Conflict and Change in an Open-Access Resource: An Analysis of Thailand's Coastal Fisheries

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I. Introduction[1]

Over the last thirty years, Thailand's coastal fishing industry has undergone remarkable growth and transition. Hovering around 300,000 tons in the early 1960s, annual production now exceeds three million tons. Fueling much of the boom, government incentives and private investment have encouraged coastal fishing fleets to expand operations, and reduce variable costs such as nets, time and labour. New technologies and increasing competition, however, have created a number of pressing environmental and socio-economic concerns. First, time- and labour-saving devices (such as the trawl and the push net) have degraded many of Thailand's most productive coastal areas, disrupting valuable spawning grounds and removing juvenile species from the system. Second, commercial fishing fleets have inundated prime fishing areas, marginalizing many of the local communities that depend on the fishery as their primary source of livelihood. Third, conflicts between small-scale communities and commercial fleets (and among small-scale communities themselves) have escalated dramatically.

A central aim of this paper is to explore development and change within Thailand's coastal fishing industry, placing particular emphasis on the often adversarial relationship between small- and large-scale fisheries and the role of the Thai state. The text is organized into six sections. Section II provides a working definition for the small-scale fishing sector. It also examines the ways in which the coastal fishing industry has developed and changed in Thailand. Section III examines the causes and nature of multiple-use conflicts in Thailand's coastal fisheries. Institutional and legal factors are examined in Section IV. Section V then reviews and assesses different theories about the ways in which resource users and managers can address coastal fishing conflicts. The final section concludes the paper by proposing alternatives and recommendations.

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II. Thailand's Coastal Fishing Sector

Although cited widely, small-scale fisheries are often poorly-defined in the literature on coastal resource management (if they are defined at all), making it difficult to determine what in fact constitutes a small-scale fishery. Thailand's Marine Fishery Census (NSO/DOF, 1967; 1985; 1995), for instance, provides no working definition for the term (although it does provide indicators; see below). A central concern here is that, without a clear understanding of what we mean by "small-scale fishing," continuity and change in the sector become extremely difficult to follow and/or comprehend.

Defining the Sector

The English-language literature on Thailand's coastal fisheries provides a wide array of descriptions for the small-scale fishing sector. Some studies define small-scale fishing (either explicitly or implicitly) as an activity in which individuals and households use "traditional" tools to pursue their livelihood (Dias and Joseph, 1993). Examples here can include anything from basic throw nets to stationary gill nets to mobile push nets and trawls. As the variation implies, one problem with defining the sector in terms of tradition is that "tradition" has a habit of changing. Motorized long-tail boats, for instance, are now a traditional tool for the small-scale fishing industry.

A second way of measuring small- and large-scale fisheries (and one used in the statistical data that follow) is to measure the size of boat and type of gear. Thailand's Department of Fisheries (DOF), for instance, classifies vessels over 14 metres and all trawls, purse nets and purse seines as large-scale fishing gear. By contrast, vessels under 14 metres and all non-motorized boats are considered small-scale. For inboard motors, the DOF classifies all boats 10 gross tons (GT) and under as small-scale (Pongpat, no date: 2).

Another way of characterizing scale in the coastal fishing sector is to measure the institutional arrangement that individuals, households, companies, etc. use to generate economic returns. In very broad terms, this refers to the relationship among capital, assets (such as boats, nets, fuel, etc.), labour and returns. Economic returns in the small-scale sector are largely a result of low technology and high labour inputs. Large-scale operations, by contrast, tend to operate on high capital investments, relatively sophisticated technologies and either wage or profit-sharing labour arrangements.

Thailand's Marine Fishery Census uses this classification to measure the type and size of coastal fisheries management (NSO/DOF, 1967; 1985; 1995). An "Operator's Household,"

for instance, is defined as a household "which engages in marine capture fishing or coastal aquaculture on its own account." A "Joint Management Household," is one in which two or more households invest or cooperate to operate a marine capture fishing or coastal aquaculture activity. A "Company" is a business engaged in fishing/coastal aquaculture and a " Fisheries Employees' Household," is "a household which does not engage in marine capture/coastal aquaculture as an operator or a joint management household but has one or more members of the household who were employed for marine capture fishery/coastal aquaculture during the last 12 months."

One problem with this final classification is that the criteria are exceedingly loose. That is, under this definition, anyone who has worked for a fishing operation within the last 12 months qualifies as a fisheries employee. The problem here is that the existing classification makes no differentiation between full-time and occasional labour (although Census statistics do differentiate between those who depend on fishing as a major and a minor source of income). The actual number of fisheries employees, then, may be somewhat less than Census figures would lead us to believe.

All of these classifications offer a way in which we can interpret size and scale in the coastal fishing sector. All are incomplete, however, in the sense that they provide very little information about the socio-economic well-being of small- and larger-scale fishing operations. More encompassing is the definition used by Panayotou (1982; 1985). Here, small-scale fisheries are defined not in terms of particular technologies or techniques, but in terms of socio-economic status. At the heart of the difference between large- and small-scale fisheries, Panayotou argues, lies an important distinction between those who have . . .

. . . a broad spectrum of options both in terms of fishing grounds and non-fishing investment opportunities (large-scale fishermen) and those who, by virtue of their limited fishing range and a host of related socio-economic characteristics, are confined to a narrow strip of land and sea around their community, faced with a limited set of options, if any, and intrinsically dependent on the local resources (small-scale fishermen). It is in this context that the dualism in post-war fisheries development should be understood and tackled . . . (Panayotou, 1982: 1; parentheses in original).

In other words, small-scale fishing communities can best be defined in terms of their marginality. Opportunity costs are at or near zero and, for this reason, fisherfolk are often forced to rely upon low-cost inputs (such as traditional or labour-intensive gear) and unfavourable terms of trade (see below).

Development and Change within Thailand's Coastal Fisheries

As Table I suggests, Thailand's fishing industry has undergone remarkable growth within the last thirty years. Fisheries production here includes statistics for capture and culture industries in both freshwater and coastal areas.

Table I: Fisheries Production in Thailand (1963-1993)

Year	Production (tons)	Value (1000 baht)
1963	393,855	n/a
1964	576,986	n/a
1965	615,120	n/a
1966	720,282	n/a
1967	847,443	n/a
1968	1,089,303	n/a
1969	1,270,034	n/a
1970	1,448,404	n/a
1971	1,587,077	5,528.1
1972	1,679,540	6,307.3
1973	1,678,901	8,209.2
1974	1,510,466	5,983.6
1975	1,555,300	7,194.4
1976	1,699,086	8,121.4
1977	2,189,907	10,660.5
1978	2,099,281	13,828.1
1979	1,946,334	14,004.1
1980	1,791,848	14.056.5
1981	1,989,000	17,133.9
1982	2,121,100	18,194.0
1983	2,255,400	19,238.3
1984	2,134,800	18,337.1
1985	2,225,200	19,785.5
1986	2,536,300	22,882.3
1987	2,779,100	27,641.6
1988	2,629,700	32,422.5
1989	2,740,000	35,870.0
1990	2,786,400	41,395.7
1991	2,967,700	53,025.8
1992	3,239,800	65,544.5
1993	3,385,100	78,406.7

Source: DOF (1995; 1982)

A number of elements stand out in this data. One is the contrast between fisheries production in 1963 and that in 1993. Panayotou and Songpol (1987) argue that three factors influenced the rapid rise of Thailand's coastal fishing sector. One was the introduction of new technology. Most notable were the trawl, the purse seine and the motorized boat. In 1960, there were 99 registered trawlers in Thailand (Pongpat and Amporn, 1988: 23). By 1973, this figure had grown to 5,837 (Pongpat and Amporn, 1988: 23) and to 8,346 by 1994 (down from 12,905 in 1990; DOF, 1996a). The speed and scope of the transition were due in large part to a series of technology transfers and aid packages from donor countries, West Germany in particular (Pongpat and Amporn, 1988: 23) .

Motorization also improved productivity within the industry, enabling large and small vessels to cover greater distances in far less time. Between 1967 and 1985, the number of fisheries households using powered boats increased from 16,121 to 40, 165 (Table II).

Table II: Type of boat among fisheries households

Year	1967	1985
Fisheries Households	38,321	56,759
With Powered Boat	16,121 (42%)	40,165 (71%)
With Non-powered Boat	15,715 (41%)	13,403 (24%)
Without Boat	6,485 (17%)	3,191 (6%)

Source: NSO/DOF (1967; 1985)

A second factor was the Thai government's "laissez-faire attitude" towards fisheries development (Panayotou and Songpol, 1987). Throughout the early period of growth, the Thai government imposed few restrictions on those who would seek to enter the coastal fishing industry. Any restrictions that did exist (primarily the Fisheries Act of 1947) were designed to discourage highly destructive fishing practices (such as the use of poison or dynamite) or to extract rent from licensed operators. It was not until 1972, when the Department of Fisheries enacted a law restricting the use of trawls and push nets in the Gulf of Thailand, that the Thai government began to (attempt to) seriously regulate coastal fishing in Thailand (more on this below). A final factor was an increase in world and domestic demand for fish products (Panayotou and Songpol, 1987).

All three of these factors, the authors assert, attracted powerful investors into what was traditionally a "poor man's occupation," (Panayotou and Songpol, 1987). Enjoying the benefits of credit, capital and an open-access resource, private operators were able to enter and exploit Thailand's coastal fisheries with relative ease (Panayotou and Songpol, 1987). Small-scale communities, by contrast, lacked both the capital and the credit to make this transition, leaving them at the margins of a rapidly-expanding coastal fishing industry.

A second point of interest is the leveling-off and subsequent drop in fisheries production between 1973 and 1975. Escalating fuel prices (stemming from the global oil crisis of 1973) appear to be the main contributing factor, although events within Thailand (notably the fall of Thanom's military regime in 1973) may have also played a role. Specifically, political instability and radical, pro-rural/pro-labour policies (ie. direct funding to tambons, proposals for radical land reform and election of non-elected officials) among the post-1973 governments (Pasuk and Baker, 1996: 301-304) may have disrupted traditional power networks within the rapidly-expanding commercial sector. Although the end of the slump and the return to authoritarian rule in 1975 appear to support this hypothesis, any relationship between the two events is of course purely speculative (suggesting an interesting topic for further research).

Table III: Fisheries Production preceding, during and after the first world oil crisis (tons)

Year	Marine	Freshwater
1972	1,679,540	6,307.3
1973	1,678,901	8,209.2
1974	1,510,466	5,983.6
1975	1,555,300	7,194.4
1976	1,699,086	8,121.4

Source: DOF (1995; 1982).

