Allocation Issues in Marine Environment:  
Managing Conflicts between Commercial, Artisanal, and Tourism in Tropical Fisheries

By  
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Abstract

Allocation of resource access and use rights is one of the most controversial issues in marine fisheries. Historically, various principles of allocation have evolved along with the objectives of public policies (such as concerns for sustainability and poverty alleviation), and recognition of different stakeholders in fishing industry. The recognition of exclusive economic zones (EEZ), development of technologies, and emergence of markets for different products, services and uses of fisheries and the marine environment provided an overall economic dimension to the allocation issues. Recognition of tourism, recreational fishing, conservation and bio-diversity values of fisheries have a recent and important influence on the allocation principles in fisheries. As a result, allocation issues in tropical fisheries have become elevated from concerns for improving and maintaining the welfare and living standards of small isolated fishing communities to a higher level cross-sectoral, national, and international development and conservation concerns.

This paper examines the conflicts and competition among artisanal, commercial, and tourism with regard to allocation of marine resources. The effectiveness and limitations of market-based allocation principles as well as common property and co-management arrangements to manage resource conflicts are discussed. The implications of replacing conventional hierarchical and command-and-control policies by moving towards greater decentralization, whether through markets, common property, or co-management, on existing resource allocation are also discussed. Both vertical and horizontal approaches to the management of the industry have been recommended to manage the allocation issues in socially, economically and environmentally sustainable ways.

I. Introduction

The allocation of resource access and use rights is one of the most controversial issues in marine fisheries ever since mankind begun to fish in the seas, rivers and oceans, and even before public policies emerged to deal with the fisheries management. Although economists refer to allocation as an economic criterion for ensuring efficiency in the production and use of a resource, historically, various principles of allocation have evolved in response to the changing objectives of public policies (such as concerns for sustainability, improving economic efficiency, and poverty alleviation) and recognition of different stakeholders in the fishing industry. The history of commercialization of tropical fisheries is a recent one since for decades fishing for food and local livelihoods were the main motivation behind coastal communities seeking allocation or rights over sea space and sea resources. On the other hand, commercial interest in tropical

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1 Sharing Fish 2006 Conference, 26 February -2 March 2006, Esplanade Hotel, Fremantle, Perth, Australia
fisheries did not stay confined in intensive harvesting of fish alone. Recreational fisheries, tourism, and resort services are few of the modern forms of uses of fisheries, which have the dimension of allocation over space, time, and efficiency.

This paper examines the conflicts and competition amongst artisanal, commercial, and tourism with regard to allocation of marine resources. The effectiveness and limitations of market-based allocation principles as well as common property and co-management arrangements to manage resource conflicts are discussed. The implications of replacing conventional hierarchical and command-and-control policies by moving towards greater decentralization, whether through markets, common property, or co-management, on existing resource allocation are also discussed. Both vertical and horizontal approaches to the management of the industry have been recommended to manage the allocation issues in socially, economically and environmentally sustainable ways.

II. Evolution of Fisheries Allocation Principles

There were times when fishing was a way of life and part of traditional food and livelihood strategies in coastal communities. The issue of allocation at that time focused primarily on the communal use and access to the resources, which was mostly governed by traditional allocation principles, such as indigenous people’s rights, and customary allocation of fishing rights over coastal and near-shore areas, coral reefs, islands and beaches. The creation of nation states that somewhat redefined many pre-existing traditional property rights, and state control over fisheries and coastal waters are relatively recent phenomena. However, their influence was instrumental in the development and design of formal principles of allocation in marine and coastal waters. While technological revolution hastened the growth of industrial fisheries, market demand and fishery characteristics contributed to further subdividing fisheries along species, gear use and fishing scale. The emergence of international policy regimes, such as the creation of EEZs, United Nations Convention on the Law of the Seas (UNCLOS) and several other international agreements and conventions that followed in the last two decades have also reshaped the fisheries and ocean management across developed and developing countries. This is also the period when a huge influence of value added and service oriented activities in coastal and marine waters, such as recreational fishing and tourism, were observed on the allocation of resources in fisheries, and many of the complex management conflicts ensued.

The early development of the fisheries industry during the 1950s through the 1960s was governed by the principle of “freedom of the seas,” where unrestricted use of the sea’s unlimited potential outside the territorial waters of a state’s three-mile territorial limit was provided with minimal regulations on offenses (see Table 1). This reflects the allocation principle of open access, which is characteristic of this period where marine resources were perceived as inexhaustible. Table 2 summarizes the influence of major global policies and institutions on national and local allocation at different time periods.

The 1970s through the early 1980s saw coastal states declaring EEZs up to 200 nautical miles, which increased territories under national jurisdiction. Also at this time, the pursuit for economic growth and revenue generation from export trade, coupled with the expansion of fishing capacity from improvements in harvesting technology and methods led coastal nations to develop their national fishing industries, resulting in a phenomenal increase in the scale of fishing activities worldwide and the accompanying accrual of substantial short-term monetary gains to those who participated in the global fish trade (Bennett, 2000). Unfortunately, this development route resulted in the dissipation of resource rent in the longer term, leading to problems of overfishing in a number of important fish stocks by the end of the 1970s, and consequently,
escalating persistent conflicts between subsistence and commercial fishers as national policies continued to advocate for increased export receipts and started renting fishing areas to distant water fleets (Payoyo, 1994; Bennett, 2000, Kearney, 2001).

Table 1. Evolution of fisheries allocation paradigm.

