

Coastal fisheries and aquaculture: Balancing management and development



Harvesting reef fish, Papua New Guinea

Photo: Joshua Cinner

This policy brief was prepared by the Coastal Fisheries Programme of the Secretariat of the Pacific Community

Purpose

The aim of this policy brief is to:

- highlight the importance of coastal fisheries and aquaculture in providing sources of food and employment for Pacific people;
- alert Pacific Island governments and development partners to the unsustainable harvesting of many coastal fisheries resources and the need for improved management; and
- identify alternative opportunities to earn income from some underdeveloped fisheries resources and aquaculture to relieve pressure on coral reef resources.

Key messages

Small-scale coastal fisheries based mainly on coral reefs have been the backbone of food security and livelihoods in the Pacific Islands. However, these fisheries are based on limited resources that can no longer meet the needs for fish in many countries and territories. Sustainable harvests from well-managed coral reef fisheries need to be balanced with development of small-scale fisheries for tuna and other large oceanic fish, small pelagic fish and deepwater snapper (where possible), and development of simple, economically viable aquaculture.

Importance of coastal fisheries and aquaculture

Coastal fisheries support large numbers of households that catch fish and shellfish from coral reefs and lagoons for food and livelihoods. Across the region, these small-scale fisheries provide around 50% of coastal households with their first or second source of income.

Coastal fisheries also provide 50–90% of dietary animal protein for coastal communities. Per capita seafood consumption ranges from 18 (Papua New Guinea) to 147 (Tuvalu) kilograms/person/year, and in many Pacific Island countries and territories (PICTs) is 3–5 times higher than the global average. These fisheries play a much more important role than industrial tuna fisheries in the nutrition of coastal communities (**Fig. 1**).

The catch from coastal fisheries is estimated at 155,000 tonnes per year (**Table 1**) with a value of USD 320–500 million. Most of these earnings go directly or indirectly to coastal communities. The contribution of coastal fisheries to gross domestic product (GDP) across the region is comparable to that from locally based tuna fleets due to the greater value-added ratio associated with small-scale fishing.

Aquaculture production is dominated by cultured pearls in French Polynesia and shrimp farming in New Caledonia (**Fig. 2**). However, several other commodities, including Pacific oyster, tilapia and seaweed are being grown with increasing success.

Table 1. Preliminary estimates of annual catches in tonnes for the three main categories of coastal fisheries in Pacific Island countries and territories. Full table at (<http://cdn.spc.int/climate-change/fisheries/assessment/chapters/12-sup-tables.pdf>)

	Reef and coastal fish (t)	Nearshore pelagic fish (t)	Invertebrates (t)	Total catch (t)
Melanesia: Fiji, New Caledonia, Papua New Guinea, Solomon Islands, Vanuatu	45,295	26,093	17,680	89,068
Micronesia: Federated States of Micronesia, Guam, Kiribati, Marshall Islands, Nauru, Palau, Commonwealth of the Northern Mariana Islands	25,335	10,118	4,917	40,370
Polynesia: American Samoa, Cook Islands, French Polynesia, Niue, Pitcairn Islands, Samoa, Tokelau, Tonga, Tuvalu, Wallis and Futuna	15,377	6,727	3,170	25,274
Total	86,007	42,938	25,767	154,712

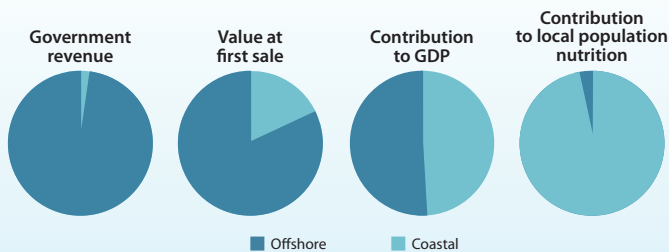


Figure 1. Relative importance of offshore and coastal fisheries in terms of types of benefits in the Pacific Islands region (data from Gillett 2009).

