NEARSHORE FISHERIES DEVELOPMENT AND TRAINING SECTION

Technical assistance to Niue Fisheries Department

SPC trained Niue's Fisheries Department staff in the planning, construction and deployment of fish aggregating devices (FADs).

FADs are very important to Niue's fishermen because they concentrate fishing effort, which saves fishermen time and fuel in getting to the fishing ground. Although the Niue Fisheries Department staff have participated in some areas of previous FAD work, they need to be proficient in all aspects of the work in order to maintain a sustainable FAD programme to ease the operations of the island's commercial and recreational fishermen.

SPC's Fisheries Development Officer, William Sokimi provided the necessary training. He worked with Niue Fisheries Department staff in constructing three FADs (Figs. 1 and 2), one of which was deployed at the Halagigie site and the other at the Matapu site. The third FAD will be deployed near Namukulu by fisheries staff at a later date. The Halagigie and Matapu sites were recommended because they were closer to Alofi and were previously successful sites. FAD deployment points were selected from earlier bathymetry survey work done by the Pacific Islands Applied Geoscience Commission (SOPAC) in Niue. The Halagigie FAD is 2 nm offshore in 720 m depth, while the Matapu FAD is 1.5 nm offshore in 700 m depth. The Namukulu FAD will be placed 1.7 nm offshore at a depth of 700 m.

The FADs were constructed according to the design recom-

Figure 1 (top): Flotation sections for the three FADs completed.

Figure 2: (bottom): Transporting FAD to the deployment site.

mended by SPC in its FAD manual. A "V" deployment strategy was used with the flotation and anchor coordinates on the V ends and the turning point at the V point. The flotation section of the FAD was dropped off at a preset coordinate at the 750 m contour. The launch then headed for the second coordinate, which was approximately half the mooring length. The positioning of the second coordinate was angled towards the 650 m contour. Before the vessel arrived at the second coordinate a slight angle on the rudder was used to bring the launch gently around to a third coordinate that marked the approximate full length of the mooring. This action created a "U" path, although once the vessel settled on its return course, the heading was angled a bit to head for the flotation section. The U turn was towards and parallel to the shallower slope (i.e. the island side).

Once the full length of the mooring rope was paid out, the anchor deployment depth was confirmed and the anchor deployed (Figs. 3, 4 and 5). Aggregators were tied on after the FADs had settled. The final settling positions were:

Halagigie: 19° 03.787'S 169° 58.861'W
Depth: 720 m

Makapu: 19° 00.674'S 169° 56.875'W
Depth: 700 m

The charted positions are shown in Figures 6 and 7.

Figure 3 (top): Deploying the anchor.

Figure 4 (middle): Anchor deployed.

Figure 5 (bottom): Halagigie FAD settled in the water shortly after deployment.

Compared with the straight line deployment method, the V or U deployment methods place less strain on the mooring ropes because the anchor makes its way to the bottom. In the straight line method, the heavy anchor places considerable stress on the mooring rope and also pulls the flotation section underwater for a short period before it resurfaces. The U method, however, does not pull the flotation section underwater, but instead trails it slowly through the water until the anchor settles. Sometimes deeper moorings pull the flotation section of the FAD underwater using the U method, but the movement is much gentler than the straight line method. Also, the anchor is deployed on the shallower slope so that there is less chance of it settling in deeper water.