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<tbody>
<tr>
<td>Dominant Paradigm</td>
<td>Freedom of the seas</td>
<td>Rationalization</td>
<td>Sustainable development</td>
<td>Conservation and social welfare paradigm</td>
</tr>
<tr>
<td>Allocation Principles</td>
<td>Open access</td>
<td>Sustainable yield &amp; efficiency (MSY, MEY)</td>
<td>Environmental sustainability</td>
<td>Ecosystem health and biodiversity conservation Multiple social and economic benefits</td>
</tr>
<tr>
<td>Management Regime</td>
<td>Development management</td>
<td>Territorial Use Rights of Fisheries (TURFs)</td>
<td>Monitoring Control &amp; Surveillance (MCS) Integrated Coastal Management (ICM) Rights-based fisheries management</td>
<td>Multiple use and user approach Marine Protected Areas (MPAs) Community-based management Co-management</td>
</tr>
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Adapted from Ahmed et al. 2005.

The signing of the United Nations Convention on the Law of the Sea (UNCLOS) on December 10, 1982 in Montego Bay, Jamaica by 117 countries ushered a new paradigm on the world’s oceans as “the common heritage of mankind.” Thus, exploitation of mineral on the ocean floor beneath the high seas were now considered global jurisdiction rather than under national authority. In addition, full sovereignty of coastal states subject to the right of innocent passage for foreign ships was extended from three to twelve nautical miles. Moreover, the establishment of exclusive economic zones (EEZs) increased the ocean resources of those countries where they were granted exclusive rights to the fish and marine life in waters within 200 nautical miles from the baseline and gave them exclusive management and usufructory rights over these resources for economic development (Hinds, 2003). The recognition of exclusive economic zones (EEZs), development of technologies, and emergence of markets for various marine products provided an overall economic dimension to the allocation issues based on conservation of the resource stocks.

Table 2. Influence of global policy and institutions on national and local allocation at different time period.

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<tbody>
<tr>
<td>Global Policies &amp; Institutions</td>
<td>Freedom of the Seas</td>
<td>EEZs, UNCLOS, common heritage of mankind</td>
<td>·Brundtland Report ·CITES</td>
<td>·Trade liberalization (e.g., WTO) ·CCRF-FAO</td>
</tr>
</tbody>
</table>
In 1987, the guiding principles of sustainable development were laid down in the Brundtland Report by the World Commission on Environment and Development (WCED). With this, allocation issues took a new dimension to include the environmental consequences of aquatic-related activities as the intergenerational aspects of economic growth came into fore. In order to assure not only the short-term but also the long-term capacity of the future generation to meet their needs, sustainable development strategies called for a balance between the pursuit of economic growth and the protection of the natural resource stock.

By the 1990s, increased competition from non-fisheries users of the aquatic environment began to surface as other stakeholders of the ocean (e.g., tourism, recreational fishing, etc.), often with diverging socio-economic goals began to assert their rights. This implies that allocation issues were no longer exclusive to the fisheries sector and that any allocation decision will now have to account for the multi-uses of the ocean.

Among the poor, declining socio-economic opportunities brought about by poverty, lack of alternative employment in the non-fisheries sector, and landlessness made fishing the only remaining alternative for

| National Response | Open Access | · Expansion of coastal states jurisdiction  
· Joint venture license agreements  
· Fleet modernization  
· MCS systems  
· Aquaculture revolution  
· Introduction of Western stock assessment & management techniques | · Coastal land use planning; Fishing zone; Gear regulations by fishing scale and use category  
· Fisheries sector review (e.g., Philippines Fisheries Sector Program-World Bank) | · Updating of national fisheries development plan (e.g., 1997 Agriculture & Fisheries Modernization Act, 1998 Philippines Fisheries Code, Cambodia’s National Fishery Law)  
· Tariff reduction |
| Local Response | Open access | · Increased fishing effort  
· Mangrove conversion to fishponds  
· Privatization | Fisheries infrastructure development (e.g., National Milkfish Breeding Program, Philippines) | · CBFM (Bangladesh)  
· Decentralization (Philippines, Indonesia)  
· Fishery management council (informal)  
· Community fisheries (Cambodia) |

Adapted from Ahmed et al. 2005.
food, nourishment, and income, increasing fishing pressure and conflict among subsistence fishers (Salayo, et.al., 2005b). This led governments around the world to commit to poverty reduction as one of their goals of the new millennium, which has equity implications in the allocation of resources.

On the global scene, while globalization opened new opportunities for increased production and trade, local coastal villages often found themselves unable to compete and in the losing end as they limit or lose control and access over fishery resources, which traditionally were accessible to everyone (Viswanathan, et al., 2003; Salayo, et.al., 2005b). At the national level, the devolution of central government control provided local governments with a direct hand in managing resources. This has helped some of the states in Asia and Africa to revitalize participatory resource management strategies (e.g., co-management and community-based management) because the prevailing centralized, top-down management strategy for fishery resource failed to respond to the needs and issues faced by local coastal communities. Clearly, allocation issues in tropical fisheries have become elevated from concerns for improving and maintaining the welfare and living standards of small isolated fishing communities to a higher level cross-sectoral, national, and international development and conservation concerns.

III Fisheries Allocation and Conflicts under Different Management Regime

3.1 Types of Management Regime and Allocation Principles

3.1.1 Traditional Fishery Management

Customary or indigenous institutional fisheries management involves community ownership of coastal resources and collective fishing rights to allocate, use, manage, and control fishery resources mainly for subsistence, based on cultural traditions and values that are generally marked by a sense of harmony with the ocean, and that is effected through kinship or similar arrangements within the respective indigenous group (Payoyo, 1994; Adams and Dalzell, 1995). Access to the near shore fishery resources is determined through several mechanisms, such as proximity of a coastal village to the fishery area, as in the case of the Micronesian islands. Beyond this exclusive zone, other fishers are allowed to harvest with the understanding that the privilege to fish in the area is a token of the island community’s hospitality and generosity and that preferential rights to the fishing grounds belong to the adjacent village. Thus, any catch that is considered to be excessive is to be returned to the local chief, who will then determine their share in the catch (Nakayama and Ramp, 1974). Table 3 shows examples of conflicts that were resolved under different management/allocation regimes, while creating new ones.