A final point of interest is the surge that occurs after 1984. Several factors appear to be at work here. One is the price of oil, which dropped steadily from 1983 onwards (Pasuk and Baker, 1996: 149). A second (major) factor was the decision to devalue the baht in November 1984 (Pasuk and Baker, 1996: 150-51). Coupled with a series of export incentives

(abolition of selected export taxes, tax incentives for export firms) in 1985 and 1986, the 20% real devaluation created an extremely favourable environment for Thailand's fish exporters (Table IV). Note also that Thailand's marine production declines momentarily following the declaration of the Exclusive Economic Zone (EEZ) in 1983, making a full recovery by 1986 (Table VI).

Table IV: Export and Import of Fish and Fishery Products (1981-1991) (metric tons)

Year	Exports	Imports
1981	320,325	47,174
1982	316,679	46,215
1983	344,899	58,942
1984	411,722	119,064
1985	466,219	152,707
1986	602,486	268,089
1987	663,650	227,327
1988	798,579	347,666
1989	875,293	455,755
1990	904,973	507,537
1991	902,575	663,971

Source: Directorate General of Fisheries and Department of Business Economics, cited in INFOFISH (1991: 28).

Export data suggest that frozen shrimp and canned seafood are Thailand's principal export commodities (Table V). Of particular interest are data suggesting that fishmeal, once a major export commodity, has declined steadily. Fishmeal, used to feed aquatic and terrestrial livestock, derives a large percentage of its protein from "trash fish," small, low-value fish and invertebrates which are caught using demersal gear such as trawls and push nets (more on this below).

Table V: Fish exports by commodity (1981, 1990, 1991) (metric tons)

Commodity	1981	1990	1991
Frozen shrimp	22,647	79,983	115,715
Frozen cephalopod	39,000	48,203	49,071
Frozen fish	49,000	44,154	51,930
Dried cephalopod	2,900	17,396	15,911
Dried shrimp	1,976	1,610	1,818
Canned seafood	40,848	267,083	308,515
Fishmeal	111,042	18,441	19,414
Others	59,912	272,363	340,201

Source: Department of Business Economics, cited in INFOFISH (1991: 29).

The fisheries boom of the 1980s and 1990s was also the result of a rapidly expanding coastal and freshwater aquaculture industry. As Table VI illustrates, aquaculture production began to increase steadily from the late 1980s onwards. This was due in part to a series of government incentives (such as low interest loans, tax incentives, infrastructure development and marketing initiatives - see INFOFISH, 1991: 48) and a consistently good price for shrimp (Table VII).

Table VI: Fisheries Production (1979-1993) (1000 tons)

Year	Marine Capture	Inland Capture	Coastal Aquaculture	Freshwater Aquaculture
1979	1802.3	103.7	10.9	29.4
1980	1587.9	110.4	60.1	34.5
1981	1756.9	116.5	67.5	48.1
1982	1949.7	87.7	36.9	45.8
1983	2055.2	108.4	44.8	47.0
1984	1911.5	111.4	61.5	50.4
1985	1997.2	92.2	60.6	75.2
1986	2309.5	98.4	39.1	89.3
1987	2540.0	87.4	61.9	89.8
1988	2337.2	81.5	108.9	102.1
1989	2370.5	109.1	168.7	91.7
1990	2362.2	127.2	193.2	103.8
1991	2478.6	136.0	230.4	122.7
1992	2736.4	132.0	229.3	142.1
1993	2752.5	175.4	295.6	161.6

Source: DOF (1995)

Table VII: Average Price of selected species at Bangkok Fish Market (baht/kg)

Year	1990	1991	1992	1993	1994
Triple-grooved Shrimp (med-size)	115.71	130.00	130.00	130.00	206.00
Banana Shrimp (med)	115.00	120.00	120.00	120.00	192.50
King Prawn (med)	70.00	81.36	85.00	90.00	140.00
Pink Shrimp (med)	52.50	60.00	60.00	65.00	95.00
King Mackerel	50.00	51.50	57.86	62.50	80.00
Grouper	45.00	51.67	60.00	62.70	70.00
Swimming Crab	39.44	37.86	40.00	40.00	60.00

Source: Centre for Agricultural Statistics (1996)

Thailand's Small-Scale Fisheries

Technological innovation, capital investment and export promotion, then, appear to have precipitated a remarkable surge in Thailand's coastal fishery production. Macro data and micro studies, however, suggest that the majority of Thailand's fishing population has accounted for a relatively small proportion of its overall catch. DOF data suggest that although the small-scale fishing sector has increased its production, its share of fisheries production has been falling consistently since 1985 (Table VIII).

Table VIII: Production of Thailand's Small-scale Fisheries

Year	Total catch - marine fisheries (metric tons)	Catch of small-scale fisheries (MT)	Small-scale % of total catch
1985	1,997,200	141,390	7.11
1986	2,309,500	146,773	6.4
1987	2,540,000	155,316	6.1
1988	2,337,200	158,353	6.8
1989	2,370,500	159,825	6.7
1990	2,362,200	149,989	6.3
1991	2,478,600	154,145	6.2
1992	2,736,400	153,074	5.6
1993	2,752,500	154,467	5.6

Source: Pongpat (no date)

It is worth noting that these data are based on the standard DOF definition (outboard engine 14 metres and under, inboard engine 10 GT and under and non-powered boats). Given that many small-scale boat owners do not register their craft (see below) and there are fishing operators who do not use boats to catch fish, one can assume that these findings understate production within Thailand's small-scale fishing sector.

Taking these inconsistencies into consideration, registration data also seem to suggest that small-scale craft (14 metres and under) have declined steadily since 1982. By contrast, boats between 14 and 18, and 18 and 25 metres appear to have reached a plateau in 1989 and have since declined. Finally, boats over 25 metres dropped between 1982 and 1989 but have since increased (Table IX).

Table IX: Type of boat by size (1982, 1989 and 1994)

Size of Boat	1982	1989	1994
Total	19,756	20,979	17,657
Under 14 metres	13,054	10,519	8,587
14 to 18 metres	3,614	4,836	4,137
18 to 25 metres	2,870	5,481	4,779
Over 25 metres	218	143	154

Source: DOF (1996; 1991; 1985)

Equally interesting are DOF registration figures (Table X), which suggest that the total number of boats and boats using high-production gear (ie. trawl, purse seine, and push net) are in decline. Conversely, small-scale gear such as gill nets and cast nets appear to be on the rise.

Table X: Number of Fishing Boats by Type

Year	1990	1991	1992	1993	1994
Total boats	21,547	18,170	16,820	18,146	17,654
Otter board trawl	10,256	8,117	7,538	7,213	6,482
Pair Trawl	2,193	2,037	1,876	1,750	1,708
Purse Seine	1,250	1,243	1,128	1,173	1,163
Mackerel gill net	143	107	137	257	328
Crab gill net	937	1,259	817	1,131	1,371
Shrimp gill net	1,583	1,367	1,369	2,084	2,045
Squid cast net	1,088	1,363	1,591	1,895	2,059
Push net	1,879	1,047	818	808	651

Source: DOF (1996a)

There are a number of possible explanations for these findings. One is the possibility that shrinking numbers of small-scale fishing boats are using more gear (and presumably, more time, labour and capital) to bring in their catch. Of course, a second possibility is that larger vessels are also using small-scale gear. Registration data (Table XI), however, indicate that

labour-intensive gear, such as gill nets, cast nets and push nets, are still used primarily by the small-scale boats, and high-production gear, such as trawls and purse seines, are predominantly the gear of the larger craft (particularly those larger than 18 metres).

Table XI: Fishing boats registered by size and gear (1994)

Gear	Total	Under 14m.	14-18m.	18-25m.	Over 25m.
Otter board trawl	6,482	2,068	2,262	2,067	85
Pair Trawl	1,708	44	504	1,152	8
Purse seine	1,163	58	189	879	37
Mackerel gill	328	298	8	22	-
Crab gill	1,371	1,288	61	20	2
Shrimp gill	2,045	1,996	45	4	-
Squid cast	2,059	1,346	554	158	1
Push net	651	558	69	24	-

Source: DOF (1996a)

A final (and more probable) explanation is that boat operators are simply under-reporting boat registration within the Thai fishing industry. Three elements may be at work here. First, fishing and harbour licenses are costly, creating a disincentive to register. Second, destruction of fishing areas and sectoral conflicts (particularly in recent years) have put pressure on enforcement officers and fishing communities alike to monitor and enforce the ban on particular types of fishing gear (in particular, push nets and trawls) (more on this below). Indeed, district officers have stopped issuing new licenses for push nets (personal interviews, Thalaang District Fisheries Office, Phuket). Fear of being fined or arrested may discourage boat operators from registering their boats and/or gear. Third, coordination within the responsible government agencies is far from perfect (see below), creating ample opportunities to "slip under the net." [1]

[1] Personal interviews with fisheries officers and fisherfolk in Phangnga Bay suggest that many fishing boats operate without a license, often for all of the afore-mentioned reasons.

Table XII: Number of fishing households in capture and culture (1967, 1985, 1995)

Year	1967	1985	1995
Fishery Establishments[2]	53,456	57,591	80,701
Marine Capture	52,144	51,245	50,312
Coastal Culture	1,312	6,346	30,389

Source: NSO/DOF (1967; 1985; 1995)

What remains unclear, however, is whether and to what extent these households are moving into alternative occupations (if the number of marine fisheries households is in fact shrinking). Certainly, Thailand's economy has undergone considerable expansion in the past thirty years, and it is possible that this growth may have created new economic opportunities for small-scale fishing communities (Midas, 1995: 5). As the Midas research team (1995) points out, "few fishermen are only fishermen," and many pursue a wide range of occupations, which may have become increasingly attractive and/or accessible in recent years.

One possibility is that small-scale fisherfolk are making the shift to coastal aquaculture. Census data suggest that the number of coastal culture households has expanded (Table XII), and the majority of these are raising shrimp (Table XIII).

Table XIII: Aquaculture Households by type of culture

Year	1967	1985	1995
Aquaculture households	1,312	6,346	30,389
Shrimp	889 (68%)	4,368 (68.8%)	25,215 (83%)
Fish	25 (2%)	860	3,143
Oyster	131 (10%)	767	2,803
Crab	n/a	73	374

Source: NSO/DOF (1967; 1985; 1995)

[2] This includes all households working in capture and culture in Thailand.

Between 1985 and 1995, however, the change in the number of coastal culture households (24,043) far exceeds the decline in marine capture households (933), suggesting that the growth is largely the result of new investors entering the industry, as opposed to coastal fishing households making the transition. Moreover, as Midas (1995: 6) points out, shrimp farming is not a labour-intensive activity, using, on average, about two employees for every five rai of farm area.

