

# ECONOMIC INCENTIVES IN MARINE CONSERVATION

## CHAPTER 1: INTRODUCTION

Inadequate protection and management of marine resources has profound consequences: the oceans house both essential species and critical ecological processes, and provide a vital source of food and livelihoods for large numbers of people, including the world's poorest. Despite this importance, marine species and habitats are increasingly endangered and fisheries are collapsing around the world.

Marine Management Areas (MMAs) are a key element of global strategy to reverse these trends, as strategically located and well-designed MMAs protect biodiversity and enhance resource yields (Gell and Roberts 2003, Halpern and Warner 2003, Russ et al. 2004, Sale et al. 2005). A comprehensive global MMA system would be economically rational given that it could be supported fully by financial resources saved by eliminating perverse subsidies to industrial fisheries (estimated at \$15-30 billion per year). Doing so would create more employment than supported by these subsidies and enhance the sustainability of global fisheries (Balmford et al. 2004, Milazzo 1998, Deere 2000, Myers and Kent 2001, Viridin and Schorr 2001). Nevertheless, marine protected areas currently cover only 1% of the oceans and in many cases management leaves considerable room for improvement, often due to inadequate funding (Balmford et al. 2004; Gravestock et al. 2008). If creation and effective management of a comprehensive global system of MMAs offers such substantial ecological and economic advantages, the challenge is to explain why this system has yet to materialize.

### **Box 1.1: What are Marine Managed Areas?**

MMAs are multi-use zoning schemes for marine areas that typically encompass several types of sub-areas, such as no-take areas (e.g., no fishing, mining) or buffer zones with particular restrictions (e.g., no oil drilling). MMAs can take many forms to address a wide range of issues and objectives. Some MMAs involve areas where multiple uses (e.g., fishing, tourism) are allowed under specific circumstances. Others involve areas where no extractive human uses are allowed (e.g., fishing, mining, drilling). Still others dedicate certain areas to one specific use (e.g., local fishing) that is judged to be the most beneficial use of that area, to the exclusion of others. The term 'Marine Managed Areas' often is used interchangeably with 'Marine Protected Areas' or even 'Marine Parks' because they refer to geographically defined areas; however, MMAs are distinct in that they are established for multiple-use management.

#### **[END BOX 1.1]**

A large part of the answer relates to distribution of costs and benefits of conservation. Many benefits are non-market values that accrue to people far removed from resource owners and users. For example, people around the world may value the fact that leatherback turtles exist, even if they never see one themselves. In contrast, the costs largely fall on coastal communities, and are immediate and tangible through lost incomes and foregone consumption of marine resources. Although global benefits from conservation may outweigh gains from destructive practices, at the level of resource users the benefits from unsustainable use often exceed those from sustainable management (Balmford et al 2002). As a consequence of these misaligned incentives, sustainable management in many contexts is either economically unattractive or unaffordable for local decision-makers, particularly in the short-term.

The challenge of making conservation economically attractive is a critical hurdle for creation and effective management of MMAs. This challenge relates to constructing economic alternatives that

make foregoing income from unsustainable resource-use a viable and preferred option for decision makers. In other words, resource users need to see tangible rewards from changing behavior if sustainable management and conservation of marine biodiversity is to be achieved.

This research effort is motivated by the proposition that changes in unsustainable behavior will require interventions that enhance the economic appeal of other resource-use options, and examines what kinds of site-based interventions show the greatest promise for doing so. Using a global set of case studies, the analysis that follows examines the ways in which different interventions result in incentives to change resource use. Although marine conservation and MMAs face a wide array of challenges beyond those discussed here, if incentives are misaligned at the local level then efforts to address other challenges are far less likely to succeed.

Conservation practitioners increasingly are turning to incentive-based approaches to encourage local resource users to change behaviors that impact biodiversity and natural habitat (Ferraro 2001; Ferraro and Kiss 2002; Milne and Niesten 2009; Simpson and Sedjo 1996; Troeng and Drews 2004; Wunder 2007, 2008). Although past approaches have employed fines and penalties (negative incentives), some current approaches use compensation of various forms (positive incentives) to encourage particular conservation practices. These approaches recognize that conservation can impose a loss in terms of foregone income or access to resources (opportunity cost). Since people face pressing socio-economic needs in many priority areas for conservation, such potential losses can hamper the acceptance and sustainability of conservation interventions. Put simply, unless conservation programs address economic needs, local resource users will be compelled to make choices that generate short-term economic returns regardless of destructive impacts.

### **Box 1.2: What is opportunity cost?**

The opportunity cost of conservation is what is given up by choosing conservation versus other uses of resources. It includes the cost of undertaking the conservation actions (e.g. program administration, wages for patrolling activities), as well as the value of foregone resource use (e.g. loss of income from harvesting turtle eggs). This second component, the opportunity cost of conservation to resource users, acknowledges that changes in resource-use patterns may come at a cost, and any intervention must consider how and by whom that cost will be addressed.

The opportunity cost of conservation to resource users is measured as the net benefits (benefits minus costs) that would be received under the next best alternative. For example, when establishing a no-take zone in an area, the opportunity cost to consider is the net benefit that could be generated by fishing in that area. Although the net benefit of fishing usually denotes revenues minus harvest costs, benefits can also include other components such as cultural role of fishing activities. These are more difficult to measure, but technically speaking, should be included. Estimating the benefits that will be foregone by shifting to different resource uses permits explicit examination of offsetting incentives required to elicit this behavioral change.

**[END BOX 1.2]**

### **Purpose of the Study**

The aim of this study is to provide guidance for conservation practitioners and policy makers with respect to selecting and deploying incentive-based tools. The role of incentives in conservation efforts is receiving increased recognition, but there are many different ways that projects can incorporate incentives. Cash compensation to desist from dynamite fishing is a very direct incentive. An example of an indirect incentive is training someone to be a dive guide, with the

expectation that they then will be less inclined to overharvest. This analysis examines incentives using case studies that represent features of the following approaches:

1. *Buyouts*: Conservation investors purchase resource rights or equipment with the intention of retiring them, thereby reducing the overall level of effort applied to harvesting. Compensation to resource owners or users is typically in the form of an up-front, one-time cash payment, followed by government enforcement to prevent illegal activities.
2. *Conservation agreements*: Conservation investors negotiate contracts by which resource-users forego unsustainable activities in exchange for benefits that are conditional on conservation performance. Benefits may be in the form of cash, services, or goods, and are provided periodically upon verifying that conservation performance targets are met.
3. *Alternative livelihoods*: Conservation investors establish livelihood activities to replace unsustainable activities by resource-users. Income or harvest for own consumption may be derived from entirely new economic activities or revised forms of previous activities. When income is sought through enterprises, benefits depend on market profitability. Whether or not these enterprises are resource-based, benefits typically are not contingent on conservation performance *per se*.

**INSERT THREE EXAMPLES (Morro Bay, Laguna San Ignacio, Kubulau) FROM BROCHURE PAGE 3 SOMEWHERE AROUND HERE TO ACCOMPANY THE THREE APPROACH DESCRIPTIONS ABOVE.**

Project characteristics in the case studies vary widely and many projects share features of multiple approaches. Nevertheless, basic project design does allow for differentiation. One important design difference lies in financing strategy: typical buyouts involve a one-time, up-front cost, whereas conservation agreements explicitly require long-term external financing and alternative livelihoods are intended to become self-financing. Another important distinction arises in the way in which benefits are structured to create incentives. In a buyout, benefits compensate for reduced harvest capacity, and enforcement is required to maintain the behavior change. Under a conservation agreement, benefits are provided only if behavior changes. An alternative livelihood project results in benefits when the livelihood becomes economically viable.

### **Research Methodology**

The methodology for this research involved gathering information on case studies representing the three approaches listed above. The interventions in the majority of cases are implemented in conjunction with MMAs. However, we did not restrict the cases specifically to MMAs as this would exclude some informative marine conservation sites from the sample (particularly those involving species rather than habitat protection). The paucity of available data required primary data collection. Indeed, the research confirmed that most projects do not consistently collect the types of data and information required for rigorous quantitative analysis of individual project effectiveness, let alone cross-comparisons among projects. Therefore the study relies on qualitative analysis.

Key informants helped compile a large set of suggested candidate projects for inclusion in the study. Constrained to a sample size of about 25 cases, random selection from all possible sites would not yield an adequately representative sample. Therefore, to ensure broad geographical representation we constructed a purposive sample that includes examples of each approach in a

wide variety of settings. The purposive sample also sought to include effective representation of best-practices of each approach (see Table 1.1 below).

A template was designed to facilitate equivalent data collection for each site (see Appendix A). The information collected includes a detailed characterization of the project: location, stakeholders, conservation objective, principal threats, intervention model, budget, duration, etc. Project implementers and other key informants including community representatives were interviewed to document each project; project implementers were invited to comment on the draft case studies. The case studies were then analyzed as a collection of project experiences.

*Table 1.1: List of case-study sites included in the research sample*

	<b>Buyout</b>	<b>Conservation Agreement</b>	<b>Alternative Livelihood</b>
<i>Belize</i>		Maya Mountain Marine Corridor scholarships	Port Honduras Marine Reserve alternative livelihood training (ALT)
<i>Ecuador</i>		Galera-San Francisco Marine Reserve	
<i>Federated States of Micronesia</i>			Pohnpei sponge and coral farming
<i>Fiji</i>		Navini Island Resort lease	Kubulau dive tag fees, Waitabu
<i>Indonesia</i>		Misool Eco Resort lease and Jamursba Medi scholarships	Ayau piggery
<i>Kiribati</i>	Phoenix Islands Protected Area fisheries license revenue offset		
<i>Mexico</i>	Northern Gulf of California gillnet permit buyout	Laguna San Ignacio community development fund	Punta Abreojos cooperative and MSC certification
<i>Palau</i>		Helen Reef	
<i>Philippines</i>			Gilutongan Marine Sanctuary tourism revenue sharing, Cagayancillo tourism entry fee
<i>St. Croix, USVI</i>	St. Croix gill and trammel net buyout		East End Marine Park interpretive ranger and commercial captain training
<i>Solomon Islands</i>		Tetepare and Rendova incentive payments and scholarships, Olive health clinic	Baraulu sewing
<i>Sri Lanka</i>			Bar Reef Sustainable Livelihoods Enhancement and Diversification
<i>Tanzania</i>	Mafia Island Marine Park gear replacement	Mafia Island incentive payments	
<i>USA</i>	Morro Bay trawl		

	permit and vessel buyout, Palmyra island purchase		
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### Remainder of this Document

Chapter 2 presents the three economic incentive approaches used to characterize the case studies, and additional information on the case study sample. Observations gleaned from the case study analysis are presented in the form of design guidance in Chapter 3. The case studies are incorporated into this document as brief summaries. Syntheses of the case studies are available as a companion volume; the complete case studies will be made available online at [XXXXX](#).

