

## **Integrated Marine Management Concessions – A New Approach to an Old Problem**

### **Abstract**

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Indonesia's marine resources are a priority for conservation -- the Indonesian archipelago sits at the heart of the biological bull's eye for coral species diversity and development. It is clear to most observers that the reefs of Indonesia are in trouble. Pressures on the reef range from overexploitation and destructive fishing practices, coastal and marine based pollution, coastal development impacts, and global climate change. With more than 200 million people, 70% of these living within the coastal zone, these pressures are extremely heavy in Indonesia and pose intense and immediate threats to the future of marine resources and the communities that depend on them.

Many have called for quick and decisive solutions to reverse this trend, and some progress is being realized. However, the rapid acceleration of degradation and loss of critical reef habitat necessary to sustain marine organisms requires new approaches and innovative responses.

The Conservation and Community Investment Forum (CCIF) team is proposing an entirely new, systematic approach to conserving marine resources in Indonesia: the development of an integrated marine management concession. The approach combines the traditional solutions and activities of site based conservation and enterprise development with the immediate and sustainable creation of a conservation concession funding mechanism. Tying the existing traditional approaches of site-based community development and enterprise development together under an integrated conservation concession approach will be challenging, but the benefits of an integrated vision and management will outweigh the difficulties and in the end preserve more reef than any one approach alone.

### **Introduction**

Stretching 3,200 miles from Australia to the Southeast Asian mainland, Indonesia's 17,500 islands make up the world's largest archipelago and fourth most populous nation. Although this country covers only 1.3% of the Earth's land surface, it is home to about 17% of the total number of species in the world, including 25% of the world's fish species. All of the world's 15 families of true reef-building corals are represented in the

Indonesian Archipelago, with a total of 80 genera and 452 species. The Archipelago contains over 85,000 square km of coral reefs or about 14% of the world's total. Indonesia has nearly 81,000 km of coastline and its vast oceans extend over nearly 6 million square kilometers. The three main Marine Ecoregions of Flores and Banda Seas (1), Sulu Sulawesi Seas (2), and Solomon-Bismarck (3) include the highest priority sites for marine conservation, as well as 5 of the 6 national marine parks (see Map 1).

Map 1.

The three Marine Ecoregions are part of the World Wildlife Fund for Nature Global 200, priority areas for conservation and sustainable management, and have also been identified by other international conservation organizations such as Conservation International, The Nature Conservancy, and the World Resource Institute as containing highly diverse marine ecosystems whose functional values go beyond the ecoregion itself. For example, these areas include important nesting sites for turtles, channels between major landmasses that serve as bottlenecks for migrating mammals and mantas, and the vast waters of the Banda Sea support feeding grounds and other habitat for large tuna populations that are targeted by international commercial fishing fleets. Circulating and seasonally changing currents accelerate re-seeding after disturbance and up-wellings of relatively cool waters from the south also protect these areas from bleaching events, which have affected many other reefs around the world.

The status of these marine ecosystems and their functions are threatened by unsustainable coastal and economic developments and by a lack of sustainable planning and management capacity at different authority levels. The more remote, eastern parts of Indonesia include areas that have not even been fully inventoried for their richness and status, but are already experiencing industrial growth. These areas are increasingly targeted by fishers that deploy destructive fishing practices and other illegal activities because resources in the more populated western parts of the region are dwindling due to limited or non-existent control and enforcement.

Despite these threats, most reef resources are relatively straightforward to manage. Since demersal fish and corals do not migrate, impacts and stock depletion can usually be linked to specific fishing gear or destructive practices. Protection of key spawning areas and no-take zones would result in rapid replenishment of local stocks, while introduction of catch quotas, size limits and closed seasons would bring rapid, demonstrable increases in target species.

