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CONFLICT IN THE COMMONS: THE CASE OF INDONESIAN FISHERIES

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Introduction

Competition and conflict between small-scale and commercial fishermen is a common problem in the Third World. The rapid growth of commercial fisheries, especially trawl fisheries aimed at export-quality penaeid shrimp species, has contributed valuable foreign exchange to national exchequers. In many cases, however, commercial trawlers operate in competition with small-scale fishermen, who over many generations have established traditional resource use rights over coastal fishing grounds where shrimp are most abundant and where, as a consequence, trawlers are most active. The profitability of shrimp trawling has led to substantial increases in levels of exploitation which in many cases resulted in resource depletion. Competition between trawler and small-scale fishermen for the dwindling resource frequently has provoked violence between these two groups.

Trawlers were the first and continue to be the most common type of commercial fishing unit in Southeast Asia, due largely to their effectiveness in capturing shrimp. The trawl net is funnel-shaped and actively pulled along the sea floor. This requires a powerful engine and a relatively large boat to house the engine. Trawlers in this Region are relatively small and unsophisticated compared with those of Europe or North America, but by local standards they represent a quantum leap in fishing power compared to that available to small-scale fishermen.

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In Southeast Asia, most countries have attempted, but with little success, to restrict trawlers from operating in coastal waters. A notable exception to this experience is Indonesia, which imposed and effectively enforced a nearly complete ban on all trawling beginning during the period 1981-83. The elimination of trawlers reflects renewed emphasis on small-scale fisheries development as a national priority. More broadly, the government's action established the importance of small-scale fishermen's traditional resource use rights over coastal fishing grounds.

This paper describes the context in which development of commercial trawling in Indonesia took place, and provides assessment of the largely favorable effect of the trawler ban on Indonesia's fisheries sector. The paper concludes by examining the concept of traditional resource use rights. It was in reference to these rights that the Indonesian government rationalized the prohibition of trawlers.

The Blue Revolution

Over the past two decades, marine fisheries in many tropical developing countries have experienced a technological transformation of major proportions. This "blue revolution" has been especially significant in Southeast Asia, a region with a long maritime tradition, a large number of fishermen, and a high degree of dependence on fish for dietary protein (Emerson, 1980; Smith, 1979). Prior to the 1960s, the fisheries of Southeast Asia were almost exclusively small-scale in nature and were oriented to supplying local domestic markets. The opening of international markets for shrimp, and to a lesser extent tuna and other high-valued species, made adoption of capital-intensive fishing technologies commercially attractive. It is this shift in emphasis toward integration into world commodity markets that is the driving force behind the "blue revolution" (Bailey, 1985).

Trawling is a particularly effective means of exploiting large penaeid shrimp species, which are highly valued by consumers in Japan, the United States, and Western Europe (Rackowe, 1983). During the period 1978-1981, the total combined value of shrimp exports from Indonesia, Thailand, Malaysia, and the Philippines was more than US \$1.3 billion (Floyd, 1984). Indonesia accounted for more than half of this total, most of which came from the operations of trawlers. Governments throughout Southeast Asia have actively supported development of commercial fisheries through gear trials, exploratory fishing surveys, extension of technical advice and training, construction of ports and related infrastructure, and provision of subsidized loans (Panayotou, 1982). Multilateral development assistance agencies, including the World Bank, the Asian Development Bank, and the Food and Agriculture Organization, encouraged development of export-oriented commercial fisheries by providing technical and financial support for these government programs (Asia Development Bank, 1980; Bailey, Cycon, and Morris, in prep.). Various bilateral donors, notably the German Agency for Technical Cooperation, also supported development in this direction. Commercial fisheries "development promised to transform marine fisheries into a technically modern and highly productive sector which, in the view of national policy makers and foreign experts alike, would generate profits and foreign exchange through the efficient exploitation of what were perceived to be abundant untapped marine resources (Smith, 1979).

The rosy glow of this optimistic forecast gradually has become more subdued. Policy makers have been forced to recognize the inherent vulnerability of biologically renewable resources to over-exploitation and depletion. Evidence that the rapidly expanding use of powerful commercial fishing technologies posed a significant threat to sustainability of fisheries landings gradually has forced Southeast Asian governments to recognize the need to balance

development programs with effective resource management policies (Marr, 1976; Pauly, 1979; Smith, 1979) .

Marine Fisheries in Indonesia

Indonesia is a vast archipelagic nation of over 13000 island, straddling the equator. The national Central Bureau of Statistics (CBS) reported a 1980 population of 146.5 million (CBS, 1981) , making Indonesia the fifth largest nation on Earth. Data published by the Directorate General of Fisheries (DGF) indicate that in 1982 nearly 1.2 million people were directly employed as marine fishermen in Indonesia (DGF, 1984) ; a comparable number probably were employed in supply, processing, distributing, marketing, and other activities supporting this sector. Fish provided approximately 60 percent of all high quality protein in the national diet (CBS, 1982) , 75 percent of which comes from marine capture fisheries (DGF, 1984) .

