

LIVELIHOOD DIVERSIFICATION AS A MARINE RESOURCE MANAGEMENT TOOL IN THE PACIFIC ISLANDS: LESSONS LEARNED

BACKGROUND

Inshore fisheries are overexploited in many areas of the Pacific Islands. A variety of management interventions, both traditional and introduced, have been used in attempts to reduce fishing effort. This paper focuses on how successful the use of livelihood diversification — securing alternative or supplementary sources of income or food to that obtained from inshore fishing — has been in relieving fishing pressure on inshore marine resources of the Pacific Islands region.

This study was supported by the WorldFish Center and the Secretariat of the Pacific Community (SPC) as part of an attempt to consolidate the wealth of experience gained over the years in marine resource development and management in the Pacific Islands region. From a historical perspective, failed initiatives have often been repeated without knowledge of previous work and, conversely, successes can go unrecognised. By consolidating the lessons of the past, scarce development and management resources may be more productively employed in the future. Although an examination of this topic of livelihood diversification is timely, other related areas deserve to be analysed from a lesson learned perspective. These include what has

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been learned from decades of experience in areas such as the promotion of aquaculture, turtle conservation efforts, capacity enhancement of government fishery agencies, and many others.

With respect to livelihood diversification, a number of terms require clarification. “Livelihood diversification” is often equated to “alternative income generation”, but the latter is less inclusive of subsistence activities, something that is quite important in Pacific Island fisheries. The term “supplemental livelihoods” acknowledges the fact that the promoted activity is not likely to completely replace the existing practice. From a practical perspective, however, these three terms are often used interchangeably in the Pacific Islands.

Although livelihood diversification has long been promoted for marine resource management in the region, the results of specific initiatives are poorly documented. This lack of documentation, however, does not negate the need for, or the validity of, an examination of the subject. Out

of necessity, this study relies heavily on the observations of key individuals. The emphasis is on past experience, rather than what may seem intuitively appealing or what appears to hold promise for the future. The time frame considered is about three decades — approximately the limit of what has occurred within the memory of senior individuals presently working in the fisheries sector.

Preliminary research consisted of two components. The first was assembling the available literature on livelihood diversification (as it transpired, this was largely limited to proposals for interventions), and discussions with 22 individuals who have promoted livelihood diversification, either as a marine resource management tool or for terrestrial conservation purposes in the Pacific Islands. That information collection phase was followed by the convening of a meeting of six fisheries specialists from regional/international organisations, NGOs, and the private sector which have a combined total of 125 years of working experience in the region. During that consultation, the major issues in the use of livelihood diversification as a management tool were identified, and in subsequent discussions of successes and/or failures and associated considerations, a number of lessons emerged. Those are reported in this paper.

It should be stressed that the importance of livelihood diversification is much broader than just fishery management. Its potential for general community development, although great, is however not the subject of this paper. Here, the analysis is

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focussed on using livelihood diversification for marine resource management. Fisheries managers in the Pacific Islands have several mechanisms at their disposal to reduce fishing pressure, but the choice of the appropriate one is often not clear. Because livelihood diversification has been for so many years mentioned, promoted, and used as a means for reducing this pressure, it is thought that the specific topic of its effectiveness as a fisheries management tool deserves attention — and is the subject of this paper.

LIVELIHOOD DIVERSIFICATION AS A MARINE RESOURCE MANAGEMENT TOOL

Livelihood diversification has been promoted as a tool for marine resource management in the Pacific Islands for at least 30 years. In this period, there have been two main categories of attempts: 1) promotion of an alternative that in itself is supposed to result in less inshore fishing, and 2) as a mitigation measure — something used when another management intervention, such as a ban on fishing, produces a temporary hardship in the form of less seafood or less income from fishing.

Four main types of alternative activities have been promoted in the region to reduce fishing pressure as alternatives to inshore fishing. These categories are:

- **Aquaculture.** There is a long history in the region of promoting the culture of marine organisms, often partly justified by the fact that such activity will reduce the amount of inshore fishing. The Samoa Fisheries Division Annual Report (Fisheries Division 2000) states, “Objectively, aquaculture and mariculture have been observed to be one of the options in

alleviating pressure on over-exploited inshore reef and lagoon fisheries’. In reviewing aquaculture in the region, Tanaka (1999) asserts, “In many countries national fishing regulations are coming into force to stop over-fishing... Without, however, offering alternative sources of income generation to villagers such co-management would not be maintained in the long-term. Aquaculture development in the coastal areas seems the best alternative for this purpose.”