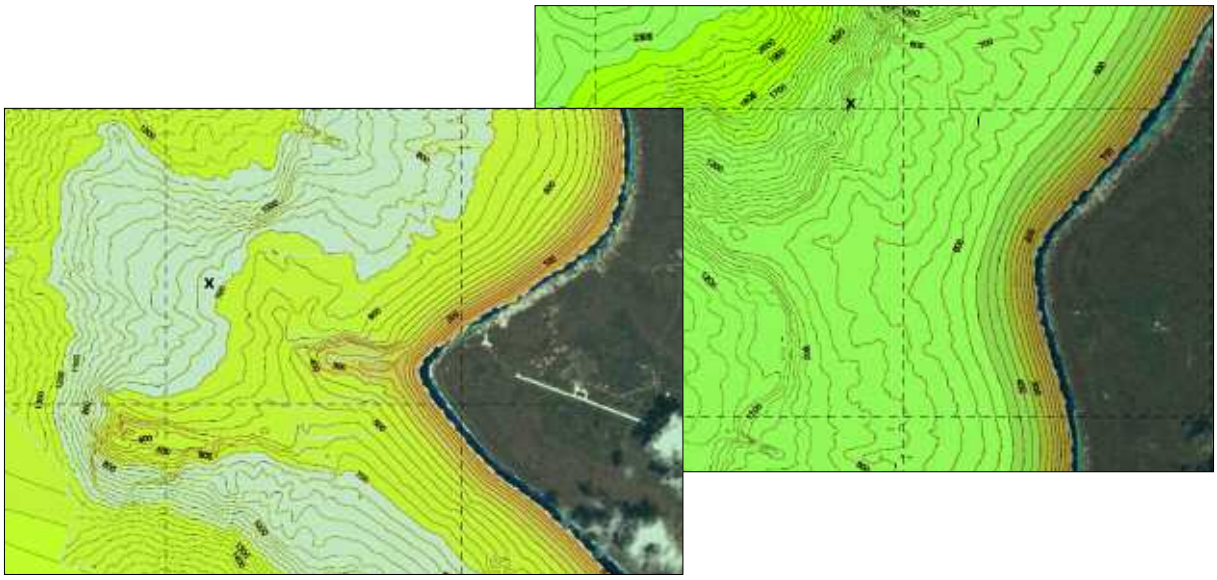


Figure 6 (left): Halagigie FAD final settling location marked with an X.

Figure 7 (right): Makapu FAD final settling location marked with an X.

Kavieng pump boat handline fishing trials

In mid-November 2007, SPC's Fisheries Development Officer, William Sokimi, worked with staff of the Commercial Fishing Operations (CFO) section of the National Fisheries College (NFC) in Kavieng, Papua New Guinea, on a pump boat handline fishing trial.

The inspiration for this project was the success of pump boat fishing operations carried out in Lae (Morobe Province, PNG), in mid-2005. The purpose of that project was to supplement tuna supplies to Frabelle Limited, a tuna fishing and canning company based in Lae. The Lae pump boat operations were based on those used in the Philippines and focused on mid-water jigging methods around FADs. Initial positive outcomes suggested that the concept could be used elsewhere in Papua New Guinea where there is infrastructure and marketing access to support a tuna fishery (e.g. Kavieng in New Ireland Province).

The objective of the Kavieng pump boat fishing trials was to ascertain whether sufficient volumes of tuna could be caught in pump boat handlining operations to encourage the introduction of a tuna and pelagic fish species value-adding processing capacity at the Kavieng seafood processing facility.

FADs for pump boat fishery

The pump boat fishery is highly dependant on FADs to aggregate and retain tuna schools. Between 20 and 30 FADs have been deployed off the coast of Morobe Province to support the Lae tuna pump boat fishery. For the Kavieng trials, however, four FADs were deployed by the National Fisheries College (NFC) a month prior to pump boat handlining trials (Fig. 1). These were spaced approximately 5 nm apart and 2–3 nm off the reef shoreline to maximise aggregating capabilities. Previous use of FADs in pump boat operations showed that tuna migrated unpredictably between the FADs within a cluster, and were most probably driven by baitfish movements, changes in local current, or regional seasonal influences on tuna migration habits.

Figure 1: N° 2 FAD in Kavieng.

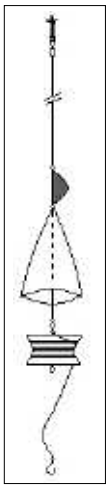


Figure 2: Chum bag gear.

