

Community-Based Fisheries Management Institutions in Indonesia

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ABSTRACT Problems and prospects associated with community-based management of tropical fisheries resources are examined through a comparative case study based on field research conducted in Indonesia during 1990 and 1991. The argument is made that the central government lacks both the detailed knowledge of local ecosystems and the enforcement capability necessary to effectively manage highly diverse fisheries resources in this large archipelagic nation.

Community-based fisheries management systems have a long history in Indonesia and under certain conditions have proven effective not only in managing fishery resources on a sustainable basis, but also in fairly allocating access to these resources among local users. The dynamics of such systems are illustrated by comparing community-based management of a freshwater fishery in West Kalimantan Province with systems used for managing marine fisheries in Maluku Province.¹ In both cases, long-standing management systems are shown to be based on detailed local knowledge and consensus among community members. These systems are shown to be dynamic and adaptive, but whether they can adapt to new pressures, created by rapidly changing market conditions and the efforts of local government authorities to gain control over resource allocation as a means of increasing tax revenues, is left as an open question. The case study materials are followed by a critical examination of the opportunities and problems associated with community-based fisheries management. The paper concludes with a set of specific policy recommendations that would encourage recognition of local rights to resources, decentralization of responsibility for fisheries management, and a recapitulation of the reasons for doing so.

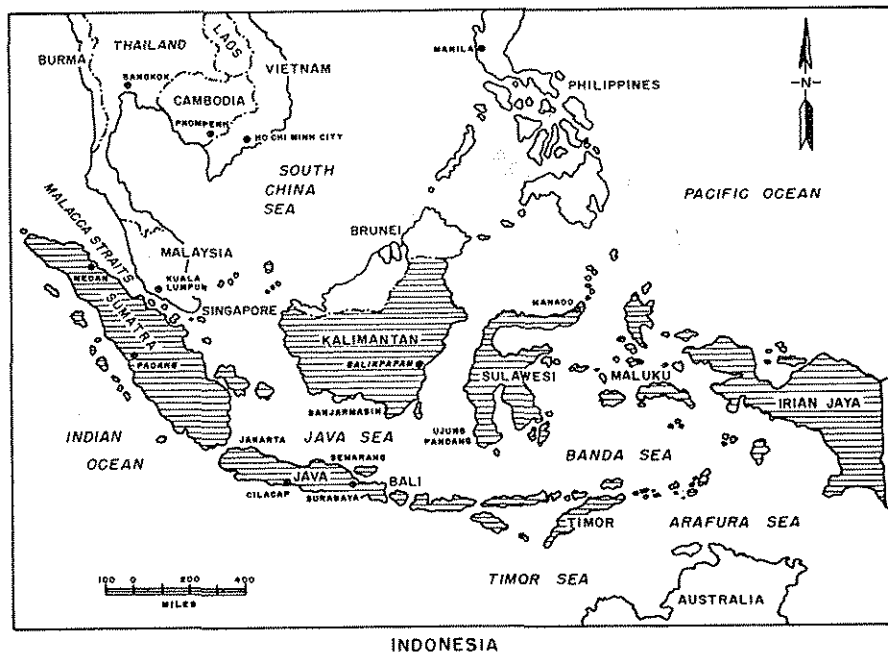
Introduction

Indonesia's marine fisheries sector is characterized by rapid adoption of new production technologies in a context of finite resource availability (Bailey et al. 1987). Opportunities for expanded harvests from the sea exist, but most important fishing grounds are heavily exploited and in some cases overexploited. During the next 25 years, resource management will become the key to fisheries development.

Fisheries management often is assumed to be a governmental responsibility (Gordon 1954). However, the effective capacity of government agencies to regulate what goes on in widely scattered fishing grounds is distinctly limited. This is particularly true in Indonesia, which has 81,000 kilometers of coastline and more than one million fishers. Compared to the scope of the problem facing government agencies attempting to control fishing activities, administrative and technical capacities are relatively weak (Bailey 1988b; Marlessy 1991a, 1991b; Zerner 1991b). Under these conditions, devolution of major resource management and allocation decisions to the local level may be more effective than management efforts which distant and understaffed government agencies can provide.

Community-based management systems offer the opportunity to allocate resource rights and benefits in a more sustainable and effective manner. Compared to these systems, government attempts to manage fisheries resources based on available scientific data are recent in origin and unproven in effectiveness. Results of our research indicate that the Indonesian government should resist the temptation to extend bureaucratic control over fisheries resources. Instead, the government should work in partnership with local management systems where they exist, and foster their extension into new areas wherever possible.