Because fishery resources were abundant and a sizeable proportion of the local village population has a direct stake in maintaining the health of the marine resource as a food source, overfishing was not a problem. Also, effective monitoring of fishing activities was easily carried out in indigenous fishing communities where everybody knows one another and where the village chief is always kept abreast with the latest developments in the community. As a result, conflicts were limited mostly to problems on boundaries of fishing grounds, which were settled through an established tradition of mediation and retribution (e.g., loss of face or standing) with nominal use of institutions (Adams and Dalzell, 1995).

For years, community access rules to manage common property was effectively handled by traditional systems. This is supported by a number of fairly recent studies on coastal communities (e.g., Hviding and Jul-Larsen, 1993; Ruddle, 1994; Dyer and McGoodwin, 1994) that show that given certain conditions (e.g., relatively small group with common needs and norms, clearly defined boundaries for resource
management, strong leadership, relatively low cost of enforcement, etc.), informal management systems can effectively promote and enforce sustainable use of fishery resources (Pomeroy, 1995; Adger and Luttrell, 2000). This further implies that the social benefits of working together as a community towards a common goal of protecting the right to fishery resources outweighed any net gains in private utility from individual profit (Bennett, 2000). However, as markets began to permeate the economy, such that vertical integration of exchange replaced the prevalent horizontal structure of transactions, customary institutions of artisanal fishery management based on communal usufructory rights became inadequate in handling the pressures and the accompanying problems brought about by the growth of a market economy (Payoyo, 1994). Thus, governments began to intervene by limiting access to marine resources in an effort to protect the welfare of local fishing communities and accommodate the growing pressure from the commercial interests.

Table 3. Fisheries management and allocation and their response to conflicts

<table>
<thead>
<tr>
<th>Management Regime</th>
<th>Allocation Principle</th>
<th>Response to Conflict</th>
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<tbody>
<tr>
<td></td>
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<td>Type of Conflict Created</td>
</tr>
<tr>
<td>Traditional</td>
<td>Open access; common property</td>
<td>Resource sustainability</td>
</tr>
<tr>
<td>Centralized/Top-Down</td>
<td>Conservation of resource stock</td>
<td>Social tension across scale of fisheries (e.g., small-scale vs. large-scale fishers)</td>
</tr>
<tr>
<td>Decentralized/Bottom-Up</td>
<td>Ecological/ environmental considerations Intergenerational equity -Multiple use</td>
<td>Social tension between managers and users of the resource (e.g., marine users vs. government authorities/fisheries administrators)</td>
</tr>
</tbody>
</table>
3.1.2 Centralized Fishery Management

Centralized fisheries management followed from the early phase of expansion of fishing in prevailing open access in the 1960s. As pressures from commercialization and industrialization began to impact on marine resources, governments around the industrialized world started to intervene in the management of fishery resources in an effort to control fish harvest (Kearney, 2001). This centralized approach to fisheries management drew largely from the biological models of maximum sustainable yield of selected fish species that has been proven to have limited use in multi-species tropical and subtropical fisheries (Pomeroy, 1996; Bennett, 2000). Nevertheless, the focus of this conventional science-based management framework is in controlling fishing effort in order to achieve a particular level of harvest and fish stock (SIFAR/FAO, 2003). Indirect controls were first imposed through regulations (e.g., shorter fishing period, restrictions on fishing areas, limits on allowable harvestable fish size, regulations and restrictions on the use of gear, boat length, and equipment, use of licenses, etc.), which proved ineffective as fishers devised creative ways to circumvent these regulations (Kearney, 2001; Jones and Bixby, 2003). For example, as the fishing season became shorter, the fishing crew became larger; as restrictions on boat length were imposed, boats with wider and deeper hulls were introduced (Jones and Bixby, 2003). In effect, these regulations were only effective during the transition period from its imposition until such time that resource users and/or technology have crafted ways to outwit the regulation (Jones and Bixby, 2003).

Because of the poor incentive structure of indirect controls to address resource use and allocation, a shift in fishery management based on the control of market forces and private ownership through the allocation of property rights gained increasing popularity in industrialized and sub-tropical fisheries (Bennett, 2000; Kearney, 2001; Jones and Bixby, 2003). Rights management or direct control on the number of fish caught was implemented mainly through individual, transferable quotas (ITQs), which confers property rights to the fish prior to harvest by providing license holders a share of the total allowable catch (TAC)\(^2\) (Bennett, 2000; Jones and Bixby, 2003). ITQs have been identified as the dominant factor responsible for the success of commercial fisheries in New Zealand and Australia, primarily because by providing each license holder with a secure assurance of a portion of the fishery resource (TAC), competition in maximizing the catch is eliminated with an effective enforcement mechanism. This implies the following:

a) ITQs reduce inefficient capitalization and increase profitability because fishers are able to concentrate solely on maximizing profits by improving the value of their catch and reducing costs instead of maximizing their catch;

b) ITQs help fishers command a higher price for their product by allowing them to spend more time in marketing;

c) ITQs is a more effective conservation method (as opposed to indirect controls) since it provides fishers a direct stake and the fishery and because ITQs are directly determined by the value of the fishery;

d) ITQs can reduce subsidy to fisheries since the more efficient fishers can buy individual shares from the less efficient fishers; and

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\(^{2}\) The quantity of fish that can be sustainably harvested in a season, as determined by biologists (Jones and Bixby, 2003).
e) ITQs provide a market mechanism to settle conflicts among various resource users through the exchange of quota shares.