# ECONOMIC INCENTIVES IN MARINE CONSERVATION

## CHAPTER 2: THREE APPROACHES TO SHAPING INCENTIVES

Economic incentives differ in the way that they affect resource use. The previous chapter introduced three approaches to providing economic incentives to conserve natural resources: buyouts, conservation agreements, and alternative livelihoods. This chapter discusses how these tools are used by conservation investors (e.g., non-government organizations, government, private sector) to engage resource users (e.g., local residents, fishermen, developers).

### 2.1 BUYOUTS

Buyouts comprise the most direct approach with respect to incentives, involving a complete transfer of property or user rights. In a typical buyout, the conservation implementer acquires resource rights or equipment for the purpose of retiring them from use. Doing so reduces the level of harvesting effort, and thereby reduces pressure on the resource base. A buyout can take several forms:

- Purchase and retirement of fishing permits, quotas, or licenses to reduce effort.
- Purchase of vessels or gear to reduce effort or change harvesting methods.
- Purchase of an area and the accompanying resource rights. (See Box X: Palmyra)

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Buyouts will only reduce harvest effort if the reduction is not readily replaced by either existing resource users or new entrants, which means that total effort or harvest level must be effectively regulated (Clark et al. 2005, 2007). In a pure buyout, compensation to resource owners or users typically is in the form of an up-front, one-time cash payment. Following the transaction, prevention of violations primarily depends on government enforcement.

Most examples of buyouts are motivated by objectives related to industry profitability or commercial stock management, rather than bycatch reduction or biodiversity conservation. However, buyouts increasingly are being implemented for other goals such as protecting ecosystems and endangered species, reducing bycatch, and conserving biodiversity in general (Curtis and Squires 2007). The buyout cases analyzed in this study are described in Table 2.1.

Although the buyout approach in principle is based on a one-time payment, half of the case studies include ongoing incentives beyond the initial transaction. In the Phoenix Islands Protected Area (PIPA), the buyout approach is adapted to conform to the national system of annual access agreements for fishing fleets, such that a trust fund will yield annual payments in return for enforcement of no-take zones. In the Northern Gulf of California, ongoing investment in alternative livelihood efforts – in tourism and alternative fishing methods – is needed to sustain the original buyout. A buyout can be used as a stopgap measure while developing alternative fishing gears. In the Northern Gulf of California, many fishermen are not willing to enter a buyout if it will entail permanently giving up the option to fish. The area offers little immediate potential for alternative livelihoods, particularly in one of the towns where there are limited tourism opportunities. Developing alternatives will take considerable time, but the threat to the

vaquita population is extremely urgent. Therefore the strategy chosen was to offer temporary compensation for not fishing inside the refuge (which does not require relinquishing a permit), while collaborating to develop new fishing equipment that reduces the risk of vaquita bycatch. Similarly, in Morro Bay The Nature Conservancy (TNC) continues to work with the fishing sector to explore alternative harvest technologies and new markets for sustainably caught fish. Thus, one component of the appeal of buyouts – the apparent simplicity of a one-time transaction as opposed to long-term engagement – is less common in practice when the approach is applied to conservation objectives. Nevertheless, the basic proposition of acquiring rights or equipment to reduce extraction pressure offers a powerful direct incentive for resource users.

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A buyout may require substantial upfront funds for a one-time payment. Declining economic profitability as in the Morro Bay trawl fishery can lower opportunity cost and make a buyout more financially feasible. However, the conditions needed for a buyout to succeed (i.e. a limited-entry fishery with reliable enforcement) typically are most likely to hold in more developed areas that also tend to exhibit higher costs, therefore buyouts are unlikely to be cheap investments. The advantage of implementing buyouts in more developed areas is that institutions for fisheries management and enforcement tend to be stronger. In contrast, buyouts in developing countries may be less costly, but management and enforcement provisions may not be robust enough to guarantee that conservation investors get what they pay for.

The buyout approach offers a direct response to the problem of excess harvesting pressure. However, implementation of a buyout can involve a number of challenges, ranging from high financing requirements as in the PIPA example, difficult social and political conditions as in the Northern Gulf of California example, or complex legal and bureaucratic requirements as in the Morro Bay example. A recurring theme is that in many contexts simply removing fishing capacity through a one-time transaction will not be enough; local stakeholders demand assistance in pursuing alternatives, whether that be in new economic activities or continuation of fishing activity but with different gear or practices. This means that buyout initiatives often will share significant overlap with conservation agreements and alternative livelihoods approaches.

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### **Box 2.1: Further Guidance on Design of Buyout Programs**

Countries such as the United States, Canada, Australia, and New Zealand have long experience with vessel and license buyouts as a fisheries management tool. These measures have been used to address excess fishing capacity, overexploitation of fish stocks, and distributional issues. In *Fisheries Buybacks*, Curtis and Squires (2007) review global experience with vessel and license buyouts, and note that these programs can be expected to increasingly include a fourth major objective, namely conservation of ecosystems and biodiversity.

The single-most important condition for effective buyouts is limited entry, which requires effective registration of licenses and vessels to form a well-defined group of participants, and well-defined boundaries of the fishery. The program must be accompanied by a mechanism to prevent new entry, re-entry, or other investments that reintroduce harvest pressures. Buyouts can be counterproductive if participants use funds to purchase upgraded equipment, or if new participants can enter the fishery as profitability increases. Therefore buyout programs may include restrictions on reinvestment of funds received by participants and on reuse of the

purchased vessel, gear or license; indeed, many buyouts require that purchased vessels be scrapped to ensure permanent retirement of excess harvest capacity.

Design of buyout initiatives must pay particular attention to clearly defining the scope of the program. For instance, should the program purchase licenses or vessels and gear, or some combination? How will the buyout price be determined? Will the program consist of a single round or multiple rounds of transactions? When moving beyond target fish stock management to pursue conservation objectives, programs may purchase vessels and licenses or pay fishers to change fishing practices (e.g. restricting location or time of harvest, or defining permissible gear). The program also must decide whether it will focus on full-time or part-time (latent) vessels. Purchasing inactive vessels or permits may be cheaper, but have less impact on overall fishing effort. Indeed, a poorly designed buyout may result in exit by only the least efficient, less profitable vessels, or fishers that were already planning to retire, again undermining the objective of reducing harvest pressure.

Financing buyouts typically involves some combination of industry, government, and NGO support, depending on the extent of benefits to industry and to the public. However, although vessel and permit owners are likely to benefit from a buyout, crewmembers often do not. The potential decrease in employment may require investment in retraining or business grants to facilitate a transition to new economic activities.

*For further discussion of specific design considerations and review of practical experiences in buyout programs, see: Curtis, R. and D. Squires. 2007. Fisheries Buybacks. Oxford: Blackwell Publishing.*

**[END BOX 2.1]**

## **2.2 CONSERVATION AGREEMENTS**

Conservation agreements offer direct economic benefits to resource users in exchange for changes in resource-use practices. A distinction between this approach and buyouts or alternative livelihoods is that it explicitly provides ongoing delivery of benefits from external sources. A key feature of conservation agreements is that benefits are conditional on conservation performance, thus requiring effective monitoring. Components of a conservation agreement include:

- *Parties and their rights and responsibilities:* an agreement typically involves two principal parties – the resource users who agree to collaborate in conservation and forego destructive practices, and the investor who agrees to provide compensatory benefits. An agreement may incorporate other parties, for example by defining the role of government agencies or other partners in monitoring activities.
- *Conservation commitments:* an agreement stipulates prohibited and required activities that will be the responsibility of the resource users, designed to advance conservation objectives. Examples include observing no-take zones, ending certain practices such as dynamite fishing, conducting patrols to deter poachers, etc.
- *Benefits:* in return for conservation actions from resource users, the conservation investor agrees to supply a defined benefit package. The value of benefits should be commensurate with opportunity costs—the value of foregone resource use (e.g. reduced fish yields from not using destructive gear) and the cost of conservation actions (e.g. wages for patrolling activities). Benefit packages can include cash payments, but usually consist of investments in social goods such as scholarships or community development funds.

- *Sanctions for non-compliance*: benefits are provided in return for adherence to conservation commitments. If commitments are not met, benefits must be adjusted; a thorough agreement will define how benefits are affected by particular types of infractions. Typically, reductions in benefits will be temporary to allow an opportunity to improve compliance and restore the full benefit package.
- *Performance monitoring protocol*: given that benefits are contingent on performance, compliance with conservation commitments must be monitored to justify continued benefit delivery. This means that commitments must be defined in a way that is amenable to monitoring, and the parties to the agreement must agree to compliance standards and means of measuring performance with respect to those standards.

Table 2.2 lists the conservation agreement cases in the study. Though rooted in the basic concept of a direct quid-pro-quo of benefits in return for conservation commitments, each agreement is tailored to a specific context in which cultural, economic, biological, legal, and institutional factors all shape benefit packages, conservation commitments, and implementation details. Some cases, though designed as quid-pro-quos to provide direct incentives as per the conservation agreement approach, do not feature all the components of a comprehensive agreement. For instance, several lack formal performance monitoring or sanctions for non-compliance. Provisions for monitoring and the types of conservation actions/non-actions required of resource users vary widely. In most agreements, resource owners commit to establishing and respecting an MMA in some form. In some cases the MMA is legally designated, in others it is an agreement to observe management rules within a defined area without formal protected status.

Long-term financing is a common challenge for conservation agreement projects. The Laguna San Ignacio easement is supported by an endowed fund. In the Misool Eco Resort case sustainability is ensured by the presence of a private enterprise with a long-term stake in the success of the agreement. However, the other cases remain dependent on short-term grant cycles, affecting both the reliability of the benefit stream and the ability of implementers to execute project management and monitoring roles.

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The conservation agreement approach has met with some resistance from skeptical conservationists, often due to incomplete understanding of how agreements can be adapted to different contexts. For example, there are concerns about an influx of cash into a small, remote community, but benefit packages can comprise in-kind benefits or funds for community development, as in the Tetepare and Rendova examples. Another misunderstanding is the impression that local stakeholders lose their resource rights. However, under most conservation agreements stakeholders retain their rights and simply agree to exercise these rights in particular ways; should the agreement become unacceptable to resource owners, they usually can withdraw from the arrangement and dispose of their resources as they see fit.<sup>1</sup> The conservation agreement case studies suggest that the basic proposition of providing benefits in return for conservation commitments resonates with resource users in many settings around the world.

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□ A notable exception is Laguna San Ignacio, where the community has signed an agreement in perpetuity.

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### **Box 2.2: Further Guidance on Design of Conservation Agreement Projects**

The Nature Conservancy (TNC) and Conservation International (CI) have developed a Practitioner’s Field Guide for conservation agreements in marine contexts, drawing on the collective field experience of many different organizations. The manual describes a step-by-step process in four phases, from initial scoping of potential for the approach in a given site to on-the-ground implementation. The Guide itself is complemented by additional resources available online at [www.mcatoolkit.org](http://www.mcatoolkit.org). The process described in the Guide is applicable to a wide variety of agreement types, ranging from formal leases and contracts that rely on legal frameworks to informal arrangements that rely on non-legally binding covenants between implementers and resource owners. Similarly, the process is applicable whether the conservation agreement targets specific areas, harvesting methods, resource access, or any other proposed behavior change with respect to resource use.

