. Because of fresh water quality and supply issues, the plant also had a desalination plant. This was expensive to run in terms of fuel, especially since fuel price increases in 2004–05. The plant also had a blast freezer and large cold storage. The cold storage was so large CPP had never used more than a fraction of the space, so it rented storage places to local food processors (Tekaata, pers. comm.). The facility was used to sell CPP products to the public as well as discards from trans-shipping vessels.

Japan responded to the Kiribati government's aspiration to do more processing by donating equipment (a steaming oven and a vacuum-sealing, plastic-packing machine) for a small loining operation in the CPP plant. It was planned that CPP would start processing one to two metric tonnes of whole fish into loins a day for export markets, moving up to 10 tonnes per day by 2007 (CPP c.2003). In 2005, CPP was processing one metric tonne of

raw material (skipjack and yellowfin) per day into vacuum-packed frozen cooked loins for sale in the local market (Onorio, pers. comm.). CPP paid A\$0.75 an hour for unskilled labour in its processing plant. This was lower than government wage levels, but because of the training nature of the project and high unemployment in Tarawa, people were willing to work for this amount (Onorio, pers. comm.).

In 2005, there was a plan for multinational fishing company Trimarine to conduct a feasibility study for a large-scale loining plant like the one in Marshall Islands (which by 2005 had closed down). The rationale for the idea seemed to be that if Marshall Islands could have one, Kiribati should be able to have one too, since the two places are geographically very similar. A key difference, however, was that Marshall Islands' close relationship with the United States and the presence of a large US military installation on Kwajalein meant that Marshall Islands had frequent and reasonably priced sea freight that could take processed loins on to destination canneries. Kiribati did not have such freight connections and thus logistics were likely to become an onerous operational cost for a loining plant in Kiribati, just as they were for Pafco in Fiji. Water supply is also likely to be a key issue.

President Anote Tong was very much in favour of a loining plant and convinced the Asian Development Bank (ADB) that its fisheries aid to Kiribati should go to this project. In 2004, staff from the Ministry of Fisheries and Marine Resource Development visited the United States and spoke with representatives of Bumble Bee, who told them about the huge market for loins in the United States, and a supply shortage problem (Tumoa, pers. comm.). There would be a demand for the product, it seemed, provided it could be produced at a competitive cost in Kiribati.

A Korean purse-seine company had suggested during licensing negotiations that it bring a processing vessel to work from Tarawa Lagoon (although this possibility had not been followed up by the government) (Yeeting, pers. comm.). In 2005, Taiwanese businessmen were also in contact with the Office of the President about a potential processing investment.

Small-scale loining for the local market at CPP had exposed to the government some of the constraints that needed to be overcome before a large-scale loining plant could be viable in Tarawa. As well as problems with supplies of fresh water and fuel, it was difficult to maintain a regular and reliable supply of raw materials.

In 2003, the SPC report into development options and constraints mentioned one small plant producing tuna jerky: Teikabuti. The plant employed 10 women and had a Hazard Analysis Critical Control Point (HACCP) plan in place, meaning it could export without fear of food safety scandals (Chapman 2003). Apparently, Teikabuti had been exporting jerky to a buyer in Fiji, who repacked it and exported it on. The SPC report recommended exploring this type of small-scale value adding, as well as salting and drying, which was a possibility for the outer islands, especially if focused towards the local market (due to the difficulties in establishing adequate systems for export-standard food safety and hygiene in outer-island areas) (Chapman 2003).

Future prospects

Since independence, the government has been looking at Kiribati's large EEZ and wondering how to make more from its tuna resources (Onorio, pers. comm.). In 2002–03, there was a thorough examination of policies and plans regarding tuna industries as part of working up the Tuna Development and Management Plan (Government of Kiribati 2003), which was contributed to by the FFA, the SPC and Canadian Government aid.

By 2005, the plan had not been taken forward by Kiribati. One reason for this was that the plan needed further work and review, especially in light of the new fisheries legislation that was needed. Kiribati was using its old *Fisheries Act*, which had been amended from time to time, and which the FFA was helping to revise in 2005. The tuna plan called for the establishment of an authority along the lines of Papua New Guinea's National Fisheries Authority or Australia's Fisheries Management Authority, which would be funded by vessel registration fees.⁴ The legislation needed to be revised so that a statutory authority could be established (Tumoa, pers. comm.). The Tong government's main hope for development from tuna resources was some form of processing factory. It intended to have a feasibility study undertaken and eventually have a processing facility built either in Tarawa or in Kiritimati (Tira, pers. comm.).

In 2005, the FAO was conducting a review of CPP as the main domestic company involved in tuna businesses, which included discussions with all the stakeholders, including the ministries, the high commissions and the fishermen's associations (Onorio, pers. comm.). It was possible this review would form a new direction for fisheries development to replace the Tuna Management and Development Plan. Since the early 2000s, the government had emphasised processing rather than fishing, although as a result of the 2005 review it seemed to CPP that the government had gone back to thinking some form of domestic industrial tuna fishery would also be good (Onorio, pers. comm.) (Table 5.3).