In general, although fisheries management worldwide is predominantly run by government, experience to date shows the inability of centralized institutions in effectively addressing the fundamental internal and external pressures to the marine environment that affect fishing communities (e.g., competing uses, rising population, globalization, and environmental degradation) and in successfully achieving its conservation objectives, which have a narrow focus on the sustainability of the fish stock (Pomeroy, 1995; Viswanathan, et al., 2003; Nielsen, et al., 2004). Worldwide evidence show continued overfishing of several important fish species and the threat of extinction for some of these stocks even as modern fisheries management has been in place for decades (Viswanathan, et al., 2003; Nielsen, et al., 2004). This has been traced largely to the exclusive use of biological models as basis for decision making, the manner in which the objectives are defined, and more importantly, the lack or absence of input and participation of stakeholders from the local community in the management process, which in turn reduced its authority and usefulness as a governance structure (Pomeroy, 1995; Hara and Nielsen, 2002; Viswanathan, et al., 2003; Nielsen, et al., 2004). As a result, the recent decade has seen a revitalization of fishery management effort towards increased decentralization and active participation of coastal communities.

3.1.3 Decentralized Fishery Management

There is a growing trend towards decentralized bottom up or shared responsibility between government and local communities in the management of marine resources (e.g., co-management, community-based management) as evidenced by partnerships established by the national and local governments with industry, NGOs, fishing communities, and local resource users in carrying out programs and policies, and in the delegation of responsibilities between them (Nielsen, et al., 2004). Because local communities and resource users are provided a voice in the decision making process and are actively involved in resource management, and because it provides a mechanism to strengthen the interaction between resource users and managers, bottom-up management broadens the information and knowledge base on which decisions are made, increases acceptability and compliance of regulations, reduces transactions costs of control, monitoring and enforcement, improves the efficacy of governance, and provides a more effective alternative to conflict resolution (Pomeroy and Williams, 1994; White, et al., 1994; Sandersen and Koester, 2000; Bennett, et al., 2004; Vedsmand and Raakjaer Nilsen, 1995; Nielsen, 2004; Nielsen, n.d). Moreover, supporters of this type arrangement have highlighted the fact that conflict can act as the catalyst for community groups and resource users to become actively involved in co-management/community-based management and thus, play an important role in conflict resolution (Nielsen, 2004). For example, co-management in Mozambique and the Philippines was prompted by conflicts over the type of fishing gear between small-scale fishers needing protection from industrial fishers; in the Laos, Malawi, Thailand, and Zambia, co-management was seen as a mechanism to exclude outsiders access to fishery resources (Nielsen, 2004).

On the downside however, bottom-up approach to resource allocation involves various user groups and hence may be more time consuming compared to the centralized strategy (Vedsmand and Nilsen, 1995; Nielsen, n.d.). In addition, the bottom-up approach may not be suitable in a number of situations, such as when stakeholders do not have the capacity or willingness to manage the resource (Vedsmand and Raakjaer Nilsen, 1995; Nielsen, n.d.). Moreover, the relinquishment of authority from centralized control may be fraught with resistance by fishery administration who may be non-supportive of the transition towards decentralized management of fishery resources (Nielsen, n.d.)
3.2 Typology of Conflicts Among Resource User Groups

Conflict among the multiple users of tropical fishery resources have never been more pronounced as today. This stems largely from strong and mounting pressure on a rapidly dwindling resource base from a rising population, changing consumer preference towards fish and fish products, globalization, competition from coastal zone development (e.g., tourism, housing, infrastructure, aquaculture, agriculture, etc.), increasing fishing effort and number of fishers. Below we discuss three cases of conflicts representing Philippines, Thailand and India. In the Philippines the conflicts relate to zoning regulations allocating access for small scale and commercial fishers in the Visayan Sea, which typifies the conflict of who controls the fishery (i.e., access issues) (Bennett et al. (2001). In the case of Thailand the main conflict was over gear use between small-scale fishers and commercial anchovy fishers in southern Thailand, and characterizes conflict on relations between fishery users (e.g., linguistic, religion, ethnic, scale of fishing, etc.). In the case of India conflicts originated from the state-government led implementation of tamil Nadu marine Fisheries Act 1983 that created separate zones for each of the dominant type of fishing (see Table 4).

Table 4. Examples of prevailing fisheries conflicts: Philippines, Thailand, and India

<table>
<thead>
<tr>
<th>Typology of Conflicts</th>
<th>Philippines</th>
<th>Thailand</th>
<th>India</th>
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<tbody>
<tr>
<td>Type 1: Who controls the fishery (access issues)</td>
<td>Small-scale fishers vs. commercial fishers and fishery regulatory bodies over zoning of fishing grounds to delineate access by category of fishers</td>
<td>Large vs. small-scale fishers over rights and access to designated zones by type of fishery and use of light luring and modern fishing gears by large scale fishers</td>
<td>Traditional vs. mechanized fishers who venture in 8km inshore waters allocated for traditional fishers</td>
</tr>
<tr>
<td>Type 2: How are the fisheries controlled</td>
<td>Small-scale fishers vs. commercial fishers and sea patrols over variable levels of patrolling and enforcement of the latter that favor commercial fishers who can afford penalties</td>
<td>Commercial trawlers, push netters, vs. regulatory agencies over lack of enforcement to control the number of fishing vessels and limit entry and operation of destructive gears</td>
<td>Fishers vs. state government on mesh size regulation</td>
</tr>
<tr>
<td>Type 3: Relations between the fishery users (linguistic, religion, ethnic, scale of fishing)</td>
<td>Local artisanal vs. migrant commercial fishermen over access and competition on fishing zones</td>
<td>Rivalry between resident small-scale vs. migrant large-scale anchovy fishers over legitimacy of access and destruction of gears</td>
<td>Traditional fishers complain over use of ring seines by mechanized fishers</td>
</tr>
<tr>
<td>Type 4: Relations between fishers and other users of the aquatic environment (fishing vs. tourism and similar water resource-based industries)</td>
<td>Fishery and sectors such as tourism, navigation/ docking, sand quarrying and mariculture over varying use of aquatic resources</td>
<td>Rice farmers vs. prawn breeders over resource use</td>
<td>-Traditional vs. mechanized fishers and hatchery operators over collection of prawn brooders -Fishers vs. government and industries on discharge of effluents; also tourism</td>
</tr>
<tr>
<td>Type 5: Relationship between fishers and non-fishery issues</td>
<td>Fishers vs government authorities over variable standards in management and enforcement arising from devolution of functions and overlapping institutional structures</td>
<td>Fishers vs government authorities over lack of proper management and enforcement</td>
<td>Fishers vs government on overlapping functions of agencies and weak structure at various government levels</td>
</tr>
</tbody>
</table>

