

MPA NEWS



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When Fishing Grounds Are Closed: Developing Alternative Livelihoods for Fishing Communities

Closure of customary fishing grounds, whether for fisheries management or as part of an MPA, can strain coastal communities. Fishers, processors, and other workers dependent on fisheries for income may find few options for other employment, particularly in remote, rural areas. When prospects for alternative employment are limited, fishing-dependent communities can suffer economic hardships, including unemployment and outward migration. In areas with little or no enforcement, fishers may be tempted to resume fishing within the closures.

It may be in the interest of governments and MPA proponents to help ensure there are alternative livelihoods available for displaced fishers. But developing viable employment options is more easily said than done. To illustrate some of the factors and potential strategies involved, MPA News this month examines three alternative livelihood programs for fishers, each with different circumstances and challenges.

Atlantic Canada: Massive adjustment to cod closures

The cod fishery off the Atlantic coast of Canada, once the emblem of the maritime culture in Canada's eastern provinces, is a shadow of its former self. Overfishing and other factors depleted cod stocks to the point of collapse in the early 1990s. Despite stringent conservation measures adopted since then, cod populations remain close to the lowest ever recorded in Atlantic Canada.

As stocks have declined, so have prospects for cod fishermen. The Canadian government placed a moratorium on cod fishing in 1992, throwing 40,000 fishermen and fish plant workers in Atlantic Canada out of work. Although the fishery was partially re-opened in the mid-1990s, this April the government re-closed three of the four open stocks indefinitely. Compared to the height of cod fishing decades ago when 800,000 metric tons/year were harvested, this year's quota for the remaining open stock - off the south coast of Newfoundland - is 15,000 metric tons.

In announcing the most-recent cod closures, which are expected to impact about 3000 fishers and plant workers, the Canadian government allotted CDN\$44 million (US\$31 million) in community-based economic development assistance, targeted to provide short-term employment for affected workers and ensure they can qualify for unemployment benefits over the next two years. This is the latest installment in what has been a CDN\$4-billion (US\$2.8-billion) effort overall by the federal government since 1992 to help fishers and plant workers adjust to cod closures. This massive effort has featured an array of initiatives including license buyouts, income support, skills training, relocation, and assistance programs for economic diversification.

While this has occurred, the federal government has also overseen a major expansion of existing crab and shrimp fisheries in the region, fueled primarily by a boom in these stocks' resource base and improved market conditions in the US and Japan, particularly for crab. Because of this, the government has been able to alleviate some, though not all, of the pain associated with the cod closures by allowing additional access to these alternative resources. Despite the shellfish boom, the total of registered fishers in Newfoundland and Labrador, the province hardest hit by the cod collapse, still dropped 44% from 1991-2002.

Impacts of the above initiatives are evident. Tourism - a major focus of government development assistance - is making a growing contribution to the Newfoundland and Labrador economy, attributable to a mix of product development, training, and advertising campaigns highlighting the cultural, historical, and environmental features of the province. From 1992 to 2002, the number of visitors to the province increased 40%, and related expenditures more than doubled to CDN\$300 million (US\$210 million) annually. Meanwhile, shellfish has become the foundation of the Newfoundland and Labrador fishery, accounting for 82% of the total landed value. Crab catches were four times higher in 2001 than 1990, and shrimp catches were three times higher.

Doug Burgess is the Newfoundland and Labrador director of public affairs with the Atlantic Canada Opportunities Agency (ACOA), the federal agency responsible for providing economic development assistance to Atlantic Canada. He says the growth in tourism is at least as much because of local initiative as government funding. "To say that the changes have come about because the government threw a lot of money at the problem would be unfair," he says. "The people who have chosen to remain here [in Newfoundland and Labrador] have shown the initiative to come up with successful projects." ACOA field staff and account managers work with community organizations to identify opportunities for the creation of alternative employment and to develop sustainable local economies.

The shifts in the provincial economy have not been seamless, says Burgess. There has been a net outward migration of 40,000 people from Newfoundland and Labrador since the 1992 moratorium. While there are success stories, certain areas of the province have lost up to 30% of their population, and unemployment remains high in many fishing-dependent areas, he says.

There are also signs that the crab fishery, which once welcomed cod fishermen, is reaching its limit: the crab quota in some parts of Labrador this year was cut by 40% compared to last year. (Shrimp harvests remain strong: the Canadian Department of Fisheries and Oceans increased the Atlantic Canada shrimp quota this year by 29% to 152,000 metric tons, and allocated some of the quota increase for the direct benefit of those affected by reductions in cod and crab.)

