

# **Environmental Stress, Economic Risk and Institutional Change: Inshore Fishing and Community-Based Management in Southern Thailand<sup>1</sup>**

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## **I. Introduction**

Theoretical propositions about the emergence and evolution of common property regimes (CPRs) assert that individuals will conserve (or at least manage) natural resources when they believe the risks of maintaining existing relations are unacceptably high. Individuals, it is argued, are more likely to overcome problems of malfeasance and free riding when they share both an interest in the new institutional arrangement and a legacy of successful cooperation.

A contradictory proposition argues that individuals will ignore or fail to implement rules of resource conservation when the stakes of survival are most extreme. Implicit here is an assertion that the costs and risks of survival are so great that they preclude participation in all but the most vital forms of social interaction.

This paper considers this debate by exploring the conditions under which rural communities in Southern Thailand implemented and enforced rules of restricted access in coastal fishing. Particular emphasis is placed on the ways in which socio-economic differentiation affects the willingness and ability to bear the costs of enforcing and maintaining rules of common property.<sup>2</sup> Variations in status and wealth, it is argued, have

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<sup>2</sup> The findings are based on a thirteen-month study (conducted in 1997 and 1998) of *Baan Ao Lom* (a pseudonym), a Muslim community on the north-eastern corner of Phuket (pronounced *poo-ghet*). Here villagers implemented, monitored and enforced rules of restricted access in their traditional fishery. My principal methodologies were key informant interviews, household surveys and the collection of

a profound impact on the extent to which individuals at the lower end of the socio-economic spectrum can participate in this important socio-political activity. Because they lacked the endowments that were essential for monitoring and enforcing the enclosed fishing area, poor villagers were effectively excluded from the act of “protecting” the village, an act that carried tremendous status within the village community.

## II. Resources, Risk and Institutional Change

As natural resource theorists have long argued, individuals are prone to over-exploit renewable resources when they lack reliable information about the resource, the future and those with whom they share resources. Ostrom (1990: 35) captures the essence of this important idea:

*Appropriators who are uncertain whether or not there will be sufficient food to survive the year will discount future returns heavily when traded off against increasing the probability of survival during the current year. Similarly, if a CPR can be destroyed by the actions of others, no matter what local appropriators do, even those who have constrained their harvesting from a CPR for many years will begin to heavily discount future returns, as contrasted with present returns.*

Even when they appreciate the long-term implications of their actions (which is rare), individuals will still be tempted to over-exploit the resource when they believe that an attempt to conserve the resource or exercise restraint will not be reciprocated (Hardin, 1968).

Coastal fisheries are particularly susceptible to dilemmas of this kind. First, the costs of allocating property rights over fish and other marine resources are generally prohibitively high (Ooi, 1990: 22). Although particular species will breed, spawn and mature in certain areas, their position within these areas can vary greatly and exogenous shocks (such as changes in rainfall, variable sunlight, water pollution) can disrupt these patterns considerably. Second, a fishery can only be maintained if there is a mature standing stock which is left to reproduce after seasonal or perpetual harvests (Ooi, 1990: 23).

Both of these factors foster uncertainty in the sense that they make it very difficult to predict how many fish (and therefore, how much income) one will bring in on any given day. This, in turn, creates strong incentives to pull in as many fish today because there may be none tomorrow, or (significantly) because your competitors may beat you to it. It also creates incentives to invest in labour and technology that will reduce the uncertainty and risk that your boat will come home with empty nets.

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government and non-governmental documents. All statements regarding occupation and assets in the village are the result of household surveys and key informant interviews. Surveys were conducted in every household in *Baan Ao Lom*.

For the individuals whose livelihoods depend on the ability to extract resources from Thailand's coastal areas, these are familiar problems. Domestic prosperity, international markets and a weak regulatory regime have attracted excessive numbers into the inshore fish industry, creating three inter-related problems.<sup>3</sup> First, time- and labour-saving devices 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 inshore fishing areas, marginalising many of the small-scale producers that depend on these fisheries for their livelihood needs. Finally, conflicts between small-scale producers and commercial fleets - and among small-scale producers themselves - have escalated significantly. Most of these conflicts are the result of trawlers and push nets entering inshore areas and tearing up gill nets, stake nets and other types of stationary gear (Johnson, 1997; 2000; TDRI, 1998).<sup>4</sup>

Proponents of local resource management assert that dilemmas of this kind are more likely to be resolved when rules regulating access and exploitation are designed, monitored and enforced by those who use the resource - as opposed to those who manage it from afar (Ostrom, 1990; Wade, 1988; Bromley *et al.*, 1992; Baland and Platteau, 1996; Pomeroy and Berkes, 1997). Underlying these assertions is an assumption that local communities possess the knowledge, information, interest and incentive to manage and conserve the resources on which they and their families depend (cf. Agrawal and Gibson, 1999: 633; Baland and Platteau, 1996: Chapter 10). Knowledge and information, it is argued, arise from an extended and intimate relationship between members of the community and the local (physical and social) environment. Interest and incentive, in turn, stem from the fact that individuals who engage in resource-intensive industries depend on these resources for their survival.

In theory, community-based management would create a system in which resource users enjoy an exclusive right to enter and exploit a designated coastal area (Christy, 1982). The logic of this is that individuals will be more likely to conserve a resource when they believe they will reap the long-term benefits of conservation and restraint. Common property, it is argued, provides this assurance by restricting otherwise open-access resources to a group that agrees to abide by rules regulating membership and resource utilisation (Wade, 1988; Ostrom, 1990; Bromley *et al.*, 1992; Baland and Platteau, 1996).

A challenge of encouraging this type of arrangement, of course, is that excluding "non-members" is a costly proposition, particularly when the resource is readily available and in high demand (Christy, 1982; Wade, 1988; Ostrom, 1990; Bromley *et al.*, 1992; Baland and Platteau, 1996). So too is the challenge of achieving conformity and conservation within the community itself (Wade, 1988; Ostrom, 1990; Bromley *et al.*, 1992; Baland and Platteau, 1996; Li, 1996; Mosse, 1997; Agrawal and Gibson, 1999; Klooster, 2000).