Considering these generally accepted approaches and the sedentary nature of the reef ecosystem there are still many questions and paradoxes: How can such vast stretches of irreplaceable reefs be destroyed for such relatively small gains obtained from blast fishing? Why aren't locals more protective of their home reefs? Why are heavily damaged reefs, which yield very little returns, so often hit again and again until they are completely obliterated? Can regulations work in Indonesia? What types of interventions have successfully preserved intact, functional reef ecosystems?

In exploring these issues, it has become apparent that while it is certainly possible to prepare and enforce a management plan that ensures the reef's long-term survival (barring further massive global bleaching events), such an approach is unlikely to take hold in Indonesia before it is too late. This results from the following:

- Regulatory efforts to control reef fishing range from the careful approach of the Queensland government in its Great Barrier Reef, to the more or less "free-for-all" in Indonesia.
- The current aquarium fishing and food fishing industries create perverse economic incentives that encourage massive collection rates, aided by the use of poison and dynamite, are rapidly accelerating the degradation and loss of critical reef habitat.
- Existing attempts by regulators, local communities and NGO's to provide local alternatives to reef destruction find obstructions along the way and are unlikely to solve the problem as a whole.

These factors lead to our final conclusion: only a coordinated approach which creates actively enforced marine managed areas, reforms the economics of commercial harvesting and promotes other sustainable businesses, and provides massive technological assistance to fisheries, NGOs and communities alike, is likely to succeed.

### **Comparison of the Regulatory Context of Reef Fishing in the Indo-Pacific**

The harvesting of coral reefs in the Southwest Pacific occurs under a range of regulatory contexts that vary greatly in their effectiveness. These regulatory approaches range from the careful approach of the Queensland government in managing the Great Barrier Reef, to a more or less "free-for-all" in Indonesia. Unfortunately Indonesian waters have the most lax regulations and are also those under greatest destructive threat. The following four basic regulatory environments are discussed in detail below:

- Free-for-all fisheries (Indonesia)
- Community fisheries (Philippines)

- Restricted fisheries (Fiji)
- Comprehensively managed coral reef fisheries (Australia)

#### *Indonesia: Free-for-all Fisheries*

Indonesia represents the most challenging regulatory case. Free access laws make local protection schemes difficult. While zoning exists for the medium to large-scale fisheries vessels that are categorized as commercial operations, the near shore coastal waters within four miles are open for “traditional small-scale” operations. Although registration with regional offices is required for all outsiders fishing within four miles of the shore, this requirement is not often enforced and it has not been a hindrance to destructive fishing. There is no legal precedent which exempts local communities from the free access laws – local lease rights (“hak pengelolaan”) have been established for terrestrial areas only, and local communities do not yet have the right to enforce local fishery management plans (even if they existed). Well-organized aquarium fishing fleets out of Java and Bali range all over Indonesia. Many use cyanide. Dynamite fishing operations abound – some of them small, others highly organized and coordinated. Hong Kong-financed live food fishing operations, many of which use cyanide, are found in most areas with remaining grouper populations.

There are currently no effective controls on fishing practices. While technically illegal, local authorities (water police, fisheries departments, navy, etc.) mostly fail to enforce fishing practice laws due to insufficient financial and technical capacity and low incentives. In such an environment, local communities have found it very difficult to protect their reefs. Ironically, one often encounters local cyanide fishers complaining bitterly about out-of-town dynamite crews blowing up their reefs. The recent decentralization of the Indonesian government may represent an opportunity to change this complex regulatory case, but establishment and implementation of local marine tenure rights is far from ready.

#### *Philippines: Community Fisheries*

The regulatory situation in the Philippines is also complex, but there are some important differences when compared to the Indonesian model. The collection and export of corals is banned in the Philippines and cyanide and dynamite fishing in the Philippines are illegal. Recent improvements in the enforcement, as well as awareness building efforts, have brought some improvement. However, free access laws that allow outsiders, and their destructive practices, access to local waters continually threaten the efficacy of these regulations.