Throughout this paper we emphasize the dynamic, historically conditioned nature of community management institutions and their embeddedness in the larger context of political and economic forces. Community management institutions in Indonesia, like those elsewhere in Southeast Asia and the Pacific, exhibit great variation in their social-distributive designs, environmental consequences, and reliance on indigenous environmental knowledge. They also differ greatly in their cultural construction of



ideas of nature, resources, and habitat dynamics. These institutions should not be understood as if they were outside of time and place. They must be understood as human creations, situated in, made of, and shaped by the historical contexts in which they are embedded.

In this paper, the positive prospects as well as problems of local resource management in Indonesia are presented through recent case studies in Kalimantan and the Maluku Islands. These case studies are preceded by a general discussion which lays out the rationale for local management of common property fisheries resources. Following the case studies, the paper concludes with a discussion of the opportunities and limitations associated with local fisheries management and with specific legal and policy recommendations for encouraging effective local management of fisheries resources in Indonesia.

Community-Based Fisheries Management Institutions

The advantages of local management of fisheries resources has been well documented in various parts of the world, including the United States (Acheson 1975), Japan (Commitini 1966; Ruddle 1985, 1989), the South Pacific (Iwakiri 1983; Johannes 1981; Ruddle and Johannes 1985); and Indonesia (Zerner in press). A growing literature on local common property resource management systems dealing with forestry, graze lands, and other biologically renewable resource systems also is available (e.g. Agarwal 1991; Berkes 1989; Bromley and Cernea 1989; McCay and Acheson 1987; National Research Council 1987; Poffenburger 1990; Runge 1986).

Recent research in Eastern Indonesia (Abrahamsz 1991; Khouuw and Simatauw 1991; Zerner 1989a, 1989b, 1991a, 1991c) as well as historical surveys throughout the archipelago (Polunin 1984) suggest that local resource management systems may serve to effectively manage and allocate inshore fisheries resources. The efficacy of coastal community management institutions appears to depend on a number of factors, including relatively low population density, homogeneity of kin- or territorially-based communities, and the use of relatively simple extractive technologies.

However, many of these conditions are changing. Indeed, the viability of local management institutions is under assault by a variety of forces including the rapid expansion of global markets for marine products, the expansion of state control over local resource systems, the often misguided efforts of international agencies to promote fisheries development, and the increasing efforts of private sector investors to gain control over coastal and marine resource systems (Bailey 1988a, 1992). The cumulative effects of this tide of forces have undermined many community management institutions, economically and spatially marginalized local coastal communities, and led to overexploitation and degradation of coastal fisheries resources (Zerner, in press).

At the core of local management is the issue of property rights. Property rights are rights to a secure stream of benefits from the territory or the particular resource in question. The existence or absence of property or control rights is a matter of fundamental importance in conceptualizing fishery management policy issues. In fisheries, problems of over-exploitation generally are attributed to the lack of clear property rights and the consequent efforts of individual fishers, in an open access

situation, to maximize benefits even at the expense of resource sustainability and long-term societal good (Gordon 1954). In open access systems, there are no effective boundaries around the resource, no limits are placed to the entry of individuals who wish to share in exploitation of the resource, and no restrictions on how the resource is to be exploited. In the absence of clear and enforceable property rights, resource competition becomes a mad scramble that often leads to resource depletion and local impoverishment. Governmental regulations to control levels of fishing effort are imposed to forestall the 'tragedy of the commons' (Hardin 1968).

Part of the problem has been conceptual: governments frequently fail to conceive of or recognize the existence of local community management institutions which may effectively manage access to local resources. The 'tragedy of the commons' may not simply result from the fishers' inability or lack of desire to restrain themselves from overexploitation. The 'tragedy' outcome may also result from a governmental failure to recognize local community institutions, rules, and intentions to successfully manage resources.

In Indonesia, government fisheries policy is based on the assertion of total state management authority over marine resources and waters. Indonesian fisheries laws and regulations, moreover, do not explicitly recognize local community tenures or property rights, although this does not amount to the proposition that such rights do not exist. Lack of explicit government recognition of community tenures in inshore territories and resources continues despite mounting evidence that local fisher communities will fiercely defend their economic interests and territorial rights against economic injustice and outsider access (Bailey 1988b; Zerner 1991b). The contrast with landholders' rights could not be more striking. On land, the Basic Agrarian Law of 1960, which governs terrestrial environments, recognizes customary law (*hukum adat*) and community territorial rights (*hak ulayat*), allowing customary land owners and/or historic users the basis for legal claims.