Determinants of success

The generally low level of economic development in Kiribati has inhibited fisheries development. The institutions, geography and infrastructure for industrial business development simply do not exist.

Freight

Freight is a major problem for any kind of economic development in Kiribati. Distance from major trading ports and the very small volume of freight coming in and out of Kiribati ports pushes up freight prices. In addition, port facilities at Betio in Tarawa are not large enough or deep enough for large vessels. Large freight vessels moor in the lagoon and freight is unloaded from the vessel to a barge, then brought to the wharf and unloaded again. The wharf built in Kiritimati was for the Japanese–United States satellite program for very big vessels bringing rocket parts, so it was too high for fishing vessels to use (Onorio, pers. comm.). The wharf on Kiritimati also has insufficient shelter from bad weather.

Table 5.3 Kiribati: indicators of tuna development, 2004–2005

Company	Domestic vessels: no. and type	Processing facilities: no. and type	Jobs for nationals: no. and type	Annual exports: volume and type	Annual domestic sales: volume and type
Central Pacific Producers (CPP)	1 carrier 1 small longline	1 medium-sized multipurpose 8 on longline vessel 29 in the office 20 at fish markets/ fisheries centres 2 miscellaneous	21 on carrier vessel		-300mt frozen vacuum-packed loins 250mt fresh fish small amounts jerky
Fisheries Division Ministry of Fisheries	1 small longline 1 purse-seine (joint venture)	- 0	- 0	- 0	- -
Teikabuti	-	1 small tuna jerky	10 I-Kiribati, 1 expatriate ~ 90	-	-
Totals	1 carrier 1 purse-seine 2 small longline	2 facilities		No regular exports in 2005	>550mt from CPP, unrecorded amounts in roadside stalls

Note: Teikabuti was not operating in 2005.

Sources: Interviews conducted in October 2005.

The 2003 SPC study into opportunities and constraints for tuna industries development in Kiribati recommended two purpose-built fisheries wharves, one for Tarawa and one for Kiritimati, with a 500-metric tonne capacity slip for Tarawa, and a smaller tonnage capacity with side-slipping capabilities in Kiritimati (Chapman 2003:18–19). There were no port redevelopment projects in Tarawa in 2005, although the Ministry of Fisheries prioritised port upgrades as vital infrastructure and was looking for donors willing to fund such a project (Yeeting, pers. comm.). Port upgrades and an increase in the volume of freight would bring the price of freight down (Tira, pers. comm.).

In 2002, there was one small, old slipway in Tarawa and no functioning slipway in Kiritimati (Chapman 2003). In late 2005, a fishing wharf and associated facilities were under construction in Kiritimati. This was an A\$8 million Japanese aid project along similar lines to the fishing wharf, cold store and processing facilities built for CPP in Betio, Tarawa. The jetty and shore base was smaller than the government had wanted, as the focus of the JICA project was for local fishermen using current boats, but it was a start (Yeeting, pers. comm.).

Airfreight was also expensive and the routes did not suit exports of fresh fish. Air Kiribati had collapsed, leaving Air Nauru as the only international carrier servicing Tarawa, and its freight prices were too expensive for fish exports (Tioti, pers. comm.). Air Nauru's route to Nadi in one direction and Majuro in the other would line up with flights to Japan, however, so it might be feasible to export sashimi this way if the price were right. Fiji Fish had apparently conducted a trial with the Fisheries Department to explore this option but department staff were unaware of the outcome of the trial (Tioti, pers. comm.). Central Pacific Producers in 2005 had discussions with Air Nauru for favourable freight rates for marine products out of Tarawa through Brisbane, Nadi or Majuro. The Air Pacific route between Nadi, Kiritimati and Honolulu was a potential commercial link for chilled fish exports from Kiritimati to the United States (Onorio, pers. comm.).

Some interviewees expressed a sense of defeatism about Kiribati's geographic location. For example, one ministry interviewee said that Kiribati probably could not compete in the loin industry because it was too far from the markets for loins in Europe and the United States. However, Kiribati is no further from these markets than the other main suppliers, Fiji, American Samoa and Thailand. And, although Kiribati might be far from the markets, it is very close to the fishing grounds (Tumoa, pers. comm.).