To manage commercial fishing, certain regions/communities/cooperatives have taken matters into their own hands and have organized some level of protection. The Philippines have begun to set the legal precedent that allows local exemptions or modifications from the “free access” rule. Pearl farmers have been successfully obtaining maritime leases, and local communities have been given the right to establish and enforce local fishery management plans (“FARM Cs”). However, true protection of the reefs remains up to the local communities, and varies greatly throughout the country.

#### *Fiji: Restricted Fisheries Model*

The Fijian model represents a preferred fishery approach in the LDCs. Limited numbers of collection permits are issued, destructive reef fishing is not allowed, and local community control over the reefs provides basic levels of enforcement. Fiji’s laws governing the use and management of marine resources are set out in Fiji Law Chapters 158, 158A, and 159. The Fisheries Act, Chapter 158, regulates fisheries exploitation and recognizes the local fishing rights of indigenous Fijians and their ability to control areas enclosed by fringing or barrier reef systems in coastal waters.

However, this collection of laws does not specifically provide for the conservation of marine habitats. For example, aquarium products (such as corals and live rock) are not specifically identified in the Fisheries Act but are considered an, “...aquatic animal whether piscine or not...” Thus coral, as well as fish, are given protection from exploitation.

Also, regulatory responsibility is spread out and can make implementation confusing, at best. Both the central government (Fisheries Division) and the local villages have a role in managing activities in the coastal zone through a process called the Dual Tenure System. This system creates a two-step permitting/regulatory process for companies interested in commercially harvesting reef products. For example, at the central government level, there are five established live aquarium product companies that hold export permits from the Fisheries Division. Historically there has been a moratorium on the issuance of additional export permits.<sup>1</sup> Since each village has management rights over their local waters, aquarium companies must also secure permission from the local chiefs governing one or more of the 409 separate fishing areas. This generally requires a “use fee,” and a requirement that local collectors be used. Both the

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<sup>1</sup>. However, after the 2000 coup, the new administration did issue an additional permit to one group on the premise that it was 1) one third Fijian owned and 2) going to focus on research. In practice however, the group has begun exporting live rock, calling into question the moratorium on export permits.

local and Fisheries Division permits are required for commercial fishing. Currently, the only commercial fishing is done off the main island of Viti Levu and each operator harvests separate areas. According to the Fisheries Code, if a company is caught with cyanide or other poisons, they lose their ministry permit. Historically, poison fishing has not been a problem in this area of the Pacific.

*Australia: Comprehensively Managed Coral Reef Fisheries Management Plan*

This is the most preferred model for all other coral reef fisheries. In 1975, Australia enacted The Great Barrier Marine Park Act, the first legislation in the world to attempt complete management of a marine ecosystem. The Act created the Great Barrier Reef Marine Park Authority (GBRMPA), who, along with the local government of Queensland, undertook the development and implementation of the project. In 1981, the Reef was named the first marine World Heritage site. Along with the honor came tighter guidelines on improved conservation and intensive monitoring. GBRMPA is faced with the task of continuously balancing the needs of commercial fishermen with the conservation concerns. Park Authorities balance conservation and economic needs without compromising either. Zone designations are reevaluated regularly through a standard process that involves community and industry input, as well as scientific analysis. The economic importance of reef fisheries is significant (in 1996 the direct economic value of the commercial fishery was estimated at AU\$143,000,000), but it requires careful supervision to remain sustainable. The Queensland Department of Primary Industries/Fisheries and Aquaculture (DPI) implements and oversees all fishing activity on the reef, maintaining the highly regulated commercial fishery program.