- **Fish aggregation devices.** The placement of anchored rafts (FADs) in offshore areas to improve tuna fishing, as well as other attempts to promote small-scale tuna fishing, have often been justified by the fact that they may relieve fishing pressure from nearby inshore areas. The following rationale is given in a FAD manual for the region: “In many coastal areas, growing populations and the need to increase fishing production have led to overfishing of inshore and reef resources. If fishermen who normally fish inshore are able to catch more fish and earn better incomes by changing to FAD-based tuna fishing, the fishing on inshore resources will be reduced” (Anderson and Gates 1996).
- **Deep reef slope fishing.** The promotion of fishing for snappers and other large bottomfish on outer reef slopes and seamounts has been undertaken in many Pacific Island countries in the context of transferring fishing effort farther offshore to more lightly exploited resources. A major focus of development agencies such as SPC was to encourage Pacific Island enterprises to move away from reef and

lagoon fishing, with its limited commercial development potential, to unexploited fisheries such as deepwater snapper (Adams and Chapman 2004)

- **Alternatives outside the fishing sector.** Activities that have been actively promoted to reduce inshore fishing pressure have included tourism (especially ecotourism), livestock raising, surfing, handicraft production, and adding value to harvested seafood. Huber and McGregor (2002) state that in relationship to establishing marine protected areas (MPAs), ecotourism is the most common alternative activity.

Although the above mechanisms are commonly employed in the Pacific Islands, data on the frequency of their use are almost non-existent. Some indication of prevalence is given by the World Bank (2000), which reviewed coastal resource management at 31 sites in seven Pacific Island countries. The study showed that income-generating programmes introduced for the explicit purpose of alleviating pressure on coastal resources were found at 18 sites (58% of all study sites). They included aquaculture (10 sites), FAD tuna fishing (10 sites), and deep slope fishing (10 sites), with some sites having more than one activity. Tourism, farming, handicraft production, and infrastructure work were also found at various sites, but in general, these had been introduced as development activities in their own right, rather than as a coastal resource management strategy.

In addition to serving as a tool for marine resource management, livelihood diversification has often been used in the Pacific Islands region for environmental purposes, especially biodiversity conservation.

Although the environmental objectives can be quite different (e.g. support of conservation area institutions and/or infrastructure), some of the lessons learned are quite relevant to the fisheries sector. It should be noted that in the region, livelihood diversification efforts that deal with the environment appear to have been better documented and evaluated than those for fishery efforts.

Outside the Pacific Islands, livelihood diversification has often been used for the management of marine resource as well as for other purposes. A literature search indicates that much of the marine experience has occurred in Asia, especially Indonesia and the Philippines, and has commonly involved seaweed farming and tourism. However, the present paper focuses primarily on the Pacific Islands experience.

THE SUCCESS OF USING LIVELIHOOD DIVERSIFICATION AS A MANAGEMENT TOOL

Requirements for success

The success of using livelihood diversification as a management tool needs to be carefully defined. For the “tool” to be considered successful it must satisfy several conditions: 1) results in activities that produce supplementary income and/or food; 2) the extra income and/or food actually decreases fishing pressure; 3) does not result in broader environmental damage; and 4) is considered to be worthwhile enough by the target fishers to be continued. Another requirement for the tool to be successful is that it must have been originally intended as a resource management measure. After all, a huge tuna cannery could satisfy the above three conditions, but because such a facility is not normally planned as an inshore fisheries management measure,

it could hardly be considered a success in that context. From the preceding, it can be seen that for livelihood diversification to be considered a successful management tool, the requirements are somewhat demanding.

The reality

In reviewing marine resource management in the Pacific Islands over the last 30 years, it is difficult to identify cases where the use of livelihood diversification as an inshore management tool could be considered clearly successful. This contention is based only to a limited degree on analysis of documented experiences, although reports on the promotion of livelihood diversification are scarce, and those evaluating success are almost non-existent. The sentiment of the poor record of livelihood diversification is based mostly on the assertions of knowledgeable individuals — 22 people who have attempted to use livelihood diversification as a management tool or have observed the results of its use.