The potential advantages of local management institutions include effectiveness and equity. They may be effective because local fishers are knowledgeable regarding the resource. Local fishers are likely to be motivated to protect their resource from overexploitation. In operation, these systems may be based on broadly accepted local notions of social justice, ensuring the legitimacy of the management system in the eyes of local residents. Local communities are in the best position to monitor compliance with regulations. In most rural fishing communities, informal social sanctions can be imposed on individuals who transgress collectively established restrictions.

The combination of physical presence and the application of informal means of social control is far more efficient than dependence on government agencies to enforce regulation. The cost of enforcing regulations along thousands of kilometers of coastline is prohibitive and in practice rarely occurs. In practice, government attempts to centralize fisheries management authority have resulted in *de facto* open access conditions throughout much of Indonesia. This is so due to the limited capacity of the central government to enforce fisheries regulations. The failure to recognize local community resource rights and responsibilities undermines community capacity to manage local resources and local incentives to comply with fisheries laws. Empowering fishermen to manage local resources is no panacea for the increasingly complex problems of coastal resource management. It is difficult to visualize achieving the goal of effective resource management, however, without the active involvement of those who will be most affected.

Case Studies from Kalimantan and the Maluku Islands

In this section we discuss the functioning of local fisheries management systems in a lake and river system of West Kalimantan Province, and management systems found to operate in the Maluku Islands. Both Moluccan and Kalimantan cases demonstrate the flexibility of community management institutions responding to rapid changes in the values of locally available resources. While the Kalimantan case demonstrates an attempt to wisely manage resources in the context of increasing market-generated pressures for exploitation, the Moluccan case demonstrates the relative weakness of community management structures and the potential for 'take-overs' by non-local, private sector or local government elites. The two case studies demonstrate that local management systems are dynamic and under significant commercial and political pressure. The case studies also demonstrate that such systems are both dynamic and variable.

Kapuas Hulu

The Kapuas River of West Kalimantan Province is the longest in Indonesia. The Kapuas River fishery is one of the most important freshwater capture fisheries in Indonesia. The fishery can be characterized as multi-species, multi-gear, and highly seasonal. Giesen (1987:133-134) reports 112 fish species associated with the upriver lake system. He notes that 19 of these species were present in at least 20% of the 25 catches (from three different gear types) he examined in 1986. Fishing activity takes place along the entire length but approximately 70% of the catch comes from the upper reaches of the River and is associated with a series of lakes of varying sizes connected to the River and each other by a series of waterways. Giesen (1987:26-27) counted a total of 83 distinct lakes, 14 of which were over 600 ha in size. During peak flood season, however, boundaries often become meaningless as the area resembles an inland sea.

Peak fishing seasons are associated with rainfall patterns. The highest catch occurs at the start of the rainy season (October-November) when the lakes begin to flood. At this time, many species of fish migrate into the lake district. A second peak in catch occurs during the months of lowest rainfall (June-July), when fish migrate from the lakes. As they migrate, fish are concentrated into known channels. At this time, they are vulnerable to being caught by fishers intimately familiar with the behavior of local species.

The lake district appears to be a key to management of the Kapuas River fishery due to its role as spawning and nursery ground for numerous fish species that inhabit the river. Giesen (1987) reports that since the early 19th century, local restrictions on fishing activities have been enforced to protect the resource from overexploitation. Subsequent field work during 1989 and 1990 showed that fishers in this area continued to control their own fishing activities as a means of ensuring sustainable harvests from the river and lake system (Bailey et al. 1990; Pollnac and Malvestuto 1992). Approximately 65 communities of fishers are located in the upper Kapuas River and lake district. The fishers themselves are organized along residential units associated with a particular body of water. Each of these groups is led by a head fisher (*ketua nelayan*). Each community has effective control over a particular area. Fishers from each community have exclusive use rights to operate within a particular area in the lake district. Fishers from one community can ask to operate in the area of another community, but must first receive permission from the local head fisher. The head fisher

generally grants permission to use a specified type of fishing gear. Outsiders must adhere to any local restrictions that are in force regarding mesh size or gear type which may be used. Permission generally is granted, but the head fisher may refuse permission during the off season when his own people are having problems fishing.