Pump boat handline fishing methods

The most effective way to catch large tuna is to use live bait. Baitfish are jigged with 15–30 kg test monofilament lines and small 4/0 J hooks with pink/blue plastic strips or chicken feathers attached. These artificial lures are attached to a trunkline in a series of three to six hooks per trunkline, with a 200 g lead sinker at the end. The mainline is lowered to approximately 20–60 m (and sometimes 100 m) where it is haltingly retrieved in a jigging manner. Live bait is hooked onto stronger lines with larger hooks to catch the bigger tuna species.

When no live bait is available, fresh bait is used with squid ink or chumbait attractant methods. The traditional dropstone fishing method is the main technique used to carry out the chum bait function. Although this method is effective, its application in commercial fishing is burdensome and restrictive because a large amount of suitable flat rocks must be carried on each fishing trip. The Filipino fishermen in the Lae fishery use broken flat pieces of building blocks for the dropstone method. When the rocks run out, fishing stops and the fishermen return to port, regardless of whether there is a good catch or not. The other restrictive aspect of the dropstone method in commercial fishing is that it does not give fishermen much scope to test the waters when tuna detection becomes difficult due to movement of schools from one FAD to another. However, the Lae pump boat fishermen have the advantage of many boats to detect the whereabouts of tuna schools within their FAD cluster. In times of low tuna aggregation, the boats spread out among the FAD cluster and keep in radio contact, sharing updated information on tuna aggregation at their station. The boats then convene at the FAD with the most tuna.

In replication of the Lae pump boat fishing methods, the dropstone method was improved on while the live bait jigging methods were retained. A chum bag with 1 kg sinker was attached to the end of the mainline. The chum bag was used to envelope the chum bait as well as 20 m of 2.0 mm monofilament trunkline with a baited 14/0 to 16/0 tuna circle hook at the end (Fig. 2). This tuna handlining method is very effective in the multi-mil-

Figure 3: Pomat Litau completing a sinker for the scatter bait fishing method.

lion dollar Okinawa FAD fishery. The principles are the same as for the dropstone method, except that the "stone" is retained as well as the "wrap around" leaf.

All fishing gear used during the trials were constructed at the NFC waterfront workshop by NFC staff and participants (Figs. 3, 4, 5 and 6). Two sets of fishing gear were made for each fishing vessel.

Outcome

The handline fishing trial did not produce the amount of catch that was envisaged to promote the pump boat fishery in Kavieng. However, the concept should be pursued. The live-bait jigging methods went well (Fig. 7) and would have resulted in a high bait catch had not controls been implemented to leave the baitfish in place for when the bigger pelagic species return.

The four FADs closer to Kavieng were aggregating abundant numbers of baitfish after two weeks in the water. Fishermen in the area were recording tuna catches three weeks after deployment. However, during fishing trials, only baitfish schools were sighted at the three remaining FADs. Tuna schools were nowhere to be found in the vicinity of the FADs and all the way along the coast as far as New Hanover. NFC's training vessel, the FTV *Leilani*, covered the east and west coast searching for running schools but none were

Figure 4 (top): Jigging rods and accessories for the scatter bait fishing method.

Figure 5 (middle): Completed lead sinker for the scatter bait fishing method.

Figure 6 (bottom): Malakai Komai displaying the bait jigging lures made from drinking straws.

found. Only small schools of Indian mackerel and rainbow runner were spotted.

The disappearance of tuna schools could be due to seasonal migration, changes in currents, or the recent spate of bad weather that passed through New Ireland. This should serve as a warning to do more research on tuna movements in the New Ireland area. Pump boat fishing should be conducted over a whole year; fishing two to three days a week, using the handline fishing methods introduced in this trial. The results from these fishing trips can be used to determine the time of the year when tuna are abundant, the period in which the large sized tuna frequent the area, and tuna spawning times.

Figure 7: Bait caught using straw lures.

Sea turtle bycatch mitigation workshop and FAD fishing workshops

During the first few weeks of 2008, SPC's Fisheries Development Officer, Steve Beverly, began working as the managing editor of the *Sea Safety Bulletin*. Also during this time, Steve participated in a sea turtle bycatch mitigation workshop, held at the Novetel Hotel in Nadi, Fiji Islands.