Land, water and power

As well as difficulties with freight, development on Tarawa is constrained by an extreme shortage of land. Tarawa is overcrowded and customary tenure systems make it difficult and expensive to negotiate use rights for land. Land is more plentiful and is not held under customary tenure on Kiritimati (all land is government-owned there as it was previously uninhabited) (Chapman 2003). Because Tarawa probably could not support more urbanisation due to land and fresh water shortages (Government of Kiribati c.2003), the government was considering that some or most future fisheries developments should be based in Kiritimati (Tumoa, pers. comm.). The fisheries wharf complex being built

with Japanese aid in Kiritimati was to be CPP's base for a fleet of small longline vessels with shallow drafts similar to the *Tekokona* design. The ministry also hoped to develop trans-shipping and service facilities for longliners and to attract foreign vessels to base themselves at Kiritimati, as in Suva. These vessels would be encouraged to employ I-Kiribati crew as part of the licensing process (Yeeting, pers. comm.).

As the centre of population, government and other commercial activities, Tarawa would be an easier location from which to operate than Kiritimati. Reclaiming land would be one solution, as would the use of factory ships moored in the lagoon.

Other problems for establishing tuna businesses in Tarawa, especially processing businesses, include a shortage of fresh water and insufficient and expensive fuel supplies. In Tarawa in 2005, diesel cost A\$0.89 per litre while in Majuro it cost A\$0.51, so CPP did not buy from the government-owned Kiribati Oil (KOIL) but from the tankers that supplied the distant water fishing fleets in the area. CPP used the *Moamoa* to bring fuel from Majuro to operate the generators and desalination plant for their processing facility at Betio (Onorio, pers. comm.). The fuel problem was partly a function of the wharf facilities and partly due to a year-long stand-off between the supplier, Mobil, and the government-owned distributor, KOIL (Chapman 2003). Because the KOIL fuel tanks were quite small, and because the wharf was not deep enough for a large tanker, Mobil had to use a special small tanker to bring oil to Kiribati and charged correspondingly high rates (Onorio, pers. comm.). The local electricity supply was also unreliable, with blackouts of several hours every couple of weeks.

Fresh water was in short supply because atolls rely on rainwater collected from roofs or groundwater that collects in lenses accessed by well or pump. Overcrowded Tarawa's groundwater supply was not very clean and there was not enough of it for a large industrial factory, so some kind of desalination plant would be needed. The problem with desalination plants is that they consume a lot of fuel.

Human resources: training, business skills and government capacity

In order for tuna industries to be based in Kiribati, or for service industries to be able to support distant water fleets using Tarawa, training for various trades and skills is necessary. According to the SPC *Development Options Report*, there were enough tradespeople in Tarawa for carpentry, welding, fibreglassing and diesel engineering, but not enough with skills in refrigeration or hydraulics. There were also not enough tradespeople in Kiritimati (Chapman 2003).

Training and education were also needed for institutional strengthening in the Fisheries Division, so as to enable staff to be able to implement data collection and analysis (including observer programs) and the monitoring, control and surveillance required for a tuna management plan (Chapman 2003). Fisheries Division employees were regularly sent overseas for a range of fisheries management and extension training to SPC courses in New Zealand and OFCF and JICA courses in Japan.

Part of the problem for establishing trading links and for I-Kiribati starting up and running businesses in tuna industries was the generally low level of interest in business in Kiribati society.

The Ministry of Fisheries had long wanted small-scale fishers to move up in scale to buy larger vessels and run them commercially. The Development Bank was supportive of this idea and willing to lend to local fishers, but the ministry was unable to encourage any local fishers to put forward a proposal. The Permanent Secretary for Fisheries, David Yeeting, felt this was probably because the local fishers did not feel comfortable about taking the risk involved in a loan. 'Kiribati people are excellent fishermen, but they lack exposure to the business world.' Lack of exposure to the business world is a major constraint for domestic fisheries development in Kiribati. Tarawa's successful small-scale fishers did not operate their fishing vessels as businesses, but as part of the production of the household economy. When the household had money for fuel, gear and ice they went out fishing and sold the surplus, with the money going back into the household or being spent on consumables. They did not keep track of costs relative to profits for fishing activities. Doing small-scale fishing thus developed fishing skills, but did not develop business skills. Operating a vessel as a business would be a completely new way of doing things. Likewise, observing carefully while working on a distant water fishing vessel would mean learning about the operations of a large-scale vessel, but the business was conducted mostly in shore-based offices, so crew did not have the opportunity to learn much about business while working on the distant water fleets. Small-scale fishermen and crew from the distant water fleets thus did not have the experience to be able to step straight into business ownership.

Kiribati society offers few opportunities for I-Kiribati to develop business skills. Partnerships with foreign businesspeople in the short to medium term, or teaming up with someone who already has a track record in business, would probably be necessary before these fishers could run fishing businesses.

The SPC report on options for development recommended that the Ministry of Fisheries collaborate with the Tarawa Technical Institute vocational training school to develop fisheries-specific business courses (Chapman 2003). This had not happened by 2005, although AusAID had funded a training scheme with an instructor from Australia's Technical and Further Education (TAFE) colleges, who conducted three courses on fish handling, safety and quality and principles of small business. Such courses go some way towards addressing the lack of exposure to the business world among I-Kiribati, but courses alone are probably not enough preparation for taking out a large loan to buy a small industrial fishing vessel or equipment for a processing plant. Gaining experience running a smaller, less risky business for several years would probably be prudent before taking out a large loan.