Socio-Economic Transition within Thailand's Coastal Fishing Sector

The reality is that there are few studies that provide a reliable indication of whether and to what extent small-scale fishing communities are making the transition out of Thailand's coastal fishing industry (see Panayotou, Donna, 1985; Panayotou et al, 1985; Panayotou and Panayotou, 1986; Panayotou and Songpol, 1987; Pongpat and Amporn, 1988; Pongpat, 1994; Pongpat, no date). At the macro level, statistics for socio-economic status are relatively thin, and those which do exist are probably too general to serve as a reliable indicator (ie. it is difficult to compare communities with different levels of infrastructure, history, culture, etc).

The *1990 Report of Incomes and Expenditures Survey of Small-Scale Fishing Households of Thailand* (NSO, cited in Pongpat, no date), for instance, suggests that the annual per capita income for small-scale fishermen was 10,387 baht in 1990. This is somewhat lower than the national average income in Thailand, which is 16,463 baht per capita per year (Pongpat, no date). The NSO survey also suggests that the Engel's coefficient (which determines the percentage of income spent on food) among small-scale fishing households is considerably higher (suggesting greater poverty) than the national average (Table XIV).

Table XIV: Annual Household Expenses for Small-scale Fishing Households

Type of Expense	Baht/year	Percentage
Total expenses	49,474	100.00
Food bought w. cash	23,696	47.9
Fish for household consumption	6,216	12.6
Total food expenses	29,912	60.5

Source: NSO. (1992). Report of the 1990 Income and Expenditure Survey of Small-Scale Fishing Households (cited in Pongpat, no date)

Compared to the national average of 36.2%, the small-scale fishing households in this survey (which, along with the survey methodology, are neither identified nor defined in this particular source) appear to direct far more of their annual expenditure towards cash and subsistence food (60.5%). Unfortunately, this particular source provides data for 1990 only, making it impossible to determine whether and how these numbers have changed over time.

Comparisons with the commercial sector suggest that Thailand's small-scale fisheries are well below the industry average. Pongpat and Amporn's analysis of the Thai fishing industry (1988), for instance, concludes that the commercial vessels in their study are able to generate a greater profit and adapt to economic and biological change with greater ease and efficiency than small-scale households (see Panayotou et al 1985b: 169, for similar findings). They also find that commercial wages are higher than the national average, which is in direct contrast to the NSO's findings for the small-scale sector.

At the micro level, local studies suggest that mobility into and out of small-scale fishing is directly related to the real and perceived availability of alternative occupations Various factors appear to be at work here.

One is economic incentive. Included here are the costs and benefits (both real and perceived) that individuals associate with fishing and non-fishing activities. A series of income and attitudinal surveys conducted in 1978 and again in 1983 provide some insight into the ways in which economic and "non-economic" (see below) variables affect decisions about livelihood (Panayotou et al, 1985a; 1985b; Panayotou and Panayotou, 1986; Panayotou, D., 1985). The original surveys were conducted in a randomly-selected set of villages in Trat, Chumporn, Phangnga and Nakhon Si Thammarat (Panayotou et al, 1985a; 1985b). The follow-up surveys were conducted using a random sample of the original sets in Phangnga and Chumporn (Panayotou and Panayotou, 1986; Panayotou, D., 1985).

Challenging the notion that small-scale fisherfolk are simply locked into their occupation, findings from these surveys suggest that small-scale fisherfolk are receptive to various economic incentives and that they do indeed enter and exit the fishing industry. Opportunity costs appear to have a large effect on whether and to what extent fisherfolk will pursue their living within or outside of the fishery. The demise of offshore mining opportunities in Phangnga, for instance, seems to have induced a large number of individuals to return to the fishery (Panayotou and Panayotou, 1986).

Other important factors include perceptions and preferences regarding viable alternatives, the proximity of these alternatives, and expected earnings (Panayotou and Panayotou, 1986). Accurate information about employment alternatives and geographic isolation, then, would appear to have an enormous effect on whether and to what extent small-scale fisherfolk will opt to pursue alternative occupations.

Although they receive little scrutiny in this particular survey, government interventions also play an important role in affecting the ways in which individuals and firms use and exploit coastal fisheries. One type of intervention is the government program, which encourages particular activities by removing or reducing the costs of undertaking these activities. These interventions often come in the form of low-credit loans or subsidies. Given their scope and complexity, Thailand's fisheries programs are examined in detail in the following section.

A second element, and one that receives far less attention in the literature on Thailand's coastal fisheries, is the role of rules, or institutions.[3] Included here are the (formal) laws and (informal) customs that shape the ways in which individuals manage and exploit natural resources (for a theoretical perspective, see Ostrom, 1990; Bromley et al, 1992). Of particular importance are the rules that determine whether and to what extent households, firms or individuals can use fisheries resources to earn a living. Examples here would include fisheries laws, terms of barter and sale, and access to markets, production inputs and credit. Although all of these factors receive scrutiny in the literature on Thailand's coastal fisheries (see Boonlert, 1994; Anat et al, 1988; Arthorn and Baker, 1989; Midas, 1995; Anon., no date; Pongpat, no date; Ruangrai and Maitree, 1992; Somporn et al, 1990; Somying, 1994; Choomjet and Somboon, no date), ***the rules that affect them*** receive very little. A central assertion here is that one cannot fully comprehend the relationship between natural resources (such as a fishery) and livelihood (fishing) without understanding the formal and informal rules that govern this relationship.

We shall return to this matter in due course. For the time being, however, the political and economic relationship between Thailand's small- and "larger-scale" fishing sectors requires further scrutiny.

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[3] Defined in this way, institutions should not be confused with organizations, which are groups of individuals that use rules to pursue collective goals (North, 1990).

III. Competition and Conflict in a Dualistic Sector

As the foregoing suggests, the last thirty years have revolutionized Thailand's coastal fishing industry. Rapid and often unfettered development, however, has degraded Thailand's coastal resources and encouraged conflict between large- and small-scale fishing fleets, and among small-scale communities themselves (Panayotou et al, 1985a; 1985b; Anat et al, 1988; Panayotou and Songpol, 1987; Somporn et al, 1990; Ruangrai and Maitree, 1992; Boonlert, 1994; Somying, 1994; Pongpat, no date; Dias and Joseph, 1993; Midas, 1995; Jate and Somsak, 1996).

At the root of these inter- and intra-sectoral conflicts are two significant factors. One is the rapid and uncontrolled development of land and water concessions surrounding small-scale communities. The other is increasing competition and the introduction of environmentally-destructive technologies within Thailand's coastal fishing zones. Although these factors are equally threatening to small-scale communities, both are qualitatively different, and are therefore examined separately.

Land Encroachment

As noted earlier, the small-scale fishing sector is unique in the coastal fishing industry in the sense that it lacks both the assets and opportunities of its larger-scale competitors. Two major assets are land and (more importantly) land title. Many of Thailand's small-scale fishing communities live in marginal areas (often occupying forest reserve or private yet unused land concessions), having little or no title to the land they occupy. For economic and institutional (as defined above) reasons, they conduct most of their fishing activities within close proximity to where they live.

These factors create two types of problems for the small-scale fishing sector. First, small-scale fishing communities tend to be highly dependent on local resources (Panayotou and Songpol, 1987; Panayotou and Panayotou, 1986; personal research in Phangnga Bay). Those who do not earn their living from fishing tend to work in local, resource-intensive industries such as rubber extraction and processing, rice farming or aquaculture.

Second, and because of this feature, small-scale fishing communities are extremely vulnerable to the negative effects of environmental degradation. In particular, encroachment from land developers and environmentally-destructive activities pose a substantial threat to small-scale communities. Rubber plantations, for instance, take up land that could otherwise

be used for farming, landing fish or homes. Likewise, shrimp farms (which have expanded dramatically in recent years - see Table XV) take up large areas of land, employ little labour and discharge harmful chemicals into coastal areas.

Table XV: Shrimp production and coverage (1980-1995)

Year	No. of farms	Area (rai)	Production (tons)	Value (million baht)
1980	3,572	162,727	8,063.05	458.91
1981	3,657	171,619	10,727.87	657.26
1982	3,943	192,453	10,090.77	765.68
1983	4,327	222,107	11,549.85	930.37
1984	4,519	229,949	13,006.75	1,024.01
1985	4,939	254,805	15,840.56	1,348.42
1986	5,534	283,548	17,885.83	1,737.58
1987	5,899	279,812	23,566.47	3,449.32
1988	10,426	342,364	55,632.84	7,900.55
1989	12,545	474,551	93,494.50	11,072.19
1990	15,072	403,787	118,227.05	14,365.36
1991	18,998	470,826	162,069.69	19,834.11
1992	19,403	454,975	184,884.321	25,500.142
1993	20,027	449,292	225,514.303	32,425.341
1994	22,198	457,793	263,445.96	39,745.252
1995	26,037	470,084	272,432.326	41,391.574

Source: DOF (1996). Statistics of Shrimp Culture

A major concern here is that the encroaching activities provide local communities with few economic benefits or opportunities and impose significant economic and environmental costs. Lacking title and power, local communities are often at the mercy of local entrepreneurs and government officials. The latter are particularly important in the sense that they are responsible for defining and enforcing regulations regarding land use. The policy of local land departments, (most notably the Royal Forestry Department - RFD), however, seems to be one of laissez-faire, permitting a wide array of private concessions, such as rubber plantations and shrimp farms.

The only viable means of defense for small-scale fishing communities are local and national networks, through which they can try to lobby public officials to intervene on their behalf. In Phuket, for instance, local villagers have joined forces with non-governmental organizations (NGOs) such as Wildlife Fund Thailand and local networks such as the Small-Scale Fisherman's Association of Phangnga Bay to lobby government officials. Past (albeit temporary) success stories include a provincial court decision to prevent a local entrepreneur from developing land surrounding Baan Pa Khlock and an intervention from the Pollution Control Department, which ordered local shrimp farms to stop releasing chemicals into fishing grounds surrounding Baan Ao Kung (both villages in Phuket) (for a related study, see Box I).

Impressive, given their opponents, these victories are exceedingly rare, largely because small-scale fishing communities have few formal, state-enforced rights to guarantee land tenure and/or exclusive fishing areas (more on this below). Because of this, the few government interventions that do occur are generally the result of unusually visible or violent confrontations between small-scale communities and local entrepreneurs.

Box I. Inter-sectoral conflicts

Beyond simple land conflicts, these conflicts represent an emerging trend towards inter-sectoral conflicts within Thailand's economy. The distinguishing characteristic here is that emerging sectors of the Thai economy are competing with already-established sectors (including the small-scale fishing sector).

At the local level, emerging conflicts are the result of direct and indirect competition over land and resources. Conflicts between shrimp farm investors and small-scale fisheries, like those described above, are a result of direct resource competition. In Baan Ao Kung, villagers have lobbied village, tambon and provincial leaders, and have even planted wooden stakes around mangrove reserves to prevent local shrimp farm developers from clearing their local fish spawning grounds.