The experience

Formal evaluation of the success of livelihood diversification as an inshore management tool in the region appears to be limited to two studies:

- In 1998, the World Bank studied coastal resource management, including alternative income generation (AIG) at 31 sites. In terms of the perceived impacts that AIG has had on reducing the extraction of coastal resources at the 18 study sites where AIG has been attempted, the results were somewhat disappointing. Residents did not believe that any of the aquaculture efforts were having a substantial impact, and the effects of FAD fishing and bottom fishing were only marginally better.

- Chapman et al. (2005) studied the effects of fish aggregation devices (FADs), including measuring their usefulness as inshore management tools. It was concluded that the success of FADs as a management tool was difficult to determine. This was due to the fact that at all locations, marine protected areas were already in place and local communities and fishermen had already changed their activities to account for this.

All of the 22 knowledgeable individuals interviewed during this study could cite numerous failures of the use livelihood diversification, but examples where it was clearly successful in reducing fishing effort were not offered. Some individuals did indicate that there are some important considerations associated with this performance record. These include:

- Even in modern developed countries, most small businesses fail, so a generally poor record of livelihood diversification in mostly rural coastal communities in the Pacific Islands region cannot be taken as proof that the livelihood diversification concept will not work.
- Some of the attempts to use livelihood diversification to reduce inshore fishing pressure not only failed to do so, but actually increased the pressure. Those that are associated with the provision of boats or boat building, or the establishment of commercial market outlets, appear prone to this risk.
- Some positive examples were cited, such as reduced fishing pressure on the reef off some resorts, but (as per success criteria mentioned above) those sources of livelihood diversification were often not primarily intended to be management tools.

The usual case is where an external agency (e.g. government fisheries agency, NGO) decides to provide some assistance to a community to commence a livelihood diversification activity (e.g. boat for off-shore fishing, materials for fish culture). This is often an outright grant (e.g. cash or goods) or something that inherently subsidises the concerned activity (e.g. free marketing service). Many such attempts are initially successful, but as expectations are unfulfilled, as business complexities set in, or as subsidies cease, either the community or external agency loses enthusiasm and the livelihood diversification activity winds down.

It may be useful to identify some specific examples of the various types of unsuccessful uses of livelihood diversification for marine resource management.

Activity ceased with termination of subsidy. In Samoa, attempts to encourage fishing outside the reef by introducing medium-sized, low-cost boats were initially successful (King and Fa'asili 1998), but when the subsidy for vessel purchase expired, other groups did not pursue the activity (Etupati Ropeti, SPC Coastal Fisheries Management Officer, pers. comm.).

Overly optimistic donor with multiple goals. In a relatively remote part of the Solomon Islands (one of the region's less-developed countries), an NGO promoted deep reef slope fishing for livelihood diversification. Project documentation stated that the activity would 1) be a successful business, 2) have a positive effect on the coastal resource management situation, 3) be gender sensitive, 4) have participation from three ethnically and culturally different communities, and 5) produce equitable benefits in those com-

munities (Gillett 1999). The intervention, however, was not successful in any of the five categories (Michelle Lam, pers. comm.).

Involvement of communities in marketing complexities. One of the stated objectives of a project aimed at producing dried tuna jerky in Tuvalu was to relieve pressure on overexploited reef and lagoon resources. A component of the project involved sending tuna jerky to overseas markets. No sustained export of this product has occurred due to the fact that individuals or associations on outer islands do not have the requisite entrepreneurial attitudes, business skills or ability to cope with complex export arrangements (FFA 2005).

No relief of fishing pressure from the activity. In Palau, culturing a wide variety of marine organisms (e.g. giant clams, milkfish, sponges, seaweeds, pearls, oysters) has been promoted over the years. One of the justifications for aquaculture was to relieve pressure on inshore reef resources (Chapman 2004). A survey in 1999 stated that the residents of six coastal communities in Palau perceived little, if any, reduction in coastal fishing because of aquaculture efforts (World Bank 2000).