Government capacity and aid dependency

The government did not have enough revenue to manage fisheries independently so it relied on aid. When government staff wanted to initiate a project, the normal procedure was to write a proposal to the ministry, which would then look for suitable donor funding (Tioti, pers. comm.). Projects in fisheries tended to be tailored to what donors would fund. After nearly 30 years of fisheries aid from a range of donors, the Kiribati government

had become somewhat disillusioned. ‘With all this aid for so many years one tends to wonder why we aren’t moving’ (Yeeting, pers. comm.). Government officials felt they were usually not given exactly what they had asked for from donors. By 2005, the Kiribati government was trying to be careful about the aid it accepted to make sure it really helped development, rather than becoming an additional cost to government.

Governing tuna industries

Tuna fisheries management in Kiribati comes under the Ministry of Fisheries, with offices in downtown Bairiki. Coastal small-scale fisheries and aquaculture extension work is carried out by the Fisheries Division, with offices and aquaculture facilities at Tanaea. Functions to do with the distant water fleet and most of the administrative work are carried out by the ministry office.

The FFA has been working with the Kiribati government to detail the necessary changes to legislation to accommodate the Western and Central Pacific Fisheries Commission (WCPFC), with the international and regional obligations membership of the commission entails. As of 2005, it was not clear whether Kiribati needed new legislation or could get by with amendments to the old act. Another issue being worked through was whether Kiribati should move towards having a fisheries authority.

As with other tuna management plans in the region, the Kiribati Tuna Development and Management Plan called for a tuna management committee to be established for consultative decision making on tuna issues. This had not been established by 2005 and, along with most other recommendations in the plan, was indefinitely on hold. *Ad hoc* cross-ministry consultation was conducted on particular issues—for example, alcohol abuse and prostitution in the fishing industry (Yeeting, pers. comm.)—but there was no continuing mechanism for cross-sectoral consultation on tuna-related issues (Tumoa, pers. comm.).

State-owned enterprise

Kiribati was unusual among the countries visited for this report in that the government still believed that public-sector companies were a viable option for development. No government-managed tuna business in the Pacific has ever been financially successful, and most have ended up costing governments far more than they generated in development benefits, so most other Pacific island countries have moved away from government involvement in tuna businesses.⁵ One reason some interviewees gave for continued government involvement in tuna businesses in Kiribati was that no local people had the capital to go into a fisheries business (Yeeting, pers. comm.), especially something on a large scale. Only small private companies were possible. It was easier for the government to extend control over such public-sector businesses, and ensure government access to data about the company’s operations (Yeeting, pers. comm.). Ministry of Fisheries officials knew that public-sector companies were unlikely to achieve development alone.

The government aim was to have development driven mostly by the private sector with government-owned CPP trailblazing to encourage private-sector development by showing people that a certain business could work and how to do it. The SPC report on

tuna development options said that far from encouraging the private sector, CPP inhibited private-sector development in its areas of business (trade in fresh and frozen fish, fish processing, agency and recruitment for distant water fleets, and cargo) (Chapman 2003). Despite CPP's presence in the market in Tarawa, however, local sales from Tarawa's fleet of small vessels were thriving in 2005. A small privately owned tuna-jerky facility producing for export had emerged and there were a couple of private-sector agents for distant water vessels.

Nevertheless, CPP's close connection to the Ministry of Fisheries could have undercut the private businesses, and CPP had all its facilities, offices and training provided under aid projects. In any case, by 2005, CPP had not managed to develop any significant export businesses itself, nor had it succeeded in encouraging the private sector to do so. The SPC report recommended the roll back of state involvement in various areas to enable private-sector development to emerge, including privatisation of CPP (Chapman 2003), but this was not part of the government's plans in 2005.

Another way to get around the 'lack of capital' problem in developing tuna businesses in Kiribati would be to have joint ventures with foreign companies (Baiteke, pers. comm.; Baree, pers. comm.; Tumo, pers. comm.). While the public sector was seen as having a role to play in ownership and management of tuna industries, 'public-private partnerships with reputable foreign investors' for fishing and/or processing were also seen as desirable (Baiteke, pers. comm.; Baree, pers. comm.; Tumo, pers. comm.; Government of Kiribati c.2003).

Foreign private investors were seen as a source of expertise, as well as of capital for infrastructure. Some interviewees also felt that allowing wholly foreign-owned ventures might be a good thing, as long as the company employed I-Kiribati, since foreign investors might be unwilling to invest if they had to hand over some of the shareholdings to the government (Tumo, pers. comm.). As of 2005, however, the only substantial joint venture with overseas companies was the government share in the Japanese purse-seiner, *Kao*, possibly because the difficult business environment of Kiribati discouraged foreign investors.

