# The river basin as common pool resource: opportunities for co-management and 'scaling up' in Northeast Thailand

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## I. Introduction

In the post World War II era, planners within Thailand's development agencies perceived water resource development as a key strategy toward stimulating modern economic development. Despite more than three decades of planning and the construction of numerous large-, medium- and small-scale water projects intended to increase water availability and improve standards of living, the river ecosystems and human communities of Northeast Thailand are instead experiencing a host of interrelated problems including water shortages, pollution and social conflict centered on water. These problems are readily evident in the Nam Phong river basin.

Since construction of the Ubolratana Dam in 1966, the Nam Phong river basin has been the focus of intensive planning and management initiatives carried out by an assortment of state agencies in the hopes of stimulating regional economic development. Results have been mixed. Most recently, controversy over environmental degradation erupted after several industries released toxic substances into the river in the early 1990s. Galvanized by these highly publicized incidents, a coalition of state agencies, academics, business leaders and non-governmental organizations (NGOs) have spearheaded efforts to develop an effective action plan for management of the river's water quality. The action plan, in effect, calls for cooperative management, or co-management, of the river among a set of stakeholders with diverse interests toward and interactions with the biophysical processes and structures that comprise the river basin.

Specific details relating to implementation of the action plan and creation of institutional mechanisms to manage the river basin remain to be worked out. Local village organizations in coordination with a variety of local and regional NGOs have promoted an alternative set of actions based on local control over resources and, in the future, a network of village organizations responsible for stewardship of the Nam Phong. Both state officials within specific agencies (resource managers, water planners) and NGOs are in effect advocating that the Nam Phong river basin be perceived as a common pool resource and that this conception will lead to ecologically sustainable resource use and meet livelihood needs.

Several questions emerge from this apparent move towards co-management in the Nam Phong basin. How might administrative and bureaucratic boundaries of multiple agencies be rearranged in order to be compatible with watershed-based resource management? In the absence of clearly designated property rights and in the presence of a rapidly changing socio-ecological context, what are the prospects for instituting a resource management approach founded on co-management ideas? Is it possible to forge an effective co-management regime for a river basin at the scale of Nam Phong? How can the aims of the state with regard to water resource development (e.g., energy for industrialization, irrigation development) be reconciled with the livelihood needs of basin residents (e.g., fisheries, drinking water)?

In this paper, I explore the prospects for and obstacles to co-management of a medium-scale river basin within a rapidly changing socio-ecological context. Thinking of a river basin on the scale of Nam Phong as a common pool resource has certain conceptual and practical advantages. However, the political and socio-economic obstacles to creating an effective management framework for the basin are substantial. One of the thorniest dilemmas is how to create effective and democratic institutions for managing water resources in a river basin characterized by environmental conflict and within a national (and international) political-economic context that demands ever more rapid resource exploitation.

## II. Some conceptual issues

This paper begins with the assumption that local-level management of common-pool resources, while not infallible and dependent on historical-geographical context, is likely to lead to more efficient, ecologically sustainable and socially acceptable forms of resource use than state- and market-driven modes of resource use (Bromley and Cernea 1989; Berkes et al. 1991, Agrawal 1996). At least two major challenges confront projects and programs seeking to encourage ecological sustainability through the continuation, rehabilitation and creation of common-pool resource systems.

The first challenge relates to the external political and economic pressures brought to bear on common pool resources that are being managed sustainably through self-contained, community-

based[1] institutions. How do community-based systems of resource management continue to operate effectively in the face of tumultuous conditions of expanding commodification of nature, state-initiated projects to extract raw materials for *national* economic development and, subsequently, increasingly scarce resources? These pressures, arguably on the increase as a result of a rapidly expanding global economy, imply the need for some type of co-management regime defined as "genuine power sharing between community-based resource managers and government agencies, so that each can check the potential excesses of the other" (Pinkerton 1993:37).

The second challenge concerns the scale at which common pool resource management systems occur. Given the micro-scale character of most "successful" common-pool resource regimes (McCay and Acheson 1990:23; Young 1994), how can such regimes be "scaled-up" to promote the sustainability of ecological systems and of livelihoods? More concretely, if state-defined resource development and management programs define a medium- to large-scale river basin as a central unit of intervention, is it possible to build on existing local-level resource management systems or generate new cooperative management regimes to ensure that development/management of the river basin is carried out in sustainable fashion? This dilemma also implies the need for co-management.

1. River basins as appropriate co-management units

Selection of the river basin as appropriate unit of analysis—both in terms of its applicability as a "common-pool resource" and in terms of its scale—also raises conceptual dilemmas. The watershed can be defined as a "geographical entity" that "possesses a basic structure and a topographic pattern that, together with the law of gravity and the flow of water, shape its biotic and abiotic characteristics and processes with considerable regularity" (Lovelace and Rambo 1991:83). This definition applies to river basins which are typically thought of as larger in scale than watersheds (Dixon and Easter 1991:5).

One of the primary obstacles to ecologically sustainable management of river basins is the gap between the perceptions and arguments of, on the one hand, resource managers and water planners and, on the other, those state officials and agencies whose jurisdictional powers are predicated on imaginary geopolitical boundaries. Resource managers argue that conceiving of watersheds and river basins as functional hydrologic units, and planning accordingly, is the only way to ensure that human intervention in river systems (e.g., comprehensive land use planning, water resource development) is carried out in a biophysically rational fashion (Ibid). However, to the extent that this argument implies significant realignment of government jurisdictional boundaries at local, regional and national (perhaps even international) levels, such institutional change will be resisted by those agencies faced with a lessening of decision-making powers.