The four phases consist of feasibility analysis, engagement, agreement design, and implementation. Of the several elements to be considered in the feasibility analysis, among the most important is the presence of a clear agreement counterpart (individuals, community, management entity, etc.) who is in a position to make concrete commitments and undertake actions that advance conservation objectives in return for specified benefits. The purpose of the engagement phase is to reach a shared understanding between the implementer and the resource users with respect to the conservation agreement approach. This encompasses understanding of the motivations for conservation, the actions required, the implications of changes in resource use, and, critically, the fact that benefits are contingent on verified compliance with agreement terms. Once all stakeholders fully comprehend and consent to the conservation agreement model, the agreement design phase can proceed. To design the agreement, the implementer and resource users work toward mutually agreeable terms on specific actions, compensatory benefits and performance metrics, as well as consequences of non-compliance.

The implementation phase can begin after the conservation agreement terms have been finalized. Implementation will include many different elements, but one of the most critical activities for the conservation agreement approach is monitoring to verify that the parties to the agreement are fulfilling their commitments. This compliance monitoring typically will be accompanied by other monitoring efforts that measure both biological and socio-economic impacts of the conservation agreement.

*For detailed guidance on designing and implementing conservation agreements, see: The Nature Conservancy & Conservation International. 2009. Practitioner’s Field Guide for Marine Conservation Agreements. Final V1. Washington D.C. 74 pp.*

**[END BOX 2.2]**

### **2.3 ALTERNATIVE LIVELIHOODS**

The alternative livelihoods approach provides incentives to resource users by developing new income-generating options. Alternative livelihood support typically is not linked directly to conservation performance. Rather, the new options are designed to result in conservation as people pursue activities that are more profitable than unsustainable resource use. Alternative livelihood interventions can take three forms:

1. *Transform existing resource extraction to sustainable use.* Many projects in this category involve working with fishermen to adopt management practices such as rationalizing harvest levels or establishing no-take zones to enhance resilience of the resource base. Thus, improved prospects for continued extraction serve as the incentive for resource users.
2. *Encourage new commercial activities that do not involve harvesting but rely on ecosystem quality.* For example, ecotourism requires intact ecosystems and abundance of species. The incentive for conservation derives from the fact that ecosystem health sustains the provision of environmental goods or services essential to the non-consumptive income-generating activity.
3. *Pursue new activities that are not or only peripherally related to the ecosystem.* The intention is to reduce dependence on marine resources, as in a project that encourages fishermen to become farmers or livestock keepers. Income from non-marine activities serves as the incentive to cease exploiting the resource of conservation interest.

Making reduced resource pressure a viable option for local users by providing alternative income options has great intuitive appeal. Consequently, it is no surprise that this basic logic underlies many conservation interventions. Indeed, several cases examined in this study suggest that acceptance of buyouts often requires adding alternative livelihoods to overall project design (for example, see Box X: NORTHERN GULF OF CALIFORNIA BUYOUT). However, under the alternative livelihoods approach, support for new activities is not positioned explicitly as compensation for displacing destructive activity. The alternative livelihood cases examined in this study are described in Table 2.3.

The opportunity cost of conservation tends to be low in the alternative livelihood cases, which might be expected given that high opportunity cost could present an insurmountable hurdle to finding competitive alternatives. Although the benefit level needed to overcome opportunity cost may be low, alternative livelihood programs also incur costs of providing continued technical assistance to overcome capacity gaps; thus, the approach can entail an expensive long-term commitment. In the cases studied, one-time investments in Baraulu and St. Croix did little to impact livelihoods or reduce pressure on resources. The projects in the Philippines opted for longer-term investments, but reduced the need for external funding by using tourism revenue and by issuing loans rather than grants.

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Community members are unlikely to benefit equally from alternative livelihood projects, according to the cases in this study. Successful projects typically include prominent roles for individuals with particular aptitudes and skills, so there is a tendency for benefits to accrue to those who are already advantaged (IMM 2008, Walpole & Goodwin 2000, Wunder 2001). These people may then face strong social pressures that can undermine a project. Such dynamics were seen in the Baraulu sewing project, where disputes and jealousies led to lack of cooperation, poaching, and project disintegration. Thus, social expectations with respect to distribution of benefits can pose a challenge for alternative livelihood projects. In Pohnpei, project implementers have avoided these problems by working directly with individuals who wish to set up their own sponge or coral farm, and extending this opportunity to all community members. The alternative livelihoods approach is attractive because it directly addresses development needs of resource users, recognizing that destructive practices will not change unless income can be generated through different means.

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### **Box 2.3: Further Guidance on Design of Alternative Livelihood Projects**

The key to a successful alternative livelihood project is taking the time to conduct an extensive, participatory process with community members to identify aspirations and capacities. Such a process is described in detail in IMM (2008) - *Sustainable Livelihood Enhancement and Diversification – SLED: A Manual for Practitioners*. This step-by-step guide also emphasizes the importance of rigorous analysis to ensure that alternative livelihood investments are tailored to realistic market conditions and opportunities. Self-evident as these two considerations may seem, they all too often are insufficiently incorporated into livelihood initiatives.

The SLED process encompasses three major phases – Discovery, Direction, and Doing – each of which entails several specific steps. The Discovery phase generates the information needed by the implementer to facilitate community livelihood development visioning. These visions must be grounded in the skills, capacities, and aspirations of the community, and must reflect consensus on the need to change existing livelihood strategies and resource use. During the Direction phase, the implementer supports community efforts to identify and evaluate ways to achieve their livelihood development visions. This is when specific alternatives are explored. Finally, in the Doing phase the implementer builds community capacity and facilitates market access by helping the community cultivate links to government, civil society actors, and the private sector.

IMM (2008) describes this process as one that empowers communities to adapt to change – including changes in management regimes over marine resources. Therefore successful SLED engagement results in benefits beyond the immediate rewards of new livelihoods to encompass social resilience. Although specific vocational skills related to a new livelihood are important, additional value results from enhancing skills related to identifying strengths and opportunities, and building networks that facilitate community responses to those opportunities.

*For further discussion of the SLED livelihood development process and review of practical experiences in alternative livelihood projects, see: IMM 2008. Sustainable Livelihood Enhancement and Diversification – SLED: A Manual for Practitioners. IUCN, International Union for the Conservation of Nature.*

**[END BOX 2.3]**

To choose sustainable management and conservation of marine biodiversity and natural habitat, resource users and decision makers need to see tangible rewards for changing resource use behaviors. The incentive-based conservation approaches discussed in this chapter all recognize that potential loss of income and access to resources must be offset. The next chapter discusses various ways in which project design must consider links between incentives and behavior to draw on strengths of each approach.

**Table 2.1: Summary of Buyout Case Studies**

Site	Year	Purpose	Incentive	Number of permits, vessels, or gear purchased	Total amount of compensation
Mafia Island Marine Park gear replacement	2002	Curb the use of destructive gear to diminish ecosystem degradation	Fishermen are compensated for turning in destructive small-mesh seine nets and issued interest-free loans to purchase new sustainable gear or pursue alternative livelihoods	Approximately 80% of small-mesh seine nets	\$4,413-13,239 per loan
Morro Bay trawl permit and vessel buyout	2006	Reduce trawling intensity off the California coast to reduce negative impact	Trawling permits were purchased from fishermen to compensate for declaring no-trawl zones. This intervention is moving towards an easement design as the licenses will be re-issued with restrictions rather than retired.	Six trawling permits, 4 trawling vessels	\$3,800,000

		s on habitat			
Northern Gulf of California gillnet permit buyout	2007, 2008	Reduce number of gillnets in the water, thus reducing vaquita bycatch	Gillnet permits were purchased or leased from fishermen to compensate for giving up fishing rights	804 fishers	\$16,600,000
Palmyra island purchase	2000	Establish conservation area to preclude destructive development	Outright purchase of private property by non-government organization, with financial support from foundations, private donors, and US government	1	\$30,000,000
Phoenix Islands Protected Area	Pending	Eliminate pressure from	Government is compensated for lost revenue from eliminating fishing from the area.	Not yet determined	Not yet determined

fisheries license revenue offset		comme rcial fishing by foreign fleets			
St. Croix gill and trammel net buyout	2008	Remov e gill and tramm el net gear to reduce impact s on benthic habitat, in particu lar corals	The most profitable gill and trammel net fishers received funds to partially offset losses from the ban on the gear.	9 fishers	\$55,000

**Table 2.2: Summary of Conservation Agreement Case Studies**

Site	Year	Purpose	Incentive	Benefits		In-kind	
				Cash		Individual	Group
				Individual	Group		
Galera-San Francisco Marine Reserve	Pending	Protect marine resources through MPA creation	Support for costs of MPA establishment and management, and institutional capacity building within community				
Helen Reef	Pending	Establish MPA with sustainable management and enforcement provisions	Endowed fund to cover management costs and support a community development fund				
Jamursba Medi scholarships	2005	Protect a turtle nesting beach and fringing forest	Scholarships provide incentives to villagers to declare and respect the no-take zone			X	

Laguna San Ignacio community development fund	2005	Protect grey whale habitat by prohibiting coastal development	Under a conservation easement, <i>ejido</i> members receive funds for community projects each year that they meet all the conditions under the agreement.	X	X		
Mafia Island incentive payments	2002	Protect leatherbacks and their eggs	Individual finders receive cash payments for allowing hatchlings to hatch from eggs	X			
Maya Mountain Marine Corridor scholarships	2003	Reduce unsustainable fishing practices in and around the Port Honduras Marine Reserve	Provide fishing households with economic support for children's education to encourage fishers to forego the use of gill nets and other unsustainable management practices			X	
Misool Eco Resort lease	2005	Protect reef habitat and species through a no-take zone	Agreement to provide incentives to the villagers in the form of employment and lease payments contingent on declaration and observance of the no take zone	X		X	
Navini Island Resort lease	1988	Protect coral reefs from fishing through a no-take zone	Agreement to provide lease payments to the landowner clan and community development benefits to the village in exchange for respecting the no-take zone		X		X
Olive health clinic	2003	Protect marine resources	Clinic built to compensate community for implementing no-take areas. No other ongoing economic benefits that are contingent on adherence to the MPA rules.				X
Rendova incentive payments	2002	Reduce poaching of leatherbacks or their eggs	Individual finders and the community development fund receive cash payments for allowing hatchlings to hatch from eggs	X	X		

Tetepare scholarships	2005	Protect forest and reef habitat through a no-take zone and other regulations	Scholarships to provide incentives for Tetepare descendents			X	
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**Table 2.3: Summary of Alternative Livelihood Case Studies**