For example, aquarium fish collection is limited to 40 licenses total, for 2 divers each. The DPI uses input controls to regulate the industry – including strict limits on gear, the number of divers/participants, and limited areas open for collection. It is a limited entry fishery with only 63 fishers currently authorized to collect aquarium fish throughout all of Queensland. Aquarium coral collection is also a limited operation regulated by the DPI. Coral is monitored by both input and output controls (quota). Currently 39 operators are licensed to collect at 60 coral collecting sites that exist throughout the park. Each collection site has an annual harvest limit of four tons. However, current harvest levels are below 50 tons (25% of total allowable catch) and estimates do not predict the entire allowable catch will be collected. Coral export from Australia is strictly prohibited and the Environment Minister recently announced that all coral harvesting will be phased out in coming years.

Comprehensive zoning is the primary guideline used in the GBRMPA management plan. The governmental zoning plan, similar to the zoning of a city or town, applies to the entire marine park, allowing for the reef to

have multiple uses and serve all stakeholders. The zoning provides for a range of activities to take place in the park simultaneously, achieving a successful balance between reasonable use and conservation.

Although there are cases of sound fisheries management (Australia), they are least present in the areas where the aquarium and food fish industries are most destructive (Indonesia). The Indonesian regulatory context is currently doing little to combat the significant economic forces that encourage these industries to be harmful. We will now turn to this topic.

### **Economic Incentives for Reef Destruction**

A large part of coral reef destruction comes from two kinds of destructive reef fishing: Cyanide-based aquarium fishing and dynamite-based food fishing. The current economic structure of these industries creates a “perverse” set of incentives, which encourage reef destruction. Each of these industries is discussed in turn.

#### *Cyanide-based Aquarium Fishing*

Coral reefs can generate significant returns. Depending on the intensity of fishing, aquarium exporters can realize between \$1,300 and \$8,000 in net profits per km<sup>2</sup> of reef per year<sup>2</sup>. Unfortunately, the economics of the industry are tailor-made for destructive fishing methods. The strong social position taken by some middlemen and all exporters and the low prices paid to the fishermen puts collectors in a no-win situation. They must either catch large numbers of low-value fish or specialize in the high valued species. Both of these strategies encourage the use of cyanide in order for collectors to fulfill their catch quotas.

The exporter's profits are relatively insensitive to the cost/mortality of the fish, which results from the use of cyanide – the cost of goods sold for the lower-value fish (about 80% of total sales) accounts for less than 5% of revenues!<sup>3</sup> The major profit driver for exporters, are turnover, capacity utilization, and species mix. From a strictly economic standpoint, it makes little sense to switch to non-destructive methods, at least in the short term. Non-destructive practices save very little in terms of mortality costs, and it cost plenty in terms of direct training and infrastructure expenses, as well as indirect costs associated with a temporary

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<sup>2</sup> CCIF interviews and analysis, May 2001.

<sup>3</sup> CCIF interviews and analysis, May 2001.

reduction in volume. (Note: while cyanide prices have recently increased sharply, this does not yet offset the costs of switching to non-destructive fishing methods.)

Destructive reef fishing is well organized. Capital accumulates in relatively few hands in the aquarium trade; the harvesting, handling, and long-distance transportation/distribution of aquarium fish and corals is reasonably complex and capital-intensive. Exporters are therefore well organized, highly profitable, and able to dictate terms and practices. Where blatantly illegal practices come into play, such as the non-CITES export of live coral, operators and authorities often work together in organizing highly profitable, protected cartels.

This situation is exacerbated by the fact that a significant portion of cyanide fishing is done by non-local collectors. Live food fish syndicates, often financed by Hong Kong importers, have fanned out all over Indonesia. Bali and Java-owned aquarium collection boats are similarly peripatetic. In the Philippines, traveling collector boats probably account for over 50% of the total aquarium fish harvest.<sup>4</sup> This effectively divorces the local community from any economic interest in the well-being of “its” reefs. In Indonesia, the free access issue looms large; communities have no legal basis for keeping outsiders out. This makes the development, implementation and enforcement strategy to ban destructive fishing practices, even if pursued at the national level, exceedingly difficult.<sup>5</sup> In Fiji, where reefs are owned by local communities, and where exporters have to contract with local collectors for their fish, the economic value of the reef is recognized locally. It is of no surprise that the Fijian reefs are in far better shape than their Indonesian counterparts.