As an example, proponents of "watershed thinking" in Thailand have been active at least since the early 1970s (Nipon/FAO 1987:1-8), yet a combination of political and economic forces mediated

[1] Most common property regimes defined as "sustainable" in the literature occur at highly localized scales of social organization (e.g., villages, communities, small-scale irrigation systems) and have developed over long periods of time (decades or even centuries).

through several key state agencies[2] have stymied any watershed-based planning from reaching implementation stage on other than a very limited basis. More recently, officials within resource management agencies[3] in Thailand and foreign consultants have pushed the idea of organizing water resource planning, development and management according to a basin-by-basin approach (Alford 1994). Under this strategy, a "master plan" would be developed for each of Thailand's 25 river basins[4], yet there remain few political incentives for moving the program beyond the early planning stages.[5]

It may be problematic to think of a river basin as a common pool resource in the first place. A river basin consists of a set of resources, as well as ecological processes, that lend themselves to management as common property in quite different ways. In addition, efforts to address how the characteristics of specific resources determine their identification by a social group as "common property" (McCay and Acheson 1990:15) must also account for the ways in which all "resources" are socially defined entities subject to varying definitions and attached meanings (Mitchell 1979:1-2). Questions over what biophysical structures and processes constitute "common property" or "common-pool" resources are compounded when incorporating full recognition of the ways that all resources are embedded within and influence biophysical processes at several linked scales. For the purposes of the present paper, it may be efficacious to focus squarely on the Nam Phong river water itself as common-pool resource, while being fully aware that other socio-ecological components within the basin (e.g., upstream forests, agricultural fields, irrigation systems) influence the river water in many critical ways.

2. Geographical scale and co-management

Another issue involves the difficulties of "scaling up" common-pool management systems, a notion which "refers to the application of propositions or models about micro-scale systems to meso-scale and macro-scale phenomena (Young 1994:429). Keohane and Ostrom (1994) argue that at "both local and global levels, researchers have found that when individuals and organizations (such as states) can make credible commitments, they are frequently able to devise new constraints (institutions, or sets of rules) that change the basic structure of incentives" for cooperative behavior in resource management regimes (404). In other words, the scale at which

[2] A comprehensive treatment of the Thai agencies responsible for water resource planning, development and management goes beyond the scope of this paper. At this point in time, the most powerful "water agencies" include the Royal Irrigation Department (under the Ministry of Agriculture and Cooperatives) and the Electricity Generating Authority of Thailand (an independent state enterprise). Both are considered "implementing agencies" (responsible for dam construction, irrigation development, and so on) and have historically been little involved in actual management of the resource.

[3] The recently created Office of Environmental Policy and Planning (under the Ministry of Science, Technology, and Environment) has been the lead agency in the promotion of resource management using a basin-by-basin approach. At a policy level, the National Water Resources Committee has also adopted the "25 basins program" as official guideline. Select officials within the Royal Forestry Department (within the Ministry of Agriculture and Cooperatives) have been advocating a watershed management approach for the past two decades in the hopes of protecting particularly sensitive upland catchment areas from further degradation.

[4] As Alford (1994) points out, this division into 25 basins is somewhat arbitrary; there are actually eight major river basins contained entirely within the country and smaller portions of two international river basins (the Salween and the Mekong).

[5] Interviews with officials of the National Water Resources Committee, 22 April 1997 and 15 May 1997.

resource management regimes occur certainly complicates matters, but the scale of the system by itself does not necessitate success or failure.

There appears to be relatively little work on the dilemmas of scaling as related to issues of ecology and the biophysical relationships within river basins. There are countless examples throughout the world of communities that have developed intimate experiential knowledge pertaining to local ecosystems through a long history of human-environment interactions. However, this familiarity with local environments on the part of user groups may in some ways constrain attempts to apply co-management on a river basin scale. The traditional ecological knowledge of communities in the Nam Phong basin (a complex mosaic of co-evolved social and ecological systems) is often highly specific to localized agro-ecological systems where they live and work. Such knowledge may not extend to recognition of the dynamic ecological interactions within the basin as a whole (e.g., upstream-downstream relationships). Part of the promise of involving the state in cooperative management is that it may furnish the type of scientific knowledge necessary to understand the consequences of these complex relations.

Another relevant aspect of scale that has received little attention is the manner in which geographical scale is produced through human social relations. Smith (1992) argues that the concept of scale must address "not only material scale worked and reworked as landscape, but...also the scale of resolution or abstraction which we employ for understanding social relationships" (74). In the Nam Phong and other river systems of the Northeast, the scales of resolution through which the Thai state chose to "develop" water resources and justify their transformation over the past four decades were regional and national. Water resource development was undertaken "for the good of the Northeast and the Thai nation."[6] Yet the unforeseen social and ecological effects of the dams and irrigation projects fell directly on the inhabitants of those basin's with altered rivers. Recent attempts to re-define the appropriate scale of water resource management as the basin reflect growing awareness that "the political power to act, decide upon socio-ecological projects and to regulate their unintended consequences has also to be defined at a certain scale" (Harvey 1996:204). The choice to pitch sustainable resource management, however defined, at the scale of a river basin may imply a significant reconfiguration of existing social relations and institutions that intersect within the basin.

3. The state as environmental manager

I also wish to stress the ways in which resource conflicts in general, and conflicts over water in particular, derive to a significant degree from the tension in the state's contradictory position vis-à-vis environmental management. A focus on the state is especially important when considering resource management strategies ostensibly including a strong co-management component (as in the case of the Nam Phong basin Action Plan). In a system of co-management, the state assumes a critical role as environmental manager and steward of resources. This state function frequently contradicts and takes a back seat to the state's role in ensuring the viability of capitalist economic development. On one hand the state "is expected to create and maintain economic growth; on the other it must maintain the viability of the productive system as a whole, entailing *inter alia*

[6] This refrain is repeated *ad nauseum* in official documentation (feasibility studies, project descriptions, agency reports, etc.) arguing the benefits of water resource development in the Northeast.

ecological balance and husbanding of resources" (Walker 1989:26). This contradiction demands a critical examination of the historical context of the state's involvement in resource management.

