



The Pacific regional strategy

To achieve sustainable use of living marine resources it will be necessary, in many cases, to reduce harvest rates from present levels. This will lead to a reduction of income in the short term. Community support for sustainable fishing interventions will be higher if alternative livelihood sources exist, or if assistance is given to develop such alternatives. An important strategy of WorldFish in the Pacific is therefore to link fishery management projects with activities that provide alternative sources of income. Partnerships are essential to accomplish this. The Solomon Islands sea cucumber fishery management project, which seeks to reduce rates of harvesting sea cucumber to sustainable levels, is linked with several other

Partners

- Government of France
- Government of New Caledonia
- Secretariat of the Pacific Community (SPC)
- Northern and Southern Province Governments, New Caledonia
- Institut Français de Recherche pour l'Exploitation de la Mer (IFREMER)
- Ministry of Fisheries and Marine Resources, Solomon Islands
- Department of Natural Resources, Solomon Islands
- Western Province Government, Solomon Islands
- Department of Fisheries, Isabel Province, Solomon Islands
- Department of Fisheries, Western Province, Solomon Islands
- The Nature Conservancy, Solomon Islands
- WWF, Solomon Islands
- Marine Aquarium Council, Solomon Islands
- UNDP – Isabel Province Development Project
- National Fisheries Authority, Papua New Guinea

New Caledonia
WorldFish Center, Pacific Office,
c/o Secretariat of the Pacific Community,
BP D5, 98848 Noumea Cedex, New Caledonia.
Tel : +(687) 260131
Fax: +(687) 263818
E-mail: worldfish-newcaledonia@cgiar.org

projects – some run by the Center, others by partners. These companion projects provide:

- institutional strengthening at the provincial level for administrative and business support for village-level business development;
- national and provincial legislation that supports resource management decisions made at the community level; and
- alternative sources of income to offset reductions in income resulting from reducing harvest rates to sustainable levels.

Providing new livelihood options to a community with few income sources can lead to cessation of illegal fishing in the waters of nearby communities. This can have far-reaching effects: the pillaged communities have a stronger sense of control and responsibility for their fished resources, no longer feeling that the stock they leave in the water will be harvested by others. Responsible and sustainable fishing practices follow.

An important challenge for WorldFish is to extend the benefits of its research as widely as possible. WorldFish is developing partnerships with NGOs so that the public goods developed by WorldFish are disseminated widely. ☺

- James Cook University (JCU), Australia
- Queensland Department of Primary Industries and Fisheries
- Australian Institute of Marine Science (AIMS)
- University of the South Pacific

Donors

- The following donors have supported research projects:
- Agence Française de Développement
 - Australian Centre for International Agricultural Research (ACIAR)
 - European Union
 - MacArthur Foundation
 - Canadian International Development Agency (CIDA)
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 - WorldFish Center core funds

Solomon Islands
WorldFish Center,
P.O. Box 77, Gizo, Solomon Islands.
Tel : +(677) 60022
Fax: +(677) 60534
E-mail: worldfish-solomon@cgiar.org

Headquarters
WorldFish Center,
P.O. Box 500 GPO, Penang, 10670 Malaysia.
Tel : +(60-4) 626 1606
Fax: +(60-4) 626 5530
E-mail: worldfishcenter@cgiar.org
Website: www.worldfishcenter.org

Improving livelihoods for coastal communities in the Pacific

The island nations of the Pacific

depend heavily on coral reef and coastal fisheries resources – globally, the highest per capita fish consumption is in the Pacific islands. Coral reefs support a rich variety of animals and plants that are valuable as food or for trade, including fish, spiny lobsters, sea cucumbers, giant clams, pearl oysters, shells such as trochus and green snail, and seaweeds. Traditionally, these animals and plants were harvested at subsistence levels.

More recently, the development of lucrative domestic and commercial export markets has provided coastal villagers with more opportunities to earn money from coral reef species. Unfortunately, the transition from a subsistence to a market economy has often led to chronic over-fishing on many reefs meaning that too few of the most prized animals remain to sustain reasonable harvests. Rapid increases in human populations, changes in land use and destructive fishing methods have compounded the problem by degrading some reefs to the point where they can no longer support commercial quantities of these species.



Improving livelihoods

The Center's research in the Pacific

The WorldFish Center is committed to assisting Pacific islanders to maintain or increase the productivity of their inshore and freshwater fisheries on a sustainable basis, leading to better food security and opportunities to earn more income. The Center is working in partnership with regional agencies, national governments, scientific institutions, NGOs and local communities to develop small-scale aquaculture technologies that will help the poor lift themselves out of poverty, and to improve the sustainability and profitability of their fishery resources.