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<sup>3</sup> ADB, 1985; TDRI, 1986; 1998; Samporn *et al.*, 1990; Ruangrai and Maitree, 1992; Boonlert, 1994; Somying, 1994; Midas, 1995; Jate and Somsak, 1996; Johnson, 1997; 2000; *Siang Prachachon*, 1997; Jate, 1998; Pongpat, 1998; Ruohomaki, 1999: 14-15.

<sup>4</sup> Unlike trawlers and push nets (which rake the sea floor), gill nets are stationary gear. Positioned vertically, they are placed either in open currents or between land and open water (from two to 24 hours, depending on the gear), where they can exploit the daily, monthly and seasonal migrations of plankton and fish.

On this latter issue, scholars are somewhat divided over the conditions under which individuals will recognise and address the error of their ways. On one side of the debate is the relatively optimistic proposition that individuals will introduce and abide by rules of restricted access when the costs of shirking or free riding are unacceptably high (Wade, 1988; Ostrom, 1990). Ostrom (1990: 211), for instance, argues that individuals will regulate the ways in which they exploit natural resources when they (or most of them) believe that a failure to change will entail social and/or personal costs. Similarly, Wade (1988: 14) asserts that villagers in South India were more likely to introduce rules of restricted access when the risk of personal loss was directly related to the ways in which other people used the resource (ie. people had personal incentives to regulate the behaviour of others). On the other is Hardin's tragedy of the commons (1968).

Where optimists such as Ostrom (1990) and Wade (1988) differ from pessimists such as Hardin (1968) is on the question of whether and in what way individuals will recognise and react to a deteriorating resource economy. Using case studies and models of rational choice, Ostrom (1990) argues that individuals will change the rules of the game, providing they understand the costs and benefits of these decisions and (crucially) they have the opportunity to decide. Wade (1988) takes this one step further and argues that individuals are more likely to implement rules of restricted access when the probability of crisis (ie. risk) is at its peak. As he states,

*It is more likely that Hardin's relentless logic will operate where the resource is not vital than where it is. Where survival is at stake, the rational individual will exercise restraint at some point, (Wade, 1988: 297).*

This is an important and controversial point, which bears careful scrutiny. Primarily, it argues that individuals *can* overcome problems of coordination and collective action, an assertion that pessimists such as Hardin (1968) are seemingly unwilling to concede. More fundamentally, it suggests that they are most likely to do so when the stakes are at their highest.

At the heart of this position is an assertion that rules emerge or evolve when the existing institutional arrangement is unable to cope with the relative weight of population, preferences and technology (or the lack thereof) (see Baland and Platteau, 1996: Chapters 11-13). Hayami and Kikuchi (1981), for instance, argue that institutions change when the costs and risks of maintaining the existing arrangement outweigh the benefits it provides. In a similar vein, Wade (1988: 169-76) argues that rules regulating access to and exploitation of natural resources are more likely when population and other ecological pressures create a situation in which the probability of losses, resulting from malfeasance or free riding, is unacceptably high. Thus, soils with relatively high levels of water retention create good conditions for grazing which, in turn, attract a (hypothetically) unsustainable number of herders, thereby necessitating the creation of rules regulating access (Wade, 1988: 169-76).

The logic has strong intuitive appeal; facing growing resource constraints, individuals will implement and enforce rules that regulate their behaviour. As Baland and Platteau (1996: 298) have argued, however, there is little empirical evidence or logical reason to

believe that individuals will *automatically* institute rules of conservation or restricted access when resources become increasingly scarce. More to the point, the assertion that relative resource scarcity induces institutional change says little about the ways in which individuals actually go about changing the rules of the game (Baland and Platteau, 1996: 264).

One major problem relates to what new institutionalists call “bounded rationality.” As North (1990: 16) argues,

*Individuals act on incomplete information and with subjectively derived models that are frequently erroneous; the information feedback is typically insufficient to correct these models. Institutions are not necessarily or even usually created to be socially efficient; rather they, or at least the formal rules, are created to serve the interests of those with the bargaining power to devise new rules.*

In short, we cannot assume that people will always have the information or ability to calculate the probability that bad things will happen. Baland and Platteau (1996) are particularly sceptical that conditions in what they call “traditional” (ie. pre-capitalist, “pre-rational”) societies will deter individuals from (consciously) managing or conserving natural resources. As they state,

*If traditional societies do not adopt conservation measures, it is because they do not perceive the relationship that exists between the stock and the flow of a resource nor the causal link between their own actions and the level of the stock, (Baland and Platteau, 1996: 211).*

A second and related problem is that institutions which minimise the probability and/or severity of subsistence crises are costly to implement and maintain. Here critics of Ostrom (1990) and Wade (1988) are particularly sceptical that the realisation of risk will enable individuals to surmount problems of malfeasance and free-riding. As Baland and Platteau (1996: 298) argue,

*. . . under the continuous (and not passing) pressure of crisis conditions, collective action may be prevented from arising or from being sustained when anarchistic solutions are available and sacrifices have to be incurred today in order to preserve future incomes.*

In other words, risks and the costs of survival may be so high that they preclude participation in all but the most vital forms of social interaction (Scott, 1985: 246-47; Berry, 1989: 49-51; Baland and Platteau, 1996: 296-98). Popkin (1979: 253) reaches similar conclusions:

*Collective action requires more than consensus or even intensity of need. It requires conditions under which peasants will find it in their individual interests to allocate resources to their common interests - and not be free riders.*

Such conditions are elusive, however, not least because individuals frequently have an interest in maintaining the status quo. This raises a third and final problem - a decidedly

ahistorical and apolitical view of rural development and change (Mosse, 1997: 470). Underlying the rational choice theoretic is an assumption that individuals are free to ascertain and select the options that will best meet their individual preferences. Somewhat lacking in this formulation is the notion that individual actions are often the result of compulsion, which eliminates (or diminishes) individual choice (cf. Scott, 1985).<sup>5</sup>

To summarise, theoretical propositions about the relationship between environmental stress and institutional change can be criticised for understating the costs of obtaining accurate information about the state of the resource, the related cost of encouraging individuals to participate or invest in resource-saving institutions and the physical and psychological costs of challenging the prevailing institutional order. At best, this leaves us with a rather empty understanding of the ways in which environmental transformations affect survival strategies in rural settings. At worst, it informs policies that exacerbate existing problems.