<b>Site</b>	<b>Year</b>	<b>Purpose</b>	<b>Incentive</b>
Ayau piggery	2007	Reduce the consumption of sea turtles	Provide local villagers with an alternative protein source for feasts. Rather than attempting to provide an income generating activity (subsidizing production), this project subsidizes consumption of a local food. It thus does not require production, marketing, transportation, etc. (Type #3)
Bar Reef Sustainable Livelihoods Enhancement and Diversification	2007	Reduce pressure on marine resources	Divert labor from destructive activities to more benign ones (seaweed culture, sea bass farming, home garden improvement, PADI licensing, tilapia farming). (Type #2 and #3)
Baraulu sewing	1999	Reduce the harvest of shellfish	Compensate women for the closures through income from a sewing project. (Type #3)
Cagayancillo tourism entry fee	2003	Preserve the globally significant biological diversity and ecological processes of Tubbataha and manage it and the surrounding areas on a sustainable basis	Address the issue of lost fishing access to Tubbataha by implementing community-based livelihood projects (through a micro-credit facility) linked with sustainable resource management. (Type #2)
Gilutongan Marine Sanctuary tourism revenue sharing	1999	Conserve, protect and maintain the integrity of coastal and marine resources	Provide a portion of revenue from tourism operations to villages. Revenue is shared with households. The logic is that better protection (and less poaching) means more tourists will visit, and thus there will be more revenue to share. (Type #2)
Kubulau dive tag fees	2005	Protect the reef system from extractive use	Provide a portion of dive-tag fees to communities for development and tertiary scholarships. The logic is that better protection (and less poaching) means more tourists will visit, and thus there will be more revenue to share. (Type #2)

Pohnpei sponge and coral farming	2001	Sustainably improve the living condition of the most impoverished coastal communities in Micronesia through sustainable small-scale mariculture ventures, decrease the stress on traditional resources	Provide training, materials, and assistance to individuals for sponge and coral farming. The income from farming is expected to increase acceptance of the MPAs. (Type #3)
Port Honduras Marine Reserve alternative livelihood training (ALT)	2003	Reduce fishing effort in the area	Provide training within the community for alternatives through which fishermen can earn income (primarily ecotourism). (Type #2)
Punta Abrejos cooperative and MSC certification	2004	Sustain fisheries production	Members of the fishing cooperative decided against pursuing alternative incomes and instead focus on maintaining the viability of their traditional livelihood: fishing. The limited access offered to the cooperative in the form of a concession creates the incentive to manage it for long-term profitability. (Type #1)
St. Croix East End Marine Park interpretive ranger and commercial captain training	2006	Eliminate fishing in the STXEEMP	Provide suitable alternative livelihoods (park rangers and boat captains) for fishermen displaced by the creation of the East End Marine Park. (Type #2 and 3)
Waitabu Marine Park	2000	Preserve coral reefs to sustain village-based ecotourism	Provide cash income for community members through small-scale tourism. (Type #2)

## **CHAPTER 3: REFLECTIONS ON PROJECT DESIGN AND TOOL SELECTION**

The preceding chapter presented three incentive-based approaches for marine conservation. Ideally, one would like to answer the question of which approach is best, or assuming there is no unique intervention that works best in all settings, how should one design a project given the conditions of a site? These questions cannot reasonably be answered given that 1) the case study approach constrained the research to a small sample size, and 2) most projects do not collect adequate measures of biological and socioeconomic outcomes. Nevertheless, the various experiences surveyed do illustrate how these cases have met the challenges of designing incentives for conservation, and how they have performed in different settings. Indeed, despite the inability to support statistical analyses, these case studies offer a number of insights into how to choose the appropriate approach and how to successfully combine different features of the approaches to fit a particular context.

### **OPPORTUNITY COST**

*Advice: Why incentives? Project design must address the opportunity cost of conservation. Incentives should be targeted towards legitimate stakeholders whose behavior or resource-use decisions the project seeks to influence, as they face an opportunity cost of conservation. However, in many cases wider distribution of benefits will be more practical and equitable.*

With respect to project design, case studies of all three approaches demonstrate the importance of addressing the opportunity cost of conservation – offsetting potential loss of income and access to resources to ensure that local stakeholders are not forced to bear an undue economic burden – but strategies to do so can vary widely. Buyouts are predicated on the notion that fair compensation can be transferred in an upfront transaction. Conservation agreements seek to provide a stream of benefits over time that offset opportunity costs. Alternative livelihood projects strive to develop new economic options that replace reliance on unsustainable resource use.

When opportunity cost is high, alternative livelihoods will struggle to generate sufficient income to replace foregone resource use; this was seen in the Port Honduras case where local fishermen expressed the need to continue fishing despite the availability of alternative jobs linked to tourism and conservation. High opportunity cost also presents a challenge to more direct incentive strategies, as buyouts and conservation agreements will involve a substantial fundraising burden. If the opportunity cost is extremely high – for instance, if offshore oil resources are present – then incentive-based approaches may become unaffordable, necessitating other strategies centered on regulatory reform and policy advocacy.

**Insert Port Honduras ALT here**

Alternative livelihood approaches will be more feasible in low opportunity cost settings, but so are the other approaches. Low opportunity costs are favorable for buyouts and conservation agreements since opportunity cost forms the basis for determining compensation levels. Many conservation agreements are implemented in remote places where there are few alternatives and costs are generally low, as in the Melanesia cases. On the other hand, areas with high opportunity costs may be those in which a buyout or agreement is most needed to induce resource owners to embrace conservation, as in the case of Laguna San Ignacio.

In general, opportunity cost and resource dependence are correlated, though high dependence can accompany low opportunity cost, as in situations characterized by poverty and dependence on small-scale fishing. In these cases, offsetting forgone resource-use through a buyout or conservation agreement will be relatively affordable, even if there is a high dependence on the

activity. Nearly all of the cases examined featured low-medium opportunity cost and low-medium dependence.

Another design consideration is the distribution of opportunity cost, which reveals who should receive benefits from a conservation intervention. For example, in the Phoenix Islands, benefits are provided to the government to compensate for lost revenues from license fees. Further incentives may be needed to secure buy-in from additional stakeholders, and often also cover at least a portion of enforcement costs (technically also a component of the opportunity cost of conservation). This targeting must be balanced with the need to avoid the perception that those with ‘negative’ behavior are being rewarded. Buyouts are generally quite targeted, as compensation goes to those fishermen or boat owners who agree to give up their licenses or vessels. The alternative livelihoods approach often is promoted with the expectation that the community will benefit as a whole. Many conservation agreements include a fund for community-wide benefits. For example, at Navini Island, the landowner clan receives lease payments, and the villages also receive funds to support schools and community development projects. It often is easier and more equitable to provide benefits to the entire community rather than a subset, and this does not necessarily involve substantially higher costs.

**INSERT NAVINI ISLAND**

### **POSITIVE AND NEGATIVE INCENTIVES: BENEFITS AND ENFORCEMENT**

*Advice: Both positive incentives from any of the three approaches and negative incentives in the form of enforcing laws and regulations are necessary for conservation success—the sources of threats to the resource base determines the balance of incentives and enforcement in successful project design.*

Most sites include a formal protected area of some kind, as well as formal laws that support conservation beyond protected areas. For example, the turtle projects in Tanzania, the Solomon Islands and Indonesia are implemented in countries that prohibit harvesting of turtles and their eggs, but the sites are remote and rarely visited by enforcement officers. Thus, weak enforcement gives rise to the need for additional incentives. Nearly all the case studies involve providing a benefit to local resource users whose activities threaten biodiversity or resource sustainability. Some cases also face external pressure, such as fishers from other regions or countries who are active in the Phoenix Islands, Helen Reef, Cagayancillo and Galera. In the most remote case study sites, illegal foreign fishing operations pose the main threat. The capacity of local communities to deal with this large-scale threat is limited, so any approach must not only provide incentives for local resource users to change practices, but also assist them with enforcement. Several projects support community efforts to enforce conservation measures against outside threats, enhancing security of property rights while also providing employment opportunities. In general, more significant external threats imply a need for greater emphasis on enforcement, while local threats may be more responsive to incentives.

**INSERT GALERA HERE**

In buyout cases, government enforcement generally remains necessary, while compensation serves to achieve equitable reductions in capacity and thereby improve acceptance of conservation measures and strengthened regulation. The Northern Gulf of California case illustrates how initial reliance on regulation and enforcement failed to thwart the risk of extinction, and then the buyout was hoped to ease the enforcement burden; ultimately, a combined investment in the buyout and enforcement proved necessary. A fishery with limited access is necessary so that there is a bundle of legal interests that can be purchased, traded, or leased; these property rights must be enforced, otherwise conservation investors cannot be

assured that by acquiring these legal interests they will quantitatively reduce harvest pressure. To maintain the impacts of a buyout, enforcement is necessary to ensure that fishermen cannot re-enter the fishery and that new entrants are prevented. The case studies suggest that in the absence of reliable enforcement, buyout project design must become more elaborate to incorporate ongoing incentives.

Conservation agreements require the ability to monitor conservation performance (see below) and apply and enforce sanctions in the event of non-compliance. In some contracts, sanctions may simply take the form of withholding funds or reducing benefits by some prescribed amount. Losing eligibility for scholarship funds if caught poaching, as in Jamursba Medi or Belize, is an example. In these cases, government or third party enforcement is not essential. However, in cases such as Laguna San Ignacio, legal action may be required to prevent development that is contrary to the terms of the contract. In most of the conservation agreement cases, the contract sought to fill the enforcement void left by an absence of laws or inadequate application of existing laws.

### INSERT MAYA MOUNTAIN HERE

In alternative livelihoods, enforcement may not be emphasized if the new activity fully replaces unsustainable behavior. However, most often livelihoods need to be part of larger set of interventions, including investment in enforcement. In the absence of enforcement, there may be little to prevent people from continuing with the unsustainable behavior that the new livelihood is meant to displace. Project design often appears to assume that time or income needs of resource users are constrained such that the alternative income opportunity will make the original resource use either impossible or superfluous; however, this is rarely the case. Building an enforcement component into the project is one possibility; another is to include alternative livelihoods in an agreement to provide funds for livelihood development in return for verified compliance with conservation requirements. This latter approach adopts the logic of conservation agreements.

### PERFORMANCE MONITORING

*Advice: Ongoing performance monitoring is critical for the success of conservation agreements, but less so for alternative livelihoods and buyouts. However, all projects will benefit from greater monitoring to assess intervention impacts and inform future tool selection and project design based on quantitative analysis.*

Monitoring is inadequate in most projects, including monitoring of conservation outcomes, socioeconomic impacts, and performance of resource users with respect to conservation requirements. Given the necessity of monitoring in the conservation agreement approach to ensure that benefits are contingent on performance, one might expect this group of case studies to exhibit better monitoring provisions. However, even among these cases monitoring leaves room for improvement, resulting in weaker incentives if the link between benefits and compliance is not sufficiently strong. The importance of performance monitoring for the conservation agreement model means that this tool should be selected only if the desired behavior change is amenable to such monitoring and the project implementers have the capacity to ensure that monitoring takes place. Again, the Laguna San Ignacio easement is a model agreement in which a third party monitors and reports on compliance on an annual basis, and funds are released based on this reporting.