Further, the current chain of custody for the average reef fish involving any number of independent fishers, middlemen, exporters, trans-shippers, consolidators, etc., is virtually impossible to control. A single fish, or a batch of fishes from one harvest operation, simply cannot be traced through the current supply chain. As a result, fish caught in a non-destructive fashion are almost always co-mingled with “cyanide” fish, and the U.S. consumer has no way to purchase a fish which is guaranteed cyanide free – even if they are willing to pay more for a more vigorous fish that has lower mortality. Unable to reap returns on their investment in non-destructive harvest training and equipment, even anti-cyanide collectors are often forced to return to destructive practices. In addition, a spot check of US retailers has shown that consumers often do not get

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<sup>4</sup> Interviews with local fishermen, CCIF, May 2001.

<sup>5</sup> Pet-Soede, et.al., *Economic Issues Related to Blast Fishing on Indonesian Coral Reefs*, p. 34.



the full truth about the origin of the fish – many retailers claim that their Indonesian and Philippine fish are cyanide free, which is, plain and simply wrong.

### *Food Fishing*

Dynamite-based food fishing is pursued by highly organized cartels as well as by local fishers who consider blast fishing the last opportunity to catch and earn enough to feed their families. When pristine reefs are available for dynamiting, the economics are very attractive. Recent interviews indicate that a 7-10 day dynamite fishing operation from a 70-ft ship carrying 10-12 fishers can gross over \$6,000 – a considerable sum in Indonesia.<sup>6</sup> In a more complete treatise on the subject by Cesar and Pet-Soede, the profitability is described as follows: “The gross revenues for blast fishing, were estimated at US\$15,000 per km<sup>2</sup> in year 1 and US\$3,200 per km<sup>2</sup> in year 20. After correcting for operational costs, which were US\$1,300 per year, and opportunity cost of labor, which were US\$360 per year, the annual net revenue of blast fishing, was US\$13,300 per km<sup>2</sup> in year 1 and US\$1,500 per km<sup>2</sup> in year 20.”<sup>7</sup> The steep decline of profitability is caused by the rapid rate of reef destruction involved. Fishers tend to compensate for this decline in profits by scaling up their operations, which further accelerates the pace of destruction.

There is therefore virtually no chance that the economics of the operations will force the fishers to stop “in time” – before the reefs are damaged past the point of no return. To quote Cesar and Pet-Soede again: “At the level of individual fishing households, the net income per person in small blast fishing operations decreased in 20 years from US\$6,450 to US\$550. The high income in year 1 when blast fishing was newly introduced formed the incentive to start blast fishing. Comparison with non-destructive fishing in an area without blast fishing, where each of 10 full-time fishers had annual income of US\$1,470, showed that blast fishing in the initial years was 4 times more rewarding than non-destructive fishing. The difference was only sustained for a short period, in the long run (more than 20 years) the income from blast fishing will reach the level of opportunity costs. In year 20 the income from blast fishing was only one fifth of what could have been derived if blast fishing had not been introduced.”<sup>8</sup>

To make things worse, recent inquiries show an alarming degree of organization behind the dynamite trade. Several interviewees indicated that an average 10-day dynamite fishing trip requires payments to local authorities

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<sup>6</sup> CCIF interviews and analysis, May 2001.

<sup>7</sup> Pet-Soede, et.al., *An Economic Analysis of Blast Fishing on Indonesian Coral Reefs*, p. 88.

<sup>8</sup> Pet-Soede, et.al., *Economic Issues Related to Blast Fishing on Indonesian Coral Reefs*, p. 37.

of \$800.<sup>9</sup> To ensure that these operations remain under full control and that they are of sufficient scale to create such payments, authorities often enforce a regional “cartel” which assigns dynamite fishing “privileges” to selected communities only. With such protection afforded the dynamite fishers, other communities have little hope of protecting their reefs.