### III. Community-Based Management in Thailand

A cursory reading of the literature and legislation on environment and development in Thailand is testament to the international scope of the discourse surrounding local institutions and community-based management. The Kingdom's 16th Constitution (1997: Section 46), for instance, stipulates that "traditional communities" shall have the right to "participate in the management, maintenance, preservation and exploitation of natural resources." Similar provisions can be found in the 1994 Sub-District Restructuring Act, the 1997 National Economic and Social Development Plan and plans for "fishing rights" and a "community-forest bill."

Reflecting on the poor and declining state of Thailand's coastal areas, government officials (Plodprasop, 1998: 45; Somying, 1994), non-governmental organisations (Worah *et al.*, 1998; *Siang Prachachon*, 1997) and industry analysts (Ruangrai *et al.*, 1997; Ruangrai and Maitree, 1992) have all advocated a shift to a more decentralised style of resource management. Ruangrai and Maitree (1992: 537), 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 . . .*

Similar arguments can be found in Somying (1994: 380), Choomjet and Somboon (1998) and Pongpat (1998).

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<sup>5</sup> Indeed, the assumptions on which institutional theorists justify their arguments imply the existence of a situation in which individual have no choice; that is a situation in which rules are perfectly enforced.

Although legislation enabling the formation of territorial fishing rights is non-existent, interviews with senior officials and government publications (Plodprasop, 1998; Chong *et al.*, 1998) suggest that the Thai government has become increasingly receptive to community-based management in coastal areas. Encouraging this transformation have been a number of international actors; the Food and Agriculture Organization (FAO), the Japanese International Cooperation Agency (JICA), the World Bank and the Manila-based International Center for Living Aquatic Resource Management (ICLARM), for instance, have all supported initiatives that would decentralise responsibility for coastal resource management in Thailand.

At the same time, village communities have become increasingly involved in the management of inshore fisheries. Since 1993, villagers in the provinces of Phuket, Phangnga, Krabi, Songkhla, Trang and Pattani have introduced rules excluding push nets, trawlers, explosives and poison from their immediate fishing areas (Midas, 1995; *Siang Prachachon*, 1997: 58-63; Ruangrai *et al.*, 1997; Worah *et al.*, 1998: 9-14; Ruohomaki, 1999: 170-71; Johnson, 2000).

Again, the role that international donors have played in this process has been pivotal. International NGOs, such as Community Aid Abroad (Oxfam Australia), WWF International, DANCED and Novib (Oxfam Netherlands) have been actively involved in encouraging resource conservation and rural development through the formation of local village associations (Ruangrai *et al.*, 1997; Worah *et al.*, 1998: 9-14; Johnson, 2000).

Although prevailing (and predominantly western) images of institutions and community have affected, encouraged and shaped the discourse surrounding environmental conservation in Thailand, however, one should not lose sight of the socio-political terrain on which these ideas have emerged.

Until the mid-1980s, Thailand's state-building process - and its response to the regional communist threat - made it difficult to form and maintain autonomous rural organisations (Morell and Chai-Anan, 1981; Pasuk and Baker, 1996; Unger, 1998). This was particularly true of the authoritarian regimes that controlled the state during the period following the student and peasant uprisings of the early 1970s (Morell and Chai-Anan, 1981). Prior to this, however, one can trace examples of active state repression. Throughout the pre-revolutionary (ie. pre-1932) period, for instance, the royal administration "specifically barred the formation of private groups," (Unger, 1998: 38).

More enduring than these episodes of active repression was an institutional legacy that places responsibility for natural resource management squarely in the hands of the state. Under Thai law, the right to monitor and enforce fisheries regulations rests with the bureaucracy; only civil servants from the Department of Fisheries and/or the police are allowed to apprehend individuals who violate fisheries regulations.<sup>6</sup>

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<sup>6</sup> Structured in this way, the bureaucratic system fosters "extreme discretion on the part of officials who adjust the uniform rules to fit local circumstances," (Ostrom *et al.*, 1994: 326). Coupled with low pay, the "authority to enforce" gives the enforcer ample opportunity and incentive to extract supplemental income

Reinforcing this relationship, fishery policies have been structured in such a way that they strongly discourage small-scale producers from moving out of coastal fishing. The government's Small-Scale Fisheries Development Program (SSFDP), for instance, funds the construction of artificial reefs and the provision of loans and extension activities that encourage investment in small-scale aquaculture and alternative fishing techniques (Somying, 1994: 380; Midas, 1995: 14). Interestingly, no fisheries projects support the acquisition of non-fishing skills or the pursuit of alternative economic opportunities. According to one senior official, a long-term objective of the SSFDP is to discourage migration into "developed areas," (Somying, 1994: 380).

In light of this history, it is not difficult to understand the largely conservative ways in which public officials have approached the issue of community-based management. Addressing my questions about local resource management, officials were adamant that village communities could not enforce an enclosed fishing area unless the state first granted them the right to do so (which, they asserted, would not be happening any time soon). As one senior official within the Department of Fisheries told me, local communities "cannot possibly" manage coastal resources "because they do not have the right." Instead of rights, the government emphasised the idea that local communities assume *responsibilities* for the management of coastal resources.