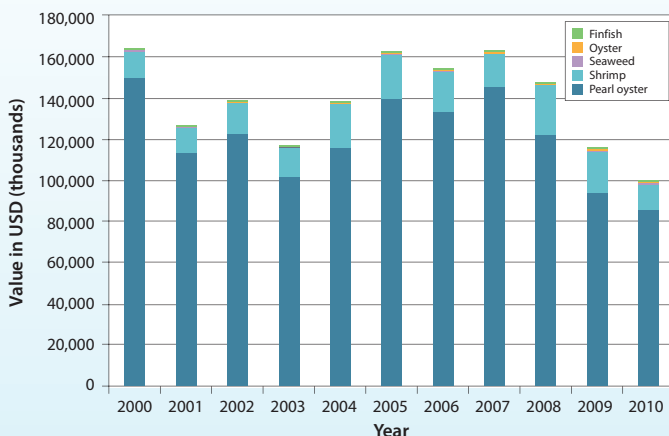


Figure 2. Value of aquaculture in Pacific Islands by year, from pearl, shrimp, oyster, finfish and seaweed production (Source: FAO FishSTAT, 2012).

Management approaches

Good management of coastal resources requires a mix of national and community-based approaches. Commercial export species (e.g. beche-de-mer and trochus) are best managed using national regulations and compliance systems. For the majority of other coastal resources, the use of community-based initiatives that include all stakeholders in developing and enforcing suitable management measures is more effective and sustainable. Many national fisheries departments now actively support and promote community-based management approaches and provide appropriate legislative support.

Unlike the industrial tuna fishery, there is no regional approach to coastal fisheries management — it is the responsibility of each PICT to sustainably manage its own coastal resources. However, one subregional initiative, led by the Melanesian Spearhead Group, has developed a roadmap for inshore fisheries management and sustainable development (2014–2023), with national implementation plans. This is the first attempt at managing coastal resources using a subregional approach.

Increasing need for seafood

The coral reefs and other habitats — mangroves, seagrass beds and intertidal flats — that support much of the coastal fisheries harvest have a limited capacity to produce fish and shellfish. Therefore, much of the additional seafood required to meet the nutritional needs of the region's growing populations, and to provide livelihoods, will have to come from nearshore pelagic fish, especially tuna, and from aquaculture. Careful management is needed to maximise the sustainable yields of fish and shellfish from coastal habitats to narrow the gap between the seafood required for food security and the harvests available from coastal fisheries (Fig. 3).

Key challenges

- Supply the additional 115,000 tonnes of fish and shellfish needed across the region by 2030 to provide enough protein for good nutrition, or to maintain traditionally higher levels of fish consumption. The majority of the additional seafood will be needed in Melanesia (Fig. 4).
- Safeguard coastal fish habitats from loss or damage (caused by poor development of catchments and the coastal zone, careless use of coral reefs and mangroves, and pollution) and coastal fish stocks from overfishing, as human populations grow.
- Increase the capacity and financial resources available to national fisheries departments to oversee effective community-based management of coastal fisheries, and coastal monitoring, control and surveillance (MCS) programmes needed for export of high-value commodities such as beche-de-mer.
- Balance the effective management of coastal fisheries with development of nearshore fisheries for large and small pelagic species, and aquaculture, to fill the gap between the amount of fish needed for food security by a growing population, and the fish available from coral reefs and other coastal habitats.
- Strengthen and standardise data collection methods, systems and databases for fish, shellfish and habitats — including socio-economic and seafood consumption data — to better inform adaptive fisheries management.
- Adapt to the negative impacts of climate change on coastal fish habitats and coastal fish and shellfish stocks, which threaten to widen the 'food gap'.

Priority actions

- Allocate more human and financial resources to national fisheries departments to strengthen community-based and national coastal fisheries management, including MCS where needed, to maintain coastal fisheries resources within sustainable bounds.
- Adopt a 'service delivery' approach in national fisheries agencies to provide effective and widespread support to fishing communities, focusing on information and strategic support.
- Promote integrated coastal zone management by all relevant government agencies, stakeholders, communities and their development partners to reduce stress on coastal fish habitats and maintain whatever natural resilience they have to climate change.
- Raise awareness of the need to implement simple community-based approaches to sustainable management of coastal resources and strengthen support for NGOs to assist communities.
- Transfer some fishing effort from coastal fish habitats to nearshore pelagic fish resources, by installing anchored fish aggregating devices (FADs) (Fig. 5) and training communities on how to fish effectively around FADs.
- Include funding for FADs in recurrent budgets for fisheries departments so that this vital infrastructure can be replaced rapidly when lost or damaged.
- Explore the potential to develop artisanal fisheries for large diamond-back squid (Fig. 6) and other under-utilised nearshore resources (e.g. small pelagic fish species).
- Encourage better planning of aquaculture within the wider process of economic development planning and/or integrated coastal zone management, focusing on favourable locations and conditions for coastal and freshwater aquaculture that will be economically viable with a minimum of government subsidy.
- Ensure that the private sector is a key partner in aquaculture activities promoted by governments or their development partners.
- Promote private sector and community-based eco-tourism related to sports fishing and snorkelling/SCUBA diving to diversify opportunities to earn income from marine-based activities and sports.
- Adopt standardised, user-friendly and cost-effective data collection systems for coastal and nearshore resources and aquaculture, to measure indicators of the status of coastal fish habitats and stocks.
- Modify household income and expenditure surveys and censuses to measure the success of management approaches to increase access to fish for food security and livelihoods, and adapt management as required.