Indonesia's marine fisheries sector is overwhelmingly small-scale in nature. More than 215,000 boats, over 70 percent of the nation's fishing fleet, are powered only by sail or paddle (DGF, 1984) . An additional 55,000 small-scale fishing boats are powered by small outboard engines, an increasingly popular innovation. Dependence on wind or paddle power serves to limit the operational range of most fishermen to coastal waters adjacent to their home community. Even the adoption of outboard engines by small-scale fishermen has not appreciably changed this pattern of exploitation. This is so primarily because tropical fisheries resources are most abundant in shallow and typically nutrient rich nearshore waters.

Coastal fishing grounds surrounding the archipelago's most populous is lands offer limited scope for expanded production and in a number of important cases are either maximally exploited or depleted due to heavy fishing pressure by both small-scale and commercial fishermen. Of most pressing concern to Indonesia's fisheries policy makers are the Malacca Straits and the north coast

of Java, where in 1980 over 379,000 fishermen (39% of Indonesia's total) accounted for 44 percent of total marine fisheries landings (DGF, 1982) . Prior to the trawler ban, these two areas experienced the greatest concentration of fishing effort by commercial trawlers within Indonesia.

Establishment of Trawl Fisheries in Indonesia

Small numbers of trawlers are known to have operated in Southeast Asia prior to 1940 (Admiralty, 1944) , but first became prominent in Thailand during the late 1950s. By the mid-1960s, trawlers had been adopted by Malaysian ^{Subgroup} fishermen along the Malacca Straits. From there the new technology diffused across this narrow body of water to Indonesian fishermen on Sumatra. This diffusion-adoption process was facilitated by geographic proximity and the ability of Indonesian fishermen to observe the effectiveness of Malaysian trawlers on a first hand basis. It also is relevant to note that on both sides of the Malacca Straits the initial investors in this technology were of Chinese descent. The presence of social and economic ties between these two economically powerful minority groups probably was a factor contributing to the rapid diffusion of this innovation into Indonesia.

In both Malaysia and Indonesia, those entrepreneurs who first invested in trawlers already had established interests in the fisheries sector. In some cases these early adopters were able to recoup capital investment costs in as little as 6 months (Budon et al., 1970) . This high level of profitability served as a powerful stimulus for entrepreneurs from other sectors of the economy to invest in construction of new trawlers.

By 1971, five years after their introduction, approximately 800 trawlers were operating in the Malacca Straits (Unar, 1972) . Naamin and Farid (1980) report a total of 935 trawlers operating there in 1974. This rapid growth in

numbers of trawlers led to significant increases in pressure on demersal resources and by the early 1970s per unit productivity of trawlers in the Malacca Straits was declining (Unar, 1972; Naamin and Farid, 1980). Even with declining catch rates, however, the numbers of trawlers in this area increased to a peak of 1,300 in 1977 before declining during the two subsequent years (Figure 1).

Unar (1972) reports that by 1971 at least 50 trawlers from Sumatra had shifted their base of operations to the north coast of Java. Also in that year trawlers were established at Cilacap, a port on Java's south coast. By 1977, nearly 800 trawlers were operating in waters off Java's north coast (Figure 2) and an additional 234 units were based in Cilacap.

Data on Indonesia's demersal fisheries resources have been reviewed by Dwiponggo (in press). His analysis clearly indicates that during the period 1975-1979, each of the three main centers of trawler activity (the Malacca Straits, and the north and south coasts of Java) experienced levels of demersal fishing effort beyond that necessary to achieve maximum sustainable yields (MSY). In economic terms, this means that the demersal fisheries of these areas were over-capitalized, with too many fishing units in competition for a finite resource. In biological terms, surplus fishing effort during this period resulted in resource depletion. In sum, surplus fishing effort in these areas led to lower total harvests being shared among too many fishing units. y

Commercial and Small-Scale Fisheries

Commercial and small-scale fisheries are clearly distinguishable on the basis of investment. As a relevant Indonesian example, investment costs in 1977 for a typical wooden hulled trawler displacing 30 gross tons (GT) were

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The term "demersal" refers to marine organisms which live in close proximity to the ocean floor. Species encountered further up the water column, including at the surface, are referred to as "pelagic."

approximately US \$20,000 (Baum, 1978; Domingo, 1978). In contrast, investment levels of typical small-scale fishing units in Indonesia varied between 1% to 10% of this figure, though most were at the lower end of this range (Bailey and Marahudin, in press).

Differences in level of investment clearly affect how commercial and small-scale fishing enterprises are operated. In small-scale fisheries, it is common to find owners taking an active role in fishing. Analysis of sharing systems reveals that clear distinctions are drawn between capital, labor, and management, but as factors of production among small-scale fishermen, these frequently are combined in the role of owner-operator (Bailey, 1983). Commercial fisheries enterprises are operated quite differently. Owners provide capital and on-shore management, paying particular attention to marketing, but leave management of actual fishing operations to a hired captain (Villafuerte and Bailey, 1984). This captain is responsible for hiring and firing of the crew, who have little contact with the owner. Thus the roles of investor, manager, and worker are clearly differentiated.