Challenging this "image of community," (Li, 1996), Thailand's non-governmental organizations (NGOs) have pushed for a more decentralised model of resource management. At the heart of this agenda is an orientation that emphasises local knowledge, community action and self-sufficiency. Wildlife Fund Thailand (WFT), the Yadfon Foundation and a DANCED-supported NGO in Songkhla, for instance, have been actively involved in encouraging sustainable rural development through the formation of village-based CPRs. More politically, WFT and the DANCED project were actively engaged in mobilising villagers to lobby the government on the enforcement of fisheries regulations that restrict trawlers and push nets from the inshore areas.

The economic and political aspirations of these organisations are reflective of a more enduring and adversarial relationship between Thailand's NGOs and the bureaucratic state. Benefiting from a relaxation of authoritarian rule and a surge in NGO-directed foreign aid, Thailand's non-governmental sector ballooned in the 1980s (Pasuk and Baker, 1996: 384-89). Many of these were informed and staffed by former communist insurgents, retaining a strong aversion for the top-down, urban-centric style of state-sponsored development (Pasuk and Baker, 1996: 384-89).

Underlying the policies and objectives that have supported community-based management in Thailand is an assumption that local group formation and environmental conservation are complementary goals. Although they were engaged in seemingly different project activities (poverty alleviation and environmental conservation

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from individuals who break the law. In exchange for cash payment, the enforcer agrees to "drop" the case and the offender never appears in court.



respectively), for instance, both Novib and WWF listed group formation as a principal means of achieving these ends (pers.comm).

In one respect, this reflects the (somewhat universal) need to design project objectives that are both achievable and demonstrable. In another, it reflects an underlying faith in the notion that the formation of locally-based village associations will lead to more environmentally-sustainable outcomes.

Beyond the aforementioned problems of information, participation and power, there are several reasons to be wary of this particular stance. First, village activities generally require the tacit (and ideally the active) approval of local state representatives (Rigg, 1991; Johnson, 2000). (Included here are the village chiefs, the sub-district councillors and, for larger projects, district and provincial officials). To suggest that community-based initiatives can and should act independent of the official state apparatus, then, is somewhat problematic.

Second, Thailand's rural economy is part of a wider political economy that has embraced one of the world's most ambitious export development strategies (Unger, 1998; Pasuk and Baker, 1996). To propose that rural communities would unproblematically implement and submit to rules of resource conservation would understate the substantial benefits they could obtain by engaging in this new and dynamic economic regime.

To illustrate these challenges, I turn to a case study on Phuket (pronounced *poo-ghet*), an island province on Thailand's Andaman coast.

#### **IV. Enclosing the Commons**

Around the beginning of 1995, the village of *Baan Ao Lom* (a pseudonym) took the rather unusual decision to restrict its local fishery from vessels using trawlers, push nets, explosives and poison. The decision was unusual in the sense that villagers had never initiated measures of this nature and theirs was the only community in a province of 28 fishing villages to implement *and enforce* rules of restricted access (ACRCP, 1996).

The rules in question were relatively straightforward. According to village accounts, access was open to any vessel that agreed to refrain from using the banned technologies. The boundaries were based on a loose, yet shared, understanding of the areas in which villagers had historically set their nets and traps. Reinforcing this, round sweeping contours and outer islands provided clear boundaries by which villagers could develop a strong sense of entitlement.

Enforcement of the CPR was exclusively dependent upon collective action from within the village community. According to village accounts, individuals would monitor the ban either by conducting special patrols or by following the situation while they were out at sea. Monitoring was facilitated by two important elements. First, information about

violations was relatively easy to obtain; push nets, trawlers and explosives are all highly conspicuous technologies which are easily detected on a shoreline dominated by gill nets and longtail boats.<sup>7</sup> Second, because it was an outright ban, ambiguity about whether individuals were in violation of the rules was minimal (cf. Popkin, 1979: 38). As a result, individuals were able to collect, interpret and act upon information with relative ease.

The principal means that villagers used to enforce the ban were intimidation and deterrence. Essential here was an ability to mobilise large numbers of people. According to village accounts, villagers would deter push net operators by assembling as many boats as they could and challenging them to leave the bay. On occasion, they would also apprehend the boats, which they would then use as evidence when reporting the violation to local authorities. The risks of engaging in such direct confrontation were significant. During one episode in 1996, a villager from *Baan Ao Lom* was arrested for (and ultimately cleared of) capsizing a longtail boat belonging to a push net operator. The following year, a villager from neighbouring *Baan Khlong Khian* was shot and killed while helping government officials arrest push netters who were fishing in their conservation zone.

What is particularly striking about the CPR is that it provided no *direct* means of encouraging individuals to bear the costs of enforcing the fishery. Conspicuous in their absence were penalties for free riding (Wade, 1988: 192-95; Ostrom, 1990: 94-100; McKean, 1986 cited in Baland and Platteau, 1996: 319-20) salaries for enforcement (McKean, 1986 cited in Baland and Platteau, 1996: 320; Wade, 1988: 193; Lam, 1996: 1046-47), and compensation for the provision of boats, fuel and labour. Equally interesting (and in contrast to the findings presented in Ruddle, 1989; Lam, 1996: 1043; and Baland and Platteau, 1996: 359-60), collective action was largely separate and distinct from the official organisational activities of the village bureaucracy. Although members of the village council were involved in the fishery protection scheme and although the village council was empowered to deal with conflicts in the community, enforcement of the territorial zone had little to do with this formal state apparatus.

In short, the CPR that emerged in *Baan Ao Lom* was remarkable for its near total lack of formal or written, pre-determined rules regulating the ways in which individuals entered, exploited and protected the fishery. That large numbers of individuals were actively involved in supporting and enforcing the CPR, then, is a remarkable achievement. Involvement here incorporated three types of activity. One was the actual enforcement of the ban. A second (and somewhat less costly) form of involvement was participation in the small-scale fishing lobby. Included here was a wide range of activities in which villagers attended or supported rallies and meetings in the village, the district office, the governor's office and other sites of contestation. A third was moral and/or financial support for both of these activities.