Burgess says that dealing with this decade of cod closures - what he terms the largest industrial adjustment in Canada's history - has provided lessons to ACOA, particularly in terms of interacting with community organizations. "Governments need to be patient when dealing with community volunteer groups," he says. "You're dealing with a dramatic transition out of a well-established industry with a particular set of skills into other industries or projects, often requiring whole new skill sets." Burgess says that by organizing programs involving multiple communities, rather than addressing each community individually, development agencies can take advantage of opportunities for collective strength. He cites one peninsula particularly hard hit by the cod closures where several communities have teamed successfully to organize and promote a historic heritage trail and related tourist attractions.

A fundamental part of ACOA's work has been to foster a culture of entrepreneurship in Newfoundland and Labrador, which Burgess says is not a traditional part of the provincial psyche. "Fishing and fishing-plant work had been so labor-intensive, there was always an opportunity to find an existing job close to home," he says.

Komodo National Park: Transforming the live reef fish trade

In Indonesia, more than 20,000 people live in communities in and around the coral-laden Komodo National Park (KNP). Largely dependent on marine resources for their food and income, these residents will be affected by the planned implementation of no-fishing zones in the 1817-km² park. Although impacts of the new zoning plan will be mediated by use zones and exclusive use rights, those local fishers who depend on reefs inside the park will experience losses, particularly over the short term. Fishers who engage in illegal fishing practices - such as the use of explosives to kill fish (blast fishing) and the use of cyanide to stun and capture fish for the lucrative live reef fish trade based in Hong Kong - have been curbed in recent years by an effective enforcement and awareness program, although these practices remain a threat and could increase again if enforcement were reduced.

To lower dependency on reef fishing among the surrounding communities, the park is working to identify and promote alternative livelihoods in conjunction with The Nature Conservancy (TNC), a US-based NGO. To draw fishers away from the reefs, KNP and TNC have developed a pelagic fishery in the relatively unfished deep waters of the park, deploying six fish-aggregating devices (wooden rafts anchored to the seafloor) to attract skipjacks and yellowfin tuna. They have also worked to foster a local seaweed farming industry. Of the livelihood projects pursued so far, however, the most capital-intensive has been the development of a fish-culture system. In addition to providing local residents with an alternative livelihood, a goal of the mariculture project is to help transform the live reef fish trade - a scourge of Southeast Asian reefs in general - from its unsustainable and capture-based structure to one that is sustainable and culture-based, thereby protecting wild populations.

The mariculture project is still under development, but here is how it will work. The project is based on a "full-cycle" culture: captive broodstocks of grouper and snapper will spawn in a hatchery and the fertilized eggs will be collected. Larvae will be reared and, when they reach fingerling size, be transferred to village-run sea cages to grow out. Once they are of marketable size, the fish will be returned to the hatchery to be marketed to Hong Kong. A percentage of the revenue from fish sales will go to the villages and the remainder will be reinvested in the project to fund continued operation of the hatchery. Villages will be given the opportunity to operate the grow-out units as independent businesses after paying back the project for capital investments (i.e., the grow-out cages).

The hatchery has already been built, and a first small batch of fingerlings has been produced. According to Trevor Meyer and Sudaryanto, TNC field staffers who are developing the mariculture project, significant quantities of fingerlings may be transferred to experimental grow-out units in September. They estimate that once the fish-culture industry is established and the existing hatchery upscaled as

planned, the project and its associated grow-out units will employ more than 200 local people. If replicated at other sites along Indonesia's 95,000-km coastline, the concepts developed in Komodo would provide livelihoods to many more people and greatly increase the contribution of cultured fish to the Hong Kong market.

"It should be understood that this alternative livelihood project does not exclusively target fishers involved in the live reef fish trade," says Peter Mous, a TNC scientist who helped start the project. Although villages with high rates of destructive fishing practices will be among those selected first to participate in the project, any fisher in the Komodo area who is willing to commit to fish culture will be welcome to participate. "It is unlikely that the revenue of fish culture workers will be equal to or higher than the money that is made by cyanide or blast fishers who work pristine reefs - this would be like expecting drug traffickers to stop their practice by offering them a job at a supermarket," says Mous. "Rather, the project hopes to offer a sustainable livelihood that compares favorably to other occupations in the area, including fishing by legal means."

The project has faced challenges. The main one so far has been to optimize juvenile fish production in the hatchery. Compared to other fish species, there are relatively few clearly defined production techniques for grouper and snapper aquaculture, says Sudaryanto, and survival rates of grouper and snapper juveniles can be extremely variable. To address this, the project has hired experienced aquaculture personnel and maintained a number of strategic partnerships with relevant research centers that have expertise in the field of grouper culture.