Head fishers play an important role in fisheries management. In one community, the head fisher banned the use of a type of stationary fish trap (*jermal*) during low water because the gear was too effective and harvests could not be divided in an equitable manner among all fishers in the village. In another community, *jermal* were banned during low water because they represented a hazard to boat transportation. Local prohibitions also have been established against fishing under or destruction of floating aquatic grass. Local fishers have observed that this grass serves as a nursery area for important species and have acted to protect these areas. Head fishers also play a role in setting fisheries management policy outside of their own immediate area of responsibility. In one area of the lake region, head fishers from several villages agreed to ban all fishing gear except gill nets. Additionally, gill nets could only be used in one half of the lake. A universal ban has been established on the use of *tuba* (a locally available source of rotenone) or other poisons.

The existence of an effective local system for fisheries management provides local fishers with the organizational capacity to deal with problems caused by recent overexploitation of the red Asian arawana (*Sclerophages formosus*) stocks. Prior to 1979, the arawana had no special value. During the 1980s, however, and especially since 1984, demand and price have escalated, resulting in heavy fishing pressure on the arawana. In 1989 and 1990, fishers in this remote corner of Kalimantan were paid up to Rp 2.8-3.0 million (US\$ 1,700) for individual fish. Gold and yellow arawana also are locally present. Their value is only one-quarter that of the red arawana. At over US\$ 400 per fish, however, these fish also are extraordinarily valuable. The directed fishery is highly effective due to local knowledge of the species and its migratory habits. In particular, the seasonal movements of the arawana from river to lake and back again are well understood by local fishers.

The combination of local knowledge of fish behavior and high price has resulted in devastation of the local arawana stock. Giesen (1987:144) reported that between 1981 and 1986 exports of arawana from West Kalimantan declined from 30,000 to 7,000 fish.² In response to rapid decline in the arawana population, local fishers and the 65 head fishers in the lake district decided on a common plan of action designed to protect the breeding stock. Beginning in 1989, local fishers were not allowed to capture or hold arawana of a length greater than 25 cm (roughly 10 inches). Larger individuals were considered to be a part of the breeding population and were to be protected. Local fishers agreed to release any mature arawana caught in their nets and traps. As they were unable to differentiate between male and female, all mature arawana were covered. Smaller juvenile arawana could be taken without restriction. Any fisher found with a mature arawana was subject to a Rp 5 million (roughly US\$ 2,900) fine.

It is too early to tell whether the local management scheme to protect mature arawana will be successful. The agreement to ban sale of mature arawana is too recently established to report on the success of this approach. However, at least two potential problems can be identified. The first of these is the entry of new fishers drawn into the area by the hope of striking it rich through the arawana fishery. Newcomers may be

less inclined than established local fishers to abide by the local agreement to release mature arawana. Secondly, fish buyers may be inclined to buy and sell anything that offers opportunity for profit. These buyers are not bound by the prohibition against taking or selling large arawana which the fishers have imposed upon themselves. Thus, a ready avenue exists for an individual fisher to ignore local restrictions. The incentive for an individual fisher to secretly sell a prohibited specimen to a local or traveling buyer may be greater than the risk of being caught and fined. Nonetheless, an attempt is being made under local initiative to accomplish a management goal. Moreover, this attempt builds on well-established local organization and practice that appears to have a high degree of local legitimacy.

Maluku Province

Community-based management systems for both terrestrial and marine resources are common throughout the central and southeast Maluku Islands (Abrahamsz 1991; Khouow and Simatauw 1991; Marlessy 1991a, 1991b; Volker 1921; see also Zerner 1991a, 1991b, 1991c). Collectively, these systems are known as *sasi*, a word of Makassar Malay origins meaning to witness.³ In the Maluku Islands, to *sasi* means to place prohibitions on the harvest, capture, or theft of particular resources of economic or subsistence value to the community. To perform a *sasi* ritual and to place *sasi* into effect means that access to particular areas -- a garden, a group of farms, or a fishing ground -- is restricted until further notice. The act of placing an area under *sasi* is accompanied by the installation of prohibitory signs (*salele*). When a mango tree is *salele*, for example, a physical sign of the prohibition against taking any mangoes is attached to that tree (e.g., a ring of sago palm leaves is tied around the tree). To local inhabitants, this would be immediately readable as a prohibition against picking the mangos. Many Malukan farmers and fishers believe that the 'closing' and 'opening' of *sasi* prohibitions is witnessed by invisible spirits. Violators are believed to be seen by these spirit-witnesses and punished through the infliction of illness or even death.