The conservation agreements that involve direct payments for sea turtle nest protection are among the best-monitored. These projects devised compensation formulas of varying complexity linked to numbers of nests, eggs, and hatchlings, as in Mafia Island and Rendova. The Mafia Island case involves per-hatchling payments, which means that each hatchling from each nest is counted. This provides valuable information regarding conservation performance of villagers as well as

hatching success rate, which may be low for various reasons. For instance, the Jamursba Medi project did not monitor hatching success, and only recently found that rates are low due to high sand temperatures and nest inundation. The project now relocates many nests, a need that would have been revealed earlier by better monitoring. These projects demonstrate how the degree of complexity and the explicit link between conservation performance and benefits have significant implications for monitoring requirements. The more sophisticated the arrangement, the more imperative it is that performance and conservation outcomes are closely monitored; such monitoring has the added benefit that the project can better demonstrate actual conservation impact.

#### **INSERT MAFIA INCENTIVE PAYMENT HERE**

The alternative livelihood approach does not depend in the same way on the ability to monitor performance, as the investment is not predicated on an explicit, negotiated quid pro quo. However, like the other two approaches, alternative livelihood interventions do benefit from monitoring to demonstrate biological as well as socioeconomic impacts of the investment. Although some cases do include monitoring of certain aspects of the marine environment, with the exception of Punta Abreojos the alternative livelihood cases do not monitor conservation performance. For instance, in Ayau there is no monitoring and enforcement protocol for the MPAs or the turtle commitments. Although this does not necessarily preclude success, impacts of these programs are difficult to assess due to the lack of monitoring data. Monitoring of resource trends is also important for sustainable resource management, as extraction rates must be calibrated with respect to stock dynamics.

#### **BENEFITS**

*Advice: Benefits should be linked to conservation performance, be sufficient to offset opportunity costs, and tailored to local needs and aspirations. While cash payments are rare, commonly seen elements in benefit packages include scholarships or other forms of support for education, direct employment in monitoring and enforcement activities, and support for new and improved livelihoods.*

The case studies exhibit a wide variety of benefits that can serve as incentives for conservation. Individual cash payments are not very common in the cases in our study. This is the form of benefit that probably most people associate with direct incentive programs due to the literature on conservation payments and payments for environmental services. However, in some contexts, cash is not fungible, or project proponents are concerned with how the cash will be used. Buyouts have traditionally involved direct payments to vessel or permit owners, but the buyout examples in this study also involve loans or alternative livelihood support. The cases in which individual cash payments are provided usually also include some other form of benefit such as employment or community development funds. A system that pools individual payments to fund public goods can achieve much greater positive impact than small individual cash payments. The *ejido* members in Laguna San Ignacio recognized this and chose to pool payments to fund community projects rather than divide them amongst households. Pooled payments can be particularly attractive when communities face institutional or social challenges to providing public goods in the absence of outside support.

Buyouts generally involve upfront cash payments as the primary benefit. Alternative livelihoods involve providing support to catalyze new livelihood options that will provide benefits in the form of income or subsistence. Conservation agreements can incorporate a range of options for benefits. From individual cash payments to funds for community development projects to scholarships, there is a wide range of possible benefits that can create individual or community incentives. Importantly, benefit packages must respond to resource user's needs and priorities, typically identified through a participatory consultation process. For instance, if unsustainable

resource use is driven by the need for cash to pay school fees, a benefit package that includes scholarships may be appropriate. Another difficulty faced by people at many sites is constrained access to credit; a benefit package can address this need by directing funds to a micro-loan facility accessible to community members, as done using tourist fees in the case of Gilutongan.

#### **INSERT GILTONGAN HERE**

Several projects in the case studies provide scholarships. In remote areas, school fees represent a major expenditure for households and lack of cash is the primary obstacle that prevents parents from sending their children to school. For conservationists, paying for school fees can be relatively inexpensive (for instance, approximately \$10,000 per year would cover the expenses for all schoolchildren in Jamursba Medi), and it is a benefit that is likely to reach nearly every household.

#### **INSERT JAMURSBA MEDI HERE**

Although the conservation agreement approach offers great flexibility in designing benefit packages to meet locally specific needs and aspirations, there is considerable convergence in the form that these benefit packages take. As noted, scholarship programs are fairly common, and benefits also often include direct employment in patrolling and monitoring activities. In addition, despite the fact that the logic underlying the conservation agreement model is distinctly different from the alternative livelihoods approach, at least a portion of benefits often takes the form of investments in improved livelihoods and enterprise development. Among our case studies, in addition to the alternative livelihoods projects themselves, nearly half of the other projects from the buyout and conservation agreement examples provide alternative livelihood support as a component of the benefit package.

### **CHOOSING APPROACHES – PROPERTY RIGHTS**

*Advice: Conservation agreements and buyouts should be implemented in areas with clear property rights (either full ownership or enforceable exclusive rights of access and use). This factor is less important for alternative livelihoods, unless the emphasis is on improving managed use of the resource.*

An analysis of the legal context and property rights is essential to inform the selection of conservation approach in a given situation. In many places, outright purchase of an area (as in the Palmyra example) or a formal easement (as in the Laguna San Ignacio) will not be possible due to the lack of essential enabling legislation that allows parties to enter into such a transaction – whether because certain types of property cannot be bought and sold, or because there is no legal recourse in the event of transgressions. Similarly, a conservation investor must be confident that, by entering into a transaction with resource owners, pressure on the resource actually will be reduced rather than simply create an opportunity for third parties to replace the previous resource users. Thus, buyouts and formal legal mechanisms will only be feasible in places that are subject to relatively sophisticated legislative and regulatory frameworks.

Conservation agreements are more flexible, as they simply require that conservation investors and resource users come to mutually agreeable terms, but they do require that property rights – whether formal, informal, or customary – are reasonably well-defined. This need not denote formal, legal rights, as several cases involve customary and traditional tenure arrangements and rights of access. The important consideration is whether the resource users entering into the agreement have a defensible claim to the resources or habitat area, such that they can make commitments that will not be undermined by the behavior of others. In some cases strong leadership can sustain an agreement despite disputes or ambiguities concerning property rights. For example, in Laguna San Ignacio an easement was negotiated with the *ejido* members,

although an additional 400 non-members also reside in the area. Although many of those 400 residents dispute the *ejido* landownership claim, the *ejido* members are sufficiently strong and well-organized to prevent the other residents from disrupting the conservation easement.

Alternative livelihoods projects can be attempted almost irrespective of the legal and property rights context, but their conservation impact does depend on who has resource access, particularly in the case of sustainable resource management schemes. Sustainable management is more likely to succeed with well-defined property rights. For instance, the purpose of the Punta Abrejos cooperative was to sustain fisheries production for its members. As the area is fairly remote and there are few income generating options, residents decided against new activities and instead attempt to maintain the viability of fishing, their traditional livelihood. The incentive for a long-term management perspective derives from exclusive access offered to the cooperative in the form of a concession. These dedicated access privileges have allowed the Punta Abrejos cooperative to exclude others from the area and reap the rewards of sustainable management.

**INSERT PUNTA ABREJOS HERE**

### **CHOOSING APPROACHES – ESSENTIAL CAPACITIES**

*Advice: Buyouts only should be pursued if reliable enforcement capacity exists to ensure a permanent reduction in resource pressure.*

Buyouts require the least local capacity, as resource users essentially relinquish ownership or rights in exchange for compensation, and therefore are no longer involved in management or enforcement activities. However, the approach typically relies on government capacity to enforce the terms of the buyout. A buyout will have no impact if the purchased vessels or gear are replaced by other fishing capacity, or if retiring licenses or permits does not reduce the total level of harvesting effort. Therefore a successful buyout requires monitoring and enforcement to verify that total capacity and harvest effort are indeed reduced. Even in cases where a nonprofit organization purchases and retires permits or equipment, to achieve a reduction in effort these buyouts depend on government commitment to control illegal fishing and not issue new permits. In some cases, a buyout accompanies a gear ban, such as the gillnet bans in St. Croix and the Northern Gulf of California. In addition to purchasing the gear and declaring a ban, the government must monitor fishers to verify that illegal gear is not being deployed.

**INSERT ST CROIX GILLNET HERE**

*Advice: Conservation agreements only should be pursued if the resource owners have the capacity to collectively negotiate and enter into binding agreements and perform the required conservation actions.*

The resource owners must be in a position to understand the agreement and to negotiate and enter the agreement as a unified party. This can be an obstacle in establishing a conservation agreement, requiring extensive consultation and often an investment in creating community decision-making mechanisms. For instance, in Tetepare, resource owners belong to the Tetepare Descendants Association, which acts on behalf of thousands of individuals scattered throughout several islands. In some cases, an investment in institutional capacity building at the community level can generate wider benefits by serving a broader community coordination role. At the same time, project implementers entering into the agreement as the conservation investors need considerable capacity, particularly with respect to benefit delivery. Dependence on short-term funding poses a challenge to ensuring that this capacity endures.

The resource owners also must be able to perform the agreed-upon conservation actions, which in many cases include specific management activities as well as reductions in harvesting. In several

of the case studies project implementers provided equipment and training for community monitoring and enforcement to strengthen management capacity, particularly in remote areas such as Helen Reef. Thus, while ability to perform conservation actions is an essential capacity, when it is lacking this gap typically can be addressed through targeted investments.

#### **INSERT HELEN REEF HERE**

*Advice: Alternative livelihood projects for income-generation only should be pursued if the capacity to operate in market context exists or can be created.*

The cases in this study represent varying degrees of local capacity for management, enforcement, and business. Alternative livelihoods are the most demanding approach in terms of the required skill set for local communities; therefore one might expect to see this approach implemented mostly in areas with high local capacity, but this is not the case in the sites in this study. For areas with limited local capacity, training and skills building may be a worthwhile investment if other conditions are amenable to the livelihoods approach, but in many cases an approach with less demanding local capacity requirements may be more suitable.

The extent to which markets drive unsustainable resource use varies tremendously among the cases surveyed in the preceding chapters. Along the coast of central California, fishermen are responding directly to local, national, and indeed global consumer demand for fish. Similarly, the sale of fishing licenses to foreign fleets in Kiribati is driven by global demand for desirable species. In contrast, consumption of sea turtle meat and eggs in Ayau and Jamursba Medi is the result of local demand, as is overharvesting of various species in the Solomon Islands cases. Interestingly, in the remote sites where resource behavior is primarily shaped by local subsistence demand, conservation actors often have gravitated to the alternative livelihood approach – in precisely the contexts where cultivating new enterprises faces the greatest challenges due to remoteness and absence of business skills and entrepreneurial capacity. One of the most important considerations in tool selection must be whether the enabling conditions for alternative livelihoods are in place, and, if not, to what degree conservation investment can strengthen these conditions.