Governing to encourage private-sector development

As of 2005, Kiribati's government had made limited headway in 'enabling' the private sector. One of the problems noted in a 2002 study was the high rates of taxes/duties on inputs for fishing-related businesses. As of 2005, import duties had been removed from most fisheries-related equipment, such as bait for longlining, fish boxes and most fishing gear (Onorio, pers. comm.), but the government still needed to do more to be seen to be providing a business-friendly environment.

The usual first step in the process to gain business approvals for fisheries was for prospective investors to go to the Fisheries Department for an informal discussion. After this, if it looked like the business was something the government would agree to, the investor was required to apply officially to the Foreign Investment Commission, which had representation from a number of different ministries, including Fisheries. In theory, if the business representatives had all their paperwork in order, this process could take

two weeks. Once a business has this approval, they have to seek approvals from the other ministries concerned, including Immigration, Labour and Fisheries. According to ministry official David Yeeting, businesspeople applying for the approval usually told him that the process was very bureaucratic and time-consuming.

One of the features likely to discourage investors in Kiribati is that policies tend to change quite markedly from government to government. One of the reasons given for the failure to take up the Tuna Development and Management Plan was that the plan reflected the policies of the previous government. It was expected that the new government (which, in 2005, was more than halfway through its term) would want to make its own policies for tuna industries (Onorio, pers. comm.; Tumo, pers. comm.). Policy stability is another area the Kiribati government needs to work on to enable private-sector development.

Fish management

The main conservation measure instituted for tuna fisheries in Kiribati thus far has been that industrial-scale vessels are prohibited from coming within 60 nautical miles of the coast, so as to conserve coastal resources for 'our own people' (Tumo, pers. comm.). No total allowable catches (TACs) for the national fishery (by gear or species) or limits on licences for industrial tuna fishing had been set by 2005 (Tumo, pers. comm.; Yeeting, pers. comm.). The ministry was not sure whether the TACs recommended by the SPC in the Tuna Development and Management Plan were the right level, and thought they could be higher (Tumo, pers. comm.).

Observer coverage had a high priority in the Ministry of Fisheries because it was linked to access fees, as well as the value of accurate logsheets for data collection for stock assessments (Yeeting, pers. comm.). Kiribati was trying to increase observer coverage and reduce inaccuracies in logsheet reporting from distant water fleets. Observer coverage was limited because of the numbers of observers available, and because distant water fleets were reluctant to accept observers (Tumo, pers. comm.). Observers were also employed by contract to do port sampling when vessels trans-shipped in Tarawa. Port sampling coverage depended on how many vessels were trans-shipping at the same time and how many observers were in town (as opposed to being out on vessels) (Tumo, pers. comm.).

The observer program started in 2002 and the ministry had 20 observers, who did up to 10 trips a year. More than 300 vessels were licensed to fish by Kiribati each year. The aim was to have 20 per cent coverage but this was difficult because many of the vessels never came to Tarawa. Sometimes the ministry sent observers to board vessels in Majuro, but this was very expensive. If the vessel was in the Federated States of Micronesia (FSM) or other countries, it was even more expensive (Tumo, pers. comm.).

Surveillance was costly and logistically difficult for an EEZ the size of Kiribati's so the government received assistance from Australia. Because of the difficulties of doing surveillance for any one Pacific island country alone, the PNA group was exploring a joint surveillance program. It had been agreed to in principle by late 2005 (Yeeting, pers. comm.).

The Tuna Development and Management Plan recommended that Kiribati's catch-data collection systems be improved because there were problems with under-reporting by distant water vessels, trying to reduce their access fees (Government of Kiribati 2003). It was not clear whether catch data from the foreign fleet were more accurate by 2005. The Foreign Licensing Unit enforced logsheet submission by fining vessels that failed to submit logsheets (Tumoa, pers. comm.).

In 2005, tuna fishing licences, which were mostly distant water access, were still administered under the old institutional arrangement from an office in the ministry rather than through the Fisheries Licensing and Law Enforcing Authority (FLLEA) recommended in the Tuna Development and Management Plan (Tumoa, pers. comm.). Kiribati has achieved the same rates (about 5 per cent of the sold value of the catch) for distant water access fees as other Pacific island countries receive (Reid, pers. comm.). In addition to fees, Kiribati has negotiated benefits from DWFNs including a great deal of aid from Japan and Taiwan, and has negotiated to have I-Kiribati crew employed on distant water fleets. One possible improvement to distant water negotiations suggested by ministry official Raikaon Tumoa was to have the negotiations conducted in Kiribati, so that more stakeholders could contribute (Tumoa pers. comm.). It was also hoped that overall fees could be increased by a change to fisheries licences being considered in 2005