Activity producing opposite effect. The Fiji Fisheries Department Annual Report for 2002 (Fisheries Department 2003) states that the provision of subsidised boats and fishing gear for tuna fishing around FADs was intended to "promote off-shore fishing relieving pressure on inshore fisheries". In 2003 this scheme "assisted 31 small-scale tuna fishers through providing fishing gears, safe affordable and recommended outboard engines and punts, under the small-scale subsidy scheme of a total sum of F\$332,999" (Fisheries Department 2004). A

study of inshore spearfishing in Fiji (Gillett and Moy 2006) gives information on the success of that scheme: "Commercial spearfishing is depleting fishery resources in areas which may be quite important for village food supplies" and that, at the most important commercial spearfishing landing site in Fiji, "almost all the fibreglass skiffs presently involved in spearfishing were originally obtained through the small-scale tuna fishing subsidy scheme of the Fisheries Department".

Successful, but not promoted as a measure to reduce fishing pressure. The small "Mystery Island" off the coast of Aneityum in Vanuatu receives occasional calls by cruise ships. Tourist expenditures ashore have resulted in less inshore marine harvesting and have been an incentive to establish a marine protected area (Hugh Govan, pers. comm.). Although a favourable marine resource management situation has resulted, the Mystery Island project was not intended for resource management purposes, and therefore cannot be considered a successful management "tool".

Other types of difficulties encountered in the use of livelihood diversification for marine resource management include naïve attitudes towards marketing ("produce something wonderful and it will be purchased"), communities receiving business advice from individuals and/or agencies that do not have the requisite experience, and soaring expectations on the part of target communities of the benefits that may result from the activity in question.

In reviewing the above, many of the difficulties fall into two categories:

- *Overly simplistic views of how individuals and communities react to opportunities and con-*

strains. There is the assumption that extra cash or food will remove fishing pressure, but the actual situation of what motivates and discourages individuals and communities is far more complex.

- *The difficulties faced by traditional Pacific Island communities in operating commercial businesses*. Crocombe (2001) reviews indigenous business development in the Pacific Islands over the last century. He concludes that the business failure rate is very high and the proportion of all business in the region handled by indigenous people is shrinking, observations that do not bode well for the usual targets of livelihood diversification: Pacific Islanders inexperienced in business, often in isolated communities.

Elements of success

It is relatively easy to cite examples of livelihood diversification failure. A more challenging, but potentially more productive exercise, is to identify success in livelihood diversification initiatives and the associated positive elements. Several apparently successful examples have not been subjected to close examination and have not yet been in place for long enough to withstand the test of time. Nevertheless, the ones that have been identified during this study are:

- About three years ago in Fiji a major coral-exporting entrepreneur began leasing reefs from coastal communities for the growing of 'live rock'. Communities receive payment and there is a perception of less inshore fishing in those communities. (W. Aalbersberg and E. Lovell, personal communication);
- Seaweed culture appears to be commercially successful in

places in Kiribati and the Solomon Islands, and there is some indication that seaweed farmers fish less, including fishing in inshore areas. (Garry Preston, Gillett, Preston and Associates, pers. comm.);

- The government of French Polynesia has installed a series of FADs, and one of the stated objectives of the programme is to encourage the "poti marara" vessels to fish away from inshore areas, which appears to be occurring at present (Terri Luciani, SPC Fisheries Training Adviser, pers. comm).

The first two examples above reinforce ideas received from individuals familiar with the use of livelihood diversification for terrestrial biodiversity conservation in the region. One of these is that the business model employed should involve a tight relationship with an empathetic business partner, rather than communities attempting to do marketing on their own. The first example demonstrates the advantage of communities obtaining passive benefits from their marine assets, rather than immersing in the complex business world. The third example is reliant on an inherent subsidy, a feature discussed later in this report.

In the above examples there is also the suggestion that the activity promoted in "successful" livelihood diversification tends to produce modest, rather than spectacular, amounts of alternative income or food.

EMERGING TOPICS AND IMPORTANT ISSUES

An examination of some issues associated with the use of livelihood diversification as a marine resource management tool may help explain the poor success record, or conversely, such scrutiny may suggest where improvements should be made.

What can an outside livelihood diversification intervention do for a community, that the community cannot do for itself?