#### **INSERT AYAU HERE**

Alternative income projects also require individuals within the community with an entrepreneurial disposition, managerial skills, and basic financial and business capacity – prerequisites for operating a successful business. While an NGO may be able to provide training and start-up capital for new enterprises, the basic requirement of cost competitiveness often will be difficult to meet due to high communication and transportation costs imposed by remoteness. One solution proposed in Ayau is to train the community to produce goods that are consumed locally, to avoid the need for transportation and marketing. Thus, alternative livelihood initiatives that focus on local subsistence rather than production destined for market often may be more viable. Value chain analyses and market studies for new products are an essential but often missed step in evaluating the potential for alternative livelihoods, including assessment of capacity to deliver a product or service at consistent quality and quantity; if products will not be competitive and supplies are unreliable, a more direct incentive approach will offer a greater probability of success.

#### **INSERT BARAULU HERE**

Many alternative livelihoods projects provide assistance with one particular aspect of livelihood development. For example, the Baraulu project provided the initial capital investment, in the form of sewing machines. However, assistance is likely needed in several areas for an alternative livelihood to succeed. In St. Croix, fishermen were assisted in obtaining captain's licenses, but

not in obtaining employment. Support may be required not only for initial equipment purchases, but also for such activities as business development, technical assistance, credit, transportation, and marketing. These observations are consistent with the findings of a global review of livelihood approaches by Campbell (2008), who lists 29 elements for consideration when designing alternative livelihoods projects; most alternative livelihood projects currently implemented address one or two of these elements, rather than a complete program.

**INSERT ST CROIX ALT HERE**

## **CHOOSING APPROACHES – URGENCY OF THREAT AND FUNDING POTENTIAL**

*Advice: The greater the urgency of conservation action, the more direct the incentive will need to be to elicit behavior change within the necessary time-frame. However, the feasibility of more direct incentive approaches depends on the degree of fundraising potential.*

The urgency of conservation action greatly impacts the suitability of a given tool. If sufficient funding is available and legal mechanisms are clear, a buyout may be the quickest way to reduce pressure. In the Northern Gulf of California initiative in Mexico, imminent extinction of the vaquita prompted a buyout. In the case of Morro Bay, a lawsuit against the National Marine Fisheries Service and the declining profitability of the fishery motivated the parties to come to the table and find a workable solution using a buyout despite the costs. However, despite the simplicity of the approach, opposition to a buyout sometimes can delay implementation for years. For example, in the Northern Gulf of California, strained relations between fishers and government made it difficult for parties to come to the table. In St. Croix, the funding available for the buyout was so limited that many fishers felt insulted. Some of these issues can be prevented by early and ongoing communication between stakeholders to involve them throughout the design and implementation process for the buyout. The conservation agreement approach can be deployed relatively quickly, as seen in cases where an initial short-term agreement is concluded as a stepping-stone toward a more comprehensive long-term arrangement, as in the Galera example. Alternative livelihood projects are less likely to result in near-term benefits, as new enterprises usually require an incubation period and the results of improved resource management systems typically will not be seen for some time. However, the skills and capacity fostered by an alternative livelihoods program may improve general prospects for long-term development, as is expected from the program in Bar Reef.

**INSERT BAR REEF HERE**

Each approach faces fundraising challenges and tool selection may be constrained by availability of financing. Consequently, tool selection must be informed by a careful evaluation of fundraising potential. A typical buyout will require a large upfront payment, which can be difficult to raise. Urgency of threat to a charismatic species such as the vaquita can strengthen fundraising potential, which made the Northern Gulf of California buyout possible. Alternative livelihoods initiatives can benefit from synergies with development donors, as was the case in Bar Reef. Conservation agreements necessarily depend on long-term funding to sustain incentives through provision of benefits.

Conservation agreements spread the opportunity cost offset over time, such that reliance on short-term grants may be viable for a period, but ultimately the objective is to secure a long-term financing mechanism. Most of the conservation agreements studied in this research effort have yet to secure a long-term funding source. Exceptions are Laguna San Ignacio, which is supported by an endowed trust fund to cover costs of benefits, monitoring, and enforcement in perpetuity, and the Misool EcoResort, which will use tourism revenues to sustain its financial commitments to the local community. While most conservation agreements seek to use short-term grants to

sustain benefits for a window of time during which long-term financing is secured, actually capitalizing trust funds for the long term is a non-trivial task.

The alternative livelihood approach reflects a model in which an initial set of investments is intended to result in self-sustaining enterprises or changes in resource management, thereby dispensing with the need for long-term financing. Although alternative livelihood projects aim to become self-financing, there are very few examples of projects that succeed in this aim and thus most continue to rely on series of short-term grants. A study by the Biodiversity Conservation Network found that very few enterprises generated any profit after several years (Salafsky et al. 2001). Ecotourism projects offer the most promise in some places for a dependable stream of benefits, such as in Fiji which already has a tourism infrastructure. Of course, tourism is not appropriate in all locations and comes with its own set of challenges (XXXXXX).

**INSERT WAITABU HERE**

### **DRAWING ON STRENGTHS FROM EACH APPROACH**

*Advice: Combining features of the three approaches can remove harvest capacity to reduce pressure on resources, provide ongoing incentives to ensure long-term compliance, and provide alternative economic options to offset forgone resource use.*

Most projects in our study attempt to provide ongoing incentives for conservation. Only a few provide purely one-time benefits and those that do, for example the Mafia Island gear exchange, also include an alternative livelihood component. The principal difference among the approaches is how benefit provision is structured to create incentives. In a typical buyout, the benefit offered is a one-time incentive to cease an activity. However, in the buyout cases surveyed, benefits are being structured to also provide ongoing incentives for compliance instead of relying solely on a one-off payment followed by enforcement. In addition to initial payments to individuals for giving up permits, vessels, or gear, project design can include a public incentive in the form of periodic payments to the community that depend on measurable performance (e.g. number of nets in the water, amount of bycatch). For example, in the Northern Gulf of California case some fishermen received one-time funds to relinquish their permits (a clear buyout transaction), while others received compensation for temporary cessation of fishing in a particular area (more like a conservation agreement), and a portion of this compensation consisted of support for alternative livelihood development.

**INSERT MAFIA ISLAND GEAR**

Alternative livelihood projects are based on the premise that incentives in the form of income or subsistence from new livelihoods will be ongoing as the new activities take hold and offer an attractive alternative to unsustainable resource use. Thus, whether the incentive truly is ongoing depends on whether the enterprise is successful, and whether people forgo unsustainable activities as a result. Importantly, most contexts are dynamic and an incentive that is adequate today may become irrelevant tomorrow. Conservation agreements can adapt to such changes by periodically adjusting or renegotiating benefit packages to account for economic or other changes, as they deliberately structure benefits as ongoing incentives that depend on verified reductions in threats to resources and biodiversity. The evolution of interventions in Baraulu and Olive reflects adjustment to the alternative livelihood approach to incorporate a more direct quid pro quo that reflects a conservation agreement model.

**INSERT OLIVE HERE**

Thus, many of the projects combine features of the three approaches. For example, both buyouts and alternative livelihoods can be integrated into a conservation agreement project structure. The Laguna San Ignacio easement involves funds to be used for community development and alternative livelihoods training. The difference between the Laguna San Ignacio livelihood investments and a typical alternative livelihoods project is that the funds are only provided conditional on conservation performance, and the implementing conservation organization is not responsible for creating or maintaining the livelihood projects. Buyouts can effectively reduce effort and address overfishing, but in many contexts fishermen do not want to just be compensated for withdrawing effort, but also desire support for developing sustainable fisheries or other livelihoods. Therefore, in many cases a buyout will only be accepted as one component of a broader plan, again yielding a hybrid of approaches. For example, in the Morro Bay trawl fishery, TNC is exploring the possibility of leasing the permits they bought back to the fishermen; these permits would include legally binding gear or time-area restrictions, mimicking the easement approach that is used in terrestrial settings.

## **CONCLUDING REMARKS**

The various considerations discussed above intersect in numerous ways, such that a simple decision-tool for selection of project design is impossible to construct. Greater need for enforcement will usually accompany high opportunity cost. Weaker market integration often implies greater resource dependence. Although one wishes that greater urgency and degree of threat would be positively correlated with availability of funding, this is not necessarily the case. Taking together these factors and the dynamics among them, the conservation implementer faces a project design task that requires careful, informed judgment.

In sum, although the complexity of successful marine conservation interventions precludes a definitive characterization of ideal approach or project design, the case studies collectively do suggest that the design of incentives is a key consideration. Economic incentives drive behavior with respect to resource use, therefore project impacts on incentives are crucial to eliciting change in that behavior. Direct incentives that reward conservation and sustainable practices offer unambiguous choices to resource users if conservation performance is measured and used to calibrate benefit packages. Thus, direct incentives present resource users with distinct decisions regarding how to extract value from their resources, and force implementers to consider important factors of monitoring, enforcement, and coordination mechanisms for resource-use decisions.

One might be tempted to conclude that the more direct the incentive, the more likely that the intervention will succeed; then tool selection first should consider whether a buyout is possible, if not then consider the potential for an incentive agreement, and finally, if neither of these approaches are feasible, settle for an alternative livelihood strategy. However, the case studies reviewed in the preceding chapters do not support such a clear-cut conclusion.

Instead, successful interventions combine elements of all three approaches. The direct incentive offered by buyouts can produce a quick, measurable reduction in harvesting pressure, thereby addressing the principal threat to biodiversity and ecosystem values. The conservation incentive agreement model is built on a stream of benefits over time, such that the incentive for resource users to support conservation is sustained. Given that most projects – regardless of approach – involve the termination or reduction of certain activities by resource users, other economic opportunities are needed to drive socioeconomic development, indicating that an alternative livelihoods component often must be part of overall strategy. Further piloting of combined approaches, such as leasing fishing rights to reduce bycatch or performance-based agreements that provide funds for education or alternative livelihood development, promise great potential for effective design of successful marine conservation interventions.

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## Buyouts

### *i. Morro Bay trawl permit and vessel buyout, USA*

Trawling, the primary method for groundfish capture on the west coast of the United States, involves dragging large, weighted nets along the sea bottom, damaging habitat and causing high bycatch. In 2003 The Nature Conservancy (TNC) and Environmental Defense engaged the Morro Bay bottom trawling industry along the central California coast to protect marine habitat. With their support, in June 2005, the Pacific Fishery Management Council approved zones that ban bottom trawling in 3.8 million acres of ocean. The regulations were enacted in May, 2006 and TNC subsequently purchased six federal limited-entry trawling permits and four trawling vessels from commercial fishermen. Now, the project seeks to sustain fisheries by leasing permits back to fishermen who commit to switching to sustainable gear and practices.