Conclusion

There are a range of necessary inputs for development in the marine sector: fish, fishing vessels and gear, crews, wharves, fuel, fresh water, ice, slipways, maintenance facilities, spare parts for maintenance, tradespeople, land and freight (air and sea). In 2005, Kiribati had only some of these: fish, crews and some vessels (*Tekokona II* and *III* and the fleet of privately owned small-scale boats). The resources are very rich and Kiribati is centrally located to them, local fishermen are plentiful and willing to work, although there is a shortage of crew with higher-level qualifications and experience, as well as a shortage in some of the other trades needed for fisheries and processing service industries. Freight was one of the most pressing disadvantages for any kind of industry because the lack of scale made air and sea freight expensive, air routes were not suitable for fresh fish exports, and there were inadequate sea and air port facilities. Fuel was expensive and in short supply, as were land and fresh water. Local companies lacked marketing expertise and trade networks, and the very high food safety standards of the most valuable markets in the European Union and the United States were another barrier to exports. Finally, the government had not created a macroeconomic environment that encouraged private-sector development. It could be that Kiribati's fragile land environment and small economy mean shore-based tuna development is never going to be competitive. Focusing on access fees, supplying crew for distant water fleets, development trans-shipping businesses (especially in trading) and sound management of near-shore fisheries could be the best policy mix for Kiribati.

Development aspirations and tuna

Aspirations for tuna development were contained in the objectives and strategies specified in the 2003 SPC study of options for development and the Tuna Development and Management Plan (Government of Kiribati 2003; Chapman 2003). These included

- providing an enabling environment for private-sector development in commercial fishing, sports fishing, processing and support sectors
- providing environmentally responsible domestic development and harvesting for food and for export-oriented income
- maximising benefits to I-Kiribati, local communities and the Kiribati economy
- generating employment and income for I-Kiribati, including in the outer islands
- ensuring accurate data collection, including by-catch and interactions with protected species
- making domestic fisheries development and regulation compatible with regional and international obligations
- reducing and replacing foreign fishing access with Kiribati-owned and operated vessels.

The following strategies were listed in relation to these objectives

- develop infrastructure
- maximise external funding
- develop tuna longlining as the most feasible domestic fishery development
- develop post-harvest activities to add value
- develop data collection and analysis systems
- review government taxes and duties to remove disincentives to invest
- train small-scale fishers in fishing techniques and business management
- have a continuing FAD program for small-scale fishers
- explore options for owning (such as cooperatives) and marketing for viable outer-islands fisheries businesses
- build capacity in the Fisheries Ministry for better fisheries management.

As has already been discussed, however, the Tuna Development and Management Plan was not taken forward by the government and, according to interviewees, the government in 2005 had a slightly different set of policies and aspirations in mind for tuna development. The aspiration that came through most strongly in interviews was that I-Kiribati felt that collecting access fees was not enough. There had long been a desire to do something more with the fishery, something owned and operated by I-Kiribati.

Kiribati's general development aspiration as detailed in the National Development Strategies was 'enhancing growth and ensuring the equitable distribution of development benefits to the people of Kiribati according to principles of good governance' (Government of Kiribati c.2003). This aim was to be achieved through

- partnership of public and private investment in infrastructure and production
- equitable distribution of services and economic opportunity

- improved efficiency in the public sector
- equipping people to manage social and economic change as individuals, communities and as a nation
- using our natural resources and physical assets sustainably
- preserving our financial reserves while making use of them to finance development.

Employment

One of the main development challenges facing Kiribati is unemployment. About 2,000 young people leave school each year but only 500 jobs become available. Forty-one per cent of the population is less than 20 years of age. Two out of three jobs are in the public sector (four out of every five dollars of pay come from the public sector), with two out of three of these jobs concentrated in the south Tarawa area (Government of Kiribati c.2003). As well as continued employment opportunities with distant water fleets, it was hoped that developing a domestic fishing fleet and onshore fish processing would generate many jobs (Tumoa, pers. comm.).

Not only were there too few cash-paying jobs, those that did exist were too concentrated in south Tarawa. There were already problems with overcrowding, expensive and lengthy processes to secure land for businesses, and lack of clean fresh water in Tarawa, so it seemed best that employment-generating development should occur outside Tarawa. The outer-islands fisheries project selling fish to Tarawa under CPP was one way that fisheries, including tuna, contributed to the development aim of distributing benefits equitably and slowing the consolidation of the population in Tarawa. Developments on Kiritimati would also further this aspiration.

Spreading development outside Tarawa

Kiritimati in the Line Islands is the largest atoll in Kiribati, has more easily available land than elsewhere and is the fastest growing population centre in the country (Government of Kiribati c.2003). Because of its location close to Hawai'i, Kiritimati seemed a good location for export-oriented tuna development. The Office of the President was considering Kiritimati as the site for a loining plant, although port and infrastructure development would be necessary before such development. Kiritimati had recently been targeted by cruise liners, so it could be developed as a tourist centre, which would create a local market for tuna, among other seafoods. The 2005 establishment of the Air Pacific route from Fiji to Hawai'i stopping off at Kiritimati was a good first step in the direction of tuna industries in Kiritimati. The government has been encouraging air force planes travelling across the Pacific to stop for refuelling at Kiritimati (Tira, pers. comm.) and hoped it would become a hub for planes.