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<sup>7</sup> Poison, of course, is another matter. Most of the individuals I spoke to in *Baan Ao Lom* admit to having used poison at some point in their lifetime. All insist, however, that they have now abandoned the activity. Issues of technological choice and institutional change are addressed in due course.

Reflecting on the preceding theoretical discussion, the implementation and enforcement of this common property resource raise two important questions. First, to what extent can we attribute these changes to relative resource scarcity? Second, how did these environmental pressures affect the ability to monitor and enforce rules of common property in *Baan Ao Lom*? To this first question we now turn.

## V. Relative Resource Scarcity

While populations have increased,<sup>8</sup> open land on Phuket (particularly land designated as forest reserve - ie. land on which many poor village communities are located) has become increasingly scarce. Satellite photographs from the Royal Forestry Department indicate that forest reserve area on Phuket dropped from 27,486 to 16,329 rai between 1984 and 1993 (RFD Landsat Photos, cited in NSO, 1997). Over the same period, farm land increased from 124,651 to 165,074 rai (NSO, 1997). The most probable reason for this was an expansion in shrimp aquaculture; between 1985 and 1995, the number of shrimp culture establishments on Phuket increased from 2 to 115; shrimp farm coverage expanded from 10 to 2,169 rai (NSO/DOF, 1985; 1995).

Transformations of this nature are consistent with changes in and around *Baan Ao Lom*. Aerial photos from 1973 and 1995 indicate a marginal rise in the number of village households. Supporting these observations, villagers told me that families started building new homes along the canal in the mid-1980s. This was most likely a means of accommodating an expanding population; of the eighteen fishing households in *Baan Ao Lom*, twelve (67 per cent) were headed by men who were born outside of the village community.

The 1995 images also indicate that land that was previously used for paddy or covered in mangrove has now been converted into shrimp farm aquaculture. Rubber plantations, which surround the village community, have remained relatively unchanged.

How do these findings compare with other villages in the area? In terms of land scarcity, there is some evidence to suggest that *Baan Ao Lom* was experiencing more land pressures than other villages in the same sub-district. The aerial photographs indicate that shrimp farms around *Baan Ao Lom* were not significantly larger or more expansive than those surrounding other villages in the area. Relative to the village population, however, we can see that *Baan Ao Lom* had the lowest farm to population ratio (population divided by area under culture) of all of the villages in the sub-district (Table I). Assuming that people were occupying relatively small parcels of land and that shrimp farms were located relatively close to villages (something that aerial photos and ground-level

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<sup>8</sup> According to Cushman (1991: 49), 45,000 Chinese and 1,000 “Thais” were living on Phuket at the end of the 19th century. The most recent estimates (NSO, 1997) put the official figure at 185,000. Accounting for foreigners (primarily of western and Burmese descent) who work and live on Phuket and migrants who travel from other parts of Thailand, the actual number is probably well over 200,000.

observation suggest), we can take this to mean that *Baan Ao Lom* had the highest level of shrimp farm encroachment for a village of its size.<sup>9</sup>

**Table I: Encroachment of shrimp farms in *Baan Ao Lom* and the surrounding sub-district**

| Village     | Population | Number of Shrimp Farms | Area under culture (rai) | Ratio of Farm Area to Population (rai per person) |
|-------------|------------|------------------------|--------------------------|---|
| Village 1   | 1200       | 11                     | 186                      | 6.5   |
| Village 2   | 950        | 8                      | 141                      | 6.7   |
| Village 3   | 1100       | 19                     | 170                      | 6.5   |
| Village 4   | 1300       | 10                     | 188                      | 6.9   |
| Village 5   | 126        | 0                      | 0                        | 0   |
| Village 6   | 590        | 7                      | 74                       | 8.0   |
| Village 7   | 463        | 0                      | 0                        | 0   |
| Village 8   | 740        | 5                      | 40                       | 18.5  |
| Baan Ao Lom | 387        | 7                      | 101                      | 3.8   |

Source: NSO/DOF (1995); ACRCP (1996)

Measurements for aquatic resource scarcities were decidedly more difficult to ascertain. Notwithstanding a comprehensive study of fish landings and local histories in the area (which does not exist), we are left with anecdotal evidence from four of the village communities in the area (*Baan Ao Lom*, *Baan Lana*, *Baan Row* and *Baan Kalock*). Individuals in all of these communities (the second and third of which, it is worth noting, were “push net communities”) were adamant that the quality and size of their catch had suffered the effects of over-competition in Phangnga Bay. Supporting these accounts, the middleman for *Baan Ao Lom* (who served over 10 villages in the area - including these

<sup>9</sup> Note that this is the population of the administrative village, which includes two more “traditional” villages. Excluded from this analysis of course are other land-based activities, such as rubber and rice farming. The 1973 and 1995 photos indicate, however, that shrimp farms have come to dominate the landscape of every populated area around *Baan Ao Lom*. It is not altogether unreasonable, then, that we measure land pressure in terms of shrimp farm encroachment. Of course, all of this presumes that data for population and farm coverage are correct. Population figures, it is worth noting, were collected by a WFT-supported research activity in Phangnga Bay (ACRCP, 1996). According to the report, the methodology involved preliminary meetings and participatory rural appraisal techniques, followed up with household surveys in all of the 114 fishing villages. Farm holdings (NSO/DOF, 1995) were most likely taken from land registration documents, which are notoriously prone to under-reporting. (If anything, then, the actual area of shrimp farm aquaculture was probably greater than these figures suggest.)

four) reported that the size and volume of his catch had been declining since the late 1980s.

All, it would appear, were affected by a period of improving demand for fresh fish and a more recent squeeze on the cost of fishing. According to village accounts, the landing price for species such as shrimp, swimming crab and grouper increased dramatically from the late 1970s onwards. This was followed by a more recent rise in the price of fuel and fishing gear (cf. Phuket Chamber of Commerce, 1997; Vorawoot *et al.*, 1989)

What this implies is that at least some of the motivation behind the institutional transformation in *Baan Ao Lom* was a declining return on investment following a period of unprecedented prosperity.