Sasi rules, institutions, and sanctions vary from locality to locality but generally are based upon customary law (*hukum adat*) and community territorial rights (*hak ulayat*). Historically, these local systems have promoted security of community rights over important natural resources. *Sasi* systems may also have promoted the equitable distribution of benefits from these resources among members of the community, but the historical picture is not yet clear.

Although *sasi* practices on land and shallow seas may share a common cultural substratum of religious beliefs concerning relationships between spirits, resources, and the human community, terrestrial (agricultural) *sasi* may also have developed in response to the historical presence of outsider clove traders who sought to secure stable supplies through contracts (Zerner 1991c). Coastal or inshore *sasi*, in contrast, may have initially regulated community access to schools of pelagic fish, and only recently become a means of regulating access to commercially valuable reef resources.

On many Moluccan islands, in coves and bays, local fishers have devised a variety of regulations which include restrictions on the timing of fishing seasons, the types of gear and techniques that may be used, which species may be taken, and where fishing is permitted to take place. Local fishers also have developed boundary concepts and devised physical markers to define and publicize the edges of community property

under particular or general restrictions. Most customary marine law regulations apply from the edge of the low tide mark on the shore to a region just beyond the outer edge of the shallow shelf surrounding many Moluccan islands. Generally, waters of more than 20 meters of depth are outside of *sasi* regulations. Most marine resources of local importance to the population occur in these relatively sunlit, shallow waters. From the standpoint of surveillance, waters more than a few miles from the coast would be hard to monitor and *sasi* restrictions would be hard to enforce.

Until recently, *sasi* restrictions in the sea were imposed primarily for reasons of hunting success and equity. Gear that only a few individuals can afford to purchase may be prohibited to insure that the gains of the hunt are distributed equitably. This includes seine nets and scuba gear which most cannot afford. *Sasi* often is declared to increase the likelihood of success in fishing for easily frightened schooling fish. If a school of fish is observed moving into a bay or inlet, *sasi* will be declared until the fish have settled down in the area. Only then is *sasi* lifted and fishing permitted so as not to alarm the fish during their migration.

The most basic means through which access to marine stocks is regulated is through seasonal opening and closing of *sasi* within specified, bounded community management areas. When *sasi* is open, local inhabitants may harvest a particular resource within the community management area, subject to regulations binding on all community members. When *sasi* is closed, no one in the community may harvest that resource. Persons or groups outside the immediate community must negotiate for rights to enter, travel through, harvest, hunt or trap within community territory. Although temporal and spatial restrictions are the basic control mechanisms applied under most *sasi* systems, control over market rights also are important and problematic (Abrahamsz 1991; Khouw and Simatauw 1991; Zerner 1991b).

Many Moluccan coastal communities have a well-defined sense of their particular marine territory. These territories are known as *petuanan* in the central Maluku islands and as *bati* in the northern Maluku Islands. Boundaries frequently are associated with natural features in the coastal landscape, especially promontories or points. Thus, in Halmahera, Saparua and Hatta Islands of the Maluku group, the outermost lateral extent of a marine *petuanan* was recognized as the tip of two proximate points. On Halmahera, an imaginary line between these two promontories on opposite sides of a deep cove, about 15 kilometers deep and 40 kilometers wide, constituted the boundary of one well-administered *petuanan*. Several island communities claim use and control rights over submerged atolls and underwater reefs known in Indonesian as *negeri tengelam* (literally 'submerged countries') which may be several miles from the island on which the community is located.

Marine and terrestrial rituals, performed on a yearly basis, make the boundaries of a community's territory socially visible. As *sasi* ritual practitioners make a pilgrimage to sacred spots (*kramat*) on the tips of points or marine promontories, they are simultaneously articulating boundary lines. Sometimes these lines are linked to trees, promontories, submerged rocks or other natural topographic features that serve as guides to the seaward boundaries of the *petuanan*. Fishers from other islands in the area recognize and respect these claims as much as they obey the regulation of the inshore island-linked *petuanan*.

Responsibility for the performance of seasonal *sasi* rituals, for monitoring compliance, and for apprehension of violators rests with customary officials known as *kewan*.