As an example, researchers must think very carefully about the state's motivations for becoming involved in co-management systems. One interpretation of co-management regimes defines them as "arrangements between state and local organizations in which states assign group rights to specific resources, establish overall guidelines for inter-group interactions, and help to create more positive environments for the operation of local organizations" (Swallow and Bromley 1994:5). Under this conception, there may be too much emphasis placed on the role of the state as the main generative force for stimulating co-management. The vision of the state presented here is one of a relatively benign set of institutions that perceive the benefits of co-management and are willing to create an environment under which local-level resource management plays a significant role. However, when considering the state's dual role as environmental manager *and* arbiter of economic development, such assumptions become problematic. There may be few incentives for the state to initiate co-management programs if the implied sharing of power over resource management decisions inhibits resource exploitation to meet development objectives.

## III. Socio-ecological transformation in Northeast Thailand

### 1. The Thai state and resource management

Thailand achieved relatively high rates of economic growth throughout the past four decades with unprecedented growth levels in the 1980s and 1990s, earning it the label "newly industrializing country" (NIC). This rapid growth, largely accomplished through a strategy of export-oriented industrialization, was also accompanied by highly uneven patterns of income distribution across social groups and regions. Most observers agree that a fundamental consequence of the country's push toward rapid industrialization has been the equally rapid deterioration of the Kingdom's ecological systems through the exploitation of forests, minerals, fish, water and other vital resources (Phantumvanit and Panayatou 1990; Panayatou et al. 1994; Rigg 1995).

### 2. Northeast Thailand's river systems

Over the course of the past four decades, the Thai state has employed a number of institutional mechanisms and apparatuses to alter the river systems of Northeast Thailand. The principal rationales in bringing about this transformation include: promotion of a reliable supply of water for those farmers able to utilize irrigation; generation of hydroelectricity to meet a burgeoning national demand; and mitigation of a perceived problem of flooding in some of the region's basins. All of these are reflected in a series of government and government-commissioned reports published over the past three decades that bemoan the region's difficult environmental conditions and economic "backwardness" (as evidenced by Thailand's lowest income levels), and demand immediate attention to overcoming these conditions (Committee on the Development of the Northeast 1961; Louis Berger 1972; Biwater 1987; Government of Thailand 1991).[7] In contrast,

[7] It is worth noting the international character of this endeavor. The project to transform the Northeast's socio-ecological systems has from its inception been encouraged and facilitated—through technical expertise, official aid and project planning—by the activities of the Mekong Committee, an intergovernmental agency initiated by the

other observers argue that the Northeast region is a classic case of "internal colonialism" whereby the promotion of the Bangkok core region has come through the exploitation of resources and labor in Thailand's peripheral hinterlands (Brown 1994:158-205).

The Northeast, termed *Isaan* by its inhabitants, is physically differentiated from other regions of Thailand by its situation on a plateau characterized by a high degree of spatial and temporal variability in rainfall. This, combined with a condition of soils generally lacking the characteristics for sustained agricultural production (Craig 1988), has placed a majority of the region's inhabitants in a precarious livelihood position. In response, the region's agriculturists, while fundamentally dependent on rice-growing, have developed an additional array of livelihood strategies (e.g., fishing, reliance on non-timber forest products) to enhance the properties of productivity, diversity and adaptability within the socio-ecological systems of the region. Water resource development as practiced by the state in the Northeast has tended to focus almost exclusively on the first of these properties and, in the process, has ignored the others. The occurrence of large-scale water development projects (dams, irrigation) as a "privileged solution" (Moris 1987) has contributed to the degradation of aquatic systems and has resulted in several cases of conflict involving the state and local communities throughout the region over the past two decades.

3. Socio-ecological transformation in the Northeast[8]

It is difficult to underestimate the pace and magnitude of changes that have occurred in the lives of the mostly rural populace of the Isaan over the past four decades as state-initiated programs of "development" and "modernization" have penetrated the region. This strategy of course hinges

> in part on the country's substantial natural resource base. This base has been "mined" to supply raw materials to export-oriented industry, to generate the electricity needed to power industry and the urbanization that has come with it, and to supply the burgeoning domestic demand for timber, fuelwood and new agricultural land. The result of this

governments of Laos, Thailand, Cambodia and Laos in 1957 under the auspices of the United Nations (since transformed into the Mekong River Commission). Nearly every medium- to large-scale water development project in the Northeast region was originally conceived as part of the broader effort to "develop" the Lower Mekong Basin in an integrated fashion. The primary Thai state agencies responsible for implementing water resource development (RID, EGAT, NEA/DEDP) have been and remain tightly linked to the Mekong Project. These linkages assume several forms: direct participation of agency personnel in Mekong Committee organizations (e.g., as staff members of the Mekong Secretariat, as representatives to the MC itself); the transfer of environmental data back and forth; and a set of shared ideological and methodological assumptions regarding water resource development. Water resource development in Northeast Thailand cannot be separated from its context as part of the broader processes of development focused on the Mekong.

[8] Initial settlements in the region occurred from the 3rd to the 10th centuries AD, with fairly large population hubs during the height of the Angkor empire (11th and 12th centuries). Historical and archeological evidence shows that from the decline of Angkor in the 13th and 14th centuries until the 17th century the Northeast was largely unpopulated. From the late 17th and early 18th centuries onward, the region has been settled by a series of migrating ethnic groups, dominated by Lao coming from the east bank of the Mekong. From the mid-19th century to modern times the region has been methodically incorporated into the Siamese (later Thai) territory through a variety of mechanisms (Keyes 1976).

> intensified use of Thailand's natural wealth has been an unsustainable path of resource development... (Hirsch 1995:236-238).