Taking this into account, a significant question remains; why did villagers in *Baan Ao Lom* change the rules of the game when others around them were seemingly willing to tolerate or support the status quo? Although villagers in *Baan Ao Lom* were suffering the effects of land-based and aquatic scarcities, there is little evidence to suggest that these were *significantly* more severe than those of other communities in the area. What does stand out, however, is the village's dependency on fishing (Table II).

**Table II: General and fishing populations in *Baan Ao Lom* and surrounding administrative villages in Sub-district Kalock**

| Village            | Population | Fishing population |
|--------------------|------------|--------------------|
| Village 1          | 1200       | 26 (2.0%)          |
| Village 2          | 950        | 163 (17 %)         |
| Village 3          | 1100       | 104 (9.5%)         |
| Village 4          | 1300       | 10 (0.1%)          |
| Village 5          | 126        | 37 (29.4%)         |
| Village 6          | 590        | 27 (4.6%)          |
| Village 7          | 463        | 67 (14.5%)         |
| Village 8          | 740        | 70 (5.4%)          |
| Baan Ao Lom        | 387        | 77 (19.9%)         |
| Total Sub-district | 6856       | 641 (9.3%)         |

Source: ACRCP (1996: 35-6)

Here we can see that only four villages (Villages 2, 5, 7 and *Baan Ao Lom*) had populations for which more than 10 per cent were dependent on fishing. Of these only

Village 2 and *Baan Ao Lom* were trying to establish rules of restricted access. Both, it is worth emphasising, were working with Wildlife Fund Thailand (WFT). For Village 2, the inability to enforce rules of restricted access appears to have been a measure of its large size, an assertion that members of the village and WFT (which was working with the community) reiterated during interviews.

Villages 5 and 7 are slightly different, and bear careful scrutiny. Although it was small and dependent on gill net fishing (Table II), Village 5 was not involved in the small-scale fishing movement. Nor was it attempting to establish rules of common property. There are three possible explanations for this. First, unlike every other village in the sub-district, Village 5 was located on an island. Here it is possible that its members had less interaction with individuals who could help them enclose and protect their fishery. Second, WFT had no project activities in the village. Finally, there is the possibility that the village was simply *too* small to mobilise the support that an enclosed fishery requires. Having only 126 people (37 of whom were in fishing), Village 5 was significantly smaller than any other village in the sub-district.

With a population of 463, Village 7 was larger than Village 5 (but not as large as other villages in the area). Moreover, 14.5 per cent of its members were engaged in coastal fishing. What is particularly interesting about this is that its size and dependency were roughly the same as that of *Baan Ao Lom*. Unlike *Baan Ao Lom*, however, Village 7 was not trying to regulate access and exploitation in its local fishery. This is largely due to the fact that (at least) four of its households were involved in the push net industry (Table III).

**Table III: Gear distribution in *Baan Ao Lom* and surrounding villages in sub-district Kalock** (number of items)

| Village     | Shrimp gill net | Crab gill net | Stake net | Hand line | Push net        | Trawler |
|-------------|-----------------|---------------|-----------|-----------|-----------------|---------|
| Village 1   | -               | -             | -         | 3         | 6               | -       |
| Village 2   | 10              | 1             | -         | 4         | -               | -       |
| Village 3   | 2               | 8             | 3         | 10        | 5               | -       |
| Village 4   | -               | -             | 2         | -         | 9               | 2       |
| Village 5   | -               | 12            | 2         | -         | -               | -       |
| Village 6   | -               | 7             | 1         | -         | 3 <sup>10</sup> | -       |
| Village 7   | 7               | -             | -         | -         | 4               | -       |
| Village 8   | -               | 3             | -         | 15        | -               | -       |
| Baan Ao Lom | 11              | 7             | 1         | 3         | -               | -       |

Source: ACRCP (1996: 114-18); Personal observations and interviews

The findings from *Baan Ao Lom* and surrounding villages, then, appear to lend some credence to the structuralist account. Population pressures and resource scarcities were high in both of the communities that tried to implement rules of restricted access. As was a dependency on fishing. Taken in isolation, however, they say little about the ways in which environmental pressures affected the willingness and ability to act collectively within the village community. To this issue we now turn.

## VI. Institutions, Endowments and Institutional Change

It is difficult to appreciate the conditions under which villagers opted to implement rules of common property without addressing the elements that restricted them from exploiting the wider capitalist economy. Here it is important to stress the fact that no one in the village received a *direct* income from the tourism industry on Phuket. Of the 88 working adults in *Baan Ao Lom*, only ten (11 per cent of the village) were engaged in an occupation that did not entail fishing, rubber tapping, factory work or temporary wage labour.

<sup>10</sup> Note that the WFT survey reported no push nets for this particular village. In 1998, however, I observed at least three that were moored on the village beach. Interviews with villagers confirmed that they belonged to individuals living in the village.

Underlying this feature were a number of inter-related factors. One was education (or the lack thereof). Although employment with hotels and tour operators on Phuket could be lucrative, it generally required (at least) a rudimentary command of English and experience in the hospitality industry. Lacking the requisite skills and experience, villagers simply could not compete with candidates from Bangkok, Hong Kong, Singapore and other regional centres. Of the 147 villagers past the age of thirteen (ie. the leaving age for primary education), only 29 (20 per cent) attended or were attending secondary school. The Thai government does not cover the costs of secondary education, which, excluding the costs of transportation and lost labour, can exceed 7,000 baht per year, a significant amount of money for a villager in *Baan Ao Lom*.<sup>11</sup>

A second and vital element was access to capital. For most of the village community (89 per cent of households), a lack of formal land title meant that institutional credit was effectively unobtainable. At the same time, net incomes and alternative sources of credit were generally too small to support a substantial investment in new entrepreneurial activities. According to household surveys, the highest reported income in the village was 5,000 baht (in 1997/98, roughly 100 US dollars) per month. Among fishing households, the largest individual loan was 30,000 baht, which was barely enough to cover the cost of a used motor or a very small boat.