Another way interviewees hoped to ensure continued employment opportunities outside Tarawa was through I-Kiribati working as crew on distant water fleets. With economic problems threatening the future of the Japanese fleet, and increased competition from other nationalities, it was not clear whether this opportunity would last into the future. The step to train officers, and the establishment of recruiting services for fleets other than Japan's, are positive moves (Bauro, pers. comm.).

Environmental and social issues

One of the factors complicating the aspiration to have more people employed as crew on distant water fleets—alcohol abuse by crew—was related to another general aspiration about ‘equipping our people to manage social and economic change’ (Government of Kiribati c.2003). Two paragraphs in the Tuna Development and Management Plan assigned the government responsibility for working with community groups to address a range of negative social impacts associated with tuna fisheries (Government of Kiribati 2003). No significant initiatives in this direction had been made by 2005.

According to Ministry of Fisheries official David Yeeting, changing gender relations and roles were part of the mix of issues understood as having negative social impacts. The MTC had started training young women to work in the German merchant marine, which was a controversial move opposed by some of the older, more conservative members of society. In recent years, some men have begun to take their wives out fishing (Yeeting, pers. comm.), and ways of raising girls in Kiribati are slowly changing.

There was an aspiration to mitigate negative environmental effects, through sustainable management of tuna resources. Ministry staff felt that in order to realise this aspiration domestic management should dovetail with regional management through bodies such as the FFA, the SPC and the WCPFC (Tumoa, pers. comm.; Yeeting, pers. comm.). They also felt it was important to achieve a balance between domestic and regional management for the purposes of sustainability, and to balance present gain against future gain from the fishery. Building the human resources capacity in the Ministry of Fisheries was seen as another necessary component for realising aspirations towards effective resource management, as well as management for economic development. Other areas where ministry and Fisheries Division staff could benefit were from studies in fisheries and business management (Tumoa, pers. comm.).

Processing

The primary aspiration of President Anote Tong’s government to generate more jobs and wealth in the domestic economy from the EEZ’s tuna resources was through a loining plant (Onorio, pers. comm.; Tumoa, pers. comm.; Yeeting, pers. comm.). In order to develop loining, Kiribati would have to develop various services and infrastructure to make the port area suitable, and to enable the country to meet the strict standards of importing countries. It was seen as important that Kiribati not export before it could meet these standards as it could damage the reputation of the fishery if Kiribati fish made people sick.

Increasing returns from distant water fleets

While I-Kiribati would prefer to run tuna businesses themselves, the revenue generated from access fees has been so significant to the economy that most interviewees saw a continued role for access agreements. Increasing the numbers and rank of I-Kiribati employed on distant water fleets was another aspiration, to generate more income from distant water fleets. They aspired to increase distant water fleets’ payments to Kiribati for access to the EEZ. ‘Cost effective use of economic diplomacy to sustain [economic]

flows from abroad has been an important arm of Kiribati's development strategies' (Government of Kiribati c.2003:13). Skilful negotiations for fisheries access in exchange for aid has been part of that strategy.

Trans-shipping service and supply

In addition to processing tuna and increasing access fees, the Kiribati government had aspirations to capture some of the wealth of regional distant water tuna fisheries by making Tarawa and Kiritimati trans-shipping hubs, for purse-seining and longlining, respectively. Overcoming obstacles to trans-shipping was one of the medium-term strategies listed in the Tuna Development and Management Plan (Government of Kiribati 2003). In 2005, port developments to encourage trans-shipping were still a government priority, although no concrete plans were under way. The Ministry of Fisheries was looking for donors interested in funding expensive wharf developments in Tarawa. Since the Line Islands have long been popular with longline fleets, especially from Korea, Kiritimati has the potential to be a longline trans-shipment hub, like Suva, but lack of port facilities, service industries and logistical problems with air and sea transport have meant Kiritimati has not hosted any trans-shipping businesses.

So as to develop trans-shipping capacity, in 2005 the government regarded a purpose-built fisheries port area with processing facilities as a desirable development. If facilities were improved, the government could require distant water fishers to offload part of their catch to Kiribati's processing facility. In addition, a better port would generate many beneficial spin-offs for the wider economy via cheaper cargo. An economy of scale in freight would be achieved with more vessels coming and going with provisions for the fishing fleet, meaning cheaper imports of food and fuel.

With better facilities in the port area, more trans-shipping service industries could develop for repair and maintenance of vessels and hospitality industries for visiting crews. Distant water vessel owners had indicated to the Kiribati government in licence negotiations that it was expensive for them to steam away from Kiribati to offload if they fished around Kiribati, so it was likely that spin-off businesses from trans-shipment could flourish if Tarawa offered more in terms of service and supply.