In Baan Bang Luuk, also in Phuket, inter-sectoral competition has produced a more indirect form of conflict. Here, fisherfolk claim their fishing areas have been devastated by effluents from a local rubber factory. As a result, they claim, they are now forced to fish in other fishing areas, where resource competition is already high. This has created intra-sectoral resource conflicts with other fishing communities (see Box II).

Over-exploitation of Coastal Fisheries

A second type of conflict stems from escalating competition between small-scale fishing communities and larger-scale fleets, and among small-scale communities themselves. Conflicts between small- and larger-scale fleets generally occur when the latter enter the fishing areas used by small-scale communities, degrading local fishing grounds, depleting local

fish stocks or tearing up stationary gear. Conflicts among small-scale communities tend to follow the same general pattern, whereby fishing communities use destructive gear (such as push nets or cyanide) to catch fish in common or neighbouring fishing areas.

The common characteristic is that too many destructive technologies are pursuing too few fish, creating persistent and violent conflicts within Thailand's coastal zones. Surveys by the Department of Fisheries, for instance, suggest that catch per unit of effort (CPUE) rates have been declining steadily since the 1960s (Table XVI).

Table XVI: Effort and CPUE in the Gulf of Thailand

Year	Fishing effort (1000 hours)	CPUE (kg/hr)
1961	358	279
1962	515	199
1963	672	295
1964	1114	288
1965	1147	233
1966	2051	177
1967	2773	158
1968	3493	147
1969	3621	143
1970	3875	137
1971	6065	100
1972	7362	97
1973	8644	85
1974	6382	93
1975	9273	77
1976	7726	92
1977	10265	75
1978	8806	81
1979	8923	80
1980	8847	62
1981	11470	50
1982	12296	49
1983	13351	46
1984	10390	60
1985	11928	54

Source: (Somporn et al, citing Phasuk and Boonyubol and Pramok-Chutima, 1990)

Surveys in the Andaman Sea have produced similar findings. Monitoring surveys in 1969, for instance, suggest that the average CPUE in Phangnga Bay was 160 kilograms per hour (Jate, citing Ratanachote and Noothong, no date: 3). By 1988 this figure had dropped to 38 kilograms per hour (Jate, citing Chantawong, no date: 3).

Several factors appear to be at work here. First, there are no ***effective*** rules governing the ways in which individuals, households and firms use resources in Thailand's coastal areas. Despite an abundance of laws regulating gear type, fish size, and geographical and seasonal closures, source material and personal interviews suggest that Thailand's coastal regulations are flaunted widely (Boonlert, 1994; Anat et al, 1988; Arthorn and Baker, 1989; Midas, 1995; Anon., no date; Pongpat, no date; Ruangrai and Maitree, 1992; Somporn et al, 1990; Somying, 1994; Choomjet and Somboon, no date; Jate, no date). This is partly due to the fact that Thailand's responsible agencies lack the capacity and, at times, the willingness to monitor and enforce the relevant resource regulations (more on this below).

The three-kilometre trawl and push net ban is a classic case in point. Implemented in 1972 (Gulf of Thailand) and 1979 (Andaman Sea), the trawl and push net bans were designed to prevent destructive gear from degrading coastal fishing areas and tearing up stationary gear (such as stake nets, stationary traps) within three kilometres of shore (the area in which small-scale communities do most of their fishing). Numerous reports and personal interviews with scholars, fisheries officials (at national, provincial and district levels) and fisherfolk (in Phangnga Bay), however, suggest that small- and larger-scale fleets persistently ignore the ban, creating widespread conflict within the three-kilometre zones (Anon., no date; Boonlert, 1994; Ruangrai and Maitree, 1992; Midas, 1995; Somporn et al, 1990).

Box II: Intra-Sectoral Conflicts.

Perhaps the most graphic illustration of intra-sectoral conflict within Thailand's coastal fishing industry was the recent death of a villager from Khlong Khian, Changwat Phangnga, who was shot while accompanying Department of Fisheries officers on patrol in Phangnga Bay. According to official accounts, the patrol boat was fired upon while attempting to apprehend a group of individuals operating a push net within the three-kilometre zone.

The shooting has raised a number of concerns about the development of coastal fisheries in Phangnga Bay and about the ways in which government agencies and local communities have responded to the problem. First, it has illuminated the fact that intra-sectoral conflicts are not merely a result of large-scale craft encroaching on and depleting the fishing grounds of small-scale communities. Indeed, evidence suggests that the individuals involved in this incident were using a (sub-14 metre) long tail boat to operate their push nets. Second, it has raised concerns about individuals, *both within and outside the small-scale community,* who are investing in and operating push nets. Little official information exists about who these individuals are, how their networks operate and where their commodities go. Finally, it has raised serious concerns about the wisdom of encouraging small-scale communities to protect and enforce rules regulating local resources. This final concern is addressed in greater detail below.

A second and related factor is the up- and downstream industries that trawls, push nets and other types of destructive gear are ultimately serving. Upstream industries here include ship building, ship repair, net construction, ice manufacturing and transportation to the cast-off points. Downstream industries include cold storage, fish processing, fish canning, fishmeal, livestock and transportation to and from the landing sites (Somporn et al, 1990: 41). Another important actor is the intermediary, who buys the fish from the boats and sells it to the next link in the chain (Midas, 1995). Intermediaries commonly represent a major source of credit and market access for small- and larger-scale fishing fleets and, as such, represent an important constraint on the way in which they catch their fish (more on this below).

Box III: Thailand's Fishmeal Industry.

Thailand's fishmeal industry provides some insight into the ways in which downstream industries can affect upstream fishing activities. According to DOF statistics (DOF, 1996d), the number of fishmeal factories in Thailand increased from 85 in 1989 to 115 in 1993. Likewise, fishmeal production rose from 1,071,025 tons in 1989 to 1,374,683 tons in 1993. As noted earlier, trash fish are a primary element in the production of fishmeal (Estimates range between 40 and 70% - interviews with DOF officials; Somporn et al, 1990: 39; Jate, no date: 3).

The price for trash fish is relatively low. DOF statistics (DOF, 1996d) suggest that the average annual price for trash fish (at the fishmeal plant) in 1993 was 2.55 baht per kilogram. This pales in comparison to the average landing prices one could get for ecological competitors such as swimming crab (60 baht/kg) or prawn (130-180 baht/kg) (personal interviews in Phangnga Bay). Indeed, trash fish do not become valuable until the processing is complete. Once trash fish are converted into fishmeal, the average price jumps to 13.72 baht per kilogram, a rise of over eighty per cent. Presumably, this price increases correspondingly until it reaches the final consumer.

Given the disparity that exists between the price of trash fish and that of its ecological competitors, one must ask why fishing boats would want to catch trash fish in the first place. One reason is that trawls and push nets make it very easy to pull in large quantities of fish. According to a DOF survey of 37 marine fish landing places in 1994 (DOF, 1996c: 10), trash fish (small demersal fish, scads and other food fish) account for roughly 33.2% of all landings (measured by tonnage), which is more than any other species of fish. By contrast, the economic value of trash fish is only 6% of all fish landings.

A second reason is that many fishing operators feel they can make more money using push nets and trawls than they would using gill nets or culture techniques. Personal interviews with push net operators in Phangnga Bay, for instance, suggest that they can pull in an average of a thousand baht per day, which, they feel, is far more than they would make using alternative techniques.

A final factor relates to the relationship between the boat operators and their intermediaries. Intermediaries frequently provide large and small boats with loans to buy their gear, boats and to pay their crew. When a boat is in debt to an intermediary, it is often obliged to sell him or her all of its catch and to pay rates of interest that far exceed the prevailing institutional rates (personal interviews with fisheries officials and fisherfolk in Phangnga Bay). If downstream markets and industries make trash fish attractive to the intermediary, then, it is not difficult for the intermediary to convince his or her clients to go out and catch trash fish.

In sum, inter- and intra-sectoral conflicts among Thailand's coastal fisheries are a result of a wide array of political and economic factors. Confounding this feature is the role of the Thai state, which is explored in the following section.

IV. Government, NGOs and Development Initiatives in Thailand

As noted earlier, Thailand's coastal fisheries have suffered from a series of less-than-optimal interventions from their various government agencies. Three factors appear to be at work here. First, evidence suggests that Thailand's public officials lack the ability and, at times, the willingness to monitor and enforce Thailand's numerous coastal regulations (Midas, 1995; Boonlert, 1994; Somporn et al, 1990; Ruangrai and Maitree, 1992). Second, policies affecting Thailand's coastal resources are decided and implemented within a highly centralized structure, leaving little room for innovation or local initiatives. Finally, influential actors with an interest in the current situation have been highly effective at maintaining the status quo .

All of these elements constitute powerful constraints that discourage public officials from effectively addressing the problems that exist within Thailand's coastal fishing industry. The following section examines these issues, and the role of Thailand's NGOs, in greater detail.

State Capacity

One element that fisheries officers commonly cite as a major constraint on their ability to enforce fisheries regulations is a lack of budgetary might (personal interviews, Phangnga Bay). The argument here is that Thailand's enforcement agencies lack the money, equipment and manpower to monitor and enforce fisheries laws effectively.

Evidence is mixed.

Provincial Fishery Patrols in Phangnga Bay, for instance, do seem to lack the necessary funds and equipment to undertake their role effectively (Midas, 1995: 10-11). The Fisheries Patrol in Krabi province has three staff but no boat, weapons or radio. Phangnga province has a ten-metre launch, which can reach speeds of 5 to 8 knots per hour. Phuket province does not have a boat. In Krabi, the funds for the Fishery Patrols (which range between 5 and 6,000 baht per excursion) come from a one-off 100,000-baht environmental conservation fund which is used for all environmental conservation activities in the province (Midas, 1990: 10).

In contrast, the Andaman Sea Fishery Protection Unit (formerly in Phuket, now in Krabi) has nine boats, three of which are over 60 feet in length (Midas, 1995: 9). Likewise, Phuket's Marine Police Department has five boats, three of which are over fifty feet long. As the Midas team argues,

The larger vessels should be able to operate in unprotected waters at times when fishing boats are active. It seems that any problems with law enforcement by Fishery Protection Units are not due to a lack of vessels or equipment (1995: 10).

A second factor relates to the way in which fisheries enforcement works in Thailand. By and large, enforcement officials will not intervene unless they receive a request for assistance. Moreover, suspects can only be arrested when they are caught in the act of breaking fisheries regulations (personal interviews with district fisheries officers). When they receive a request, any combination of Fishery Patrol staff, Fishery Protection staff, District Fisheries Officers and marine and terrestrial police will respond to the call. Most often, it is the district officers and terrestrial police who intervene in these situations (Midas, 1995: 10-11; personal interviews). Interviews with district, provincial and national fisheries officers suggest that the district officials are responsible for providing the initial response (personal interviews in Phuket and Bangkok). Failing resolution, provincial officers and, under extreme situations, marine and terrestrial police will be asked to intervene. All of these officials are authorized to arrest individuals who contravene fisheries regulations and other criminal laws.