The workshop was organised and sponsored by the Pacific Islands Forum Fisheries Agency (FFA) and was attended by fisheries officers from most FFA member countries, as well as experts from around the region in the field of sea turtle bycatch mitigation. During the workshop Steve, along with Carolyn Robins of Beldi Consultancy (Australia), gave a presentation on bycatch mitigation awareness raising materials, and the tools and techniques used for mitigating turtle bycatch in longline fisheries, and releasing hooked turtles unharmed. Workshop participants helped to provide advice and direction on the development of a strategic work plan (action plan) relating to the mitigation of interactions with sea turtles and fisheries in FFA member countries. Most discussions related to longline fisheries, with a focus on circle hooks and the use of release equipment.

The results of the workshop will help direct related work by FFA members and will be used in determining obligations under WCPFC Resolution 2005-04 (resolution to mitigate the impact of fishing for highly migratory fish species on sea turtles) and FAO's guidelines for reducing sea turtle mortality in fishing operations.

After the workshop, Steve visited Wallis and Futuna where he conducted two FAD fishing workshops, one on Wallis and one on Futuna. The workshops were organised by Wallis and Futuna's Office of Agriculture, Forestry and Fisheries in Mata Utu. Steve described to participants the three FAD fishing methods that would be used during the workshop: vertical longline, palu ahi and bidon dérivant (drifting bottle).

After the classroom instruction, participants began making up gear (Fig. 1). Six vertical longlines were fabricated and

mounted on Alvey Reef King reels, four palu ahi lines, and numerous drifting bottles. The Alvey Reef King reel (the largest model) can hold a vertical longline fabricated from 2.0 mm monofilament with 20 spaces for branchlines (Fig. 2).

On the third day of the workshop Steve accompanied five fishermen on a 7 m aluminium half-cabin boat. Two other similar were (Fig. 3). These boats were ideal for this type of training because they were previously equipped with Alvey Reef King reels and had the reel mounts on the rails. This made it easy to install the project reels, some of which were purchased by the Office of Agriculture, Forestry and Fisheries for this workshop, and others that were the property of the fishermen. Steve and the fishermen departed early for the FAD in the south.

Unfortunately, the FAD was not productive. No fish were caught on any of the workshop gear and no fish were caught trolling. There were no birds either. One boat, however, had caught several skipjack tuna on the way to the FAD by trolling. Upon returning to the office and discussing the outcome, it was decided that all boats would fish in the north the following day, in the vicinity of a lost FAD that had been productive before disappearing. Some fishermen expressed concerns that the gear, circle hooks, and bait (Pacific sardine, *Sardinops sagax*) were not suitable. However, circle hooks and sardines work well elsewhere, especially in

Figure 1 (top): Fishermen making up vertical longlines.

Figure 2 (middle): Alvey Reef King reel with a 20-hook vertical longline.

Figure 3 (bottom): One of the workshop boats: a 7 m aluminium half-cabin runabout.

industrial longline fisheries, and vertical longlines have caught fish in the past. Steve reminded the fishermen that the workshop was an exercise in demonstrating techniques, and was not a commercial venture.

On the following day, the same three boats headed out. A 15 kg yellowfin tuna was caught while trolling and Steve used the opportunity to demonstrate proper fish handling techniques for sashimi quality tuna. Several small yellowfin and skipjack tunas, two wahoo and two barracuda were caught while trolling, and one rainbow runner was caught on a vertical longline.

Steve debriefed participants after the workshop. pointing out that the total effort for the vertical longlines had been only 240 hooks soaking for about two hours, which is not much effort. A mid-sized longliner sets about 2000–2500 hooks daily that soak for 8–16 hours. A good catch rate might be one fish (e.g. a large bigeye tuna or yellowfin) per 100 hooks, or 20–25 fish per set. Based on these amounts, the fact that participants caught no fish on 240 hooks is not unusual. Vertical longlines, like horizontal longlines, need to count on numbers. After several days' fishing and several sets in different areas (depending on whether or not fish were present), Steve assured participants that if they were patient and persevered, they would start catching fish with the vertical longlines.