### **New Approaches Required for Transformative Change**

The current efforts by regulators, NGO’s, and local communities to significantly slow or even stop the pace of destruction find obstructions along the way for a number of reasons. Regulatory efforts, particularly in Indonesia, are undermined by corruption, the current trend towards decentralization of power to insufficiently equipped regional governments, and considerable political instability in the country. There is very little institutional capability to enforce existing laws against destructive fishing practices and the situation is unlikely to improve in the near future.

International efforts to regulate the export of reef products are also problematic. The efforts of CITES to control the harvest of corals in Indonesia through a quota system do not appear to be fully effective. Any attempt by import countries to ban the import of aquarium fish would most likely also be counterproductive, as it would force the collectors who are dependent on the industry into even more destructive forms of fishing.

Community based approaches offer some local alternatives to destructive fishing. However, the record of such initiatives is spotty, and a significant level of investments in local alternative employment schemes on the part of multi-lateral institutions has not slowed the pace of reef destruction. In a country of 210 million mostly poor people, the very idea of “alternative employment” may be fundamentally flawed. There is no doubt that Indonesia offers significant opportunities for the development of mariculture. In some cases, such as pearl farming in Northern Palawan region of the Philippines, highly profitable applications have already been developed at scale. The Nature Conservancy is currently implementing a fish culture plan in Komodo that, when fully operational, is expected to produce 27 tons of fish per year valued at US\$648,000. Profits are expected to be US\$435,000 per year. The facility is expected to employ 74, but that number may be underestimated.

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<sup>9</sup> Exporter interviews and analysis, CCIF, May 2001.

However, considerable additional research needs to be done before mariculture can emerge as a realistic alternative to destructive reef fishing – while there is plenty of anecdotal information on lobster/grouper/seaweed/pearl/coral farming, no systematic set of best application practices exists as of yet. For a local economic development official or investor it is an almost insurmountable task to determine which mariculture application could be “in the money” in a particular local context. In addition, the availability of local management talent to run what is often a relatively complex business is often a problem. Many maricultural applications offer employment for relatively few locals, are highly space intensive, and require very specific conditions for success. Lastly, much more needs to be known about the environmental characteristics of certain intensive mariculture operations such as grouper grow-out farms.

Tourism can, in specific instances, have a very significant effect. In Bunaken Park (Northern Sulawesi), for example, a coalition of dive operators is instrumental in enforcing the park’s ban on destructive fishing. In a specific local context, the economic value created can outstrip that of the (incompatible) destructive reef fishing. It can thus be a powerful deterrent. It is estimated that the net present value of a tourist operation can be as high as US\$55,900.29<sup>10</sup>. However, there are over 150,000 km<sup>2</sup> of reefs in Indonesia and the Philippines and in countries as politically volatile as these, tourism will offer protection to only a very small number of sites.

While these strategies and opportunities have conservation potential, an overall framework is necessary to successfully conserve large areas of productive, intact reefs in Indonesia. Also, to provide an interesting investment climate, investors must feel safe about the longevity of their activities without running risks that the very resource base to their sustainable alternative income generating strategies will be destroyed by outsiders through an open-access situation.

### **Next Step: Towards Integrated Marine Area Management Plans and Concessions**

It is exceedingly important that integrated, site-specific conservation plans be realized for the richest reefs in Indonesia. To be very clear: reforming commercial fisheries will greatly contribute to the health of the Indo-Pacific reefs. However, reforming each industry one by one will take too much time and the reefs will be destroyed in the current lax Indonesian regulatory climate. Additionally, this type of reform may not generate

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<sup>10</sup> Pet-Soede, et.al., *Economic Issues Related to Blast Fishing on Indonesian Coral Reefs*.