A second distinction between small-scale and commercial fisheries can be drawn in regard to the relative importance of profit in comparison with other possible goals. Small-scale fishermen operate within a community context where expectations of generosity and reciprocity to some extent modify the pursuit of personal profit (Collier et al., 1979). Commercial fishing operations are more clearly understood with reference to neo-classical economics wherein emphasis on profit maximization is assumed to be rational behavior. The separation of ownership, management, and labor serves to lessen owners' social obligations, a buffer which owners are careful to maintain (Villafuerte and Bailey, 1984).

A third distinction which can be drawn is more technical and refers to the manner in which trawl nets and most small-scale gear are operated. As noted above, trawlers employ an active approach to fishing. In contrast, most small-scale gear use more passive forms of fishing; rather than actively pursuing fish or shrimp, small-scale fishermen employ baited lines, nets which drift with the current, nets which are anchored in place, or a variety of stationary gear including traps and liftnets. The significance of this technical distinction will be made clear in the following sections.

Impact of Trawling on Demersal Resources

The rapid expansion of trawling in Southeast Asia has forced governments in that Region to modify their initial enthusiasm for development of trawl fisheries, to recognize resource limitations, and to focus attention on fundamental issues of fisheries management and allocation.

There is clear evidence that in many parts of Southeast Asia, including Indonesia, trawling has contributed significantly to over-exploitation of inshore demersal fisheries resources (Dwiponggo, in press; Marr, 1976; Pauly, 1979; Pauly, 1982b). As used in Southeast Asia, trawl nets are "non-selective" and typically capture a high proportion of undersized fish and shrimp before they have matured and been able to reproduce (Azhar, 1980; Pauly, 1979; Pauly, 1982a).

The potential threat to fisheries resources posed by trawlers is exacerbated by the common practice of trawling in shallow inshore waters which serve as breeding and nursery grounds for many commercially valuable species (Pauly, 1982a). Trawler fishermen prefer operating in coastal waters primarily because penaeid shrimp are concentrated near shore (Dwiponggo, in press; Martosubroto and Naamin, 1977; Turner, 1977).

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See von Brandt (1972) for a more detailed description of trawlers and other types of fishing units discussed in this paper.

No data exist on the composition of trawler catches in Indonesia. However, available data from the Malaysian side of the Malacca Straits for trawlers of comparable size and using trawl nets with similar design and mesh size provide some basis for estimating catch composition of Indonesian trawlers. Azhar (1980) reports the following catch composition for Malaysian trawlers based in Kedah: penaeid shrimp (17 percent); finfish for human consumption (17 percent); and "trash fish" for reduction into fish meal (66 percent). One-quarter of this "trash fish" (and 16 percent of total landings) was comprised of juveniles of commercially valuable finfish or shrimp species. Azhar's data are supported by Yap (1977) who reports that 60% of the trawl catch landed in Perak and Selangor on the Malaysian side of the Malacca Straits consisted of trash fish. Removal of undersized demersal finfish and shrimp threatens the biological renewability of these resources and directly affects the ability of small-scale fishermen who operate bottom set gill nets, trammel nets, fish traps, or other demersal gear.

Competition and Conflict

Direct competition between commercial trawlers and small-scale fishermen is widespread in Southeast Asia. The far greater fishing power of trawlers, with their powerful engines and highly effective nets, has placed small-scale fishermen at a serious disadvantage in competing for a limited and often dwindling resource. In the absence of data comparing the catch composition of commercial trawlers and small-scale fishermen, it is difficult to state precisely the extent to which these two groups compete for specific resources. This has, however, been done in the case of San Miguel Bay (Philippines) where results of a thoroughly documented two-year study show substantial overlap (and hence direct competition) in the species composition of trawlers and the most important types of small-scale fishing gear (Pauly, 1982b).

Based on personal involvement in the San Miguel. Bay Study (Bailey, 1982) and my familiarity with the coastal fisheries in Indonesia, I have no doubt that direct competition existed between trawlers and small-scale fishermen prior to 1980. Several studies conducted along the north coast of Java indicate that this competition between trawlers and small-scale fishermen led to declining incomes among the latter and a subsequent withdrawal from fishing among those no longer able to earn an adequate livelihood (Collier et al., 1977; Mubyarto et al., 1984; Supradono, 1974). Joenes et al. (1979) and Naamin (1982) report parallel developments in the area of Cilacap. Landings and incomes among small-scale fishermen along the Malacca Straits also are reported by Darus (1982) and Unar (1974) to have declined as a result of competition with trawlers.

In some cases small-scale fishermen found employment on trawlers or other types of commercial fishing units (Darus, 1982; Mubyarto et al., 1984). More often, however, those small-scale fishermen who were no longer able to compete at sea sought employment as agricultural laborers or engaged in petty trade (Mubyarto et al., 1982). Particularly on Java, these displaced fishermen added to the already swollen ranks of the underemployed (Hugo, 1981; Schiller, 1980).

Trawlers not only competed effectively against small-scale fishermen for a dwindling resource, but, because of their "active" mode of operation, they frequently damaged or destroyed more "passive" small-scale gear. This problem was then most active and easily caught. As an added incentive, trawlers operating illegally in coastal waters were less likely to be apprehended at night. As Panayotou (1980:44) notes in the case of Thailand:

Small-scale fishermen using traditional fishing methods must either abandon those types of gear that are susceptible to destruction by trawlers or change fishing grounds, a choice that can be ill afforded by fishermen with limited fishing range and meagre funds.