Sources:
1 Bennett, et al., 2001.
2 Siason, et al., 2004.
3 Nissapa, et al., 2004.
3.2.1 Philippines – small-scale municipal fisheries versus large-scale trawl fisheries

Republic Act (RA) 8550 is a zoning regulation that restricts fishing activities of commercial fishers to waters beyond 15 kilometers from the municipality’s coastline. However, certain actions by the government authority, and perceptions among competing groups increased the level of conflicts rather than resolve them. Salayao et al. (2005a) observed that commercial fishers are allowed to access to municipal waters within 10-15 kilometers from the shoreline in Concepcion, Iloilo, Philippines for a rental fee of P2,500 (approximately US $50) per 2 weeks). The commercial fishers view that preferential treatment has been given to municipal fishers since the best fishing grounds are within the seven kilometers from the shoreline in Concepcion, Iloilo, whereas it is the commercial fishers who pay taxes and license fees. As a result, non-violent conflicts between the municipal and commercial fishers usually due to collision of smaller municipal fisher boats with the larger commercial vessels have increased since the promulgation of RA 8550 (Siason, et al., 2004).

3.2.2 Thailand – gear conflict versus weak enforcement of zoning regulations

The long-standing conflicts in Songkhla Province, Thailand can be traced to the a) difference in the type of gear used by local small-scale fishers and those used migrant large-scale anchovy fishers (i.e., light luring falling net vs. traditional fishing gear; small-scale light luring falling net vs. large-scale light luring fishing net; light luring falling net vs. light luring purse seine; and trawl vs. traditional fishing gear); b) entry of non-local fishing boats in local waters; and c) use of better fishing technology by migrant fishers. Although there were regulations on zoning and restrictions on use of fishing gears, poor enforcement by government authorities prompted both local and migrant fishers to break the law. In the end, local fishers and the local community lost out in the competition for access to fishery resources, which resulted in a reduction in fish stocks by 50 to 70 in the area (Nissapa, et al., 2004).

3.2.3 India – Tamil Nadu State Fisheries Act 1983 versus fishing practices

In the study sites in India Salayo et al. (2005) identified the key conflicts that arose from the resource sharing and indiscriminate fishing practices of the rival groups of fishers. Specifically, conflicts were due to use of smaller mesh-sized nets, trawling in breeding grounds, and weak marketing structure. The use of mechanized boats encroaching in areas allocated for traditional fishers was one of the most common conflicts not only in the study area, but also in adjoining fishing areas. The dispute was being linked to state government-led implementation of the Tamil Nadu Marine Fisheries Regulation Act 1983 aimed at curbing the excess capacity of mechanized fishing boats by creating separate fishing zones for the three sub-sectors. In the nearby Kerala State disputes arose from the imposition of closed fishing season which the fishers believe are ill-advised and lacking scientific basis.

The above examples show that while weak enforcement of regulations can be cause severe resource conflicts, attempts to enforce regulations targeting one user group or sector can also create an increased level of tensions and conflicts, especially when the desired results of such regulations remain at large. As a consequence regulations themselves are linked to the conflicts among fishery stakeholders, including conflicts between fishers and government officers who are perceived as not rightfully implementing the enacted regulations. Conflicts also arise from polluting effluent discharges and oil spills from various
industries in the vicinity. Tourism and the gathering of shrimp brooders for the growing hatchery business in Tamil Nadu were also noted as cause of conflict between these industries and traditional fishers (Selayo et al. (2005).

3.3 Conflict Resolution Instruments Under Alternative Management Regime

Instruments and reform measures to resolve conflicts vary across typology of conflicts and management regime (Table 5). For example conflicts arising from who controls the fishery can be resolved by traditional mediation in the case of traditional management. On the other hand, regulatory enforcement of access rights is a popular instrument for this type of conflict when fisheries are managed through central controls, although weakness in the surveillance and enforcement capacity couple with high management cost has made this instrument ineffective in resolving conflicts. The same can, however, be accomplished at a reduced transaction cost through decentralized and participatory managements such as co-management. Often, co-management and participatory management has to rely on integration of management with exit strategy and rehabilitation measures (Table 6).

In the case of Philippines, effective monitoring and enforcement of RA 8550 had expected to result in the exit of some municipal commercial fishers from some parts of the country (Table 6). Alternative livelihood options have been explored in order to reduce the pressure on the already overfished marine area. Moreover, the provision of educational opportunities primarily to the children of fishers may reduce the entry of new fishers into fisheries since fishing is often seen as an early employment outlet for those who couldn't afford to go to school (Siason, et al., 2004).

For Songkhla Province, Thailand, small scale fishers were willing to compromise with the larger scale anchovy fishers by working part-time in processing anchovies in order to augment their income and manage the conflict. At the same time, they sought the assistance and support of local government officials and worked with academics and non-government organization (NGOs) in obtaining information and advice about the situation (Nissapa, et al., 2004).
Table 6. Conflict resolution instruments and reforms under alternative management regime.