Trading and marketing

While interviewees were aware of fishing, processing and service industries as potential development strategies, on the whole they were less aware of marketing and trading as equally important facets of tuna industries. Trading and marketing expertise is an important deficit in the local economy constraining Kiribati from realising its aspirations for development from tuna resources.

Fishing

Notwithstanding the current government's aim was to undertake tuna processing, the majority of interviewees aspired for I-Kiribati to do the fishing. Ministry of Fisheries official Raikon Tumoa said he would like I-Kiribati to be involved in fishing and to have

their own fleets, to replace some of the distant water fleets (Tumoa, pers. comm.). Nauan Bauro also felt that Kiribati should have the means to reap its own huge tuna resources. He thought it would be good for the government to continue giving some licences to foreign fleets, while also developing a local fleet (Bauro, pers. comm.).

Fisheries Division interviewees said they would like to see the foreign fleets replaced by Kiribati fishing companies in the future (Temwaang, pers. comm.; Tioti, pers. comm.).

Nauan Bauro, as head of the Japan Tuna-funded Kiribati Fisherman's Service, knew that the Japanese fleet faced financial difficulties, but he felt the surest way to safeguard I-Kiribati employment opportunities on tuna vessels was for Kiribati to have its own fleet, or to attract more foreign-owned vessels to be based in Kiribati. Through developing a large fleet and controlling fishing conducted in Kiribati's EEZ, FTC principal Teorae Kabure hoped Kiribati would be able to control the market for tuna and keep the prices at beneficial levels

This research, as well as other reports into similar topics cited here, show that these kinds of aspirations to fish tuna might not be economically viable. CPP General Manager, Barerei Onorio, noted that in the 2005 FAO review of CPP, when stakeholders were asked what they wanted for the future of tuna industries in Kiribati, many did not know enough about the background of fishing in Kiribati or about tuna businesses to be able to give realistic answers (Onorio, pers. comm.). This lack of knowledge of the history of failure of most Pacific island government-owned tuna-fishing ventures is one explanation for the apparently naïve expectations that if I-Kiribati were given the capital to start they could make a financial success of tuna fishing.

Recommendations

While many challenges face the domestication of tuna fisheries in Kiribati, the following are some areas that could yield benefits

- increase the understanding of tuna fishery-related developments, especially what is likely to generate real long-term benefits to the Kiribati economy, then align activities to focus on realising the most promising developments
- improve freight and transport infrastructure and management
- seek to build on the undoubted capabilities of I-Kiribati seamen, possibly by undertaking a feasibility study for a private-sector joint venture based on a medium-scale, domestically based tuna fleet using and expanding on the existing CPP facility
- reconsider the advice provided by the FFA and the SPC in terms of strategies for tuna management and development
- encourage development of business training and experience
- support industry training and develop new training for trades and business development.

To maximise the benefits from distant water fleets, it will be important to

- gain an improved understanding of the economics and dynamics of the Western and Central Pacific Ocean distant water tuna fleets to engender a better understanding of what benefits can be realistically extracted from DWFNs
- build on the current use of Tarawa (and possibly Kiritimati) as a trans-shipment port by providing competitive service industries and business-friendly approaches as per the Marshall Islands' model
- consider ways of maximising access revenue with the FFA and other Pacific island countries, for example, by examining the nature of existing agreements, including the contracting party (individual licences versus association-based agreements)
- vigorously pursue subregional (PNA) and FFA-wide cooperative arrangements to maximise the long-term benefits arising from the vessel days scheme and to secure equitable allocations and acceptable management measures at the WCPFC, in a reasonable timeframe
- continue to train and find employment for fishing crews, recognising that competition from Chinese and Southeast Asian crews is likely to increase
- avoid expenditure of government revenue on high-risk tuna-fishing developments.

Notes

- ¹ The previous Permanent Secretary made a study tour of the Maldives but was transferred soon after returning to Kiribati, so his study was not utilised by the Ministry.
- ² Kiribati steadfastly reserved the right to license EU vessels throughout the negotiation of the WCPF Convention and signalled this intent during discussion and agreement of a resolution at the third MHLC negotiating session in Hawai'i in 1999, calling on states to 'exercise reasonable restraint in respect of any regional expansion of fishing effort and capacity'.
- ³ Observations of roadside stalls in October 2005 showed the basic price for fish in Tarawa was between A\$1 and \$2.50 a kilogram.
- ⁴ In Papua New Guinea, the entire fishing access fee went to the National Fisheries Authority, but in Kiribati access fees were too large a part of the country's revenue, so only the vessel registration part was considered for funding an authority.
- ⁵ The only other people interviewed for this project who believed government-owned companies could be successful were the managers of government-owned Soltai Fishing and Processing in Solomon Islands, and some interviewees, not NFA officials, in Papua New Guinea.