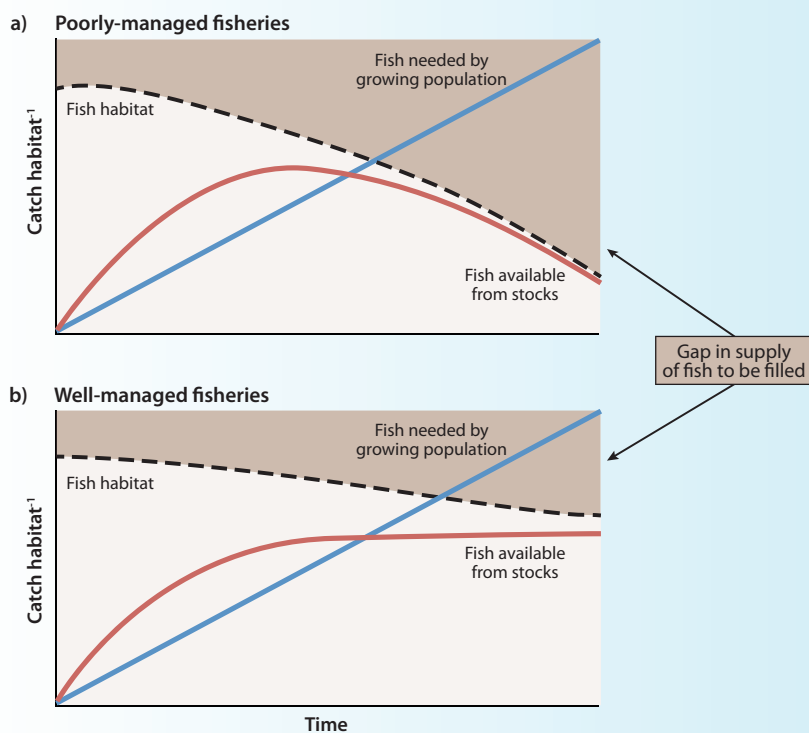


Figure 3. In a poorly managed fishery (graph a), fish stocks and catches (red line) decrease, and fish habitat (light blue area) deteriorate over time. In a well-managed fishery (graph b), fish stocks and catches remain at a sustainable level. Well-managed fisheries minimise the gap between the seafood required by rapidly growing human populations and sustainable harvests of demersal fish and invertebrates (SPC 2008; Bell et al. 2011).

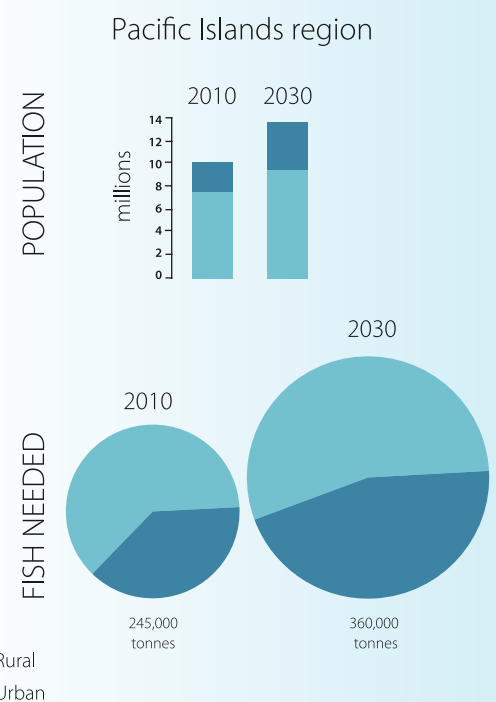


Figure 4. Forecast of population growth and quantity of seafood needed for good nutrition in rural and urban areas in the Pacific.



Figure 5. Small pelagics around an anchored FAD.

Photo: David Itano



Figure 6. A diamond-back squid.

Photo: William Sokimi

Further reading

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