<table>
<thead>
<tr>
<th>Typology of Conflict</th>
<th>Management Regime</th>
<th>Management Instrument</th>
</tr>
</thead>
</table>
| 1) Who controls the fishery | Traditional | -Traditional claims/preferential rights  
-Conflict settlement through tradition of mediation and retribution |
| 2) How are fisheries controlled | | -Collective fishing rights based on cultural traditions/values  
-Direct dialogue between various parties  
-Community policing–Chieftain tradition (Ghana, Africa) |
| 3) Relations between fishery users | | -Inter-village disputes settlement through negotiations among village chiefs |
| 4) Relations between fishers and other users | | -Inter-village disputes settlement through negotiations among village chiefs |
| 5) Relations between fishery and non-fishery | | -Council of Elders |
| 1) Who controls the fishery | Centralized | -Zoning regulation (Republic Act 8850, Philippines) – municipal vs. commercial |
| 2) How are fisheries controlled | | -Indirect controls/rights management on fishing effort  
-Direct controls on catch limit (ITQs – New Zealand) |
| 3) Relations between fishery users | | -Indirect controls on fishing effort |
| 4) Relations between fishers and other users | | -Recreational regulations – bag and size limits, method and gear restrictions, closed areas and closed seasons (Australia) |
| 5) Relations between fishery and non-fishery | | -Use of industry liaison for arbitration  
-Monitoring and enforcement of fisheries regulations, public strategic policy, and economic planning usually based in government agencies |
| 1) Who controls the fishery | Decentralized | Zoning agreement based on sustainable use, integrated and co-management of the marine resource and multiple use (Caribbean) |
| 2) How are fisheries controlled | | -Social inclusion and industrial organization  
-Amicable settlement through payment of damages (Philippines)  
-Rational harvesting between scallop and oyster (New Zealand)  
-Build non-fishery capacity and alternative livelihood |
| 3) Relations between fishery users | | -Community-Based Fisheries Management Programme operating hand-in-hand with the traditional institution (Ghana, Africa) |
| 4) Relations between fishers and other users | | -Establishment of MPAs (Sulawesi Sea) –small scale vs. tourists  
-Information, education, and communication to create and enhance awareness |
| 5) Relations between fishery and non-fishery | | -Industrial organization (i.e., power sharing and balanced fisheries management)  
-Empowering co-management (i.e., empowerment of fishing communities) |

Salayo *et al* (2005a)
In terms of policy measures, majority of stakeholders in Thailand agreed that zoning of fishing grounds could be an effective measure in minimizing the conflict and rehabilitating the fishery stock in the area by protecting particular areas from encroachment and guaranteeing poorer stakeholders privilege rights on selected fishing grounds. In addition, government control on the use of destructive fishing gear should also be promoted through improved licensing. Moreover, while of local community rights in resource management has been recognized, regulations that explicitly include the role of fishing communities in the management process of the aquatic environment and its resources should be promulgated (Nissapa, et al., 2004).

IV. Fishing-Tourism Interaction—Allocation Issues and Emerging Conflicts

The coastal fisheries resources available to many countries no longer constitute just a source of food and income, but also an important tourist attraction, which in itself is a huge global industry. The concept of ecotourism in marine environment centers around the use of coastal resources for water sports, such as swimming and diving, and the recreational interest over fish, coral reefs, and other underwater resources. Sport fishing and diving are gaining increasing importance for tourism. Tourism uses can be beneficial, for instance, game fishing generates substantial revenues and is selective, while for many reef-dependent species, localized fishing sanctuaries can help reduce conflicts between user groups.

Coral reefs are an important part of the growing tourism industry. Corals are living organisms that contribute to fisheries in a number of ways: a) reef fishing itself; b) fishing in shallow coastal waters where the reef forms an essential part of the food web; and c) offshore fisheries which depend in part on the reef's productivity. It has been estimated that one-third of the world's fish species live on coral reefs (WRI, 1986). Many artisanal fisheries also depend on coral reefs. Such fisheries represent 90 percent of fish production in Indonesia and 55 percent in the Philippines (Clark, 1992). Hence, there tends to be a high level of conflict over coral reef usage, especially between fishing, tourism, and coral mining. The issue of carrying capacity is a major management concern in all these usages. Clearly, coral mining leads directly to physical degradation as do some fishing methods, notably muro-ami. Recreational visits may also cause damage, e.g., anchoring. Reefs are also subject to a variety of natural disasters, including hurricanes, reef-destroying animals (crown-of-thorns starfish) and diseases.
While allocation principles in fisheries tended to become complex over time, and needed to deal with multiple industry sub-groups, the emergence of tourism around the marine and coastal resources has created both opportunities and new challenges for allocating the resources. With few exceptions, exploitation of sea and fisheries resources for tourism have been fraught with conflicts with more traditional fishing activities since fishers rarely reap the benefit from this alternative form of resource use, which directly restrict their livelihoods dependent on the same resources. Hence, increasing tourism and fishing has added to the already complex allocation problems in marine fisheries. Coordination of traditional fisheries, marine reserves, and various forms of tourism appears to be the best way to avoid conflicts among different users of coastal areas. Short- and long-term resource allocation strategies have to be established in accordance with countries' economic and social needs.

In certain parts of the tropical world, such as the Caribbean, tourism has given to multiplicity of conflicts requiring newer principles of allocation. Even in some Central American countries, the Pacific and Indian Ocean fisheries management of tourism as an integral part of the allocation decision and resource management policies. However, many of the allocation principles have evolved through a trial and error process, and relied heavily on the participation and grass-roots democracies.

4.1. Fishing and Tourism Interaction in the Caribbean

4.1.1. Soufriere, St Lucia

In this case, a conflicting situation prevailed for over a decade before some principles and policies emerged. The range of conflicts include: a) commercial dive operators vs. fishermen over the use of, and the perception of impact on, the coral reefs; b) yachts vs. fishermen because of anchoring in fishing areas; c) local community vs. hoteliers over the access to beaches; d) fishermen vs. authorities at both the local and national levels over the location of a jetty in a fishing priority area; e) fishermen vs. hoteliers over the use of the beaches for commercial fishing or recreational, tourism oriented activities.