Steve conducted a similar workshop on Futuna. The main difference was that there was no FAD to fish on so participants fished off the reef on the northernmost point of Futuna, which is normally a good fishing spot. Results, however, were similar to those on Wallis: no fish were caught on any of the workshop gear.

Steve observed that fishermen in both workshops, although disappointed with the fishing results, learned a good deal about making up all three gear types and the techniques used for fishing with these gear types. Steve found that in general, the artisanal and subsistence fishermen in Wallis and Futuna could benefit from further assistance and training in safety at sea and in fish handling. None of the boats used during the workshops had adequate safety gear, and some had none at all, not even life jackets. None of the fishermen were knowledgeable about proper fish handling techniques, and fish were handled roughly and not iced properly. Steve noted that any future assistance to these fishermen from SPC should concentrate on these two facets of fishing. He also reported that the Office of Rural Affairs and Fisheries could use some assistance in their FAD programme.

DevFish assists Tongan fishing association

The importance of national fishing industry associations in representing the views and interests of their members is recognised in many countries in the region, although most associations rely on the voluntary services of their members. But because members are likely to be occupied with running their own fishing business, they are seldom able to devote the time needed to association work. There also the perception that they are pursuing the interests of their own company, rather than those of the association. Unfortunately, fishing associations typically have a small membership of relatively small companies, and lack the resources to hire staff.

To try to address these problems, the European Union-funded DevFish project provided funding support for an executive officer post with the Tonga Export Fisheries Association (TEFA) for a six-month trial period, starting in late 2006.

TEFA's request for support was primarily due to 1) the increasing amount of outstanding work and issues affecting the interests of the association and its members, and the fishing industry as a whole; and 2) lead TEFA executives having difficulty in attending to association matters, as well as concentrate on running their own businesses.

Naitilima (Tima) Tupou — a Tongan national with several years of work experience in the tuna industry — was hired as executive officer (see photo below). While waiting for office space to be provided, Tima arranged TEFA's files, set up a library, and created an email account. Tima was also given the responsibility of managing TEFA's bank account with cheques endorsed by the association's treasurer or president.

A setback in TEFA's work plan was experienced with the passing away of the king and the subsequent riot in Nuku'alofa. As a result, the executive officer's real work didn't begin until January 2007.

The hiring of an executive officer for the fishing association has been a success, and the DevFish project hopes the situation will be a model for similar in-country assistance to other Pacific ACP countries. The establishment of the position has proved to be a positive step, not only for association members, but for the fishing industry in Tonga as a whole.

Positive outcomes

Although acknowledgement of the executive officer's role by private sector and government agencies has been slow, there has definitely been more representation of the association and the industry. Tima has also been able to initiate contacts with lead donors and development assistance agencies, identifying potential future support for the association. There is also more openness within the association. The executive officer conveys members' views to the government; previously, individual companies were often reluctant to communicate directly with the government.

The industry's ability to be represented and to participate in core policy-making committees and consultations has increased dramatically. Before the appointment of the executive officer, TEFA had membership in five forums (Pacific Island Tuna Industry Association (PITIA), Fisheries Working Group, Fuel Concession Committee, Tuna Management Advisory Committee, and the Fisheries Management and Advisory Committee).

Through the executive officer's efforts, acknowledgement and membership has expanded to include the following additional organisations:

- National Economic and Development Council;
- National Export Strategy Team;
- Export Working Group To Government Task Force;
- Ports Authority Advisory Board;
- WTO Facilitation Committees;
- Department of Fisheries Working Group.

Tangible results of the executive officer's representation in various committees include: 1) the new Customs Act (to be implemented in early 2008), which contains tax concessions favourable to the fishing industry; 2) the gazetting of the Snapper Fishery Management Plan (which contains a cap on vessel numbers); and 3) the accountability of Tonga's Fisheries Department with regard to some of its fisheries management obligations (e.g. on the prompting of the executive officer, the fisheries minister requested the department to report on implementing agreed upon recommendations of the National Commercial Fisheries Conference).