The essential input of an external agency into the livelihood diversification process has most often consisted of identifying business or product opportunities, providing marketing support, giving subsidies, supplying technical assistance, and performing the role of an "honest broker" between the community and a business. When the assistance is disaggregated to this level, some of the weaknesses become apparent. An important point is that much of the assistance is provided by officers of government fisheries departments and environmental NGOs. These people often do not have the depth of experience required for effective identification and critical evaluation of opportunities; those types of agencies characteristically do not embody or foster such skills. Providing marketing support is an important area of assistance by external agencies, but because commercial opportunities are rarely static, marketing support is an ongoing need. However, fisheries departments and NGOs are simply not set up to provide such assistance in perpetuity. The same could be said for livelihood diversification activities that require long-term subsidies. On the other hand, agencies that focus on performing the role of "honest broker" between communities and commercial businesses seem to enjoy a higher degree of success. This appears to be the case for seaweed farming in Solomon Islands and live rock culture in Fiji. The reason could be that the type of agencies that promote livelihood diversification are reasonably capable of performing the vital role of moderating expectations and performance between communities and businesses.

The good, bad and ugly of subsidies in livelihood diversification. Many of the interventions of external agencies are outright grants or something that inherently subsidizes the concerned activity, such as free marketing services. Ideally, the subsidies would:

- 1) Only be required to catalyse a process that would subsequently become feasible or stand-alone (e.g., boatbuilding where it is promoted for livelihood diversification), or
- 2) Demonstrate something that, once observed by the target audience, would be adopted (aquaculture in most places where it is promoted for livelihood diversification), or
- 3) Be provided by a donor with substantial financial resources and ability to provide a very long-term commitment. (see box text below)

The reality is that most livelihood diversification projects that were intended to be “kick started” with a subsidy (#1 and

#2 above), have been discontinued when the subsidy was withdrawn. Reasons for this could include elevated financial expectations, the fact that obtaining the subsidy becomes the primary reason for involvement in the livelihood diversification activity (getting a free boat), a feeling of being disadvantaged or cheated in starting an activity without a subsidy when others previously have had one, and a lack of a clear exit strategy. Livelihood diversification projects that involve long-term subsidies suffer from the lack of donors with such generosity. The box text below describes one project apparently predicated on perpetual support that was not forthcoming.

Getting over the “fisheries management hump”. There is often mention in the Pacific Islands of the needs associated with the temporary impacts of fisheries management initiatives. King and Fa’asili (1998) describe this situation and indicate that alternative seafood and income sources are needed to compensate for short-term

losses of income or fish when establishing marine protected areas (MPAs) and other management schemes until the protected stocks recover to higher levels of abundance or productivity and can be exploited again. There are many considerations associated with both the existence and magnitude of such a “fisheries management hump”, many of which relate to what position on the catch curve an exploited fishing area is located (Tim Adams, SPC Director, Marine Resources Division, pers. comm.). The prevailing hypothesis upon which many of the region’s MPAs are based is that short-term losses will be compensated by long-term production gains. Assuming this to be true, an important point should be made: the few positive examples of livelihood diversification as a management tool, both in marine and terrestrial areas, suggest that achieving success takes a considerable amount of time, while the need for overcoming management-induced hardship is immediate. The incompatibility of the two time frames could

Reliance on long-term subsidies*

In 1997, an environmental NGO decided to proceed with the construction and operation of a rural fishing centre (RFC) in Waghena, a village close to the Arnavon Islands Marine Conservation Area (AMCA) in the Solomon Islands. The RFC was established with the support of the NGO, and was modelled on those being promoted at the time by the European Union's Rural Fishing Enterprise Project. The difference in this case was that the RFC had the express goal of providing income opportunities that would allow local residents to forego harvesting threatened species from the AMCA. These species included hawksbill turtles, megapodes, and sedentary marine resources such as pearl shell, trochus and beche-de-mer. As well as establishing the RFC, the NGO had already supported the establishment of community-based management (CBM) arrangements for the AMCA, and the two initiatives were seen as being inter-linked. In addition to providing alternative income for the resource users of the area, it was hoped that profits produced by the RFC could support the cost of community patrols and other CBM activities. Unfortunately, the technical and economic feasibility of the RFC was dubious from the start. An independent pre-project assessment advised that the RFC would not be financially sustainable as designed without a permanent subsidy from the NGO (Preston 1996). The local representative of the NGO at the time stated that the organisation would indeed be willing to provide a subsidy in perpetuity in order to achieve its conservation goals in the area, but this was apparently a personal view and not the NGO's official position. The RFC ceased to operate after several years of subsidised operation, and there is little evidence to indicate that the activities of the centre contributed anything to conserving the marine resources of the AMCA.