A final and related factor was an ability to develop and maintain relations with individuals outside of the village community. Here social connections were instrumental in determining whether and to what extent individuals could obtain access to credit, capital and information about new and emerging economic opportunities. Dominating this strata were two small minorities; (a) individuals whose position within the village bureaucracy facilitated the pursuit of economic opportunities outside of the community; and (b) individuals of Chinese descent.<sup>12</sup>

Of the 44 households in *Baan Ao Lom*, eighteen (41 per cent) derived an income from coastal fishing. At the heart of this community were five full-time fishing households. Marginally beyond this core were eight households in which income was split between full-time fishing and non-fishing pursuits. Further still were the part-timers, whose fishing revenues constitute only part of their total income. Finally, at the outer edge of the fishery, was a nebulous group, whose members catch and sell aquatic species, but only on occasion. Included here were individuals who used to fish, but moved into other occupations or into semi-retirement as the costs of fishing (and the benefits of pursuing alternative livelihoods) became too great. Also present were women and children, who collected shellfish during the low tide, and wage labourers, who worked the boats of full-

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<sup>11</sup> The rewards were significant, however. Of the ten households that reported education beyond primary level, seven were engaged in occupations that did not involve fishing, rubber tapping, factory work or low-skilled labour. Two of these were the village headman and the district councillor.

<sup>12</sup> Underlying these elements were a number of factors, which go well beyond the scope of this paper. One was a cultural and socio-economic split between the Muslim peasantry and Thai, Sino-Thai and foreign capital on Phuket. A second was a close (and somewhat more universal) relationship between political position and economic opportunity.



and part-time operators.<sup>13</sup> For most of this latter group, the benefits that accrued from the fishery were so scattered that in the preliminary village survey they (or their household respondents) did not report fishing as an occupation.

Reflecting the rising cost of inputs, such as netting and fuel, high competition and the general uncertainty of catching fish, coastal fishing was an important yet risky source of income and subsistence; ecological change, slackening demand and/or illness in the family could all push poor fishing households beyond the margins of subsistence. For this reason, villagers had strong incentives to minimise risk and uncertainty. Beyond the act of implementing rules of restricted access, a principal means of achieving this was to diversify household income.

Of the 18 households that fished on a regular basis, the wealthiest and most secure (measured in terms of reported income, food as a percentage of household expenditure and household assets) were those that diversified into non-resource activities (such as factory labour) and alternative coastal activities (such as small-scale marine aquaculture). Considerably less secure were the wage labourers and poor part-timers who either worked the boats of friends, family and neighbours or used highly labour-intensive technologies, such as throw nets and hand lines.

For this latter constituency, the risks of economic and ecological decline were particularly acute. First, their position within the local fishery was highly tenuous. For the small-scale operators who owned and operated the boats and gear, casual labour was by far the most expendable factor of production. During my time in the village, three owners stopped hiring casual labour in order to cover the escalating costs of fuel and netting. To recoup these costs, they either recruited family members or operated the boats and nets on their own.

Second, these were individuals who lacked important endowments, such as formal land title, valuable household assets or alternative skills, which they could sell or exchange during times of hardship and need.

Finally, because they used inferior technologies, they were able to capture only a small percentage of the available catch. For the same reason, the fish they did bring in were generally of lower quality and less value. Indeed, the intermediaries would frequently pass over the catch of non-gill net technologies (such as throw nets and hand lines) because it was either too small or inappropriate (ie. low value species) for the Phuket market (the one exception to this rule was black crab, which served a highly specialised niche).

In theory, everyone who derived an income and/or subsistence from fishing had at least some interest in a regulated fishery. This, in turn, reflected the time and money

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<sup>13</sup> In *Baan Ao Lom*, gill netting was generally a two-person activity; one person would operate the boat while another collected nets. Three types of labour arrangement - household, family and share-harvesting - determined the amount of fish or money individuals could extract from the final catch. All of the boat owners were involved in the fishing process.

individuals had invested in the industry, the risk of financial or subsistence failure and a dearth of viable alternatives. By no coincidence, individuals who invested most extensively in the village fishery (ie. the full- and part-timers) were among the strongest proponents of the CPR. Although they had opportunity to free ride, many fishing households were actively involved in enforcing the territorial ban and supporting the small-scale lobby. This, in turn, reflected the benefits they were receiving from the new institutional arrangement (ie. more and better quality fish) and the risks they would incur if they allowed push nets and other banned technologies into the bay.

In practice, however, the wage labourers and poor part-timers were by far the least involved in efforts to protect the CPR. Although they attracted many people, all of the official village meetings I attended were seemingly dominated (physically and ideologically) by village elites, full-time fishermen and members of WFT. If the poorer members of the fishing community were in attendance, I did not see them and they certainly did not speak out. Similar assertions were true of rallies outside of *Baan Ao Lom*.

Supporting these observations, my conversations with the individuals in question indicated that their interest in the movement and the CPR was marginal at best. When I asked whether they were involved in policing the bay, many of the poorest wage labourers would shrug their shoulders and agree (probably because they thought it would accelerate the interview). Others appeared to have no knowledge of what I was describing.

Responses of this nature were in stark contrast to those provided by the leaders of the movement, who justified their actions in terms of defending the poor (“*khon jon*”) and the village in general. Encouraging this image was WFT, whose members argued that the defence of the fishery was in the interest of everyone in *Baan Ao Lom*.

Other individuals were decidedly more sceptical. One elderly man, for instance, refused to speak with me until I assured him I was *not* with an NGO and I did not want him to provide any more “free labour.” His perception was that the fishing movement and the work of the NGO were synonymous, and that they both exacted demands on his time.