A fundamental problem with the current arrangement, however, is that the monitoring and enforcement system places far too much responsibility in the hands of members of the public and local government officials, who lack the enforcement power to deal with these situations effectively. First of all, plaintiffs are expected to initiate the intervention, which, depending on location and infrastructure, can be prohibitively costly and time-consuming. Given the fact that fishing villages are often without telephone and other means of communication, the time that takes place between the original call and the ultimate intervention can be quite significant (interviews with villagers in Phuket, Phangnga). Second, witnesses are frequently asked to identify the guilty party - in person. When the offenders are individuals with power and influence, this type of criminal procedure can be extremely difficult - and dangerous - for the witness. As a result, few fisheries offenses find their way to trial or prosecution.

Third, fisheries enforcement officers are, by and large, ill-equipped to deal with the violent confrontations that frequently arise when they and/or members of the public attempt to apprehend those violating fisheries regulations. Although Fishery Patrols possess 12-gauge shotguns, these weapons are fairly inappropriate for enforcing situations within the confines of a small fishing boat. As the Midas Report (1995: 14) argues, "apart from being unwieldy, (shotguns) are unnecessarily lethal." Some officers have hand pistols, although these are weapons they have purchased with their own money. Government regulations prevent fisheries officers from using rifles (Midas, 1995: 14).

A final factor relates to the quality of communication and coordination among Thailand's responsible agencies. According to the Midas report (1995: 12-13), Fishery Protection Units will respond to requests they receive from Provincial Fishery Patrols, although distance, prior engagements and a pervasive "reluctance to get involved" can mitigate this response considerably (if not absolutely). As the Midas team states,

It seems to be a general situation that Fishery Protection Units do not see coordinated action with Provincial Fishery Patrols or Fishery Officers as a part of their duties (Midas, 1995: 14).

Coupled with the somewhat less than adequate communication capabilities of the Provincial Fishery Patrols, this makes for an extremely uncoordinated and ineffective system of law enforcement.

One notable exception is the police, who Midas (1995: 13) reports, "generally provide immediate response to requests to participate in patrols." In return, however, Fishery Patrols must provide police with meals and a *per diem*, making this type of activity prohibitively costly. Likewise, interviews with the Marine Police Unit in Phuket and DOF officers in Phangnga Bay suggest that the Marine Police will assist fisheries officials when requested. In fact, included among their formal responsibilities are the enforcement of fisheries regulations and the protection of coastal areas. Also included, however, are a series of costly and time-consuming responsibilities (such as drug enforcement, search and rescue, border patrol and the pursuit of tax evaders), which can seriously impede their ability to monitor and enforce Thailand's fisheries regulations (interviews with DOF and Phuket Marine Police).

Thailand's licensing system also suffers from poor coordination. As noted earlier, many fishing boats operate without a license in Thailand. This is due in large part to a lack of coordination between the issuing agencies and the enforcement agencies. Under Thai law, fishing boats are required to possess two types of license: a fishing license from the District Fisheries Office (DFO) and a navigation certificate from the Harbour Department (Boonlert, 1994: 113). Once a boat has both of these licenses, however, it is free to enter any (Thai) fishing area it likes. This means that the larger vessels can move in and out of provincial fishing areas without having to register with local fisheries officials. Moreover, even when a boat lacks the requisite certification, the issuing office is unlikely to find out unless a Fishery Patrol boards the ship and discovers the violation (which is unlikely) or a third party reports the infraction (equally unlikely).

In the unlikely event that fisheries officials are able to catch and prosecute the guilty party, the penalty for a fisheries violation (a fine of three times the price of an annual gear

license, which is, on average, 200-300 baht per year) is hardly an effective deterrent. Moreover, according to district fisheries officials (Phuket), enforcement officers are usually only able to fine the captain of the boat. The owners, it seems, are able to ensure they are conveniently detached from any form of illegal fishing activities.

Coordination problems also exist between the DOF and other relevant government agencies. As noted earlier, many of Thailand's small-scale fishing communities are vulnerable to land encroachment because they are located on forest reserve. In spite of this situation, however, interviews with villagers in Phangnga Bay, fisheries officials and forestry officials suggest that little cooperation takes place between the Royal Forestry Department (the RFD) and the DOF. Indeed, interviews with staff in the Bay of Bengal Program (BOBP) of the Food and Agriculture Organization (FAO) suggest that the two agencies rarely consult or coordinate with one another. The inability to coordinate the activities of these two inter-related agencies makes it extremely difficult to address problems of coastal area management (such as mangrove encroachment) in an effective manner.

Bureaucratic Centralization

Thailand's coastal fishing problems are also a measure of the ways in which the Thai government has tried to address and alleviate problems within the coastal fishing sector. At issue here are the subsidies and programs the Thai state uses to direct development and change within the coastal fishing industry.

According to the Department of Fisheries (Somying, 1994: 380; Midas, 1995: 14), the short-term objectives of its Small-Scale Fisheries Development Program (SSFDP) are to: i. improve socio-economic conditions within small-scale fishing communities; ii. upgrade the biological productivity of Thailand's coastal fishing areas; iii. promote and develop the fishing industry; iv. develop suitable areas for coastal aquaculture; and v. train small-scale fishermen in marine culture and post-harvest processing (objectives iv. and v. are only cited in Midas, 1995). Its long-term objectives are to: i. maximize an equitable and profitable distribution of coastal resources; ii. reduce conflict between small-scale and commercial fisheries; and iii. discourage migration into developed areas (this last objective is only cited in Somying, 1994).

The SSFDP has three main activities. One is the promotion of cage culture and aquaculture. Implemented and assisted by the District Fishery Offices, this activity provides a grant of 900,000 baht (800,000 in year one, 100,000 in year two) to groups of 30 fisherfolk, who can lend the money to members for shrimp aquaculture and cage culture activities. Members must repay 50% of the loan in year one, 30% in year two and 20% in year three

(Midas, 1995: 15). A second activity is a credit scheme (the Fishing Gear Demonstration Program) designed to sever the lending relationship between small-scale fishing communities and intermediaries. A final activity is the installation of artificial reefs. Designed to rejuvenate stocks and deter trawls and push nets from entering coastal fishing zones, the reefs are composed of large concrete blocks which are sunk into selected coastal areas.

Experience and personal interviews (in Phangnga Bay) suggest that all three of these project activities suffer from a highly centralized style of project management (see Midas, 1995; Ruangrai and Maitree, 1992: 536; Somying, 1994: 380-81). Although project locations and activities are identified by provincial and district fishery officers, all plans and budgets are decided, evaluated and allocated by DOF staff in Bangkok (Midas, 1995: 15). Interviews with fisherfolk in Phangnga Bay and source material suggest that client communities are rarely consulted about the costs and benefits of implementing a particular project activity (Midas, 1995; Ruangrai and Maitree, 1992: 536; Somying, 1994: 380-81). In its assessment of the artificial reef program, for instance, the Midas team (1995: 17) cites an example in which a company installing an artificial reef at Koh Yao Noi (in Phangnga Bay) either ignored or misinterpreted previous discussions between fisheries officials and local communities, and installed all of its blocks on one village's shrimp fishing grounds, in spite of their protests.

Government-sponsored credit schemes seem to suffer from similar problems of planning and miscommunication (see Box IV). According to DOF staff in Phangnga Bay, defaults on loan repayments are common. Reports from Midas (1995) and Somying (1994) contain similar findings, although default rates do appear to vary. Community-based initiatives, by contrast, appear to be far more successful, attracting investors and encouraging members to repay their loans. Baan Ao Kung and Baan Pa Khlock (Phuket), for instance, have initiated (with the help of a local NGO) what appears to be a very successful community bank. After six months of operation, the bank has 105 members and repayments are 100% (personal interviews).[1]

A vital issue here, and one that receives little attention in the literature on Thailand's fisheries, is the role of ***trust***. Interviews with community bank members in Baan Ao Kung suggest that the bank works because the members trust one another and, equally important, they feel they have a stake in its operation and success. All of the bank's activities, from book keeping to loan decisions are the responsibility of its members. This is in stark contrast to an

[1] Whether the bank has the financial and institutional fortitude to sustain itself - particularly without the aide of the local NGO - and to support economically viable activities, however, still remains to be seen. Field research is currently on-going.

ill-fated government credit scheme, which, according to Ao Kung villagers and members of the local NGO (Wildlife Fund Thailand), divided the same community five years back. Unlike the community bank initiative, there appears to have been little trust between small-scale fishing communities and government officials. Indeed, a common phrase among Thailand's fisherfolk is that government officials are rarely ***jingjai***, they are rarely sincere.

Box IV: Fishing Gear Conversions: Problems and Constraints

Partly in response to the shooting incident described in Box II, the DOF initiated a credit program designed to encourage individuals in Phangnga Bay to convert from push nets to less destructive gear, such as gill nets and cage culture. Under the plan, individuals would receive a six-month loan that would help cover the costs of buying new gear and learning new fishing techniques. In exchange for the skis from their push nets (which were subsequently destroyed), villagers in Baan Bang Luuk and Baan Para (both in Phuket) were allowed to take part in the program.

Interviews with fisheries officials in Phangnga Bay and villagers in Baan Para suggest the program (which was initiated in October 1997) suffers from a number of constraints. First, the individuals participating in the program report that the costs of converting to gill nets far outweigh the profits they were making from using push nets. This is due in part to a lack of experience. Reforming push netters in Baan Para report that their lack of experience about tides and currents makes it difficult to catch fish using gill nets. In addition, they claim, their push net boats are too large and consume too much fuel to make the use of gill nets a profitable activity.

Second, and because of these problems, many villagers in the target communities continue to use push nets. Provincial and district officials within the DOF say they suspect villagers in Baan Bang Luck and Baan Para are still using push nets. Likewise, individuals from neighbouring villages in Phuket and Phangnga report that they see push nets operating 100 metres offshore during the night.

Finally, the push net program in Phuket province has done little to aide the poorest of the poor within the target communities. In Baan Para, for instance, DOF loans were extended to six individuals who were previously using push nets. Relatively speaking, these are individuals who are extremely well-off, compared to other members of the Baan Para fishing community. Interviews suggest that push nets and push net boats can cost from 60 to 80,000 baht. Individuals using push nets, then, are people with access to a sizable amount of capital and/or credit. The majority of those living in Baan Para, by contrast, are unable to afford the option of using push nets. According to DOF officials, however, this segment of the community has ***never*** been targeted for aide or assistance by the DOF.