One concern faced by nearly all fish aquaculture initiatives is the threat of disease transmission in captive populations. "The main precaution against stress and disease is to keep the densities low," says Sudaryanto. "We will develop a set of best practices and standard operating procedures to that effect." Another concern: the potential for the grow-out units to be misappropriated for raising wild-caught fish, although Mous suggests this will not be a major problem. "It is expected that the hatchery will become a much more constant source of fingerlings in terms of quantity and quality, so it is unlikely that grow-out of captured juveniles will become much of an issue," he says.

It is not guaranteed that even the employees of the grow-out units will refrain from engaging in destructive fishing practices in their free time, away from the project. "As far as illegal fishing in the park is concerned, we do not rely exclusively on alternative livelihood projects to address this problem," says Mous. "Our alternative livelihood projects are part of a more comprehensive program that includes modules on park planning and financing, outreach, and surveillance. We think that all of these modules together achieve conservation success, whereas none of these modules would achieve much if implemented in isolation."

CORDIO, Indian Ocean: Producing for local market

Alternative livelihoods for fishers may become necessary when fisheries are degraded and no longer productive, whether or not formal closures are instituted.

CORDIO, an international program created to address coral reef degradation in the Indian Ocean, is working to mitigate the impacts of coral bleaching through, among other efforts, the development of alternative livelihoods for coral-dependent communities. These alternatives, designed to reduce pressure on reefs, also aim to help human communities avoid economic dislocation in the event of mass coral bleaching. The program is funded by Sida (Swedish International Cooperative Development Agency), the World Bank, IUCN, WWF, and the governments of Finland and the Netherlands.

Olof Linden, a biologist at the University of Kalmar (Sweden), serves as a coordinator of the program. "We are dealing in reality with coastal communities and their struggle to survive on what is produced locally," says Linden. "We have been involved, for example, in developing alternative livelihoods for communities on the Tuticorn coast, India. There, families cannot survive any longer on fishing alone, so activities under CORDIO have helped to develop aquaculture, post-harvest processing (to increase the value of fisheries products), and various composting activities for the production of fertile soils for agriculture."

Because of the breadth of the program's focus - the entire Indian Ocean - the feasibility of potential livelihoods may differ widely among communities within the program area. CORDIO is developing aquaculture for aquarium fish in Sri Lanka, and for crab, fish, and prawn in East African mangrove areas. Seaweed farming has also been successful as an alternative livelihood in East Africa, but has been a bust in South Asia, where growing conditions are different and there is no traditional market for the product.

David Obura, director of CORDIO's East African operations, says the main challenge facing the program is to establish a context for developing livelihoods that reflects the culture and resources of the target community. "CORDIO has worked with an education and training center called KWETU in Mombasa [Kenya] where we have tried to motivate local fishers to develop mangrove crab culture in pens in the mangroves, rather than relying on wild-caught crab," says Obura. "To match their resources, we have intentionally not used high-protein feed such as fish and meat that needs to be transported from local butcheries, commercial fish markets, etc. Instead, we have tried to rely on local trash food."

Unfortunately, the local food source for the crabs has not been in high enough supply or of sufficient protein richness to stimulate the rapid growth rates that cultured crabs can attain, says Obura. "Another setback has been that the fishermen with whom we work, while well-skilled at catching and maintaining crabs and observing how they are growing, are not experimentally minded enough and do not adapt quickly to problems," he says. "They will observe crabs fighting and breaking each other's claws off without visualizing solutions such as isolating the crabs somehow or binding their claws."

This highlights the importance of interaction between researchers/technicians and local resource users for identifying real alternatives. "The challenge is to find the right specialist, who may need more skills in public relations and adaptive management than in specialist science," says Obura. Relating to resource users is key, particularly in situations where there may be community suspicion of the intentions and motivations of an "outsider" program like CORDIO. "The local political dimension is perhaps the biggest wild card in our work," he says.

For many communities near coral reefs, dive and snorkel tourism is an option as a livelihood. Linden says CORDIO encourages communities to get involved in the tourism industry. "Tourism will develop whether we like it or not," he says. "We might as well try to develop forms of tourism in such a way that the negative effects are minimized."

Obura notes that tourism has been around for so long in the Indian Ocean that many of the local communities are already involved in it in some way. "Many fishers take to guiding tourists on the reefs if they get the chance, as the returns are higher than for fishing, but the work is highly seasonal and their boats don't often stay in good enough condition for very long," he says. "For alternative livelihoods, I operate a policy of 'produce for the local market' rather than over-dependence on tourism - particularly in a place like Kenya, where the tourism market is so volatile." The projects in which Obura invests CORDIO time all relate to local or near-market consumption. The food produced in part to protect the nearby reef may also be retained within the household for protein.

Obura says the term "alternative" should not imply a complete switch from one livelihood activity to another, but rather the ability to adopt multiple alternatives or options. "Diversifying household income and food security rather than depending on single activities is perhaps the best way for the poor to withstand shocks and unpredictable events," he says.

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