Fishery management and restocking of sea cucumbers

The sandfish (*Holothuria scabra*) is one of the most commercially valuable species of sea cucumbers, and the backbone of the economy in many remote coastal communities. Sandfish are very easily harvested from their shallow inshore habitat, and many populations have been severely depleted. Restocking sandfish can help to accelerate the rate of recovery of overfished populations, especially where they have been depleted so badly that fertilisation success is very low. Methods for producing sandfish in captivity have been developed in Solomon Islands, and techniques for land-based growout in earthen ponds have been developed in an extension of this project in New Caledonia. Optimal release methods to maximise survival rates after release in the sea have also been developed, and final release trials and bioeconomic analysis are nearing completion. Project benefits will then be extended to coastal communities in the western Pacific through national and provincial partnerships.

Although restocking can play a vital role in regenerating overfished stocks, it is preferable to prevent fished stocks from becoming depleted in the first place. The Center is addressing the overfishing problem by assisting coastal communities in Solomon Islands to fish their sea cucumber resources in a sustainable way. Together, the fishery management and restocking projects are delivering major benefits to coastal communities that rely on producing *bêche-de-mer* (processed sea cucumbers) for income. The Center is also helping communities obtain better returns for their *bêche-de-mer* by adopting processing methods that yield a high-quality dried product for the market.



The WorldFish Center is committed to assisting the Pacific islanders to increase the productivity of their coral reef fisheries.



Restocking sea cucumber will help to accelerate the rate of recovery of overfished populations.



Marine protected areas assist coastal communities to manage their marine resources effectively.

Culture of blacklip pearl oysters in the Western Pacific

Farming black pearls is a \$200 million per year industry in French Polynesia. The technology for catching and rearing wild spat of the blacklip pearl oyster, *Pinctada margaritifera*, has been transferred from Polynesia to Solomon Islands. The transfer involved modifications to overcome the effects of more intense predation on the juvenile oysters, and higher levels of nutrients and sediments in the waters around the continental islands of the Western Pacific.

A demonstration black pearl farm established in Solomon Islands has shown that quality pearls can be produced at lower cost. It is estimated that one major farm could provide moderate to high annual incomes for at least 100 households through collection and sale of spat. Meanwhile, such benefits are already accruing to local communities in Fiji where pearl farms have recently been established. Current research is assessing the abundance and distribution of the larger, and more valuable, goldlip pearl oyster, *Pinctada maxima*, in Solomon Islands to help attract investors in pearl farming there.

Capture and culture: farming for the aquarium trade

The harvest of coral reef fish and invertebrates for the tropical marine aquarium trade is a growing industry in Asia and the Pacific, worth \$300 million per year. Unfortunately, specimens are sometimes gathered in ways that damage the coral. In the



worst cases, fish are collected using sodium cyanide, which can kill the coral and other reef invertebrates. Research by WorldFish and partners has shown that sustainable artisanal fisheries can be established that catch and culture the pre-settlement stages of coral reef fish and crustaceans. Fishers can avoid damaging the habitat by using crest nets and other benign harvesting devices. A wide variety of species can be caught and species of interest to the aquarium trade can be reared quickly to market size on locally available diets. This has led to moderate to high levels of income in remote coastal communities. Importantly, the time lag between business start-up and income generation is only a few weeks, and adoption of this technique is expanding.

Our research has developed simple methods for producing giant clams (*Tridacna* species) in hatcheries and growing them in simple underwater farms. Coastal villagers now can rear the 'seed' of five species of giant clams for sale to the marine aquarium trade. More than 30 small-scale giant clam farms were established in Solomon Islands and hatchery technology transferred to private enterprise. This

project is being continued under a new 'sustainable livelihoods' project to provide sustainable, small-scale alternative sources of income.

ReefBase

ReefBase (www.reefbase.org) is a global information system on coral reefs, developed by the WorldFish Center. This online database provides quality data and information on the location, status, threats and management of coral reefs in nearly 100 coral reef countries and territories. It features a state-of-the-art Geographic Information System (GIS), providing access to a wide range of coral reef-related data sets from multiple sources on interactive maps. A Pacific node for ReefBase is being set up in New Caledonia in collaboration with Pacific partners, with additional staff in Fiji, Samoa and French Polynesia. This regional node will assist in the compilation, communication and transfer of scientific information and other data useful in the assessment, monitoring and management of living marine resources in the Pacific. 

About the Center

The WorldFish Center is an autonomous nonprofit international scientific organisation. Its mission is to reduce poverty and hunger by improving fisheries and aquaculture. The Center, established in Manila in 1977, became a member of the Consultative Group on International Agricultural Research (CGIAR) in 1992. In February 2000 the Center's headquarters moved to Penang, Malaysia.

The WorldFish Center works in developing countries. Its program of work aims to resolve

critical technical and socioeconomic constraints to increasing production, improving resource management and ensuring the equitable distribution of benefits. It pursues these objectives in the fields of aquaculture, capture fisheries, coastal area management, biodiversity conservation, genetic enhancement, socioeconomic and policy research, and information exchange. This is achieved through cooperative research with institutions in developing and developed countries.