### *ii. Northern Gulf of California gillnet permit buyout, Mexico*

The vaquita (*Phocoena sinus*), a small porpoise endemic to Mexico's Northern Gulf of California, is killed as bycatch in gill nets used to harvest fish and shrimp. To avoid imminent extinction, the Mexican government launched an initial buyout of permits in 2007, offering fishermen start-up funds for tourism enterprises. Another option was for fishermen to receive funds for purchasing new gear. A second round in 2008 included a third option, namely compensation for not fishing with gill nets inside a designated vaquita reserve. Realistic options for alternative livelihoods are limited, and few fishermen will support any plan that prevents them from fishing. Therefore, the long-term strategy includes better enforcement against illegal fishing, maintenance of no-fishing zones, and development of gear that avoids vaquita bycatch.

### *iii. Palmyra island purchase, USA*

Located 1,052 miles south of Hawaii, the Palmyra atoll consists of 275 hectares of land and 6,277 hectares of pristine coral reefs. In 1947 the Fullard-Leo family prevailed in a protracted US Supreme Court battle with the US Navy for ownership of Palmyra. In 2000, after more than two years of negotiations, the Fullard-Leo family agreed to sell the atoll to TNC for about \$30 million. The U.S. Fish and Wildlife Service (USFWS) contributed \$9 million to the purchase of above-water forest lands and most of the submerged lands and open water, including the reefs; these areas are a National Wildlife Refuge, while TNC manages the remainder of the atoll, about a third of the total, as a preserve.

### *iv. Phoenix Islands Protected Area fisheries license revenue offset, Kiribati*

The Phoenix Islands lie in Kiribati, in the Central Pacific Ocean. Their reefs are among the most pristine tropical Pacific islands, but are threatened by foreign commercial fishers. The Phoenix Islands Protected Area (PIPA) was created in 2006 using a buyout

model; the boundaries were finalized in 2008 to encompass 410,500 km<sup>2</sup>. The size of the PIPA no-take zone (NTZ) depends on financing to offset foregone fishing license revenue. To guarantee revenue replacement over time, the New England Aquarium and Conservation International are working with the government to create an endowed trust fund, from which payments to replace fishing license revenues will continue as long as conservation objectives of PIPA are met. An initial target of \$25 million is estimated to justify closing 25% of PIPA to commercial fishing.

*v. Mafia Island Marine Park gear replacement, Tanzania*

Covering 822 km<sup>2</sup> on the southeast of Mafia Island, and involving over 20,000 people in 14 villages, Mafia Island Marine Park (MIMP) is one of the largest marine protected areas in the Indian Ocean. Its resources are threatened by destructive fishing methods as well as over-exploitation. In line with strategies set out in the MIMP management plan (2000) a credit-based gear replacement scheme was initiated in 2002 that offered fishers the chance to obtain materials for any sustainable livelihood, including fishing, in exchange for destructive fishing gears, principally illegal small-mesh seine nets. Fishermen could access interest-free loans by which to buy replacement materials. The incentive to participate was that MIMP set a deadline after which illegal gears would be confiscated and the opportunity to get loan assistance would have passed. Participants in the gear replacement program say it has played an important role in sustaining livelihoods while conforming to new regulations against destructive techniques. The scheme was initially supported by WWF up to 2005, thereafter additional support has come from a World Bank program. About 75% of illegal seine nets have been removed, but evidence suggests some fishermen simply go outside of protected zones or fish with illegal gears at night, at times when they are confident of avoiding MIMP patrol boats.

*vi. St. Croix gill and trammel net buyout, USVI*

St. Croix is the largest of the U.S. Virgin Islands located in the Caribbean, East of Puerto Rico. An estimated 400 species of fish live in and around the East End Marine Park of St. Croix, and the area is also important to several sea turtle and sea bird species. Overfishing is a key concern, especially using gill and trammel nets. In 2002, the St. Croix Fisheries Advisory Committee (FAC) recommended a ban on trammel and gill nets, with a strategy to simultaneously buy out destructive gear. Regulations to ban gill and trammel nets were approved in 2006, and the one-time buyout program took place in 2008. However, the ban remains controversial and unpopular among fishermen, as the buyout budget was very low relative to the value of the fishery, and many are unconvinced that an equipment ban addresses the main ecological threats.

## Conservation Agreements

*i. Laguna San Ignacio community development fund, Mexico*

In 2005, the 43 members of the Luis Echeverria community agreed to protect 120,000 acres of grey whale habitat, in exchange for annual payments of \$25,000 that support small-scale development projects. The area is monitored by a third party to verify compliance with contract terms, and payments are released upon confirmation of successful results. Payments have been used to provide business training and launch new income-generating activities. Every year any community member can present a project proposal for review by the leadership, and all the members vote on the proposals in a general assembly. The agreement is financed through a dedicated trust fund that covers annual payments, monitoring, and legal expenses. The contract was signed by the community and NGOs (Pronatura, International Community Foundation, Maijanu), and is designed to last in perpetuity.

*ii. Misool Eco Resort lease, Indonesia*

Raja Ampat is a large archipelago in eastern Indonesia's Papua province. In 2005, the Misool Eco Resort (MER) entered into a 25-year lease agreement with the customary owners of uninhabited Batbitim island to establish a 425km<sup>2</sup> no-take zone around Batbitim and many neighboring islands. The lease grants MER exclusive rights to the islands, including hills, forests, coconut trees, water, animals and the surrounding lagoon. The no-take zone protects animals, coral reefs, turtles, sharks, rays and fish. The agreement was made under both customary law and Indonesian law. In addition to paying lease fees, the resort also employs villagers and provides them with health insurance, job training, and English lessons. Under the agreement the resort regularly patrols the area for illegal fishing and shark-finning and manages the area for conservation, including observance of the no-take area.

*iii. Jamursba Medi scholarships, Indonesia*

Jamursba Medi, in Indonesia's Papua province, hosts the largest remaining leatherback nesting population in the Pacific. WWF-Indonesia has worked with the villages of Saubeba and Warmandi to protect this site since 1993. Past attempts to create incentives for turtle conservation included alternative livelihood projects, but these all failed due to lack of transportation and marketing infrastructure. Thus, benefits only accrued to 24 village patrollers receiving salaries, causing tension in the villages. In 2005 WWF collaborated with SEACOLOGY to provide 13 3-year scholarships for village students in exchange for protecting a 280 acre nesting beach and 160 acre fringing forest reserve. If a family is found poaching eggs, they no longer will be eligible for participation in the scholarship program. In August 2007 the villages agreed to protect an additional 2,031 acres, including 25 kilometers of turtle nesting beach.

*iv. Tetepare and Rendova incentive payments and scholarships, Solomon Islands*

Tetepare Island is located in Western Province of the Solomon Islands and is approximately 11,880 hectares in size. The island retains roughly 97% of its original forest growth. The majority of the landowners – collectively the Tetepare Descendants' Association (TDA) – live in 15 zones around the Province, but primarily inhabit four

villages on Rendova, the closest island west of Tetepare. In return for agreeing to protect the island habitat, villagers receive three types of benefits, including a scholarship program operated through the TDA and training and employment opportunities linked to conservation activities and ecotourism. One incentive is a payment scheme in Rendova for turtle nest protection that provides cash payments to individuals and a village development fund for nests found and protected.

*v. Olive health clinic, Solomon Islands*

Olive is a village located in the Roviana Lagoon, in the Western Solomon Islands. In 2003, Olive permanently closed 157 hectares as an MPA to protect coral reefs and reef fish. The MPA is part of a system developed in collaboration with the Western Solomons Conservation Program (WSCP). WSCP assists communities who establish MPAs with social development benefits (e.g., clinics, health posts, schools, school renovations, community halls, women's halls). WSCP only funds benefits that will accrue to the entire community or some large portion of it (e.g. women or children); in Olive, the selected benefit was a health clinic completed in 2008. There are no specific requirements for a village to receive benefits, other than establishing an MPA and providing the timber and labor for construction.

*vi. Galera-San Francisco Marine Reserve, Ecuador*

The 546 km<sup>2</sup> Galera-San Francisco Marine Reserve (GSFMR) was established in October, 2008 in Ecuador's Esmeraldas Province. Ecuador's Ministry of the Environment and Ecuadorian NGO Nazca will use a conservation agreement to offset short-term losses to fishermen caused by improved management that will generate greater returns in the future. Preparatory actions for conservation agreements were signed in February 2010 with the Marine Reserve association and the Galera fishermen. The actions will include designing and implementing a communication program, building capacity for the Marine Reserve association to operate as an organized group and creating a seed fund to improve livelihoods, mapping fishing areas for marine reserve zonation, designing and implementing fisheries rules and a monitoring system, and strengthening the fisheries cooperative. These steps will feed into the development of a management plan and a conservation agreement.

*vii. Maya Mountain Marine Corridor scholarships, Belize*

The Toledo Institute for Development and Environment (TIDE) co-manages Belize's Port Honduras Marine Reserve (PHMR) with the Department of Fisheries. One type of incentive provided by TIDE to communities is a Scholarship Program. This program encourages fishers to give up unsustainable management practices in return for scholarships, thus providing an alternative way for parents to finance their children's education. Over 50 students have received scholarships. The program targets children whose parents agree to stop using unsustainable fishing and farming methods. The recipients of the scholarship program are expected to contribute to conservation efforts and work alongside TIDE on community outreach activities. Although scholarships are

provided in exchange for commitments to foregoing unsustainable fishing practices, eligibility is not directly contingent on performance, and there is no explicit quid pro quo or formalized sanction system.

*viii. Mafia Island incentive payments, Tanzania*

Before 2001, surveys indicate that all turtle nests discovered by residents on Tanzania's Mafia Island were poached. In 2001, the Mafia Island Turtle Conservation Program was initiated through a collaboration between Mafia Island Marine Park and Mafia District Council, with financial support from WWF. The program led to the establishment of a local NGO, Sea Sense, which trained and paid elected community monitors to patrol nesting beaches, relocate nests when necessary and assist with data collection. Staff perceived that the monitors were not sufficient, since 50% of nests were still poached. In 2002, Sea Sense began paying individuals for finding and reporting nests, with the amount depending on the nest's hatching success. Under the combined program of nest monitoring, nest protection payments, and education programs to raise awareness and concern about sea turtle conservation, the poaching rate decreased to 3% in 2002, 2% in 2003, and less than 1% in 2004. Between 2005 and 2008, the incidence of poaching remained low averaging 3.4%.