Violators of *sasi* regulations are brought before village councils, and sanctions are issued. The system of sanctions formerly included public shaming (binding the violator with the physical sign of *sasi*). In recent years, such sanctions have become increasingly imposed in the form of monetary fines.

Prior to the 1950s or 1960s, marine *sasi* systems focused on resources used for subsistence purposes. These included schooling finfish as well as shellfish. During the 1960s, a commercial market developed for mother of pearl from the shell of a mollusk known as trochus (*Trochus niloticus*), which is used to make a variety of ornamental items including buttons and paint pigments. Until this time, trochus had been harvested as a minor subsistence food; the animal in the shell was eaten and the shells themselves were thrown away. In recent years, however, the trochus shell has become a valuable export commodity. The total volume of shell exports from Maluku Province tripled in one year, from less than 80,000 kg in 1987 to over 256,000 kg in 1988. From the shallow shelf and reefs of Kei Besar, a single island in southeast Maluku Province, a total of 7.5 tons of trochus shell, with an approximate value of US\$ 65,000 was harvested in 1989 (Abrahamsz 1991). By 1991, trochus shell was selling for Rp 16,750 (over US\$ 8.00) per kilogram.

Emergence of a new market in trochus resulted in new pressures on *sasi* community management systems throughout the Maluku Islands. Local governments and private exporters have begun competing with local communities and families for rights to control inshore fisheries resources. In some areas, local government officials have asserted government dominion over *sasi* rights, claiming that societal needs for 'development' override the rights of kin groups or communities which historically claimed local rights to resources. In some cases, outsiders have been hired by the local government to harvest the resource, meaning that local residents lost not only income but employment as well. A detailed case study of this process in Desa Nolloth is presented in Zerner (1991a).

In the southeastern Maluku Islands (Aru and Kei), Indonesian entrepreneurs have succeeded in acquiring rights to community-owned fishing grounds through the advancement of loans to individual families during the monsoon season. The *petuanan* itself, or rights to harvest it, was the security for these loans. Once indebted, many families transferred their rights to these entrepreneurs. In some communities, outsiders have acquired sole rights to harvest local marine resources, resulting in loss of local control over the community's resource base. Recent studies in Aru and Kei islands document significant losses in income by local residents as a result of this transferral (Abrahamsz 1991; Khouw and Simatauw 1991).

Equally disturbing has been the rapid depletion of trochus resources. In the inshore waters of many Moluccan islands, trochus and other reef-resident species are being overexploited and depleted (Abrahamsz 1991; Zerner 1991a, 1991b, 1991c). Until the 1960s, *sasi* prohibitions against harvest of trochus lasted from three to five years, a period sufficient to allow populations to mature and reproduce at least once. Depending on the area, local government officials, private sector agents, as well as local villagers are encouraging annual harvests from the reefs, with the result that the resources are overexploited. On Saparua Island, for example, annual harvests are yielding only 800 kg, where previous harvests on a three year cycle were 3,000-4,000 kg.

The causes of this overexploitation include pressures from local government officials for increased revenue, rapidly rising consumer aspirations of local villagers,

and the short-term profit orientation of private entrepreneurs. In some areas, local officials claim they have attempted to resist villagers' desires to shorten the interval between harvests. Whether the result of governmental or entrepreneurial encroachment, these external pressures are diverting economic benefits from villagers to other parties. These processes have disturbing implications for village economic development. Further loss of control removes the incentive local fishers have had to restrain their level of resource extraction, undermining a potentially effective and adaptive system of resource management.

Limitations and Problems

The argument has been made that local resource management systems can be effective, efficient and equitable in their distributional effects. Yet, as one observes marine fisheries resources in Indonesia, it is obvious that such systems are the exception rather than the rule. Local control over fisheries resources has been documented in parts of Sumatra, Kalimantan, Sulawesi, and the Maluku Islands. No such systems have been documented for Java or any of the Lesser Sunda Islands. Only a small minority of Indonesia's million-plus fishers have any say in the management of the resource base upon which they depend. This does not mean that such systems are inconsequential. Overexploitation of fisheries resources is a serious problem in many parts of Indonesia (Bailey et al. 1987). Self-regulation by those who exploit the resource may prove to be a crucial element in achieving sustainable fisheries harvests. Lessons learned from existing local management systems may prove valuable in achieving this goal. Among these lessons is recognition of the dynamic quality of these systems and the presence of pressures that tend to undermine such systems.