A conflict resolution process was initiated in 1992 by the Soufriere Regional Development Foundation, a community based non governmental organization (NGO) involved in facilitating development activities in Soufriere. After two years of numerous negotiations between all the parties involved, an agreement on the Soufriere Marine Management Area (SMMA), to be managed by the Soufriere Foundation, was endorsed on February 1994 by the government. The agreement contained details of a proposed zoning agreement (marine reserves, fishing priority areas, multiple use areas, recreational areas, and yacht mooring sites), legal provisions needed to manage individual activities such as fishing, diving, yachting, marine transportation, demarcation requirements, materials for user information, and training needs.

A management plan was produced, defining the institutional arrangements and responsibilities, revenue sources (including specific fees to be charged for various categories of users, systems of fee payment and collection), job responsibilities and skills required for four area wardens and the SMMA manager, specifics of infrastructure needed (demarcation and mooring buoys, demarkation signs), systems for monitoring the resource base and levels of resource use, surveillance, maintenance, and public awareness needs.

In 1997 and 1998, after a period of relative instability, an institutional review with analysis of issues and problems was conducted with all the stakeholders. The SMMA mission states that: “The mission of the SMMA is to contribute to national and local development, particularly in the fisheries and tourism sectors through management of the Soufriere coastal zone based on the principles of sustainable use, cooperation
among resource users, institutional collaboration, active and enlightened participation, and equitable sharing of benefits and responsibilities among stakeholders" (ICRI, n.d.). As a result, new arrangements were put in place, such as the designation of the zone as a Local Fisheries Management Area, the creation of a new organization, the Soufriere Marine Management Association, comprising all the agencies with management functions in the Area, the establishment of a Stakeholders Committee, arrangements for a structure for law enforcement, development of a communication plan to address specific communication deficiencies.

The project has successfully addressed the main conflicts between users, mainly through zoning. Key to the SMMA’s success in managing conflicts on an on-going basis was the very close contact which exists among user groups, and between them and the SMMA management. The SMMA played the role of a facilitating link between the user groups and not an enforcement agency.

The SMMA has shown that two essential conditions for conflict management are:

a) Direct participation of resource users, because community institutions do not always provide adequate representation and because stakes/interests often vary from individual to individual; and

b) Direct communication among stakeholder groups, for example, by allowing fishers to directly address conflicting interests to others, such as divers, or yachts people.

4.1.2 Barbados and Negril, Jamaica

The major areas of conflict between fishers and tourism interests in coastal areas are the same throughout the region and include:

a) Beach access: The uses of the two sectors are generally seen as incompatible, and the tourism sector often finds ways to move fishers from beaches used for boat landing or seine fishing;

b) Trap fishing: Recreational divers dislike seeing trapped fish and many are concerned that traps contribute to fish stock declines by catching underage fish; fishers complain that divers cut lines or damage traps to release fish;

c) Zoning: Both sectors fight for Marine Protected Area (MPA) zoning that supports their use and constrains that of the other sector, and both often feel that the other sector is getting the better deal; and

d) Decreases in fish stocks: Fishers believe that pollution and sedimentation from tourism construction, beach resorts, and other tourism facilities are responsible for fish stock declines, while tourism interests are more likely to attribute declines to over-fishing.

Conflict resolution in Barbados consisted of an agreement between the tourism and fisheries sectors and the government on a legal fish trap mesh size adequate to protect young stocks. Since some dive tourists were damaging traps, the national fisheries association got support from the tourism sector and government for a visitor information program on how the mesh size law protects young fish.
In the case of Negril, Jamaica, until its transformation into a major tourism resort, the economy of Negril, revolved largely around fishing. While some residents have now found opportunities in tourism, many still rely on fishing for much or all of their income. The Negril Marine Park has worked hard to protect and enhance local livelihoods. The NGO that manages the Park relies on the help of community partners, including the fishing and tourism sectors. Representatives of both sectors are on the NGO’s Board and so have regular input into management.

Many Negril fishers have supported the Park and become involved in management measures, such as protected nursery areas. These committed stakeholders have also been successful in getting other fishers to use good management practices, but they cannot deal with issues that involve other types of users (for example tourist boats that anchor in nursery areas) or “outside” fishers who do not respect local rules. For these matters fishers need help from government enforcement agencies, but they do not feel that these agencies take their problems seriously.

Coastal development has had serious impacts on the Park’s natural resources, but planning decisions are generally based on narrow economic analyses and rarely take the existence of the Park or the needs of local fishers into account. For example, a hotel developer was permitted to dredge through a sea grass bed within a protected nursery area. The Park has no recourse when planning decisions are taken at the political level. Over the years tourism expansion has squeezed fishers out of traditional landing beaches and forced them to move to less suitable areas. Although beaches are supposed to be public, allocation of their use is based on the property rights of adjacent landowners, not the traditional rights of local users. These are some of the challenges that the Park and the fishers are facing together (CANARI, 2005).

4.2. Fishing and Tourism Interaction in Central America

Galapagos, Ecuador

The islands’ fisheries and tourism resources are both under pressure from the domestic and international markets. The relative success of these industries in the Galapagos, combined with a high rate of unemployment and underemployment in mainland Ecuador, has turned the islands into a magnet for migration.

The establishment of the Galapagos National Park, especially the delimitation of its boundaries, provoked the first major conflict with the local populace. Declaration of the marine reserve in 1986 and approval of the management plan in 1992 (PDR–CPIG 1992) produced a second conflict, essentially over the move from a system of free access to one of restricted access, without any effort to provide information, use persuasion, or negotiate with key users of the marine resources.