Local Government Initiatives

One alternative way in which a community can obtain funding for local initiatives is to apply to the local government councils within the Ministry of Interior. Included here are the village councils, the newly re-organized tambon councils, the ampoes and the changwats. Under this system, village councils can submit a funding application to the tambon council, which can then decide to pass the application on to the ampoe, which, in turn, can then pass it to the changwat for final approval.

Traditionally, this system of funding has suffered from both a lack of communication and a lack of accountability between those who control the spending budgets (the governors, *nai ampoe, kamnaan, phuyaaybaan* and Ministry of Interior officials in Bangkok) and those who receive the money (Rigg, 1991; Atkinson and Vorratnchaiphan, 1991; 1994). Since funding comes directly from Bangkok, client communities have few means of ensuring that local government officials meet their needs effectively or appropriately (Rigg, 1991; Atkinson and Vorratnchaiphan, 1991; 1994). Indeed, one commentator has argued that corruption within the village and tambon councils is so vast that grassroots development is effectively a "lost cause" in Thailand (Rigg, 1991).

Despite these powerful constraints, recent transformations within the local tambon councils may provide cause for (guarded) optimism. Under the Tambon Administrative Organization (TAO) Act, all tambon councils with more than 150,000 baht per year will be transformed into TAOs (the process began in 1995 - Kobkun, 1996: 34). Each TAO has a council and a committee, which are (respectively) responsible for planning and implementing development initiatives within their jurisdiction. Significantly, TAOs have the ability to collect revenue from local real estate transactions, business taxes, and license fees, giving them (in theory, at least) a direct financial link to ***some*** of their constituents (Kobkun, 1996: 38).

In terms of representation, TAO councils are comprised of the *kamnaan* (tambon head), all of the *phuyaaybaan* (village heads), the tambon doctor and two *obatah* (elected TAO representatives) from every village. The councils are responsible for considering and approving budgetary requests from villages within the tambon. The TAO committees, comprised of the *kamnaan*, two village heads and four *obatah* (appointed by the *nai ampoe*), are responsible for implementing development plans that have been approved by the councils (Kobkun, 1996: 35).

In theory, the new tambon structure boosts both the power and accountability of local political organizations in Thailand. TAOs have their own source of funding, which they can

collect and allocate as they see fit. Moreover, the *obatah* are elected by their constituents - the villagers in their community. As Kobkun (1996: 33-38) argues, however, the *kamnaan*, the *nai ampoe* (the ampoe chief), the provincial governor and other officials within the Ministry of Interior retain significant powers (particularly their ability to appoint TAO councilors) suggesting the new structure may face many of the same patronage problems that plagued its predecessor. In addition, the new structure appears to have few provisions that would prevent influential civilians (landowners, capitalists) from exerting ***undue influence*** on the local political process.

A key factor will be whether and to what extent supporters of decentralization in Thailand can devise institutions (rules) that stipulate standards of performance for TAO councils and committees, and provide a means of penalizing government officials who fail to adhere to these standards. As it stands right now, only the provincial governor can dissolve the TAO council (Kobkun, 1996). At the time of writing, Thailand's Constitution Draft, which would increase the number and power of local elected officials and further reduce the power of Ministry of Interior officials, has been passed by the House of Representatives.

Non-governmental Organizations

Another way in which communities can initiate development activities in Thailand is to enlist the aide of non-governmental organizations (NGOs). Benefiting from a relaxation of authoritarian rule and a surge in NGO-directed foreign aide, Thailand's NGOs have ballooned since the early 1980s. The National Statistical Office (NSO) estimates there were more than 1100 social welfare NGOs in Thailand by 1989 (Amara and Nitaya, 1995: 63). As Pasuk and Baker (1996: 384-89) argue, Thailand's NGO movement grew out of the left-wing radicalism of the late 1970s, dropping many of the more extreme ideological tenets of the communist movement, while retaining its aversion for the top-down, urban-centric style of state-sponsored development.

Thailand's NGOs support community-based development in two significant ways. First, and very simply, they represent an alternative source of aide. Second, and more significantly, they represent an alternative style of development. In contrast to the government approach, which generally decides development initiatives with little or no consultation with local communities, many of Thailand's NGOs have tried to foster and support a more decentralized style of community-based development (CBD) (Pednekar, 1995; Amara and Nitaya, 1995; Pasuk and Baker, 1996: 384-89). The principal distinction here is that client communities decide and have a stake in local initiatives, as opposed to simply receiving

government largesse.

Source material (Midas, 1995) and personal interviews suggest that NGOs in Phangnga Bay have tried to encourage this type of relationship by facilitating the work of existing community-based initiatives. The *Andaman Project for the Participatory Restoration of Natural Resources* of the Wildlife Fund Thailand (WFT), for instance, plays a large role in supporting and coordinating the activities of small-scale fishing groups and communities along Thailand's Andaman coast. As noted earlier, the NGO has been instrumental in facilitating the formation of a community bank in Baan Ao Kung and Baan Pa Khlock (Phuket). Although NGO staff attend the monthly bank meetings and assist members with basic skills such as bookkeeping, however, the bank is very much a community-based initiative, leaving all decisions regarding allocation and investment to the villagers themselves.

WFT's lobbying activities appear to follow a similar vein. According to fieldstaff in Phuket and Bangkok, the NGO tends to stay away from direct lobbying, opting instead to facilitate the lobbying activities of community networks in the region, such as the Small-scale Fishermen's Associations of Phangnga Bay and Southern Thailand. Facilitation here can entail anything from translating newsletters into English to coordinating regional meetings among small-scale fishing associations and communities. WFT appears to be highly skilled at using the Internet to foster networks among NGOs, academics and government agencies at a national and regional level.

It has also played an important role in facilitating local networks among villages and fishing groups at the local level. At times, NGO staff will act as a "go-between," exchanging information among communities that are unable to communicate with one another. In other instances, they will cover (or at least reduce) the costs of attending regional and national meetings (such as the Forum of the Poor), providing transportation and compensation for lost work.

In short, the NGO approach can differ vastly from that of Thailand's government agencies. Despite these positive features, however, NGOs are not without their flaws. One relates to the level of expertise within the non-governmental sector, a concern expressed by NGO staff themselves (Midas, 1995: 46). Although Thailand's bureaucracy is exceedingly rigid, it also contains rules designed to ensure that government officials are qualified to undertake their responsibilities. All civil servants, for instance, must take a written exam to proceed to a higher bureaucratic level in Thailand. NGOs, by contrast, lack many of the rules

that ***are designed*** to ensure quality control within the public sector.[2] Likewise, NGOs often lack opportunities for training and professional development (eg. scholarships for higher education, training workshops, etc.) that are available to government employees.

A second factor relates to accountability within the non-governmental sector. Lacking rules that stipulate what in fact constitutes an acceptable performance, NGOs frequently find themselves in a position in which they have vast opportunities to undertake activities that may contradict and/or undermine the interests of their client communities (for a theoretical exploration of these issues, see Brett 1993). When beneficiaries are ill-informed about the activities of the NGO, they can be highly vulnerable to this form of mismanagement.

Source material (Midas, 1995) and interviews with WFT staff suggest that NGOs can mitigate these problems by increasing the amount of time they spend with their client communities. Regular consultations can ensure that beneficiaries are well-informed about the activities of the NGO and that the NGO is well-apprised on the needs of its beneficiaries. Indeed, the Phuket office of WFT has tried to institutionalize this feature by conducting regular evaluations, in which members of the client communities are asked to rate the NGO's performance and to suggest alternative activities. Whether and to what extent these preferences are incorporated into the NGO's program activities, and (significantly) whether and how the NGO balances these particular needs with the needs of its financial sponsors, however, remains unclear.

A final concern touches upon the relationship between NGOs and the government in Thailand. Under Thai law, all NGOs are required to register with the Ministry of the Interior. Without doing so, they cannot receive official development assistance (ODA) (Farrington and Lewis, 1993: 277). Despite this stipulation, many Thai NGOs opt not to register, either because they lack the requisite funds or they do not receive ODA (Amara and Nitaya, 1994: 44).

In either instance, it appears that many of Thailand's NGOs have a rather uneasy relationship with the Thai government. This stems in part from the left-wing legacy of Thailand's rural development organizations (Pasuk and Baker, 1996: 384-89). It also seems to stem from the way in which Thai NGOs perceive their role in Thailand's development and their relationship with the Thai state. Source material and interviews with various Thai NGOs suggest that fieldstaff perceive their organizations (and the sector in general) as an important departure from the governmental institutions that have plagued Thailand in the past (Pasuk

[2] At the same time, it is this lack of bureaucratic red tape that gives the non-governmental sector the flexibility to do the work that it does.

and Baker, 1996: 384-89; Midas, 1995: 46).

Cooperating with government agencies, then, can be anathema to a sector that defines itself in terms of its ability to be all that government is not. A central concern here is that an anti-governmental stand may distance Thailand's NGOs from the Thai state and, consequently, from an opportunity to influence state policy.[3] Evidence suggests that many of Thailand's NGOs have been grappling with this very issue, some (such as WFT and Siam Environmental Club) taking a relatively non-confrontational approach and others (such as Project for Ecological Recovery) using media and demonstrations to influence Thailand's decision making process (Suchit et al, 1993).

A central issue here relates to the pros and cons of establishing a ***closer*** relationship with the state, an issue explored throughout the literature on NGOs and the state in Asia (Farrington and Lewis, 1993; Heyzer et al, 1995). While a closer relationship may provide NGOs with opportunities to influence public policy, it also places them in close proximity to an organization that far exceeds their capacity to generate revenue and influence human activity - the state. Interviews and source material (Midas, 1995: 46; Farrington and Lewis, 1993) suggest that NGOs are often reluctant to cooperate with the state because government officials have betrayed their trust in the past. Moreover, by entering this relationship, NGOs also run the risk of losing (or depleting) an important source of power and support - their client communities.

In sum, NGOs represent an important alternative to the ways in which development happens in Thailand. Powerful factors (namely their lack of political clout and their dependence on foreign funding), however, may place strong constraints on their ability to service the needs of their beneficiaries. Thailand's government agencies, flawed as they may be, play an equally essential role in improving development and coastal resource management within Thailand's small-scale fishing communities. Potential solutions are addressed in the following section.

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[3] This is important because it is the state that creates and enforces the rules that affect the ways in which NGOs can operate in Thailand.

V. Theories and Solutions

Reflecting a wide and well-founded feeling of dissatisfaction with the public sector, proposed solutions to Thailand's fisheries problems tend to favour institutional arrangements in which individuals and communities (broadly defined) are empowered to manage coastal resources on their own (for a theoretical perspective, see Ostrom 1990; Bromley et al 1992; for Thai policy initiatives, see below). Although these arrangements have their positive features, however, they are problematic in the sense that they understate both the role of the state and the costs of encouraging the state to intervene effectively. These and other issues are explored in greater detail.