The centralizing tendency of Indonesia's government policies is a major factor tending to undermine the authority of local institutions responsible for resource management. Other factors tending to erode local abilities to manage fisheries resources include expanding human populations and the emergence of national and international markets for newly valuable marine resources. Indonesia's growing population has generated increased demand for fish while international markets for trochus, spiny lobster, sea cucumber and other marine species have increased the economic stake associated with control over local inshore fishing grounds. The resulting commercialization of marine fisheries not only has created new economic opportunities for local fishers, it often has led to loss of community control over local resources. While some local individuals have benefited from this transformation, these benefits frequently have been won at the expense of resource depletion and the erosion of resource allocation systems based on local standards of distributional equity.

In addition to demographic, economic, and political factors tending to limit the operation of local management systems, physical limitations also pose serious constraints to the spread of such systems. Christy (1982) notes that community management systems are most easily established and maintained where clear natural boundaries exist (e.g., an estuary, a reef) or where the resource is relatively immobile (e.g., shellfish). Our case study materials tend to support this view. Highly migratory species (e.g., tunas and other pelagics) generally are not manageable by a single

community. Clear, defensible boundaries may not be easily established where fishing takes place offshore of open coastlines. However, even on the high seas, marine property rights systems have been enforced (Pastoral 1987; Zerner 1989a, 1989b). Community-based fisheries resource management systems also may be difficult to establish or maintain in settings where social, political or ethnic divisions occur within the community. Operation of these systems depends on their acceptance by local fishers, who jointly enforce compliance. Where communities are internally divided (e.g., between rich and poor, political factions, etc.) or where demographic patterns are rapidly changing (e.g., through the migration of outsiders into an area), systems based on consensus will not be effective. Again, our case study materials tend to confirm the importance of internal community cohesion as a factor in establishing and maintaining effective management systems.

Local communities, like states, are polities increasingly driven by the same interests which motivate contemporary governmental and commercial elites. The emergence of regional and global markets for tropical fisheries resources, as well as consumer products, have created new sets of incentives that are affecting local actors' cultural and economic interests and institutions. Therefore, in advocating community rights to manage and allocate access to local resources, we must be careful not to romanticize the distributive consequences of local institutions or the environmental consequences of local cultural conceptions of the natural world. Community management institutions should not be considered to be timeless, unchanging cultural inventions. Rather, they should be understood as dynamic institutions that are social inventions, shaped by local experience and influenced by external forces. Further, we do not advance a simplistic image of local communities living in harmony with their environment or intrinsically equitable in their distributive arrangements. To the contrary, contemporary actors and institutions on the local village scene are increasingly driven by the same market incentives and economic imperatives that drive governmental officers and private sector entrepreneurs. Attempts to create or strengthen contemporary community management institutions must be based upon a realistic assessment of the motives, ethics, interests, and cultural conceptions which drive local actors.

Having noted the above limitations, we believe that local resource management systems should be a key component of Indonesia's fisheries management program. Fishers and their communities cannot be ignored if realistic resource management programs are to be implemented. If fishers do not have a recognized stake in resource management, they will have no incentive to protect the resource. Local property rights over fishing grounds and resources provide an important incentive for fishers to restrain their individual greed for the collective long-term good. In contrast, erosion of local resource management systems increases the probability that local actors will become local despoilers of the coastal commons.

Social scientists are just beginning to explore the range of possible social designs which would encourage effective local-level resource management. There is an urgent need to increase our knowledge of community organization among fishers to better appreciate the potential role of local communities in resource management. Studies are needed to document the contents of customary law and local territorial rights, types of institutional structures, and problems of implementation and enforcement. Additionally, such studies need to document success or failure in resource management and

equitable distribution of resource flows. Case study analysis of existing systems will provide a basis for understanding the larger economic, political, and ideological contexts within which such systems operate. From these particular, historical narratives of changing institutions we may glean valuable principles of institutional and legal design. What we do know is that, in certain conditions, they represent low-cost and socially sound alternatives to centralized and sectorally segregated governmental control. Co-management designs, based upon formal and *de facto* recognition of community rights and delegation of some resource management authority to local institutions, suggests itself as an appropriate embarkation point.