*ix. Helen Reef, Palau*

Hocharihie (aka Helen Reef) is located over 500 km south of the main islands of Palau and 65 km east of Hatohobei Island (also called Tobi). Its reefs are threatened by illegal fishermen from the Philippines, Indonesia, Taiwan and Korea, as well as locally-driven unsustainable harvesting. The Hatohobei State Government and Hatohobei traditional leadership are working with Conservation International and Natural Equity to protect Helen Reef using a conservation agreement. Management challenges include conservation planning, monitoring and enforcement, but the greatest challenge may be reconciling conservation management with economic needs of the Tobian community. The incentive agreement strategy for Helen Reef includes an endowment to support a community fund for with social development investments that compensate the Tobians for foregone resource use, and finance monitoring and enforcement of Helen Reef as a marine protected area.

*x. Navini Island Resort lease, Fiji*

Navini is one of 32 small islands in Fiji's Mamanuca group. The Navini island MMA exists by agreement between the Navini Island Resort and the chiefly clan of the Tui Lawa, the paramount chief of the Malolo region. The MMA protects the reefs surrounding the island with a complete ban on extraction of any resources. Surveillance and monitoring of illegal activities falls under the daily duties of resort staff, who inform the Tui Lawa of infractions which he addresses using traditional authority mechanisms. The agreement, including an annual payment of FJD5000, has been renewed every year since 1988. Additional benefits include purchasing library books and other materials for the local primary school, and support for community development projects with

resources, cash or labor. Local communities are also seeing ecosystem benefits as stock recovery around Navini is having positive spillover effects for fishing grounds throughout the Malolo region.

## Alternative Livelihoods

### *i. Punta Abreojos cooperative and MSC certification, Mexico*

In 1994 the Mitsubishi Corporation and the Mexican government proposed to construct the world's largest salt plant in Laguna San Ignacio, a wetland on Mexico's Pacific coast. The anticipated impacts of this facility on whales and the lagoon generated great concern, and the local fishing village of Punta Abreojos worked with a consortium of Mexican and American NGOs to defeat the proposal. Instead of the jobs offered by the salt plant, the fishermen chose to continue fishing. Punta Abreojos holds an exclusive concession to its fishing territory for lobster, abalone, and other benthic species, renewable every 20 years. The area is co-managed by the cooperative, which provides internal and external enforcement, and the Mexican government, which conducts stock assessments, and implements management measures, such as area closures, gear restrictions, legal minimum sizes, and protection of gravid females. In 2004 the Mexican red spiny lobster fishery conducted by Punta Abreojos and 8 other neighboring cooperatives obtained Marine Stewardship Council (MSC) certification, the first small-scale community fishery to be MSC certified.

### *ii. Baraulu sewing, Solomon Islands*

Baraulu and Bulelavata villages are on the Roviana Lagoon, in the western Solomon Islands. In 1999, these communities decided to periodically close mangrove areas to shellfish gathering to reduce overexploitation. A small-scale sewing project was implemented to offset income lost by women who would normally sell shells. Positive experience with temporary closures led to the establishment of a 103 hectare permanent closed area in 2002, but the sewing project failed due to disputes about distribution of benefits and challenges relating to consistent product markets, transportation to those markets, reliable people to handle finances, and entrepreneurial skills—requirements that are difficult to meet in this remote location. Difficulties facing alternative livelihoods prompted a shift in project focus to infrastructure projects that are more likely to benefit the whole community and depend less on these additional conditions.

### *iii. Kubulau dive tag fees*

The communities of Kubulau district in southwestern Vanua Levu, Fiji's second largest island, have created a network of 13 marine management areas, anchored by the Namena Marine Reserve. The site is one of the best diving areas in Fiji, but is threatened by poachers from nearby villages as well as more distant urban centers. Together with Moody's Namena Resort, the Kubulau communities enforce no-take areas against poaching to protect important dive sites, using a surveillance system involving

community fish wardens. The system is financed through dive-tag fees paid to the Kubulau Resource Management Committee (KRMC) by dive-tourism operators, used for community development, tertiary scholarships, operational costs such as patrolling and mooring maintenance, and other management expenses. Strong community ownership of the project is made possible by recognition of customary fishing rights under Fijian law, and benefits from extensive technical support from NGO partners such as WCS and CORAL.

#### *iv. Waitabu, Fiji*

The Waitabu MMA is located on Fiji's third-largest island, and covers an area of over 27 hectares. This MMA is part of the Fiji Locally Managed Marine Area Network (FLMMA) as well as the Bouma National Heritage Park, and is managed by local community members with support from Marine Ecology Consulting and the Coral Reef Alliance (CORAL). A small-scale marine reserve ecotourism project was developed in 2000 to provide cash income for community members. A snorkeling access fee system provides funds for community development and to support the operation of the MMA. In addition, community members can earn income through home stays and sale of souvenirs. There is no formal surveillance program and the area has attracted occasional poaching by people from neighboring villages due to perceived increases in fish abundance.

#### *v. Cagayancillo tourism entry fee, Philippines*

The municipality of Cagayancillo covers Tubbataha Reefs Natural Park (TRNP), which in 1988 became the first national park in the Philippines. The TRNP is under a no-take policy that bars all activities except tourism, research and management, but is threatened by illegal fishers from other coastal communities in the Philippines and as far away as Taiwan and China. One TRNP management strategy is a community-based livelihood program to compensate Cagayancillo residents for lost fishing access. The municipality receives 10% of park entrance fees. Half is allocated to road construction, the rest to a microcredit facility. Two types of loan are offered—livelihood loans to support enterprise development and salary loans against future income. To date, 80% of recipients used their loans to finance livelihoods, principally seaweed farming. Low repayment rates in 2006/07 led to a new system of weekly (rather than monthly) collection and group (rather than individual) loans.

#### *vi. Gilutongan Marine Sanctuary tourism revenue sharing, Philippines*

Gilutongan Marine Sanctuary (GMS) is located in the Philippines' Cebu province. GMS is one of the country's few "urban" MPAs, located 20 kilometers from Cebu City, the second largest urban area in the Philippines. The ordinance that established the GMS includes a tourism revenue sharing scheme between the municipality of Cordova (70%) and the village of Gilutongan (30%). Alternative livelihoods are promoted to reduce dependence on reef resources, including seaweed farming and tourism-based activities (catering, lifeguarding, boating service, selling of souvenirs, etc.). Loans are available to

finance new livelihoods, but only 10% of loans have been repaid. Another issue is disputes over revenues; municipal officials claim they have given the allocated share to village officials each year, but village officials deny this.

*vii. Ayau piggery, Indonesia*

The Ayau islands are part of the Raja Ampat archipelago in Indonesia's West Papua province. Turtles and turtle eggs have long been a staple food in Ayau; in the past, villagers would harvest up to 100 adult turtles for large communal gatherings such as the annual Christmas feast. In 2005, Conservation International engaged the Ayau villages to reduce turtle consumption. The headman of Yenkawir village suggested that a large communal protein source would be needed as a replacement for turtle meat. Yenkawir committed to cease turtle hunting at the end of 2007, and CI agreed to supply six large pigs for their Christmas feast. CI also supplied each extended family with two piglets to raise for later feasts and provided intensive technical assistance to design a closed system piggery to collect waste for processing into cooking bio-gas and compost manure. The compost aids fruit and vegetable production which currently is limited by poor soil quality. The pigs initially were offered as a one-time benefit, but CI has continued to provide pigs for Christmas feasts.

*viii. Port Honduras Marine Reserve alternative livelihood training (ALT), Belize*

The Toledo Institute for Development and Environment (TIDE) co-manages Belize's Port Honduras Marine Reserve (PHMR) with the Department of Fisheries. Many local fishers complain of illegal fishermen from neighboring Honduras and Guatemala. Although most arrest cases involve foreigners, some are locals involved in the TIDE training programs. TIDE operates an Alternative Livelihood Training (ALT) program to link sustainable natural resource management with livelihoods for local communities. The ALT program provides training in ecotourism fields such as kayaking, birding, fly-fishing, diving, hospitality and small business management. Since tourism has not met growth expectations, trainees increasingly are looking for other opportunities to use their new skills. Despite the ALT, people say their income is insufficient for daily household needs and community representatives argue for relaxed restrictions on fishing and harvesting of marine resources.

*ix. St. Croix East End Marine Park interpretive ranger and commercial captain training, USVI*

In 2001, the St. Croix East End Marine Park (STXEEMP) was created, the largest marine protected area of the U.S. Virgin Islands. The Nature Conservancy (TNC) received a grant from NOAA and private funding to strengthen the STXEEMP, including alternative livelihood initiatives. The Nature Conservancy has implemented two alternative livelihood programs for fishermen in St. Croix. One commercial fisher was trained as an interpretive ranger for the STXEEMP. In 2006, TNC began a commercial captain's license training. Fishermen displaced by the STXEEMP received first priority for the twelve available training spots; following low response the program opened to the wider

community, but only eight fishermen enrolled. Some displaced fishermen were unable to participate because of literacy and language barriers. Also, the alternative livelihoods may not have been lucrative enough to compete with fishing, opportunities for those receiving captain's licenses were limited, and TNC could not assist fishermen in finding new employment. Nevertheless, at least one fisherman found a job as a commercial captain, and another as a ferry driver.

*x. Bar Reef Sustainable Livelihoods Enhancement and Diversification, Sri Lanka*

In 1992, Sri Lanka's Bar Reef became a 306.7 km<sup>2</sup> marine sanctuary, housing over 200 fish species and 120 coral species. Destructive fishing methods and overfishing threaten many of these species. The villagers of Kudawa rely on fishing around Bar Reef. Starting in 2007, the Coastal Resource Management Project and Community Help Foundation employed IMM's Sustainable Livelihoods Enhancement and Diversification (SLED) approach to create new income-generating options. Extensive community consultation led to investments in seaweed farming, fish farming, home gardens and PADI diving license training. Seaweed farming at the village level has not reached viable scale, but several PADI licensees have found new employment, aquaculture is taking hold, and home gardens are reducing cash needs that drive destructive fishing. However, the project currently is unable to verify whether success in jumpstarting new livelihoods is achieving conservation outcomes, and it is not clear when the livelihoods will become economically self-sustaining.

*xi. Pohnpei sponge and coral farming, FSM*

In 2001 the Conservation Society of Pohnpei (CSP) began working with communities to re-establish State sanctioned Marine Protected Areas (MPAs) within Pohnpei lagoon. There are in total eleven Marine Protected Areas that have been designated by law and CSP currently works with seven of these areas. To provide additional income-generating opportunities, CSP partnered with the Marine Environmental Research Institute of Pohnpei (MERIP) to establish sponge farming with MPA communities around Pohnpei. In 2005, income-generating activities were expanded to hard coral, soft coral and other marine invertebrate farming. A fragment of sponge or coral is removed from the parent colony and heals to form a new colony. Sponges are sold locally and for export as beauty products, while corals are exported for the aquarium trade. The farming project is resulting in increased income for the 32 participating community members, but it is not being used as an incentive for conservation per se, since participation in the program or profitability of the farming does not depend on conservation behavior. However, it does offer an environmentally benign income source in an area where these are few and far between.