The ecologically unsustainable path of development described by Hirsch has been accompanied by socio-economic upheavals as millions of farming families in the Northeast have been forced to live with little or no land tenure; thousands more have been forced from their land due to dam projects, reforestation schemes, and questionable land deals involving high-level government officials (Hirsch and Lohmann 1989). In addition, as the state's development policies—encouraging ever-tighter linkages with national and global markets—came to fruition starting in the 1960s, the Northeast experienced a "radical change in the mode of ecological adaptation" of human communities. More and more farmers converted their marginal rice lands to fields of cash crops ultimately for export (kenaf, jute and sugar cane in the 1960s and 70s; cassava and eucalyptus in the 1980s and 90s) (Turton 1989). While providing a viable means of income generation, this strategy also opened up farmers to the vagaries of price changes on the international market.

I emphasize this on-going socio-ecological transformation[9] of the Northeast simply to point out the potential stumbling blocks and windows of opportunity for co-management of the Nam Phong as a common-pool resource. For example, rapid exploitation of the region's resource base and, subsequently, increasingly scarce and polluted water resources have contributed to increasing instances of social conflict over water. However, these conflicts have catalyzed social movements throughout the Northeast to collectively demand compensation for unjust government development schemes. Small-scale producers have achieved an unprecedented level of political awareness, much of it centered on a drive to ensure the sustainability of livelihoods dependent on the integrity of local ecological systems.

## IV. Degradation and response in the Nam Phong basin

### 1. Transformation and degradation in the Nam Phong basin

Following several years of feasibility studies and reports on potential tributary projects within the Lower Mekong Basin, the Thai state in cooperation with the Mekong Committee[10] launched construction of the Nam Phong Multipurpose Project in 1964. Designed for electricity generation, flood control and irrigation development, the project was heralded by the Thai government as "the milestone for the development of the North East."[11]

Somewhat forgotten amidst the hoopla was the extent to which construction of the Ubolratana Dam, completed in 1966, profoundly altered the character of the Nam Phong itself. The Nam Phong basin covers 15,000 square kilometers (1.5 million hectares) with an estimated population of 1.6 million people (NSO 1992). Most of the basin falls within the province of Khon Kaen (see

[9] I employ the term "socio-ecological" throughout this work to stress the dialectical relationships between social and ecological processes and "the sheer necessity of *always* taking the duality of social and ecological change seriously" (Harvey 1996:184).

[10] op. cit. 4

[11] Quoted from a plaque situated on the crest of the dam memorializing the project and its builders.

Figure XX). The dam transformed a river characterized by marked seasonal changes in flow rates and seasonal flooding into an impounded river characterized by a large reservoir environment, reduced flooding in formerly flood-prone areas, and much more constant flow rates in the river throughout the year. This was the primary "intended effect" of the impoundment.

Some of the other intended effects included: conversion of approximately 50,000 hectares of rain-fed agricultural land to an irrigation zone producing an additional 5,000 tons per year of paddy rice; migration of 4,000 farming families (approximately 20,000 people) from the lands flooded by the reservoir to special "resettlement zones"; and generation of 65 Gwh of electricity per year. By contrast, some of the "unintended effects" of impounding the river included: a sudden influx of families to take advantage of a highly productive reservoir fishery, albeit one characterized by little management and deteriorating socio-economic conditions of fishing families; the complete destruction of the fisheries in the Nam Phong downstream of the dam including the extirpation of 24 species; and the social disruption of those families forced to resettle on marginal land (Nam Pong Environmental Management Research Project 1979). Furthermore, regulation of the river's flow regime created an enabling environment for future industrial development in the basin.

In 1982, Phoenix Pulp and Paper Company (hereafter "Phoenix") opened its pulp factory in the Nam Phong municipality of Khon Kaen province on the southern bank of the Nam Phong, just 10 kilometers downstream of the Ubolratana Dam. The impounded river provided a sufficiently large volume of flowing water (year-long) for double-use in the production process; first, as crucial input in the delignifying and washing of wood fiber and, second, in the disposal of the organic byproducts of production (largely chlorine compounds and some dioxins). An early feasibility study undertaken by the company also cited the area's proximity to raw materials, availability of cheap power, and availability of land for purchase as important locational factors (Phoenix 1975:277-285).

In 1992 at the height of the dry season (March-April), a series of devastating pollution incidents on the Nam Phong transfixed the nation. A molasses spill from a sugar factory left a nine kilometer slug of black ooze that moved slowly down the Phong to the Chi and Mun Rivers and eventually to the Mekong, leaving in its wake a trail of dead and dying fish estimated at 500 metric tons.[12] In late April of the same year, Phoenix Pulp and Paper Company was charged with polluting the river and ordered to halt production by the Provincial Governor. Officials from the Department of Industrial Works allowed the plant to reopen in June 1992 following promises from plant management they would strive to improve the quality of the treated waste water they were releasing into Huay Chote, a small swamp adjacent to the Nam Phong that served as Phoenix's main repository of treated effluent (Kunsiri 1992).

More recently social conflict has erupted over Phoenix's "Project Green", a plan first forwarded by officials of the local Department of Industrial works to reuse the plant's treated wastewater. The idea of Project Green is rather simple. Instead of diverting the plant's treated effluent to Huay Chote where it would eventually reach the Nam Phong, deliver it instead via a network of pipes and small irrigation ditches to the approximately 48 has of eucalyptus fields surrounding the

[12] Interview with Dr. Wanpen Wirojkood, Engineering Faculty, Khon Kaen University, 8 July 1996.

factory where it could be reused for irrigating the trees. These trees, provided by Phoenix, would then serve as raw materials for a new production cycle.[13]

Project Green went into effect in early 1994 and quickly engendered its own set of problems. On occasion excess water in the delivery ditches would cause an overflow of the banks of a small creek near the factory and flood into nearby rice fields. Soon after implementation of the project, villagers living near the plant, particularly those not enrolled in Project Green, observed dead fish in their family ponds, dying trees in rice fields, and seemingly healthy rice plants with atrophied grains or no grains at all.[14] One villager who had signed on to the project observed: "At first we thought the company will allow us to control the water to be used in the plantation. But since the project began, the company has sent in more water than the eucalyptus needs" (quoted in Walakkamon 1994).