The Role of a Coastal Fishery

Up until now, little has been said about the normative role of a coastal fishery. In other words, little has been said about the types of benefits a coastal fishery should provide to its users, and to society in general. In order to address this issue, one needs to consider a number of assumptions about the ways in which societies prefer to use coastal fisheries. One relates to the contribution a fishery makes to a nation's economy and the interest policy makers take in maximizing this contribution (Johnston, 1992: 2). A second relates to the benefits that individuals, households and firms derive from using the fishery. A fishery, then, is assumed to represent a source of multiple and, at times, conflicting interests and livelihoods (Johnston, 1992: 2). Indeed, it is this feature, combined with the open-access nature of coastal fisheries, that leads to the inter- and intra-sectoral conflicts described earlier.

A third element relates to the normative principles on which the fishery is to be used and exploited. A central argument of this paper is that a coastal fishery should serve three (potentially contradictory) purposes. One is to meet the needs of those who seek to use it. A second is to ensure that exploitation remains environmentally and economically sustainable. This implies that economic activity should remain at a level where economic returns exceed the costs of using the resource (ie. rents are sustained) and resource depletion does not exceed the natural rate of regeneration (Panayotou, 1982; Christy, 1982; Ostrom, 1990). A final (and significant) one is to guarantee access to the least fortunate members of society, in this case, the small-scale fishing communities (Midas, 1995; for a theoretical exploration of this normative assertion, see Rawls, 1971).

In short, coastal fisheries can be used so long as they are maintained at levels that do not exceed the economic and regenerative capacities of the resource ***and*** they guarantee

livelihood for those least fortunate.

In theory, Thailand's coastal fishing regulations come very close to achieving these normative principles. Indeed, the three-kilometre trawl and push net ban represents a clear stipulation preventing large-scale and destructive fishing technologies from depleting small-scale fishing areas and disrupting small-scale fishing gear. As noted earlier, however, the gap between formal regulations and informal practice can be wide indeed.

A challenge for state and non-state actors alike, then, is to devise a way in which governments, firms, individuals and communities can foster these three broad objectives in Thailand's coastal fishing areas. The following section examines these issues in greater detail, reviewing and critiquing two ways in which scholars and policymakers have proposed to address coastal resource problems in Thailand.

Quotas

One proposal for achieving efficiency and equity within the coastal fishing industry is to implement a system of quotas, which, it is argued, would reduce both the number of fishers and the costs of monitoring and enforcing fisheries regulations (Shallard, 1996). Depending on how they are used, quotas can restrict either the inputs (such as the number and size of fishing gear) or the outputs (the number and size of the fishing catch) of a particular fishing activity (Shallard, 1996; Asada et al, 1983: 23-4). Output quotas can govern either the entire catch (Total Allowable Catch - TAC) or the catch of an individual boat. One advantage of the individual quota system is that it allows individual boats to meet their quotas at their own pace, removing the incentive to "race to the finish," (Shallard, 1996).

Before implementing any type of system, however, those managing the fishery first need to devise a way of allocating the original quotas. One way of doing this is to allocate quotas on the basis of historical use. Allocations, then, would be decided by determining those with the longest record of using the fishery. An important prerequisite here is a clear and reliable record of those who have used the fishery in the past. A second way in which a fishery can allocate quotas is to use an auction. Under this type of scheme, quotas are simply allocated to the highest bidders. One advantage of using the second option is that it gives newcomers an equal opportunity of obtaining a quota.

According to Shallard (1996), an additional advantage of an output quota system is that it reduces the costs of monitoring and enforcing fisheries regulations. Instead of having to monitor input regulations (such as gear size), fisheries officials can simply concentrate on monitoring and enforcing the number and size of landings. If enforced effectively, the quota

system can then maintain the size and stability of the coastal fishery.

Another argument is that the quota system promotes economic efficiency by encouraging "inefficient" producers to leave the system (Shallard, 1996). By setting a TAC, for instance, the quota system artificially shrinks the size of the resource, reducing the number of economic rents and discouraging inefficient producers from entering the system (for a theoretical discussion on rents and open-access fisheries, see Panayotou, 1982). Likewise, tradable quotas enable all eligible producers to enter the system, but they allow the inefficient producers to trade all or part of their quotas when they are unable to compete. By "making space" for others to enter the system, the inefficient producers can then be compensated in a number of ways. First, if quotas are allocated by an auction, proceeds from the auction can go towards the producers who are forced to leave. Second, in a tradable quota system, producers can buy and sell their way in and out of the system periodically, depending upon their primary needs, opportunities and ability to pay (Shallard, 1996).

Although they improve efficiency, however, quota systems entail a number of pressing (theoretical and empirical) concerns, which require careful scrutiny. First, many quota systems are designed in such a way that they squeeze the least capable producers out of the fishery. As noted earlier, these are generally the producers with the least opportunities for alternative income - the small-scale fisheries. Although they would receive compensation for leaving the fishery, it is questionable whether the inefficient producers could re-invest the capital in another productive activity or save the capital to re-enter the fishery at a later date. Moreover, without an effective system of economic calculation and enforcement, there is little guarantee that the inefficient producers would receive appropriate compensation (ie. there is little guarantee the payment would compensate the cost of lost fishing opportunities, particularly if the payment is never made).

A second and related concern is an implicit assumption that the inefficient producers will in fact be willing to leave the system (ie. they will respect the rule of law). Although an output quota system certainly reduces the costs of enforcing compliance (ie. it only has to concentrate on landings), it also requires a highly sophisticated and well-coordinated means of surveillance. As noted earlier, Thailand's government agencies suffer from poor coordination, weak capacity and widespread corruption. Without a serious transformation in budgetary and institutional structure, then, there is little reason to believe that Thailand's government agencies would have the institutional fortitude to keep track of individual quotas or to prevent smuggling and cheating.

Given that the most recent arrivals are also the most powerful producers, it is unlikely that a historical quota system would work in Thailand's coastal fisheries. Likewise, an auction system would simply reiterate the current situation - small-scale fisherfolk would be forced out of the system, lacking the land, skills and capital to diversify or to return to the fishery. The only way of ensuring access for those least fortunate, then, would be to give them a special allocation (Shallard, 1996). Once again, though, this raises the question of how one would allocate quotas within the small-scale fishery. Moreover, it would require highly-sophisticated micro-management skills that (at the present time) Thailand's government agencies simply do not possess.

Finally, for it to work effectively, any type of quota system would require detailed and accurate information about the large- and small-scale operators who use the system. The most important informational needs would relate to the size and activities of vessels using the system, the type and quantity of species they are catching, and the markets and landing places they are serving. As noted earlier, official statistics for large- and (particularly) small-scale vessels are unreliable in Thailand. Implementing an effective quota system, then, would require an information retrieval system that far exceeds the capabilities of the one currently in place in Thailand's coastal fishing sector.

TURFs

A second way of achieving efficiency and equity in a coastal fishery is to implement a system of territorial user rights ("TURFs" - territorial use rights in fisheries - for short). TURFs differ from quotas in the sense that they regulate the areas in which producers can fish, not the size or quantity of their gear or catch. The right in question, then, entails a right to use a particular resource area, a right to obtain benefits from the resource, and (significantly) a right to exclude others from using or obtaining benefits from the resource (Christy, 1982: 4). Note that this does not imply ownership (Christy, 1982: 4).

Depending on the type of institutional arrangement, TURFs can take a number of forms. One type of TURF is a private concession. Here an individual reserves the right to use an area of water or coastline to undertake a particular economic activity. Given that many types of fish are fugitive in nature, private concessions are generally best suited to sedentary species, such as oysters or mussels (Christy, 1982: 9).

A second type of TURF is a state-enforced system. Here territorial use rights can go either to an individual, a firm, a state agency or a community (see below). The distinguishing feature here is that the state (including all responsible government agencies) assumes the costs

of creating rights and ensuring that they are respected and enforced. In other words, the state is the guarantor. To a degree, this is the system that Thailand currently uses to regulate effort and exploitation within its coastal fisheries. As noted earlier, the Thai state assumes responsibility for designing, monitoring and enforcing the right to use particular fishing areas.

A final type of TURF is a common property resource (a CPR). Here the costs of monitoring or enforcing a private concession are too great for any one individual to bear, creating a situation of ***common*** property. A CPR differs from an open-access resource (an OAR) in the sense that it has rules, defining the conditions under which individuals may use the resource (Christy, 1982; Ostrom, 1990; Bromley, 1992). When enforced effectively, these rules restrict access to a particular group of members (often called a community), who enjoy the right to use the resource in return for their compliance with the rules in use.

In reality, all three of these institutional arrangements are highly interdependent. Private concessions, for instance, frequently exist within common property regimes. Japan's coastal fishing system, for example, allows private concessions within common property arrangements (Panayotou, 1982: 46; Asada et al, 1983). Likewise, both private and common property regimes require institutional support from the state (although some theorists would reduce this role considerably - see below). Traditional CPRs have also been known to thrive when states (either by choice or by accident) give them the space to operate on their own (Ostrom, 1990; Panayotou, 1982: 47).

Different types of arrangement are thought to produce different types of benefit for the fishery and for those who use and exploit it. All are common in the sense that any type of TURF creates a zone in which individuals or communities possess the right to exclude others. This, in theory, creates a strong incentive for resource protection. The argument here is that individuals and/or communities are more likely to protect a resource when they have a credible guarantee that they will receive the benefits of doing so (ie. when they have tenure).

Theories differ, however, about the ways in which these conditions can best be obtained. Private concessions, for instance, most commonly arise when governments allow them to. By granting and recognizing an individual's right to use and exploit a resource, the state is effectively passing the costs and benefits of the resource onto the individual. In short, the individual has command over the resource, but this command depends on the state. Very few, if any, resource theories propose that individuals enforce their own right to property. This is because the costs of doing so would generally far outweigh the benefits one obtains from protecting private property.

Theories about common property resources, by contrast, are far less clear about who should and ***who can*** enforce the right to use a resource (Ostrom, 1990; Bromley, 1992). CPR theories, for instance, suggest that rules regulating common property are most effective when they are designed, monitored and, in some cases, enforced by members of a well-defined community (Ostrom, 1990; Bromley et al, 1992). Most important here are rules that define membership and stipulate boundaries and codes of acceptable behaviour. Equally important is the notion that the individuals who use the resource have a large hand in deciding the ways in which it is managed. This frequently entails a relatively high degree of autonomy from " outside" resource managers (particularly central state agencies) and intruding economic interests (Ostrom, 1990).