Setbacks

Some problems were experienced during this trial period of the executive officer. The restructuring of the government, and the Ministry of Fisheries downsized to a department, has meant that the industry is a lower priority for the government. The voluntary redundancy programme last year, after the civil service strike, has left the Department of Fisheries with some core positions vacant.

With the increased capacity for representation and participation by fishing organisations, there is a misconception that industry is badgering government departments. Some fishing association members feel that their operations have been singled out and discriminated against. One member had been "disadvantaged" from an open forum where he had openly discussed the shortcomings of a government department.

The tragic national event of November 2006 affected the association's activities, both internally and externally, due to a shift in the government's priority and Tonga's immediate development partners. This in turn affected Tima's efforts to secure alternative funding sources for the continuation of her position and for certain association projects. Despite these setbacks, Tima was able to establish contact with lead donors and development assistance agencies, and secure some assistance for TEFA.

Executive officer's observation

Tima acknowledges that because of the diversity of the association's membership, there are both common interests and conflicting issues between members. The association represents companies in the tuna longline, deep bottom fish, and aquarium fish businesses. Tima believes she has built a rapport between members, and hopes to further nurture this relationship.

Tima believes that planned association activities must be concrete and objective, time limits must be set, responsible persons identified, and a form of measurement determined so as to assess the progress towards objectives. Tima plans to continue working and building relationships with different government departments and organisations, building the association's capacity; and maintaining

the ability to be objective to ensure the association's views are not marginalised.

Tima believes her independence and representation of the association definitely limits the misconception that association representatives are only pursuing their personal interests.

Accountability and good governance

The DevFish project acknowledges the timeliness with which Tima carried out TEFA's obligations under the MoA of this funding support. All required reporting requirements, including full expenditure acquittal and financial records, have been provided.

Industry representation in various forums and committees enables good governance practice by having a balanced and objective discussion on issues and policies. In recognition of the objectiveness and integrity displayed by Tima, the Government of Tonga nominated her, in her capacity of executive officer of TEFA, as the official delegate for Tonga to the Tuna Commission meeting in December 2007.

TEFA is a member of the Pacific Island Tuna Industry Association (PITIA), and Tima assists with work of the PITIA secretariat. Tima is also in discussions with PITIA and SPC for some collaborative training work.

This success in Tonga has been brought to the attention of multiple fishing associations in Samoa and Fiji, and has generated some interest in those associations for putting aside their differences and forming umbrella associations to focus on policy issues of common concern.

External review

The DevFish Project recently had a mid-term review. On the subject of the TEFA executive officer, the review noted:

> *DevFish funding for a committed and qualified officer at the Tonga Export Fisheries Association has had significant positive impact on fisheries policies and has resulted in a situation that could be considered a model of the positive benefits of a fisheries association…"*

The executive officer has promoted the association's interests. While DevFish cannot support the position indefinitely, other potential sources of funding have been identified as well as some revenue generating initiatives. DevFish approved TEFA's request for an extension of the executive officer position and has provided funding support for a further six months. DevFish has provided similar assistance to three other countries. Other donor agencies interested in supporting private sector fisheries development in the region may wish to consider this kind of assistance to fishing industry associations.

For DevFish Project assistance and project technical reports, visit: www.ffa.int/node/542.

Economic benefits of a domestic tuna purse-seine fishery

The purse-seine fishery

Purse-seine fishing catches the largest amount of tuna in the western and central Pacific: about 1.5 million metric tonnes (mt) or 70% of the total tuna catch in each of the last two years. The catch consists mainly of skipjack as well as small yellowfin.

The purse seine is a large net that is closed at the bottom ("pursed") to trap fish. The fish are then transferred onto a fishing boat and frozen in large tanks of refrigerated brine. Purse seining is an efficient and capital intensive fishing method. Most purse-seine vessels operating in the Pacific catch an average of more than 30 mt of tuna per day, and can carry over 1000 mt onboard. A new vessel of this type now costs more than USD12 million, and has operating costs of over USD2 million a year, but needs less than 30 crew members.