* See Leisher et al. 2007 and van Beukering et al. 2007 for an alternative interpretation of community assessment of the value and effectiveness of the Arnavon Islands Marine Conservation Area.

therefore explain at least some of the difficulties of using livelihood diversification as a management mitigation measure.

Business skills. It is common knowledge that the general level of business skills in rural Pacific Island communities is quite low; this is understandable given the largely subsistence nature of the economy over much of the region and the egalitarian qualities of many of the cultures. In this context, in the promotion of livelihood diversification that depends on business skills, there is no “magic solution”, but rather the road to success must start by the development of basic financial literacy. This is a long and complex process that could easily overwhelm an initiative focussing on the fairly narrow subject of using livelihood diversification as a marine resource management tool. Accordingly, this could be another explanation for the high failure rate of such projects. Conversely, it could also be a factor in the success of those projects that remove village-level participants from business complexities, such as arrangements for passive leasing of lagoons for aquaculture or having an “honest broker” for interfacing with commercial firms.

Village selection. The process of selecting sites for livelihood diversification for resource management seems to have a considerable effect on subsequent success. In many programmes, sites have been selected due to a need that is perceived important by outside agencies (e.g. high biodiversity value, or the protection of aggregations of threatened species) or after “selling” the project to residents, while in others (e.g. the PNG Coastal Fisheries Management and Development Project and the AusAID/Samoa Fisheries Project) villages were made aware of management efforts, including livelihood diversification activities, and could apply to be part of the

project. The latter method, although not the most common, seems to be more successful at identifying communities with a real interest in resource management, rather than those whose primary interests are the fringe benefits.

Other items on the agenda.

Some supposed uses of livelihood diversification as a management tool are simply not genuine, and were never really intended to relieve pressure on inshore resources. Included in this category are measures to temporarily mollify vocal communities when harsh measures are put into place (e.g. a livelihood diversification project to muffle dissent after a total ban on a particular species), words inserted into a proposal to a donor to add extra appeal (often for aquaculture projects: “...in addition, it will relieve pressure...”), and as justification for distributing goods prior to an election (e.g. materials conceivably related to seaweed farming). In the extreme, several of the allegations of corruption associated with fisheries in the region have involved fiddling with items related to supposed livelihood diversification (e.g. free or subsidised boats and engines), hence a sinister incentive for formulating or accepting such programmes. All of these dubious uses have detracted from the performance record of livelihood diversification as a management tool.

LESSONS LEARNED IN THE PACIFIC ISLANDS

In the use of livelihood diversification for resource management in the Pacific Islands region, past experience points to some important overall conclusions. These include:

- Agencies promoting livelihood diversification that focus on performing the role of “honest broker” between communities and commercial interests seem to be the most successful.

- Businesses are generally better than fisheries departments or NGOs at identifying and/or developing opportunities, but often have difficulties in spreading benefits and in community relations, hence the need for somebody to smooth the interface between business and community.
- It seems to be more effective for an agency to identify and work with an empathetic businessman than to attempt to drag communities into the complexities of the business world.
- The rare livelihood diversification initiative that is successful requires a long time to achieve profitability and the eventual profits are characteristically modest rather than spectacular.
- Although most subsidies are intended to only catalyse a livelihood diversification activity, their withdrawal most often leads the demise of the concerned activity. The effective subsidy exit strategy is rare.
- Expectations of the target community often grow to unrealistic levels, leading to disenchantment when such benefits are not attained.
- Boats and boatbuilding activities for livelihood diversification often “backfire” and results in even greater inshore fishing pressure.
- Most livelihood diversification interventions have not been properly evaluated to determine their effectiveness at reducing fishing pressure as intended, but this aspect should be essential.
- In reviewing past failed livelihood diversification initiatives, there appears to have been a lack of consider-

ation given to other management measures to reach the desired objective.

Perhaps the most important lesson learned about livelihood diversification in the Pacific Islands is that its performance has not been to the level where it can be considered an effective resource management tool. In many cases, livelihood diversification could even be a distraction that deters communities from gaining an awareness of the need for, and benefits of, more effective forms of marine resource management.

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