sufficient local income to motivate local communities to protect their local reefs. For example, implementing a sustainable aquarium fishing operation will improve local conditions by eliminating cyanide fishing, but it would by no means guarantee the full protection of the reefs from the destructive forces of dynamite and live food fishing. At sustainable levels of aquarium fish harvesting, a coral reef simply does not generate sufficient profits to pay for a team charged with the enforcement of all maritime protection and fisheries laws. Having said that, it is also exceedingly important that integrated, site-specific conservation plans be realized for at least some of the richest reefs in Indonesia. Sustainable aquarium fishing, mariculture, ecotourism, etc. will all be important contributors to such endeavors, but a strong overall management framework will be required to overcome the free access issues currently contributing to the destruction of the Indonesian reefs.

CCIF is laying out a foundation to respond effectively and comprehensively to these issues through:

1. Promoting the CCIF Reef Product Alliance (RPA) business plan that calls for the formation of a for-profit limited liability investment corporation managed by professional venture capitalists and tropical fisheries experts to invest in sustainable commercial harvesting businesses, and
2. The establishment of marine conservation concessions to ensure protection and enforcement while the necessary conditions and objectives of marine area management plans can be developed and realized.

Both of these items are discussed in more detail below.

#### *RPA. Reef Product Alliance*

RPA's objective is to finance the conversion of leading companies in the international aquarium fish and marine ornamentals trade to fully sustainable fish collection, handling, holding, transporting, and marketing practices. RPA investments in the Philippines and Indonesia will compliment and can be incorporated into CCIF's site specific strategy to ensure long-term protection of reef resources through community focused marine area management plan approaches. While these long-term protection schemes will necessarily differ between Indonesia and the Philippines due to their differing regulatory environments, they will have the same objectives:

- Establish a social process for developing effective fisheries and conservation management systems,
- Establish local knowledge system of resources and foster community "ownership" of these resources,
- Determine threats and set use regulations to manage these threats,
- Create recognition by community, outsiders, and local and central governments of area status,
- Use regulation and management authorities, and
- Identify and develop sustainable enterprise activities to offset concession payments and cover the continuous costs of conservation.

### *Marine Conservation Concessions*

As discussed above, there is no legal basis for comprehensive marine resources management planning in Indonesia. The conditions described throughout this analysis all point to the urgent need to immediately set aside specific marine environments under formal conservation concessions. These conditions include: the rapid rate of reef and fishery destruction in some of the most ecologically important regions, threats driven by large-scale extractive industries and opportunistic cottage industries, the lack of stable, responsible government intervention, and the lack of community sensitivity to, and recognition of, the threats facing their resources. If Indonesia hopes to preserve these areas of marine biodiversity, action must be taken immediately. Individual reform to the multiple industries that are profiting from the reef will not solve the problem before the reefs are completely destroyed. Reforming one industry at a time will take forever. A conservation concession would provide a safety net to ensure protection and enforcement and safeguard investments in sustainable development while the necessary conditions and objectives of a marine area management plan can be realized. Using conservation concession model will provide a framework for stopping the immediate threats to the coral reefs while local economic development analyses are conducted to develop sustainable industries.

To describe it fully, a conservation concession is a program that establishes direct economic incentives for the service of “conservation”. A mechanism is developed where payments from conservation groups, governments, development organizations, or corporations are paid to entities controlling natural ecosystems in exchange for the ‘conservation services’ that they provide. The efficient price for these services is equivalent to the social opportunity cost of not destroying the natural resources embodied in the conserved ecosystems. The resources in most threatened tropical ecosystems yield poor returns, making this opportunity cost very low. Additional costs can be imagined.

A successful concession must include:

- Identification of interested local counterparts (NGOs currently working in the field),
- Identification of key sites of prevention,
- An economical model that supports the feasibility of a concession at a particular site (correct opportunity cost and current land and marine value – considering current industry and government taxes),
- An existing legal and institutional framework that supports this form of financial incentive,
- A stakeholder analysis that supports the model and identifies intangible values and benefits to stakeholders and the community from the concession,

- An assessment that determines the long-term viability of the concession.