Fishing is concentrated near the equator. There are also impor-

Purse seiners

tant tuna purse-seine fisheries in the waters of Japan, Indonesia and the Philippines, but most of the catch comes from the EEZs of eight Pacific Island countries: Kiribati, Federated States of Micronesia, Marshall Islands, Nauru, Palau, Papua New Guinea, Solomon Islands and Tuvalu, all of which work together to manage and regulate the fishery.

Processing the catch

Nearly all purse-seine catches in the region go towards making canned "light meat" tuna. This is a huge industry, with a global demand for around 7 billion cans per year. In the Pacific Islands, there are canneries in Solomon Islands, Fiji, and two in Papua New Guinea, but these are small by international standards. Cannery production in the Philippines and American Samoa is higher, but the world's biggest producer of canned tuna is Thailand.

Preparing tuna for canning is a labour intensive process, and has become very expensive in countries with high wages. Tuna canneries in Europe, for example, now mainly import loins (cooked, cleaned tuna fillets), which are prepared in factories nearer to the fishing grounds. This creates savings in both labour and freight costs. All Pacific Island canneries now also export loins; there is one factory in PNG that only produces loins; and a loining plant that operated in the Marshall Islands for some years will re-open soon.

Economic benefits of the industry

The high capital and operating costs of purse-seine vessels have made it difficult for Pacific Island companies to participate in the fishery, which has been dominated by foreign fishing fleets. Currently, purse-seine vessels from Japan, Korea and Taiwan catch most of the fish taken from Pacific Island waters. These catches are landed at processors in Japan, or are transshipped in large refrigerated ships to canneries in American Samoa, Korea, the Philippines, and Thailand. Transshipping is a common activity in Honiara, Pohnpei, Tarawa, Majuro and other Pacific Island ports. Access fees paid to Pacific Island countries by foreign fleets are substantial — around USD60 million per year — and make up a high proportion of government revenue in countries such as Kiribati and Tuvalu. Development aid is often linked to access agreements, and there may be some benefits to local economies through port dues and the local purchase of supplies and services during transshipment.

Despite these benefits from foreign access arrangements, most Pacific Island governments feel that they are not capturing the full economic benefits from their tuna resources. Papua New Guinea, in particular, has pursued a determined strategy to attract foreign investment in locally based tuna purse seining and processing operations. The purpose of the DevFish study was to measure the economic benefits that can be secured by the development of a domestic industry.

Measuring economic benefits

As in an earlier DevFish study of the longline fishery, six measurements of economic impact were used, each in US dollars, and calculated per metric tonne of tuna. These six measurements were:

- *Value added* — the key measurement. This is calculated from the value of goods produced by an enterprise, less the cost of goods and services purchased from other firms. It can be considered as the net gain to the national economy from a fishing or processing activity;
- *Net local purchases* — Adds the value of supplies bought by fishing companies, less the cost of import of supplies from overseas;

Left: A locally based purse seiner landing fish in PNG.

Right: Preparation of tuna in a Pacific Island cannery.

- *Employment earnings* — The wages paid to crew and onshore workers who are resident in the country;
- *Gross profit* — Measured as earnings before interest, tax, depreciation and amortisation;
- *Contribution to the balance of payments* — The value of export sales, less the cost of imported goods used;
- *Government revenue* — The amount from licence fees and other charges.

Data were collected from purse-seine tuna fishing and processing companies in the Marshall Islands, Papua New Guinea and Solomon Islands. These enterprises are classed as "locally based" and account for 105,000 mt of purse-seine catches and 70,000 mt of fish processed per year as well as 5500 jobs. These enterprises have a combined annual turnover of USD150 million. The study used their actual financial results for 2006.

