

Are moored fish aggregation devices the solution to sustaining small-scale fishing?

Moored fish aggregation devices (FADs) are once again at the forefront of Pacific Island government fisheries departments' list of priorities when addressing food security and safety-at-sea issues. Between March and June of this year, SPC's Nearshore Fisheries Development Section (NFDS) constructed 42 FADs and deployed 21 of these in three Pacific Island countries: 33 nearshore FADs were constructed for Kiribati, with 1 FAD each deployed off 11 islands in the group. The other 22 FADs were stored away for future deployment at other sites. Six offshore FADs were constructed and deployed at six sites in Samoa and three offshore FADs were constructed and deployed at three sites off Majuro in the Marshall Islands. Future FAD projects are in the pipeline for several other Pacific Island countries.



Constructing nearshore FADs in Tarawa, Kiribati.

So, why are moored FADs in demand again by Pacific Island coastal fishermen? The truth is, the need for moored FADs never really dissipated. Since the start of SPC's various FAD projects (mid-1980s), small-scale Pacific Island fishermen have continued to appreciate the concepts and practical application of moored FADs to their fishing operations. Moored FADs enhance the chances of catching fish and provide a central location to carry out fishing operations. Fishermen do not have to scout vast ranges to fish running schools, which reduces a fisherman's operating costs. This factor alone should be sufficient to attract fishermen to moored FADs, especially considering the current high fuel

prices throughout the Pacific region. There is also the safety factor where, in case of engine problems, there is a good chance that other boats will be around to provide assistance or, in cases where boats do not return to base at the expected time, their route can be back-tracked from the fisherman's base to the moored FAD site or vice-versa. In addition, moored FADs complement inshore marine protected areas (MPAs) by providing an alternative location for fishermen to catch fish while giving reef stocks time to recover.

Funding woes

Few stakeholders have recurring funds to maintain ongoing FAD programmes. In most cases, FADs are deployed when or if funds are made available, so FAD deployments are intermittent, with hardly any maintenance or backup plans. In the last two to three years, many Pacific Island fisheries departments had a lapse in their FAD programmes because they had to prepare well in advance to secure funding. Quotations for FAD materials and logistical costs of FAD programmes had to be identified well in advance for approval before being incorporated into the budget for the next fiscal year. This is why this year many Pacific Island countries have asked to revive their FAD programmes. SPC's Nearshore Fisheries Development Section has assisted these islands with identifying material requirements and sourcing quotations from suppliers.



Nearshore FAD moored off Banaba Island, Kiribati.



Offshore Indian Ocean FAD moored 3 nm off Ajaltake in Majuro, Marshall Islands.

There are probably two main reasons why stakeholders found it hard to secure funding. One reason is that many FADs did not last as long as it was hoped, so the long-term potentials of FADs could not be sufficiently ascertained to convince budget controllers and donors that FADs were handy implements for fishermen. The short lifespan of previous FADs was mainly due to poor weather-resistant designs; too many joining parts in the mooring system that became weak points; lack of funding to maintain a consistent FAD programme; and vandalism.

The other reason is because stakeholders did not produce sufficient data to highlight the effectiveness of FADs in terms of catch rates and food security impact. In many cases, during budget bashing, parliamentarians questioned the need to throw away money on devices that did not last long enough to justify the cost of putting them there in the first place. Bilateral grant assistance agencies and non-governmental organisations also had the same reservations. Very few Pacific Island government fisheries departments or fishing associations maintained logbooks on FAD activities, which they could have used to emphasise the benefits of FADs to local fishing communities.

Data collection on FAD activities

Considerable work is now being carried out by SPC's Nearshore Fisheries Development Section in collaboration with Pacific Island fisheries departments to highlight the importance of FAD data collection. Data collection has been made a priority of FAD programmes. Pacific Island government fisheries staff will coach fishermen on how to complete the logbooks. They will also provide information and explain how fishermen's input will help to obtain funds and manage FAD fisheries activities. Ideas are being tried out to simplify logbook entries in order to make it more user-friendly for fishermen yet still provide sufficient information for fisheries management controls.