The advantages of implementing or encouraging a common property arrangement are numerous. First, they are structured in such a way that they capitalize on the wisdom and experience of the local community. In this way, they seek to avoid repeating the mistake of designing rules and regulations that are totally inappropriate for the particular resource setting (Ostrom, 1990; Bromley et al, 1992). Second, much like a private property arrangement, CPRs create incentives to protect the resource. When members have credible assurance that they will derive benefits from the resource, they are more likely to assume the costs of ensuring its health and longevity. Finally, there is an argument for cost-efficiency. Since members spend large amounts of time using the resource and since they have a stake in its well-being, they are well-situated to collect information about local resource-related activities and to ensure that other members follow the resource rules.

Recognizing the advantages of this form of resource management and the disadvantages of maintaining the status quo, proposals for Thailand's fishing industry resonate strongly with this type of institutional arrangement. Ruangrai and Maitree, for instance, make the following prescription for Thailand's coastal fisheries:

Being the users of the resources, the community should be capable of managing its own resources. They have necessary information on the resources and their exploitation such that, within the rights they have been granted, they can perform the necessary management functions such as limiting entry, fishing gear regulation, collection of resource rent, and benefit distribution . . . (1992: 537).

Similar arguments are made in Somying (1994: 380), Choomjet and Somboon (no date: 8-9) and Pongpat (no date: 8). Indeed, the Department of Fisheries is now in the process of implementing a series of pilot projects that would enable selected communities to design, monitor and possibly enforce their own resource rules (Somying, 1994) (more on this below).

As the Midas report (1995: 18) argues, however, little is said about how these community-based TURFs would be protected and/or enforced. As noted earlier, the primary source of conflict within Thailand's coastal fishing areas is encroachment from land speculators and competition among large- and small-scale fisheries (Midas, 1995). Lacking the capacity to repel outside interests (most notably, commercial fishing fleets) or to induce the state to intervene on their behalf, however, there is little reason to believe that small-scale fishing communities would have the power to enforce their own exclusive fishing zones (Midas, 1995: 18-9). Moreover, given the problems that already exist within Thailand's public sector, it is unclear why government officials would contravene the interests of those who support the status quo (most notably, the fishmeal, ice and transportation industries).

Local communities would also need vast authority in order to overcome the interests of "rule breakers" within the TURF. Evidence suggests that population pressures and uneven accumulation of capital within the community can lead to instability and conflict (Ostrom, 1990; Panayotou, 1982: 46). As Ben-Yami argues,

. . . most traditional fishery systems break down not because of a result of "invasions" from outside but because of enterprising "insiders" who have taken advantage of existing technologies, markets and capital to improve their incomes and who are the first to "break" the rules and traditions, (cited in Panayotou, 1982: 47).

Whether and to what extent local communities could control these transformations remains unclear. Unless they possess the ability to mete out negative or positive sanctions (ie. fines or compensation) and/or the ability to exclude those who fail to follow the rules, it is unlikely that local communities would be able to maintain these institutional arrangements (and the mutual assurance they provide) (Ostrom, 1990; Bromley et al, 1992; Panayotou, 1982).

Other factors suggest that a TURF system would be difficult to implement within Thailand's coastal fishing areas. First, it is doubtful that Thailand's small-scale fishing communities would conform to a rigidly-defined system of fishing rights. As the Midas report points out,

Fishermen do not generally fish only in one area adjacent to their community. They are frequently engaged in a variety of fisheries in different locations, often shared with people from a variety of other communities. Identification of "territories" will be complex, time consuming and subject to considerable dispute, (1995: 19).

As noted earlier, current and historical data for Thailand's coastal fishing industry are far from reliable, suggesting that any type of demarcation or compensation would be

extremely difficult to carry out (Somying, 1994: 386). Given the lack of coordination within Thailand's government agencies (which are not well-addressed in the DOF's TURF proposal - Midas, 1995: 19), there is little reason to believe that the existing government structure would be able to implement these new institutional arrangements or manage the conflicts they would create. Moreover, how local communities would coordinate their activities with those of the relevant government agencies remains unclear.

A second concern relates to the criteria on which local communities would define " membership." As noted earlier, a central feature of a community-based TURF is the notion that members enjoy the right to use a resource because they submit to the rules of membership. Among traditional CPRs in Sri Lanka, for instance, new entrants were allowed to participate in the fishery "only by buying shares in existing nets," (Panayotou, citing Alexander, 1982: 47). Although the system allowed new entrants into the system, however, it also enabled a small minority to take control of the fishery. As Panayotou (citing Alexander) states,

. . most shares were accumulated in the hands of a small elite with access to capital which converted a subsistence technology into a profitable enterprise ***by limiting the number of nets****, (1982: 47, emphasis mine).*

In other words, rules of membership can be used and abused to serve the interests of particular groups within a local community. Lacking rules that would guarantee equitable distribution, there is little reason to believe that similar situations would not arise among TURF communities in Thailand.

In short, creating an exclusive fishing zone (and enforcing the rules that define it) is a highly political act. As Christy (1982: 8) argues, "without full government support, the enforcement and protection of a localized TURF is likely to become very difficult." A central challenge, then, is to devise a system in which local communities have the right to monitor and design their own resource rules, the right to use the fishery, and the right to call upon the state when these rights are violated. Likewise, the state must ensure that local communities are both willing and able to maintain a fishery that is both efficient and equitable.

The following section concludes the paper by exploring the ways in which these conditions can best be obtained in Thailand's coastal fishing sector.

VI. Conclusions and Recommendations

Theoretical arguments in favour of state intervention are well-established. Most of these justifications generally start from the Hobbesian notion of trust and assurance in society. A central assumption here is that individuals associate rules and norms with personal benefits, and, as a result, they have strong incentives to ensure that these rules are followed (Knight, 1992: 188-9; North, 1990: 46-7). The costs of encouraging others to adhere to these rules and norms, however, are often well beyond the resources and capabilities of any single interest group in society. Unable to trust one another, interest groups turn to third parties to monitor and enforce formal rules in society (Ostrom, 1990: 41-2). As Knight argues,

The logic of formal institutionalization is to constrain the actions of others through the actions of a third party (1992: 188).

Enter the nation-state. An important assumption here is that states possess physical and/or administrative qualities that enable them to assume the costs of high-cost enforcement (North, 1990: Chapter 7; 120-21; Ostrom, 1990: 41; Knight, 1992: 171-92). In particular, legislatures, judiciaries, militaries and other agencies of control can use this monopoly to define, monitor and enforce formal institutional arrangements (Ostrom, 1990: 41; North, 1990: Chapter 7).

As Thailand's experience suggests, however, states do not always intervene when they are required to, and these interventions are not always effective. Moreover, states are susceptible to influence from outside interests, who can encourage legislators and enforcers to design and enforce rules in ways that suit their own personal interests. Thailand's coastal fishing regulations are a perfect case in point. In one sense, the DOF has decided to protect the interests of small-scale fisheries by legislating the trawl and push net ban. In another, it has resigned itself to serving the interests of the commercial fleets and downstream industries by providing inadequate enforcement. As Knight (1992: 188) argues, it is this struggle over what constitutes a formal rule, and how it is enforced, that represents "the basic politics of state decision making."

A central argument of this paper is that, in order to effectively address the problems that exist within the coastal fishing sector, individuals, communities and government agencies must change the ways in which rules are decided and enforced in Thailand.

Community-Based Management

Notwithstanding the foregoing critique, community-based management offers a constructive way in which stakeholders can address persistent problems within the coastal fishing industry. Its main problems, however, relate to enforcement capability and institutional design. In terms of enforcement, the notion that small-scale fishing communities can or should have the capacity to enforce territorial fishing areas is clearly unrealistic and potentially very dangerous. More viable is the notion that local communities monitor the existing rules and appeal to local authorities when these rules are violated.

This type of system will not work effectively, however, unless the following conditions are met. First, if they are to monitor fisheries regulations, local communities must have a strong understanding of what constitutes a fisheries violation. The best way of achieving this objective is to give them a large role in defining the rules in use. This will require a means by which all interested stakeholders (large- and small-scale actors alike) can present and discuss their respective interests in the fishery. If the number of potential stakeholders is exceedingly large, representation may be necessary. It will also require a mechanism through which stakeholders can take a collective decision. As noted earlier, implementing any type of exclusionary regime (be it quotas or TURFs) will always create a set of winners and losers. New institutions (rules), then, will need to provide a means by which stakeholders can resolve their differences, allocate compensation and enforce the ultimate resolutions.

Second, the coordination and response of Thailand's enforcement agencies must improve dramatically. This means better and more appropriate equipment (weapons and boats) for enforcing fisheries regulations. It also means better coordination among local, regional and national offices. As the Midas report (1995: 13) points out, there appears to be considerable overlap between the Fisheries Protection Units and the Provincial Fisheries Patrols. Serious thought needs to go into whether these units could be merged or re-directed more effectively. All field officers should have radio transmitters to communicate with patrol boats and regional offices. Local communities will need a reliable means by which they can contact enforcement officers who should ideally be situated within close proximity to the communities for which they are responsible.

Third, once resource rules are decided and an effective enforcement system is in place, resource users will need a means by which they can resolve disputes regarding interpretation of resource rules. When conflicts arise, there needs to be a legitimate (see below) and disinterested party to which disputing parties can appeal. Although Thailand's judicial system

is relatively well-equipped to deal with resource-related disputes (see Kobkun, 1996; Somying, 1994), the costs of using it are generally prohibitively high. For most Thai civilians, litigation is simply not an option. In order to redress this imbalance, the transaction costs of interpreting and using the Thai judicial system will need to be reduced (particularly for those living in small-scale fishing communities). Although NGOs frequently cover the costs of activities among Thailand's poorer communities, however, recent judicial interpretations suggest that they are not entitled to intervene on behalf of a third party (Kobkun, 1996). Notwithstanding a change in this jurisprudence, subsidies may need to be provided for those who seek to litigate.

Finally, and perhaps most importantly, decision making and representation within Thailand's political system must be made accountable. This entails three essential features. First, constituents must have the opportunity to obtain information about the activities of their political representatives and their civil servants - at all levels of political activity. Second, they must possess a means by which they can deliver negative sanctions when these officials fail to perform their duties in an appropriate manner. Third, constituents and representatives alike need to have a common understanding of what in fact constitutes an appropriate performance.

In short, resolution to Thailand's coastal fishing problems represents an extremely tall order. As noted earlier, however, the Constitutional draft has been passed by the House of Representatives, and contains measures that would increase the number and power of local elected representatives, guarantee the freedom of information, stipulate rules and duties for elected and non-elected officials and, most importantly, give local communities the authority to manage their own natural resources. Likewise, the DOF is initiating plans to establish national, provincial, and local Fisheries Coordination Committees (Somying, 1994: 384), which could represent an important forum for planning and conflict resolution - if they are accountable.

Whether and to what extent these ambitious plans will become a reality for Thailand's coastal fishing sector, however, only time will tell.

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