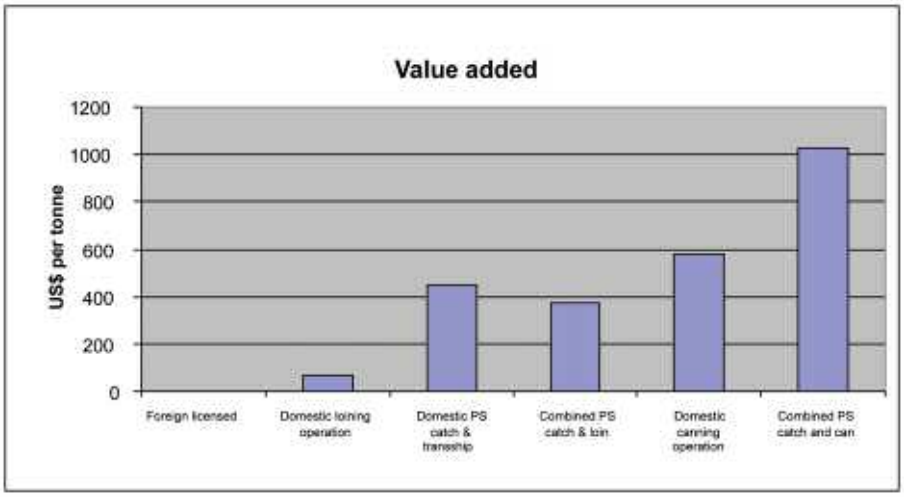
The DevFish study looked at six operational models:

- Domestic purse-seine vessel catch and transshipping in a local port;
- Domestic contract loining operation;
- Domestic canning operation;
- Combined domestic catching and loining;
- Combined domestic catching and canning; and
- Foreign licenced (fishing offshore and transshipping elsewhere).

Each of these has different impacts on local economies.

What are the benefits?

The graph below shows the value added per metric tonne of tuna caught and/or processed under each of these models. The table below gives the average values for all six criteria.



Note that these are average values for more than one enterprise, often covering more than one country. There were considerable differences between enterprises of the same model, reflecting the nature of their investment and operations. It should also be noted

Operational model	Value added	Net local purchases	Employment earnings	Bal. of payments	EBITDA (profit)	Gov't revenue
Domestic PS catch and transshipment	447	81	9	528	424	24
Domestic loining operation	71	214	114	143	188	42
Domestic canning operation	577	279	41	856	528	52
Domestic PS catching and loining	375	296	123	671	236	66
Domestic PS catching and canning	1024	361	50	1384	952	76
Foreign licensed, no transshipment	-	-	-	-	n/a	80

All values are in USD per metric tonne of tuna (catch or factory throughput)
PS = purse seine; EBITDA = earnings before interest, taxes, depreciation and amortisation

that the study looked at direct expenditure by fishing and processing companies. The wider effect on the economy and tax revenues from increased employment, for example, was not considered.

Conclusions

This study demonstrates that returns to the national economy from the surface tuna fishery are significantly enhanced with local basing of vessels and as the level of onshore processing increases. This supports the policy direction of countries that have sought to develop locally based purse-seine fishing operations and onshore processing, particularly canning. However, under the current tax regimes, these returns (particularly direct government revenue) are small compared with the returns to fishing enterprises.

Despite the various incentives, the scale of onshore tuna processing from the surface fishery in the region remains small. It is suggested that the main reason why these government interventions have failed to achieve more significant onshore processing is that those policies have been directed at vessel operators in an attempt to persuade them to become food processors. This has often been ineffective because, as shown by this study, vessel operators are already making adequate profits without getting into the unfamiliar business of onshore processing.

A policy option that directs vessel operators to land their catch for onshore processing in the host country, without requiring them to get involved in processing themselves, may be more successful in increasing the volume of processing in the Pacific Islands. A strategy is also needed to restructure tax, operational and management regimes applied to the surface tuna fishery to improve the balance between resource owners and the enterprises exploiting the resource.

Further information

This summary is based on a report by Peter Philipson that was commissioned by the DevFish project. A copy of the full report can be downloaded from www.ffa.int. A printed copy can be requested from Jonathan Manieva, DevFish Project, Secretariat of the Pacific Community, BP D5, 98848 Noumea Cedex, New Caledonia.

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