These events spurred a great deal of discussion among people living in the communities adjacent to Phoenix about what should be done. People who have been adversely affected by Project Green have transformed its name from *kronggaan khiew* ("project green") to *kronggaan pben ta khiidiiyat* ("project ugly", not only ugly in the aesthetic sense but in a moral sense as well). Frustration over Project Green came to a head in August and September of 1995. Following several unfruitful efforts to negotiate directly with Phoenix and requests for assistance from government agencies that was not forthcoming, farmers from the villages near the Phoenix factory staged demonstrations at the Khon Kaen Provincial Hall. They demanded just compensation for the rice plants, trees and fish lost to Project Green. Negotiations are continuing over just compensation for losses (rice, trees and fish), and some monitoring programs are in place.

The Project Green incidents and other industrial pollution in the Nam Phong set the stage for creation of the "Study project for preparation of the action plan for the Pong[15] River water quality rehabilitation" (Nam Phong Action Plan), developed by researchers at a local university and promoted by government officials as the means to undertake cooperative management employing a holistic approach that focuses management decisions on the Nam Phong basin as a functional unit. Before examining the Plan in more detail, it is worth looking at previous attempts to implement a management plan for the Nam Phong.

## 2. Early responses: the Nam Phong Environmental Management Research Project (NPEMRP)

The proposed Nam Phong Action Plan was not the first attempt to establish a comprehensive management program for the Nam Phong. The history of the "Nam Pong Environmental Management Research Project" (NPEMRP) is instructive for what it implies about the Thai state's commitment to resource management in general and the possibility for co-management. The

[13] Interview with Phoenix managers and villagers of Baan Nong Bua Noi, Baan Noen Udom and Baan Kud Nam Sai; July 1996 and March-April 1997.

[14] Interview with villagers of Baan Noen Udom and Baan Ubolrat, 8 July 1996.

[15] Most research carried out on the Nam Phong (literally "River Phong) has transliterated the Thai name of the river into "Pong". Because authorities on Thai-to-English transliteration universally use "ph" to signify the aspirated "p" sound in English (pan, lap), "Phong" is the more consistent Anglicization.

NPEMRP was launched in 1976 by the Mekong Committee[16] to study the environmental and socio-economic effects of the Nam Phong Multipurpose Project ten years after implementation. The project was carried out in three phases over the period 1976 to 1982. Phases I and II entailed data collection and analysis of changes in variables such as hydrology, water quality, water use, fisheries, land use, socio-economic circumstances, human and animal health, and numbers of insects and pests (Ruangdej 1987).

Phase III of the project focused on the creation of a computer simulation model as part of broader aims to transfer "a specific environmental impact assessment methodology to a team of Thai scientists" and to apply the methodology to the Nam Phong development project and its impacts (Ibid:238). Phase III, completed in 1982, was intended to provide the state agencies responsible for environmental management in the Nam Phong basin with an effective tool for predicting and responding to resource scarcity dilemmas and social conflicts over resources. There was clear recognition that the more than ten separate agencies involved in resource management in the basin greatly complicated efforts at effective management and that some kind of coordinating mechanism was necessary (Mekong Committee 1982). Despite the passage of fifteen years since inception of the NPEMRP, the Nam Phong basin still lacks any semblance of a governmental authority responsible for promoting, coordinating and enforcing basin-wide management efforts.[17]

And what of the computer simulation model—consisting of four sub-models focusing on the potential interactions of basin variables concerning water, reservoir fisheries, land use and socio-economic issues (KKU 1985:12-14)—designed to guide resource management decisions in the Nam Phong basin? Dr. Sanguan Patamatamkul, Project Coordinator of a follow-up program to the NPERMP, revealed that the model's software quickly became obsolete during the microcomputer boom of the 1980s and 1990s, and that as external funding for further developing the model evaporated, it was never actually applied by any relevant government agency.[18] Even if put to use, the efficacy of the model is open to question. Applied to the basin in the early 1980s, the model predicted that future "emerging problems" in the basin would revolve around water scarcity, environmental health, and reservoir fisheries management (Ruangdej 1987:245). To be fair, these are pressing issues in the basin, but the model and its proponents made no mention of the potential for severe degradation of water quality in the basin of the kind exhibited in the 1990s.

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[16] op cit. 4

[17] During conversations with state officials from over twelve different water resource management entities I carried out during 1996-1997, nearly all interviewees mentioned "lack of coordination among agencies" as a particularly debilitating characteristic of present water planning and policy. I would argue that this lack of coordination owes both to old-fashioned "institutional inertia" (the budgetary and staff costs of transitioning to greater coordination among existing agencies concerned with water management are outweighed by the administrative/jurisdictional difficulties associated with such a move) and lack of political incentives (the political and financial benefits accruing to those state bureaucrats, politicians and water professionals in private consulting firms from maintaining "uncoordinated" water development and management are much greater than other alternative institutional structures). This argument will be more thoroughly flushed out in my dissertation (Sneddon, in progress, *Altered rivers: socio-ecological transformation, water conflicts and the state in Northeast Thailand*).

[18] Interview with Sanguan Patamatamkul, 29 May 1997. Arguably, the legacy of the NPERMP is to be found on several computer diskettes occasionally put to use by a research assistant in the Faculty of Engineering at KKU.