The zoning of the marine reserve by executive decree, without the support of law, highlighted at least five areas of conflict among the various interest groups (Coello, 1996):

- Conservation interests vs. small-scale and commercial fishers;
- Local fishers vs. mainland fishers;
- Small-scale fishers vs. tourism;
- Commercial fishing vs. small-scale fishers, the authorities, and tourism; and
- Conservation authorities vs. fishing authorities versus military and police authorities.
After 1990, progressively more severe restrictions were placed on free access to certain fishing resources, but no thought was given to providing compensation or finding alternative solutions. By mid-1994, fishing interests were complaining that they had been without work for 14 months, thanks to the various prohibitions or closed seasons that blocked them from their primary fishing sources and the fact that a freeze had been placed on permits for expanding the size and capacity of their fleets.

The sea cucumber fishery, in which high profit margins led to flagrant violations of national park rules, was the flashpoint for disputes between local fishers, especially those of Isabel Island, and the authorities for the protected area. This activity, which had arisen as a substitute for lobster trapping during the closed season, was legally open for only a few months in 1992 and between October and December of 1994.

The closing of this fishery provoked a series of violent reactions, and illegal fishing became the number-one problem in the region. In 1995, a popular uprising saw the active involvement of fishers, who went as far as to threaten to kidnap tourists and to burn areas of the national park. The national park authorities confiscated large volumes of sea cucumbers, and the fishers suffered losses amounting to thousands of dollars.

With respect to fishers, there was a general feeling of exclusion brought about by the systematic increase in restrictions on access to fishing resources without any process of consultation or direct or indirect measures of compensation. The underlying causes also included tensions arising from:

- The perception of a tacit alliance between the conservationist forces and mainland tourism companies to displace fishers from coastal areas (the intertidal and lagoon zones) that had been their traditional fishing grounds but were now coveted by tourist interests as areas of great biological diversity and as favoured waters for recreational diving;
- The growing crisis among local tourism operators, who had invested heavily in infrastructure that was now underoccupied;
- The lack of local government funds to meet the needs of rapidly growing human settlements;
- The inequitable distribution among the islands of the benefits of tourism, which had been concentrated primarily on one island; and
- The influx of new fishers from the mainland, the increase in illegal fishing in the marine reserve, and the fines and penalties exacted against violators.

In order to forge a resolution to the conflicts, the following three key points were made: 1) preparing a frame of reference for addressing the problem and defining strategies; 2) establishing a participatory process to revise the management plan of the marine reserve; and 3) preparing the special legislation.

Regime for the Province of Galapagos (Congreso Nacional 1998). The approval of this legislation clarified the legal regime governing the entire island territory. This put an end to jurisdictional disputes between the provincial and the conservation authorities, set limits on the scope of each entity's authority and action, and clearly establish the manner in which available economic resources are to be distributed. More significantly, it set a precedent for the sustainable management of natural resources by local communities by defining the principles that are to govern policies and activities in the national park, the marine reserve, and the various human settlements. These principles represent an unprecedented advance; they incorporate the concepts of conservation and sustainable development into Ecuadorian legislation, in line with the international instruments adopted during the Rio Summit and in keeping with regional decentralization schemes, respect for traditional user rights, and the recognition of local management capabilities.
The new law had important implications for the local fishers:

- It introduced the principles of conservation, adaptive management, and sustainable use, as well as a zoning structure for fishing activities;
- It created the category of marine reserve, with multiple uses and integrated administration, for protecting marine resources;
- It confined the extraction of marine resources to the local, small-scale fishery;
- It empowered the national park authorities to collect, administer, and distribute tax revenues to finance the marine reserve’s management plan; and
- It created a participatory management body.

The case of Galapagos Islands, Ecuador, exemplifies an evolving allocation and management in protecting a valuable natural area, a prolonged conflict over the use of marine resources by various sectors, and recent efforts to manage the conflict through a participatory process (Oviedo, 1999).

4.3 Fishing and Tourism Interaction in the Indian Ocean

Maldives

Establishment of marine protected areas in the tourism zone to protect marine biodiversity by supporting in-situ conservation and the aesthetic integrity of marine dive sites is a specific ecotourism project amongst a few which aims to solve problems that arise due to conflict of interests between divers and fishers using the same marine resources. Twenty-five important dive sites have been declared as marine protected areas in the main tourism zone where anchoring and fishing (except bait fishery that sustains the traditional pole and line fishing industry), is strictly prohibited (Maldives Ministry of Tourism, 2005).

V. Conclusions

While fisheries management objective has shifted toward preserving the integrity of the ecosystem and biological diversities, a major element of fisheries management in the developing country is ensuring equity benefits and managing multi-stakeholder conflicts. The complexity of fisheries allocation issues calls for an integrated approach to dispute management. CBD and MPA management while restricts allocations (including imposition of no take zone), market based allocation such as quota and TURF-type of allocation can still promote the principle of economic efficiency (Gordon 1954; Scott 1955). Both vertical (in relatively specialized fishing) and horizontal (in cases where multiple uses are concerned) integration will have to be utilized in order to maximize the benefits from the ocean and to assure that allocation issues are managed in a socially, economically and environmentally sustainable manner. Non-extractive use, such as diving and tourism (chartered boat; sea taxi) can be the basis of horizontal integration of resource allocation, and give equity benefits to fishing communities. This way, management can address the issue of losses to fishermen from reduced fishing ground due to MPA management. The WSSD goals require drastic actions of overcapacity in industrial fisheries—allocation of equitable use rights, effort reduction along with strengthening monitoring and control system through co-management type of arrangements (World Bank 2004). Likewise, in small-scale fisheries, MDGs and WSSD will warrant support for organization of fishers, allocation of use rights, alternative employment and income generating opportunities, and establishment of MPAs, where needed (World Bank 2004).
References


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