Destruction of small-scale gear by commercial trawlers also has been reported in the Philippines (Bailey, 1982; Smith, 1979), Malaysia (Bailey, 1983; Gibbons, 1976; Smith, 1979), and Indonesia (LaPorta, 1978; Sardjono, 1980). Damage or destruction of small-scale fishing gear caused by the incursion of trawlers into shallow coastal waters has resulted in serious economic losses to the fishermen involved and provided continuous threat to the life and livelihood of others.

Increasingly, small-scale fishermen have responded to these threats by attacking trawlers with (among other things) molotov cocktails - a particularly in-effective weapon when used at night against wooden boats at sea. In Malaysia between 1970 and 1973, over 60 boats were sunk and 23 fishermen killed (Smith, 1979; see also Anderson and Anderson, 1977; Gibbons, 1976; "Small Fishermen in Asia Speak Out," n.d.; "Trawler Invasion Persists," n.d.). Similar violence occurred during the 1970s in the Indonesian portion of the Malacca Straits and in waters off both coasts of Java (Collier et[^] al., 1979; LaPorta, 1978; Naamin, 1982; Sardjono, 1980).

Competition and conflict between commercial trawlers and small-scale fishermen throughout Southeast Asia, combined with mounting evidence of resource depletion, has spurred fisheries policy makers of that Region to attempt restricting the operations of commercial trawlers. For the most part, these regulations have specified use of larger mesh sizes, limited the numbers of trawlers permitted licenses to operate, and sought to restrict trawlers from operating within a certain distance (e.g. 7 or 12. miles) of shore.

In practice, however, these regulations have proven difficult to enforce and therefore largely have been ignored. In both Malaysia (Gibbons, 1976; Yap, 1977) and Indonesia (CBS and DGF, 1979) large numbers of trawlers operated without licenses. Attempts to enforce restrictions on the areas in which trawlers were permitted to operate have been hampered by lack of adequate

personnel and equipment and by lack of clear enforcement responsibilities (Bailey, 1984; Marr, 1982). The difficulties involved in overcoming these problems are increased by political influence exerted by trawler owners (Gibbons, 1976) and corruption (LaPorta, 1978; "Trawler Invasion Persists", n.d.).

Presidential Decree 39

In Indonesia, evidence of continued illegal operations by trawlers and the increasingly violent conflict between trawler and small-scale fishermen finally led to the proclamation of Presidential Decree 39 banning all trawlers from waters off Java and Sumatra. In 1983, Presidential Letter of Instruction No. 11 extended this ban on trawlers nationwide, with the exception of the Arafura Sea. Personal observations in the affected areas during 1981, 1982, and 1984 indicated that, unlike previous efforts to control trawler operations through ministerial decrees and regulations issued by the Directorate General of Fisheries, Presidential Decree 39 was effectively enforced.

The imposition of the trawl ban in waters off more significant than the subsequent extension of this ban because, with the exception of the Arafura Sea, trawling elsewhere in the archipelago was of limited importance. In the Arafura Sea, joint-venture shrimp trawling enterprises formed between Indonesian and Japanese interests were permitted to continue because they did not compete with small-scale fisheries. In 1980 the large modern trawlers operated by these enterprises contributed over half of all shrimp exports from Indonesia (Rachman, 1982). Moreover, eliminating these joint-venture enterprise would have been diplomatically awkward.

The ban on trawlers led initially to declining harvests and adversely affected both domestic fish supplies and quantities of shrimp available for export. To overcome these expected problems, the Indonesian government initi-

ated three special development programs: (1) a loan program to encourage conversion of trawlers for operation with other types of fishing gear, especially purse seines to harvest lightly exploited pelagic species; (2) a program to promote brackishwater pond production of shrimp, and (3) expanded loan and technical assistance programs for small-scale fishermen in areas where previously trawlers had dominated the fishery.

To a large extent, these programs achieved their goals. By 1982, landings of demersal species along the north coast of Java surpassed those preceding the trawler ban (DGF, 1982, 1984). Between 1980 and 1982, the number of fishermen operating along this coast increased by nearly 10% to over 290,000 (Ibid.). The size of the fishing fleet remained relatively constant, but the use of engines increased, as did the per unit productivity of demersal fishing gear, which nearly doubled during this period (Ibid.). Naamin (1982) reports that average household incomes increased by 30% among small-scale fishermen on the north coast of Java and in the area of Cilacap on the south coast. These figures go a long way to explain the significant increase in numbers of fishermen operating in waters off Java subsequent to the trawler ban.

Unlike the north coast of Java, along the Malacca Straits demersal landings per unit productivity of demersal fishing gear continued to decline. In this area it appears that the removal of trawlers did not result in a significant reduction in fishing effort. There was, instead, a major increase between 1980 and 1982 in numbers of small-scale boats (21%), demersal fishing gear (40%), and fishermen (21%). No data are available on changes in household income. The apparent creation of additional employment opportunities in this area is a positive feature, but this also has contributed to continued resource depletion.