In Indonesia there is a precedent for establishing land-based concessions, however, no marine-based conservation concessions have been awarded to-date. There are marine conservation concessions that are close to completion such as for example in Komodo, but no others.

The next step is for CCIF to conduct a feasibility study of the areas that may be good candidates for a conservation concession. It is clear that implementing a successful marine conservation concession in Indonesia will be challenging and difficult. Key to the success of a conservation concession is two-fold: 1) working at the local level to develop the social systems and local “ownership” in the process and 2) bringing together the people and information from different arenas (government, NGOs, investors).

### **Conservation Concessions Can Strengthen Existing Conservation Efforts**

The next few years are a propitious time to engage stakeholders and the Indonesian government on the issue of reef fisheries management. Not only has a new, reform-minded government taken power, but there is also a trend in governance towards decentralized decision-making and regional autonomy. Natural resource management has been identified as a priority for decentralization in recent national legislation and state policy guidelines passed by the last parliament and the current People’s Consultative Assembly. During the past few years, the Indonesian government has enlarged its role in fisheries management and within the new government, a new Ministry of Maritime Exploration and Fisheries has been formed. Previously, the national government placed greatest emphasis on large-scale commercial fisheries, under-emphasizing the role of local fisheries management and marginalizing artisanal fisheries. However, the new Ministry has shown an interest in placing greater emphasis on coastal communities and in linking fisheries management with the conservation of marine protected areas and coastal zone management.

Efforts are already underway in Indonesia to improve coral reef and fisheries management in general. These include a capacity building and pilot site program with provincial fisheries staff, funded by the Asian Development Bank (ADB). The World Bank has also funded a project, targeting Maluku province that identified cyanide fishing for the live food fish trade and foreign fisheries as major threats. The Coral Reef Rehabilitation and Management Project (COREMAP) is a large World Bank and ADB-funded project focusing on data management and rehabilitation methods for Indonesian coral reefs. Bilateral programs such as the Natural Resources Management program include major marine and coastal project activities throughout Indonesia. National programs of the larger international conservation NGOs such as

Conservation International, The Nature Conservancy, and the World Wide Fund for Nature build on partnerships with government and other NGOs to achieve conservation and management of marine and coastal resources. The Marine Aquarium Council (MAC) has initiated partnerships with Indonesian coral exporters, the Indonesian Ecolabeling Foundation, and others in order to develop a certification system for products of well managed reefs. The Destructive Fisheries Reform Initiative (DFRI) program being run by the World Resources Institute in partnership with the Indonesian NGO, Telapak, is the most comprehensive attempt to counter the live food fish trade regionally and is making exciting progress. There are many areas within the fisheries sector, such as bomb-fishing, inadequate or inappropriate data and monitoring tools, and lack of capacity in reef fisheries management issues, where gaps need to be addressed. CCIF hopes to team with these organizations in hopes that collaboratively their strengths can combat the destructive forces that are collectively degrading the reef ecosystems of the Southern Pacific.

### **Conclusion**

CCIF has already laid the initial groundwork that will assist us in successfully creating marine conservation concessions in Indonesia. We have established connections with local groups that will collaborate with us (International Marinelife Alliance, Telapak, Conservation International, The Nature Conservancy, World Wildlife Fund, Yayasan Bahtera Nusantara), and have started the process of engaging the necessary government authorities needed to support a concession in the areas we are considering (Ministry of Environment, Ministry of Forestry, Ministry of Marine Affairs). CCIF is committed to 1) introducing the idea of marine concessions in Indonesia and 2) incorporating sustainable businesses into these concessions to provide an economic incentive for locals to try preserve reefs (e.g., the aquarium fishing industry, mariculture, ecotoursim, etc.).

Please contact us for further information:



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