Recommended Legal and Policy Initiatives in Indonesia

In Indonesia, legal issues are among the obstacles to the maintenance and development of effective community management institutions. Customary law (*hukum adat*) and community territorial rights (*hak ulayat*) are not mentioned in the Indonesian fisheries statutes dealing with fisheries management. Similarly, the law which authorizes the structure of village level government (statute No. 5 of 1979) does not recognize community level institutions and leadership roles other than formal government structures (Abrahamsz 1991; Marlessy 1991a, 1991b). Locally fashioned institutions and common law customs reflecting accepted standards of social and economic justice have been ignored in shaping national and regional resource management institutions and laws. In the absence of governmental support, coastal fishing communities lack the ability to manage their fishing grounds or defend their interests against powerful outsiders.

Government recognition and support of local resource management in coastal fisheries should be formalized through amendment of the National Fisheries Law No. 9/1985. In particular, explicit legal recognition needs to be given to the concepts of customary law (*hukum adat*) and local territorial rights (*hak ulayat*). Legal procedures for recognition of these rights need to be spelled out clearly. According to current law, all Indonesian citizens have the right to fish anywhere (though certain vessel size and gear restrictions apply). A revised national fisheries law would include recognition of local rights to manage and allocate access to particular resources and territories. This would provide the legal basis for communities of fishers to regulate exploitation of inland waters, reefs, coves, inlets and estuaries. Provision should be made for enabling communities of fishers to incorporate as rights-holding corporate bodies (*badan hukum*), encouraging the expansion of local fisheries management systems and local, autonomous economic entities.

In addition, the National Administrative Law No. 5/1979 needs to be revised to recognize the authority of local legislative institutions. As currently written, this law does not recognize any source of legal authority other than nationally appointed or elected officials. Recognition of community management institutions would constitute an important initial step in establishing the legal standing of local management systems. Once this is done, provincial and regency level regulations (*peraturan daerah*) should be issued which formally recognize the status of existing community ownership and/or use rights over coastal and marine resources.

Indonesian non-government organizations, including the Indonesian Environmental Forum (*Wahana Alam Lingkungan Hidup*), should be invited to participate in drafting proposals for legal reform and institutional innovation. These NGOs are ideally placed to work with coastal communities in encouraging community resource management (Korten 1986, 1990).

As the value of coastal resources rises, pressures on local institutions and leaders also increases. If equitable and effective community management is deemed a priority policy goal, then alternative marketing schemes and institutional arrangements must be designed to support community interests. Care must be taken in implementation of such legal changes so that local elites do not capture control over fisheries resources and exclude those who have enjoyed historic traditional use rights over local resources and territories. Local NGOs can play an important function in monitoring implementation and identifying problems.

Conclusion

The Indonesian government's ability to effectively manage the nation's far-flung and extraordinarily diverse fisheries resources is extremely limited. Under what amounts to open access conditions, many important fisheries resources in Indonesia are being overexploited. There is no reasonable prospect for this condition to improve in the short term without a wholesale rethinking of the government's approach to fisheries management. In this paper, we have argued that local resource management should be an important part of the resource management equation. Such systems offer the possibility of effective stewardship based on clear articulation of community rights and responsibilities, effective indigenous institutions, and intimate knowledge of local ecosystems. The record in Indonesia and elsewhere shows that such systems have the potential to combine effective resource management with distributional equity. Giving local fishers a fair share simultaneously gives them a stake in the long-term sustainability of the resource. Given the potential advantages of effectiveness, efficiency and distributive equity offered by local management institutions, the key question becomes whether the Indonesian government is willing to recognize the rights as well as the responsibilities of local communities in managing and sustainably developing local resources.

Notes

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2. These export figures must be regarded with some caution. The arawana is on the CITES list of endangered species and, as such, could not legally be exported prior to 1990. In that year, this species was 'down listed' to the CITES Appendix II category, allowing Indonesia an annual quota of 1,200 specimens for export (Watson 1990). Despite these restrictions, an active trade in arawana between West Kalimantan and Singapore is known to occur. There is direct air service between the provincial capital of Pontianak and Singapore and fish can easily be carried in oxygenated bags concealed in hand luggage.

3. In the Indonesian language, the word for witness is *saksi*. James Collins of the University of Hawaii notes that *sasi* means 'witness' among Makassar Malays of South Sulawesi (personal communication), a group long engaged in inter-island trade. The same word for 'witness' is used by the Minangkabau of Sumatra (Iskandar 1970).

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