The trawler ban's impact on shrimp exports was less serious than initially expected. Prior to the issuance of Presidential Decree No. 39, trawlers had

accounted for the bulk of all shrimp exports (Gafa and Rustam, 1981; Naamin, 1982; Nugroho and Murtoyo, 1981). The quantity of shrimp exports did decline (13%) between 1980 and 1983, but foreign exchange earnings increased by 15% (FAO 1983), in part due to improved product quality. Unlike the shrimp landed by trawlers, most of which had been on ice for several days, small-scale fishermen land their catch every day. Once logistical problems were overcome, shrimp processors successfully adopted to obtaining supplies from small-scale fishermen and brackishwater pond operators.

Why Presidential Decree 39?

By issuing Presidential Decree No. 39, Indonesia's President Suharto put the considerable weight of both the government and the military behind enforcement. The combination of clear political will from the highest authority in the land and the relative ease of enforcing a total ban compared to previous restrictions were the primary factors contributing to this improved enforcement performance.

It is clear that the main impetus behind Presidential Decree 39 was the widespread and increasingly violent conflict between small-scale and trawler fishermen. The resulting death and destruction dramatized and made impossible to ignore the threat which commercial trawling posed to inshore fisheries resources and the livelihoods of large numbers of small-scale fishermen who for generations have fished in these waters.

According to Admiral Sardjono, then Director-General of Fisheries, Presidential Decree 39 was clearly, a "political decision" justified primarily in terms of protecting the interest of small-scale fishermen:

Every sudden change in policies or regulations by a Government might indeed upset certain established systems or investment, but compared with the aim of reaching social peace and stability, by way of providing better protection to the poor traditional fishermen masses, the disadvantages become very minor (Sardjono, 1980:3).

To understand the logic behind Presidential Decree 39, it is necessary to recall that beginning with the colonial era, governmental policy consistently has supported traditional resource use rights of small-scale fishermen. Moreover, recent national Five Year Development Plans have emphasized distributive equity as a primary development goal for all sectors of the national economy. Presidential Decree 39, then, is consistent with long established fisheries policies and with current national development priorities.

Support for Presidential Decree 39 also came from other, more clearly identifiable, directions. Government marine biologists had become increasingly concerned about the detrimental impact of trawling on important fisheries resources, and within the DGF and other government agencies, strongly supported the ban on trawling in waters of Java and Sumatra. University scholars examining the impact of trawling on small-scale fishing communities documented serious declines in income, the reduction of employment opportunities within the fisheries sector, and the general marginalization of small-scale fisheries within that sector. Popular awareness of widespread unrest among fishermen was established through the print media. Reporters actively publicized the plight of small-scale fishermen, characterizing trawler operators as rapacious, an image fostered by the popular Indonesian term for the trawl net: "tiger net" (pukat harimau).

Several influential politicians working through the "All-Indonesia Fishermen's Association" (Himpunan Nelayan Sa Indonesia, or HNSI) also became effective lobbyists in support of small-scale fishermen's traditional resource use rights, arguing that trawler operations should be curtailed or eliminated.

The HNSI is a nominally non-governmental organization representing the interests of small-scale fishermen. In practice, the HNSI serves as a forum through which small-scale fishermen can communicate their concerns to the government. As such, it fits a general pattern of socio-political organization

under the Suharto administration whereby various interests are aggregated into identifiable "functional groups." These groups serve to articulate interests in the government and provide a power base to politicians. Governmental responsiveness to the needs of these groups and their leaders in turn serves to build and maintain political support. Thus, groups such as the HNSI have influence in government councils because they generally support the government. Politicians closely associated with the government tend to be selected as leaders of such groups, as is the case with the HNSI, to provide assured access to the corridors of power. In return, these politicians are assured an organized constituency in a political system without direct national elections.

One further factor, the issue of ethnicity, must be mentioned if we are to explain the government's decisions to ban trawlers. Most of the owners of trawlers were Indonesian citizens of Chinese descent. Ethnic Chinese comprise

roughly 3% of the national population but dominate key sectors of Indonesia's economy, just as they do throughout Southeast Asia. Among all citizens, they are the ones most likely to have access to the capital resources necessary to invest in- shrimp trawling or any other profitable enterprise.

Most small-scale fishermen, however, are not ethnic Chinese but rather Javanese, Sudanese, Malay, or other indigenous ethnic groups known collectively as pribumi. There is a long history of ethnic antagonism between the economically aggressive Chinese and the indigenous populations of Indonesia. These facts may have exacerbated tensions and led to the high level of violence between trawler and small-scale fishermen.

There is no evidence that the trawler ban was imposed because trawler owners and many of their crewmen were ethnic Chinese. However, the nature of ethnic tensions may have been a contributing factor to the effectiveness of

enforcement. At the very least, the fact that the trawler ban negatively affected relatively wealthy Chinese reduced the political costs of this action.

Traditional Resource Use Rights

Throughout Southeast Asia allocative issues became increasingly important during the 1970s, when competition for a dwindling resource gave rise to widespread violence between commercial and small-scale fishermen. In response, governments throughout the Region attempted to devise fisheries development and management policies which balanced the goals of social welfare, economic efficiency, and resource sustainability.