Underlying these elements were a number of factors, which bear careful scrutiny. One was the type of activity in which individuals were expected to participate. As the preceding suggests, village meetings were relatively low-cost fora through which villagers could express their opinions and lend support to the fishing movement. Far more costly were the patrols and *ad hoc* rallies villagers used to prevent push nets and other banned technologies from entering the bay. Reflecting the risks of confrontation and prevailing ideas about gender, activities of this nature were carried out only by men. According to village accounts, patrols were organised on a rotational basis but, like other institutional arrangements in the village, the rules regulating contributions were highly informal; as one villager told me, “some participate more than others.”

A second and related element was the sexual division of labour within the household, and throughout the wider village community. Women were responsible for a wide range of household tasks, which effectively obviated them from participating in activities outside of the village community. Principal among these were the rearing of children, the preparation of meals and the provision of non-remunerable labour (ie. mending nets, repairing cages, etc.). Underlying these practices was a strong cultural expectation that women were not supposed to attend religious services at the Mosque or, to a lesser extent, negotiate “political matters” in government offices. (Here the fact that a Muslim woman attended outside rallies [as did women from other villages] suggests that the latter norm was beginning to change. Religious institutions, it would appear, remained highly resilient.)

A final element was the effect that poverty and class had on one’s ability to contribute to and participate in the village conservation scheme. Here it would be tempting to infer that the poor were “too busy being poor” to participate in “non-essential” village activities. This would be somewhat misleading.

First, it would underplay the socio-economic factors that *prevented* individuals from participating in collective activities. For those participating in patrols, one basic (and essential) requirement was a boat. Lacking the most important means of monitoring the fishery, the part-timers would have found it far more difficult to make a meaningful contribution to the protection scheme. Similar factors affected one’s ability to support and/or lead the wider movement. Here, access to communication technologies created a situation in which a small village elite could obtain information about rallies and meetings, which they could then communicate to the rest of the village community. Only four families in *Baan Ao Lom* had a telephone. Of these, three were the sub-district councillor, the village headman and a member of the village council (who was also a leader of the fishing movement).

Second, it would underplay the material and symbolic benefits villagers could obtain by supporting and leading the fishing movement. Because of the size of the village, any meeting or gathering was effectively a public event. This was particularly true of the meetings in which outsiders - such as government officials or NGO workers - conducted activities in the village. Unlike the formalised relations between village officials and public officials, however, meetings in support of the small-scale fishing movement were highly inclusive affairs, which tried (although did not necessarily succeed) to attract villagers from all “walks of life.” For this reason, they provided an important means by which leaders and aspiring leaders could assert their place in and commitment to the village community. Reinforcing this process, the tactics that proponents of the CPR used to pursue their goals were highly contingent upon negotiations with (relatively) high-ranking government officials and visible demonstrations outside of the village community.

The benefits of engaging in and/or leading such activities were twofold. First they provided a means by which individuals could cultivate relations with individuals outside of the village community. These, in turn, could help villagers establish a name for

themselves in the movement and, by extension, their home communities. Second, they provided a mechanism by which individuals could demonstrate their commitment (both within and beyond the village community) to the fishing movement. At a basic level, participation in rallies (particularly ones that required travel) illustrated a willingness to bear the costs of travelling to the demonstration and forfeiting a day at work. More substantially, participation in “closed-door”<sup>14</sup> negotiations demonstrated a willingness and ability to deal with high-ranking officials. In return, participants received exclusive information about the government’s views on the demands of the lobby and the state of negotiations - ie. issues that villagers were eager to hear.

In short, low levels of participation were not merely a matter of opportunity costs. More fundamentally, they reflected important historical constraints that further prevented the poorest elements in the village from cultivating (or even establishing) relationships on which better or more stable livelihoods could obtain.

## VII. Concluding Remarks

A principal aim of this paper was to consider the ways in which environmental scarcities affect collective action and institutional change. The findings from Phuket provide evidence to support the notion that resource-dependent communities can institute and enforce rules of common property. In addition, they suggest a relatively strong correlation between environmental degradation and institutional change.

To infer that collective action was purely the result of relative resource scarcity, however, would understate the costs *and benefits* individuals could obtain by supporting and leading activities of this kind. (Indeed, if it were, we would expect to see enclosed fishing zones all over Southern Thailand). More convincing is the notion that the act of supporting the CPR – and protecting the village – was a deeply symbolic affair, reflecting well-established rules, norms and expectations governing power, gender and class. This raises a number of points about processes of environmental degradation, economic risk and institutional change.

First, it suggests that perceptions of risk were of less importance than enduring structural constraints, such as gender and class. In theory, the wage labourers and poor part-timers had an extremely large stake in a regulated fishery; lacking alternative sources of employment, they were highly dependent upon the regular income the fishery could provide. For the same reason, they were particularly vulnerable to fluctuations in biological supply and economic demand. However, in spite of these factors, they were effectively uninvolved in the move to implement and support the CPR.

Second, the findings presented here appear to challenge the notion (supported by many Thai NGOs) that community-based action is somehow separate and distinct from wider

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<sup>14</sup> Only one representative from each village was granted access to the negotiations I attended. Interestingly, the government ruled that NGOs were not eligible to participate in fisheries negotiations.

structures of market and state (cf. Li, 1996; Mosse, 1997). If anything, villagers supported the move to conserve coastal fishing because it provided a potential means of improving one's position within the village hierarchy and of securing a better niche in downstream markets.

Finally and more generally, the experience in *Baan Ao Lom* illustrates the challenge of encouraging poor populations to participate in development planning and institutional design. As noted earlier, models of community-based management are often justified as a means of exploiting local knowledge and wisdom for the purposes of sustainable development. As Li (1996) has argued, however, "images of community" are rarely (if ever) so value-free; more often, they provide an important vehicle through which individuals vocalise and legitimate the right to institute and defend a particular form of property (cf. Mosse, 1997; Scott, 1985). In *Baan Ao Lom*, proponents of the CPR used their historical presence and an image of poverty to justify an institutional arrangement that prevented push nets, trawlers and other competitors from entering the bay. Dominating this process were the full-time boat owners, members of the NGO and villagers whose perceived stake in the fishery and the community was strong.

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