

8. Alternative fishing methods and sources of seafood 71

Supporting community-based fisheries management

Community-based fisheries management depends on the availability of professional technical support for the communities involved. Scientific input is required to assist communities with finding alternative sources of seafood and to advise on and monitor community actions.

Whether community-based or not, most fisheries conservation measures, including the prevention of destructive fishing and the imposition of fish size limits, will cause a short-term decrease in catches. The same is so for marine reserves as they reduce the area available for fishing. As most subsistence fishers require seafood for their families on a daily basis, it is unreasonable to expect fishing communities to adopt conservation measures which will initially reduce present catches of seafood even further without offering alternatives. Accordingly, an extension programme should include the promotion and development of alternative sources of seafood to those resulting from the present heavy and destructive exploitation of near-shore reefs and lagoons.

Alternatives could include the introduction of medium-sized, low-cost boats (to divert fishing pressure to areas immediately beyond the reefs), assistance and training in fishing beyond the reef, the promotion of village-level aquaculture and the restocking of depleted species of molluscs in village areas. Support could also include government assistance with non-fisheries development, particularly in livestock and agriculture. This would need the support of government departments other than those involved with fishing and the marine environment.

The overall aim is to compensate communities for the short-term decrease in availability of seafood which inevitably accompanies the imposition of fisheries regulations, whether community-based or not. A community-based extension programme which does not promote alternative means of obtaining seafood is unlikely to be sustainable.

The extension process outlined in Chapter 6 describes a joint effort with both the community and the government making certain commitments to help find solutions to problems. In this process the community agrees to certain actions, while the government agrees to reciprocal actions necessary to support the community's undertakings. These may involve the national fisheries agency providing technical advice on how to care for the marine environment, and on the development of alternative sources of seafood to those resulting from the present heavy exploitation of lagoons and damaged near-shore reefs. Non-government agencies may assist both the government and the community in this work, both in the area of information as well as training.

Village-level aquaculture

Village-level aquaculture is one way of ensuring the community continues to have a source of seafood. It can also be used to restock species that have been overfished; this is especially important for sedentary species such as sea cucumber, giant clam, trochus and green snail (Figures 2.5 and 2.6). The aquaculture and restocking potential of some species are still being assessed (e.g. sea cucumber) while other species are being farmed successfully at present (e.g. giant clam and green snail). Aquaculture of food or non-food species can also be used to provide a small-scale business for a community. In Palau several farms have

been set up growing sponges for export and research is being conducted on growing hard and soft corals for the aquarium trade.

Several questions should be asked, and the advice of fisheries agencies sought, before deciding which species would be appropriate for aquaculture. Is there a possibility that the farmed fish could have a detrimental effect on the environment? If being farmed for food for the community, is the fish acceptable to the local tastes? Is it easy and cheap to farm? How soon and how often will it be able to be harvested?

If appropriate research is not carried out, aquaculture may produce poor results. In Kiribati, *Tilapia mossambica* were introduced into milkfish ponds in the 1960s, to provide cheap protein. It was later found that the tilapia were eating milkfish fry and competing with the milkfish for food and space, resulting in poor growth of the milkfish. Tilapia, introduced as a food source to ponds in Tuvalu, are despised as a food fish locally. In Samoa, however, a fast-growing species of tilapia, *Tilapia niloticus*, has proven to be popular, easy to look after and cheap to feed.

Sometimes the long-term success of a project is affected by whether or not the whole community is involved. For instance, an aquaculture project in Palau, aimed at farming milkfish, rabbitfish and shrimp, provided training for the men in the communities where the farms were located. However, the traditional role of the men is to go fishing in boats while the main role of the women is to daily tend the crops. As the aquaculture project had more similarities with farming than with fishing, providing training for women would have been preferable (Lambeth, 1999). It may have been better to involve women in the day-to-day tasks of the

fish farm while the men could have been responsible for the large and irregular tasks such as building the ponds and harvesting the fish. Not involving the whole community may have partially contributed to the failure of the project.

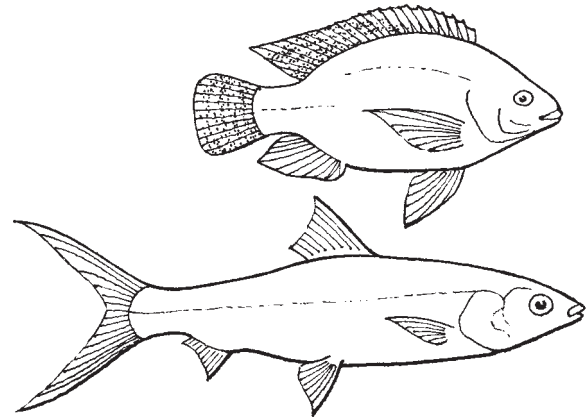


Figure 8.1: Commonly farmed fish species include (from the top) tilapia (*Tilapia niloticus*) and milkfish (*Chanos chanos*).

Fishing for less exploited species, and in less exploited areas

Fishing for offshore species is one alternative to overfishing in inshore areas which has the most potential for quickly providing seafood to the community. The introduction of low-cost boats and new fishing techniques into a community has the potential to reduce fishing pressure on inshore fish stocks while providing fishers with access to less-exploited areas and stocks. Tuna and other offshore resources are targeted by commercial and foreign fishing vessels in most Pacific Island countries, but their potential for subsistence fisheries should also be considered.

In Tuvalu the introduction of the outboard motor in the 1980s changed the fishing patterns of fishing communities. The men now find it easier and quicker to go trolling for tuna outside the lagoons to provide enough fish for the family, and subsequently, women do less inshore fishing. Although outboard motors were not initially introduced as a means of getting people to fish offshore, and the reasons for changes in fishing patterns are complex, the example shows the potential for moving fishing pressure to offshore areas. In Fiji and PNG attempts were made to introduce local fishermen to trolling for Spanish mackerel, *Scomberomorus commerson*, a popular food species which was not heavily exploited.

In Samoa low-cost boats with outboard engines for outer reef fishing were promoted in villages participating in the Fisheries Division's extension programme. This was combined with training in fishing gear and methods, fish handling and processing, sea safety, small-boat handling and outboard engine maintenance. A catch and effort data collection programme was also introduced with three-monthly summaries of the

information being given to the fishermen to encourage continued interest. The relationship built up between the village fishers and the fisheries extension officers during the long process of developing the village fisheries management plan made it much easier to introduce a data collection programme. The catch and effort data are valuable in monitoring the long-term health of the species targeted, but it should be noted that the collection and analysis of data is a labour-intensive and difficult task for any fisheries agency.

The potential for fishing alternative inshore species is much more limited and care should be taken not to contribute to existing problems. There are species which are utilised in some parts of the Pacific and not in others, especially sea urchins, seaweeds and some types of sea cucumbers, but these are all very vulnerable to overexploitation. Any encouragement to fish for an alternative species should be combined with training and information on sustainable harvesting techniques. For instance, *Caulerpa* or sea grapes, are harvested in Fiji but not traditionally in Palau. In Fiji the women harvest carefully, leaving part of the plant behind to regrow and even replanting sections of the seaweed. In Palau, an increasing immigrant population, largely from the Philippines, is now starting to harvest sea grapes, and Fijian harvesting techniques could be used to conserve the resource (Lambeth, 1999).

Whichever alternative is promoted, the fisheries agency and the community should have an ongoing commitment to achieving and maintaining a healthy marine environment.