The existence or absence of property rights over the resource itself is a matter of fundamental importance in conceptualizing these policy issues. In fisheries, problems of over-exploitation generally are attributed to the lack of clear property rights and the consequent efforts of individual fishermen to maximize benefits even at the expense of resource sustainability and long-term societal good (Gordon, 1954). Hardin's (1968) statement of this problem as "The Tragedy of the Commons" served to focus attention on the unique management needs of renewable natural resource systems. More recent studies follow Ciriay-Wantrup and Bishop (1975) in distinguishing between "common property" and "open access" resources.

An open access system is one where no boundaries exist around the resource, no limits are placed to the entry of individuals who wish to share in exploitation of the resource, and no restrictions are placed on how the resource is to be exploited. In short, there are no property rights over the resources in question. In common property resource systems, boundaries and limits to entry do exist and are imposed by the community which controls or "owns" the resource in question. Property rights are held in common by members of some community. The resource in question may be exploited equally by all.

used to support a religious or educational institution, or allocated to certain individuals based on need, privilege, or lack of the draw.

The definition of common property implies some institutionalized means of resource allocation, the existence of some clearly marked boundary, and the ability to exclude outsiders. Unlike agricultural land, where clear and enforceable boundaries exist denoting private ownership or control, the fish in the sea are a fugative resource moving unseen through a fluid medium. Establishing boundaries in open water is at best a difficult task and would not affect the seasonal movements of fish across such artificial boundaries. Local communities are more likely to be successful in establishing control over sedentary marine species such as shellfish, or over fishing grounds within estuaries and lagoons which are partly enclosed by a physical boundary (Christy, 1982).

There is a rapidly growing literature describing the workings of common property institutions in a variety of marine settings around the world (Acheson, 1981; McCay and Acheson, in press). The South Pacific appears to be a particularly fertile environment for establishing marine common property management systems (Iwakiri, 1983; Johannes, 1981; Ruddle and Johannes, 1985). However, relatively few common property systems exist in contemporary maritime Southeast Asia. Polunin (1984) reviewed the available literature on Indonesia and noted only scattered instances where marine common property management systems exist.

It is unclear whether common property resource systems at one time were more prevalent among fishermen in Southeast Asia. It is possible to identify several factors which may have tended to undermine such systems over the past century or so. Growing populations certainly generated increased demand for fish. This, combined with establishment of a cash economy created new opportunities to sell surplus catches. New fishing technologies were introduced to

generate these surpluses. As the general population grew, so too would the number of fishermen. The combination of these factors could be expected to have encouraged increasingly intensive exploitation of fisheries resources.

The temptations for personal profit entailed in the historical process described above would have placed tremendous internal pressure on common property resource systems in Southeast Asia. Consolidation of power by colonial regimes during the first part of the twentieth century, and the expanded presence in rural areas of independent States since the middle of this century, may have undermined the authority of local institutions responsible for common property resource management.

Fisheries management in Southeast Asia currently is based on open access principles partly modified by restrictions designed to limit conflict between user groups and, secondarily, to control levels of fishing effort to prevent resource depletion. For whatever reason, few marine common property systems exist in contemporary Indonesia or elsewhere in Southeast Asia. It may be, as Polunin (1984) argues, that this approach to resource management offers limited future potential.

In the absence of common property systems, the principle of open access has come to dominate fisheries management policies in Southeast Asia. These policies tend to favor development of commercial fisheries wherein certain individuals and groups use financial and institutional advantages to support adoption of new technologies. As fisheries resources become fully exploited, competition between fishermen resembles a zero-sum game in which technological advantages enjoyed by certain fishermen have a direct negative impact on others. Under conditions of rapid technological change, small-scale fishermen tend to become marginal producers who have little hope of finding alternative

employment (Bailey, 1982). Under these conditions, it is not surprising that widespread violence has occurred.

The concept of traditional resource use rights explicitly draws attention to issues of resource allocation. As used here, traditional resource use rights differ from the concept of "territorial resource use rights" advanced by Christy (1982). Christy's formulation emphasizes the ability to identify and establish a boundary around particular resources and is more applicable to shellfish and enclosed fishing grounds than to fisheries conducted along open coastlines. As such, Christy's focus is on the practical mechanics of resource management rather than on allocational issues. The concept of traditional use rights explicitly addresses issues of resource allocation, drawing attention to these rights as important determinants of policy.

Conceptually, these rights occupy an intermediate position between open access and common property models of resource management. Traditional resource use rights modify the principle of open access by giving precedence to those who have historical claims based on a record of utilization. In the context of contemporary Southeast Asia, these rights pertain to small-scale fishermen as a class rather than to communities of fishermen; in the latter case, a common property system would exist.

The utility of traditional resource use rights as a concept is that they can be applied to a wide range of circumstances and provide an ethical basis for restricting access to fisheries resources. Whether these rights are the decisive factor in determining resource development and management policies must be determined on a case-by-case basis by those responsible for making such decisions. Indonesia's trawler ban is a good example of the kinds of policies likely to be established when traditional resource use rights of small-scale fishermen are given serious consideration. As this paper indicates, allocation

of access to fisheries resources based on traditional use rights may be supportive of broad social goals concerning employment and income distribution.