Another look at FAD designs

Ever since FADs were identified as being advantageous for small-scale offshore fisheries development in the region, SPC has been tasked with providing insights and technical information on FAD development work. The challenge was to produce durable and affordable FAD designs that could withstand the worst of the tropical



Briefing Marshall Islands Marine Resource Authority staff on FAD work and the importance of data collection.

Pacific Ocean's sea conditions for up to three to five years. If it were possible, fishermen who spend a lot of time at sea would like FADs to remain in the water forever. The problem is that the more durable the design, the more expensive it is to produce and Pacific Island stakeholders cannot afford to install costly designs.

A concerted effort was made in identifying cost-effective and durable FAD designs that were suitable for the region. Several FAD manuals and training materials were produced to provide technical details on site surveys, construction, deployment and maintenance. The two designs recommended for regional adoption were the SPC Spar Buoy and the SPC Indian Ocean type FADs. These FADs were reasonably priced and could last for many years if constructed and maintained according to specifications. The Indian Ocean FAD is becoming the more favoured of the two designs because it is easier and cheaper to construct. Anyone with basic rope-work skills can put the Indian Ocean FAD together. The recently revised Indian Ocean FAD is a very good offshore FAD that can last three to five years (or more). The Spar Buoy FAD, on the other hand, requires an experienced boilermaker to fabricate and weld the plates together. The Spar Buoy also exerts greater tension on the mooring and requires more maintenance attention than the Indian Ocean FAD.

Despite efforts already made in producing durable and affordable FAD designs, new developments continue to surface with changes in priorities and parameters. Previously, it was advised that FADs aggregate most effectively when moored 4–5 nm from seaward reefs and spaced 10–12 nm apart. When applied to industrial-scale commercial fishing, especially purse-seine and pole-and-line fishing, this may hold true because bigger vessels need upwards of 20 t of fish per FAD to make it worth their while to fish there. They will also need clear space around FADs to conduct their fishing operations safely. However, for small-scale commercial fishing, 10–20 t should suffice, although when fully functional, FADs can aggregate upwards of 100 t of fish whether they are nearshore or offshore FADs. The precept that nearshore FADs would not be productive is not entirely true. Nearshore FADs can be just as effective for small-scale fishermen as offshore FADs are for industrial fishing. The same principle applies; it depends on the target species and the location in which they are moored.

Nearshore FADs

Increases in fuel costs, small-craft sea safety issues, and increasing requests by canoe and non-powered craft fishermen to be considered as part of fisheries development plans has prompted several Pacific Islands fisheries departments to re-examine their FAD programmes to include nearshore FADs as well as offshore FADs. Because most non-powered craft fishermen live in rural areas or outer islands, it was decided to design a FAD that is not only durable and affordable but also easily constructed and deployed in rural and outer island settings using light-gauge material and a smaller anchor system so that the whole unit could be transported and deployed using the type of boats available in the outer islands.

While the SPC Indian Ocean FAD is still the preferred design, outer island fishermen are not able to readily deploy these types because the anchor system is too heavy and bulky and they don't have heavy lift equipment or big vessels for deploying them. Fishermen would need to wait for a trading vessel to arrive and this would be too restrictive and expensive for rural and outer island fishing associations to maintain sustainable FAD programmes.

Purchasing FAD gear, and constructing, deploying and maintaining FADs can easily be done by island fishermen. It is possible for island fishing associations to have direct input into running their own FAD programmes if FADs are modified so that they can be deployed from 5-m to 7-m outboard powered boats, which are common in the islands. This is one of the areas that SPC's Nearshore Fisheries Development Section is trying to address by trying out several nearshore FAD designs. So far, good headway is being made and several critical areas have been identified for improvement. More time is needed to assess the durability of designs and the results will be published when information becomes available.

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