3. Current response: the Nam Phong water quality action plan

It was within a context of heated debate over recurring pollution incidents and the uproar over Phoenix's Project Green that the framework for the Action Plan was introduced in 1996. The Action Plan, first proposed by the president of Khon Kaen University in 1993, was the product of a steering committee comprised of local academics and government officials from a wide array of agencies who convened a series of planning meeting and carried out preliminary studies of the main problems in the river from 1994 to 1996. The Action Plan was then presented to those concerned with the pollution of the river at a series of seminars designed to receive input and assemble a committee concerning implementation of the plan. During the first such meeting in April 1997, held at the *wat* (temple) of a village (Baan Na Phiyang) located on the right bank of the Nam Phong downstream from the irrigation weir,[19] a government official declared:

> The Action plan stipulates that in 1998 an "awareness plan" will be initiated along with training of people along the river about the role of the environment, including the factory. This will teach people to love the Nam Phong. The Plan calls for monitoring to continue, for rehabilitation (we received money from MOSTE for this purpose already), and for further research. It is my hope that all agencies can cooperate together to help the Nam Phong.
>
> Deputy Governor of Khon Kaen province speaking at seminar on "Our Nam Phong," 24 April 1997

Also at this first meeting, some villagers expressed their dissatisfaction with the Action Plan, which seeks to create a comprehensive management plan for the entire river basin, and the proposed strategies for implementation.

> Why is it that during the setting up of this committee there is no mention of the people's organizations? We talk about the Tambon Administrative Organizations and NGOs but these are still external organizations. People's organizations must be included as part of the action plan and must participate. People in the village are the ones closest to the problem and should be included. The problems of the Phong must also be solved...where the people know the problem more precisely [reference to the area near Phoenix where problems are most acute...]. The *chaobaan thii thaejing* ["real people"] are in the best position to watch the effects on the environment.
>
> *Phu yai baan* (village head) of Baan Kood Nam Sai speaking at seminar on "Our Nam Phong," 24 April 1997

[19] Much was made of the fact that this was one of the first meetings of its kind to be held "in the field" at the site of an environmental problem. In the past, such a meeting would have been held at a upscale hotel or government office.

A similar statement of frustration over the activities of state agencies thus far in the conflicts surrounding water pollution in the Nam Phong can be found in the following:

> I already made a proposal to ask for help, but nothing happened. Academics must have more work to do. I will raise my own fish in the river and see if the fish die. If they do, I will sue. We do not expect any help from academics or the government. MOSTE should have clear practical plan for the Nam Phong.
>
> *Phu yai baan* (village head) of Baan Nong Bua Noi
> speaking at seminar on "Our Nam Phong," 24 April 1997

The ideas and sentiments expressed by the village heads at this meeting represent real stumbling blocks to the development of some type of co-management regime within the Nam Phong basin. A long history of experiences with the condescension and inactivity exhibited by officials charged with responsibility for resolving environmental disputes has contributed to a widespread disgust with "official" channels of negotiation between state and village. However, it is also clear that the people most affected by the river's degradation are prepared to contribute to management of the river's water quality through any means available.

Yet what does the Action Plan actually propose? The objectives of the project study (the first phase of the Action Plan) include: to examine the existing conditions of the Nam Phong basin regarding biophysical characteristics, water use, pollution sources and current management strategies; to determine causes of water quality degradation; to generate a viable action plan; and to provide opportunities for public input through seminars, workshops and open meetings (KKU 1995:1). The study divides the Nam Phong basin into three distinct sections: upstream watershed area; middle watershed area (Ubolratana reservoir); and downstream watershed area (below the Ubolratana dam to the Phong's confluence with Nam Chi) (see Figure XX).

The "Study project for preparation of the action plan for the Pong River water quality rehabilitation" is by several measures an impressive effort. First, it clearly identifies the responsibilities of different stakeholders toward improving the water quality of the Nam Phong. For example, the project study states that Phoenix Pulp and Paper Company must "adhere to appropriate effluent standards, including limits on $H_2S$ and COD" and singles out the regulatory agencies responsible for enforcing the standards (Ibid:11-12). Second, it is exhaustive in its coverage of the different pollution sources, proximate causes of pollution and amount of water extracted for different uses. It stresses the need to address not only the most obvious and pressing pollution sources (effluent from local industries), but to target future pollution problems such as increasing use of chemical inputs by farmers and organic wastes associated with a rapidly expanding urban population in Khon Kaen city.

How the plan addresses the most problematic area of the river basin, the stretch from the Ubolratana dam downstream to the Nong Wai irrigation weir, is illustrative. Land uses consist of: industrial areas for the Phoenix Pulp and Paper Mill and EGAT's Combined Cycle Thermal Power Plant; several rural communities; and agricultural areas employing insecticides, herbicides, rodenticides, and chemical fertilizers. The chief problems in this area include: poor water quality

resulting in periodic fish kills; a decrease in fish populations;[20] excessive water releases from Ubolratana; industrial effluent (primarily Phoenix) and pesticide residues used to deter termites; overgrowth of water hyacinth resulting in lower DO levels; community discharges of wastewater; and non-point pollution from agricultural discharges (Ibid:8-11).

However, several questions and potential dilemmas remain regarding actual implementation of the management plan. The mitigation measures identified with reference to the problems listed above recommend feasibility studies on reservoir water releases, strict adherence by industries to effluent standards, provision of domestic waste water treatment facilities, rehabilitation of fisheries through releases, and a series of measures to reform the institutional environment for managing the basin's resources. Effective monitoring of water quality is a major obstacle as previous efforts to enforce water quality standards following the 1992-1994 pollution incidents demonstrates:

> Monitoring of the Nam Pong by the Office of Environmental Protection and Policy has not been occurring on a continuous basis. Furthermore, no one is really sure where Phoenix is placing the waste water; as if the location is a "secret". Most of the Thai state agencies do not do appropriate work with the people. As an example, the monitoring program set up by OEPP works from the morning until 4 pm. There is no opportunity to meet an talk with farmers who are working in the fields during those hours.[21]

As this points out, the institutional reforms are equally crucial. In this regard, the Action Plan calls for, among other things, greater levels of "collaboration between government agencies and NGO/village organizations to increase understanding" and inclusion of "village organizations in participating in water quality monitoring" (Ibid:12). Yet there is mention neither of the procedure through which the institutional reforms will come about and nor a clear delineation of the process by which these reforms, if taken, will lead to effective mitigation measures. To be fair, these are profoundly political issues and the Action Plan places priority on initiating negotiations among divers social groups. Yet it is precisely these issues which must be tackled for a meaningful form of co-management to come about.