Conclusion

Indonesia is not the only country in Southeast Asia where endemic conflict in the fisheries sector is a problem. Development of commercial shrimp trawling has had a direct negative effect on hundreds of thousands of small-scale fishermen in Southeast Asia. Shrimp are most abundant in shallow coastal waters, fishing grounds over which small-scale fishermen have established traditional resource use rights based on generations of exclusive exploitation. Competition between commercial and small-scale fishermen over a finite resource frequently has led to declining catches and incomes among the latter group. As competition led to violent conflict, governments throughout the Region were forced to respond.

The banning of trawlers in Indonesia represents an important turning point in that country's fisheries development strategy. Traditional resource use rights of small-scale fishermen have been confirmed in a manner consistent both with sound biological management and with important social goals of improving incomes and employment opportunities for the majority of those employed in the fisheries sector. Elsewhere in Southeast Asia, competition and conflict between trawler and small-scale fishermen continues to be the single most pressing issue faced by those responsible for establishing fisheries management and development policies.

In the foreseeable future, it is ^{unlikely} unlikely that the common property model will achieve widespread acceptance for management of fisheries resources in Southeast Asia. The open access model has proven both biologically and socially unworkable, due to increased pressure on the resource caused by population growth, technological innovation, and new marketing opportunities. As

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marine stocks are threatened by depletion, there arises the need to impose some controls on open access fisheries.

Restrictions placed on access to finite resources entail allocational decisions which are inherently political. Powerful economic interests often are able to influence political processes to their advantage. The concept of traditional resource use rights introduces a countervailing perspective on resource allocation based on historic usage. In the context of Southeast Asian fisheries, traditional resource use rights pertain to small-scale fishermen as a class and lead to recognition of employment generation and income distribution as important considerations in resource management. Where viable economic alternatives are not available to small-scale fishermen, as is generally the case, allocational decisions which do not give priority to traditional users are likely to lead to further conflict.

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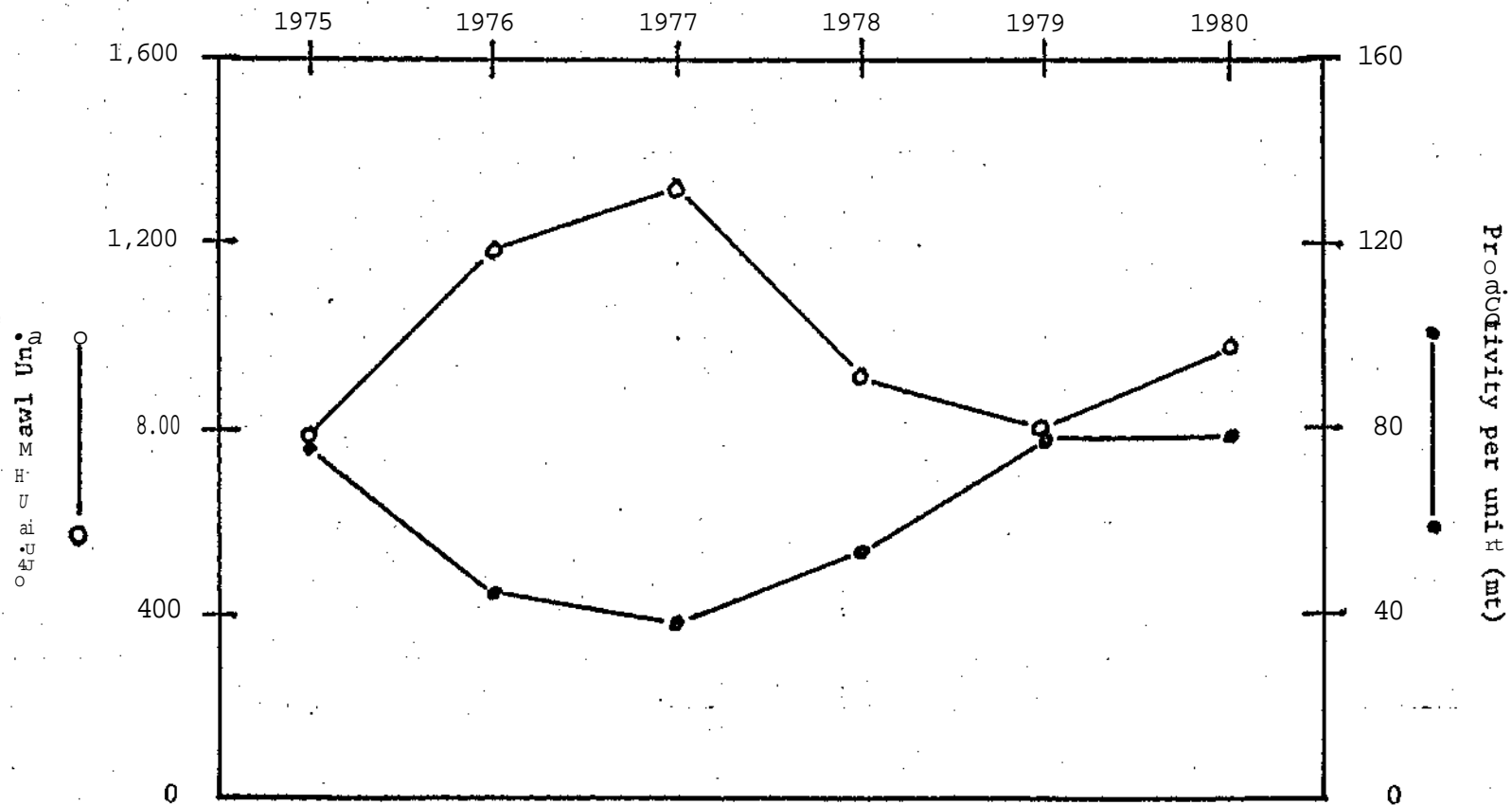
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FIGURE 1

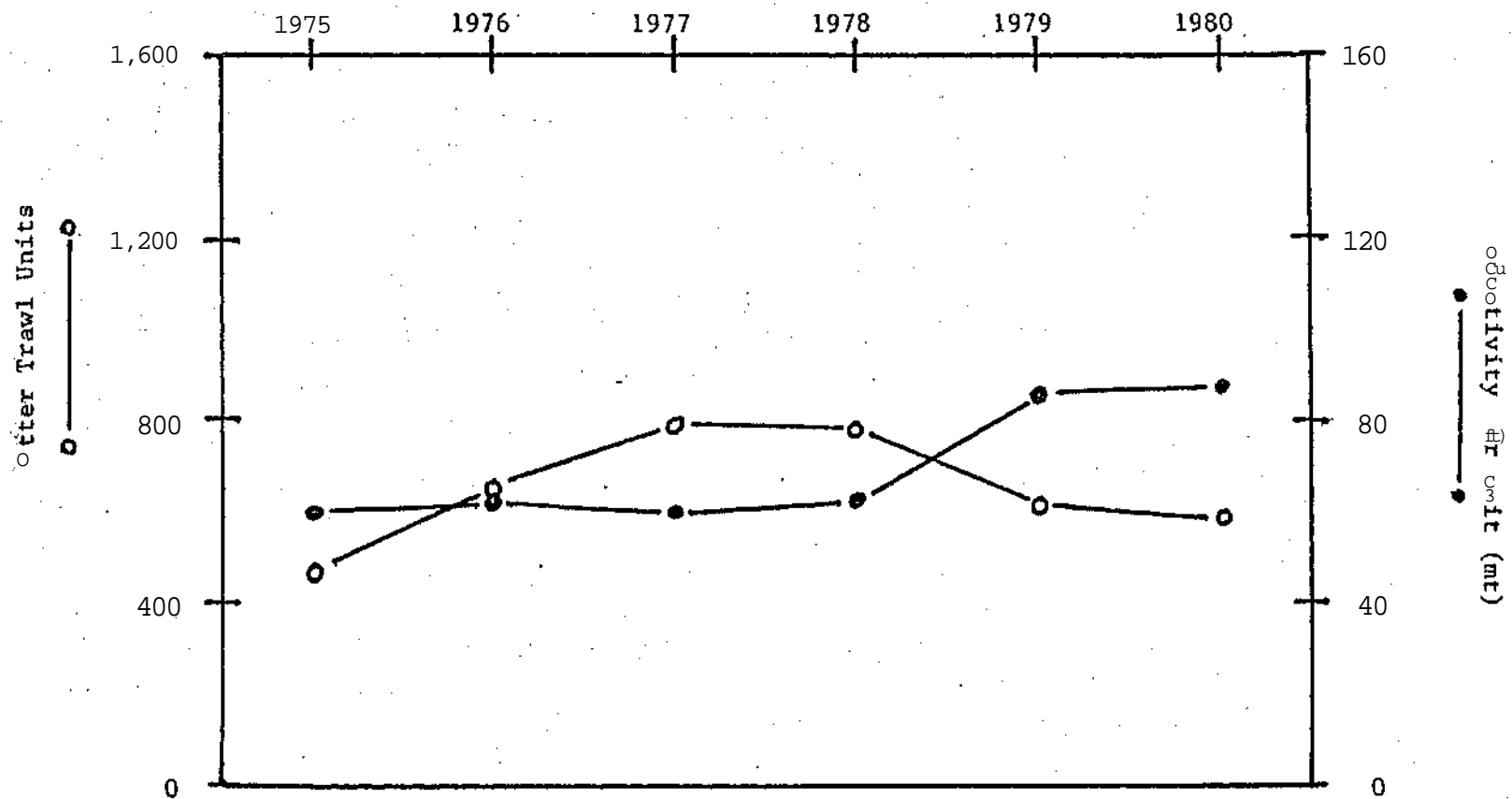
THE TRAWL FISHERY OF THE MALACCA STRAITS:
FLEET SIZE AND LANDINGS PER UNIT, 1975-1980



Source: Directorate General of Fisheries
Annual Fisheries Statistics

FIGURE 2

THE TRAWL FISHERY OF JAVA'S NORTH COAST:
FLEET SIZE AND LANDINGS PER UNIT, 1975-1980



Source: Directorate General of Fisheries
Annual Fisheries Statistics