Another dilemma concerns the ambiguous role of local industries in implementing the Action Plan. Part of the frustration on the part of the small-scale farmers was grounded in their suspicions that, as in the past, industries would collude with government agencies ("under the table" payments, etc.) to stymie any actions taken to regulate water pollution. At the first informational meeting, industry representatives pleaded their commitment to maintaining a clean Nam Phong (the Phoenix representative intoned solemnly that he too was a "resident of the basin). Throughout the period of pollution incidents (1992-present) Phoenix has denied any responsibility for the fish die-offs and has employed a variety of channels (blaming government ineptitude, giving out

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[20] Fish requiring high levels of DO have already been extirpated. These include: *Aeanthopsis choirorhyncos* (long-nosed loach or plaa son sai), *Botta* sp. (yellow-tail loach or plaa nam muek), and *Morulius chrysophekadion* (greater black shark or plaa ka). Species with auxiliary breathing organs have moved in: *Trichopsis vittatus* (striped croaking gourami or plaa krim), *Trichogaster trichopterus* (three-spotted gourami or plaa khradu mor), and *Trichogaster pectoralis* (snake-skin gourami or plaa salid) (KKU 1995:10).

[21] Interview with coordinator, Nam Phong Ecological Recovery Project, 2 May 1997.

compensation packages, arguing their economic contributions to the local area) to forge an effective public relations campaign.

These shortcomings of the Action Plan are not insurmountable, and my purpose in raising them was not to vilify state agencies and other actors. Rather, I wanted to illustrate the structural constraints to institutional reform and movement towards co-management in the Nam Phong basin.

## V. Concluding considerations

1. Prospects for co-management in the Nam Phong

Institutional arrangements to manage common-pool resources, at whatever scale and scope of operation, entail several general "design principles" that will likely facilitate ecological sustainability and representative decision-making within resource management systems. These include: an ability to partition larger groups of actors into smaller groups that can meet "face-to-face" and negotiate over particular concerns; a relatively open and substantial flow of information to cultivate "extensive common knowledge" of resource problems; ways to ensure that monitoring and enforcing programs "fit" with specific situations; and, perhaps most importantly, mechanisms for including all participants in the creation and modification of management regimes in order to take advantage of diverse sets of knowledge (Keohane and Ostrom 1994:423-424).

While design principles for the effective operation of institutions are crucial, analyzing their efficacy in terms of the proposed management plan for the Nam Phong basin perhaps presumes too much. Many co-management initiatives assume *a priori* the existence of common property and/or cooperative resource management on the part of local-level management systems. The promise of co-management as it appears in the literature on common property and common-pool resources is predicated on those communities with historical experience of common-pool resource management negotiating with the state from a position of relative strength owing to their effective, long-term management efforts. Such communities can at the very least present a compelling argument and historically informed evidence (oftentimes translated through the academic press and "official" documentation of agencies) that their management regimes have contributed to ecological sustainability and social acceptability.[22] Efforts at forging co-management in situations where local communities have little or no experience with common property regimes, or where such regimes that did exist have been ravaged by decades of exposure to state development projects and expanding markets, may be far more difficult to implement.

For researchers examining cases of co-management in such situations, the lack or dilapidated state of common property regimes or some approximation presents a conundrum. One response is found in recent work on local dependency in industrialized societies, which argues that the idea of co-management (cooperation between the state and specific social groups in civil society) can be

[22] Although it should be pointed out that the "socially acceptable" assumption of common property regimes of resource management is coming under increasing scrutiny as researchers recognize deep divisions—along gender, ethnic, and class lines—within societies and communities utilizing common-pool resources (see the proceedings of the Fourth IASCP Conference, 1992, "Dividing the commons," for further elaboration).

fruitfully divorced from research solely concerned with common property and common-pool resources (Reed 1995). As Reed points out, communities "tied to the model of industrial capitalism may not be able to maintain cooperative formations over long periods" (Ibid:134-135). Furthermore, many of the communities correctly identified as engaging in common property regimes are part of indigenous societies with long histories of independence from state- and market-directed forms of resource use. While Thai society has hardly achieved "industrial capitalism" status and the label "indigenous" remains problematic for the rural communities of the Northeast, the situation I have described in Nam Phong resonates strongly with these caveats.

Building on these arguments, the Nam Phong Action Plan is, in many respects, attempting to facilitate a process of conversion from river water as open access resource[23] to river water as co-managed common property. It may thus be more fruitful to examine these efforts in light of several variables that are crucial in making this transition: the character of the resource itself; the supply-demand conditions of the resource; the characteristics of the users; and the nature of the political and legal environment (Bromley and Cernea 1989:23). The prospects for co-management in the Nam Phong basin can be addressed through examination of each of these variables and their interrelations.

a. Characteristics of the resource and supply-demand dynamics

The characteristics of the resource (the Nam Phong's river water) and the difficulties associated with approaching a river basin on the scale of Nam Phong as a form of "common property" were addressed in section II. However, recognition of these difficulties does not make some form of co-management obsolete. I would argue quite the contrary; the complexity of social and ecological relations within a river basin virtually demand some form of co-management. As one of the village heads expressed in his statement on the Action Plan, the people living closest to and most familiar with the river are indispensable in recognizing environmental problems and bringing them to the attention of the state.

The supply-demand dynamics of water in Nam Phong are complex and rapidly changing. While previous management efforts and the Action Plan treat water quantity and water quality as separate issues, pollution effectively reduces the amount of water available for human consumption. One of the strategies of a local NGO working on water issues in the basin (the Nam Phong Ecological Recovery Project) is to raise awareness on the part of urban residents of Khon Kaen city (the provincial capital) concerning the potential impacts of industrial pollution upstream of the city's water supply facilities. In the past, water shortages have not been a significant problem for the basin's different user groups (agricultural, industrial, rural and urban domestic), but could emerge in the future as more industries locate in the basin and the urban population continues to grow at a rapid clip.

[23] Thai laws concerning water rights do not help sort out this situation. While legislation can be an effective tool for clarifying water rights, enforcing water quality standards, an producing effective management programs, "(s)uch a solution does not seem to exist in Thailand since water resources problems so far have been handled by piecemeal legislation, [and] there is virtually no law laying down general principles for the systematic utilization, development and management of water resources" (Amnat et al. 1993:1).

b. Characteristics of the users

Some crucial aspects of resource user groups that will facilitate management of the Nam Phong on a co-managed common property basis are the level and types of cooperative behavior exhibited by basin residents. Approximately 85 percent of the basin's inhabitants are farmers and the vast majority (about 90 percent) cultivate their own land in order to meet subsistence needs (Ruangdej 1987:239). The aforementioned changes in the Northeast's political ecology (market penetration, non-farm labor opportunities, state development programs) have placed great stresses on traditional aspects of village life that in the past encouraged more overt forms of collective behavior. One example is the practice of *long khaek*, or mutual assistance on special occasions. In the past, this practice was commonplace in most villages, and help with harvesting, house-building or some other form of labor exchange was given freely without strict expectation of reciprocal labor. Today, full repayment for labor time in anther person's fields is "counted on" (Phongpit and Hewison 1990:123).

The following observation illustrates some of the older social mores that are increasingly rare:

> An elder in a village once asked a young man: "If you got a big fish, what would you do in order to have that one fish provide for the whole year?" The young man gave many answers such as making salted fish, drying it, or selling it to get money to buy food, and so on. The elder then gave his answer, "You should share it with your neighbours, so that when they have fish, they will share it with you" (Ibid).

The above example offers a useful entry point for understanding the dynamic context through which cooperative management of the Nam Phong basin is being negotiated. The parties attempting to stimulate cooperative action around the idea that all social groups within the basin must be included in the decision-making and management aspects of the river's water quality are not working with a blank slate.

In some respects, the vision of co-management in the Nam Phong is working directly against a broader set of political and economic processes that have for the past three decades encouraged state ownership and control over resources to benefit private interests focused on national economic growth. However, ideas and ideologies more strongly associated with "traditional" Isaan culture—rice and buffalo "banks" and other forms of cooperative social behavior—have had something of a renaissance in the past two decades as part of a burgeoning "community culture" school of thought in Thailand (Chatthip 1991). This "social movement" also has a strong political edge, with groups of farmers throughout the Northeast region finding common cause with cohorts in other provinces and with a coalition of NGOs, sympathetic academics (and occasionally bureaucrats), and student action groups.[24] Insofar as effective co-management regimes require

[24] The history of Thai social movements organized around human rights, gender equity, environmental issues, alternative agriculture, health care, and a host of other issues, as well as debates over the effectiveness of the movements, is rich and complex. See Turton (1983), Hirsch and Lohmann (1989), Rigg (1991; 1993), Rush (1991), Hewison (1993) and Callahan (1995) for "external" perspectives on this history. For perspectives from within Thailand, see issues of the *Thai Development Newsletter* produced by the Thai Development Support Committee.

the active participation and interest of those most directly engaged with resources, the presence of social movements in the Northeast and the willingness of small-scale farmers in the Nam Phong basin to organize and demand action from the government and industries regarding water pollution is a positive sign.

c. The political-economic environment

Finally, one of the more potent obstacles to cooperative management in the Nam Phong basin and in Thailand is the relative mismatch between the state's concern over "resource management" and its objectives with regard to "development" of natural resources. Figure XX plots the evolution of the state's intervention in the Nam Phong basin as a function of concern over developing water resources (hydroelectric and irrigation development), and, eventually, managing water resources (watershed management, river basin planning).

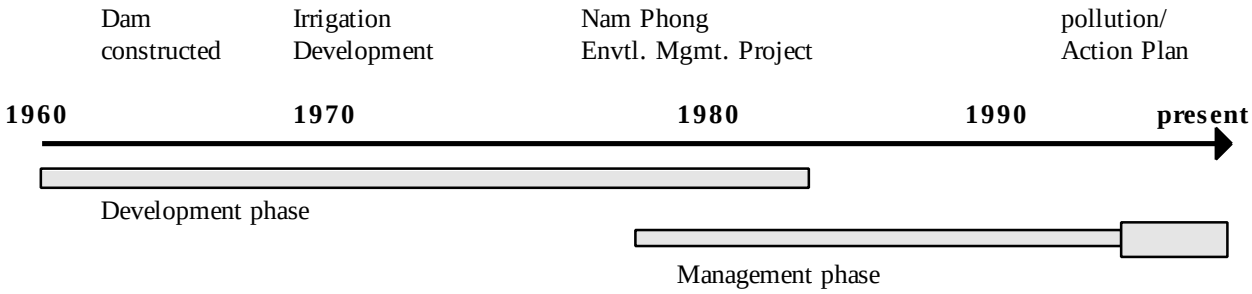


Figure XX. Evolution of state intervention in the Nam Phong basin.

A concern over management, expressed through the stated goals of the Nam Phong Environmental Management Research Project (NPEMRP), did not manifest until the late 1970s, and even then was prompted more by external factors (the Mekong Committee's recognition of some of the more problematic impacts of the impoundment) than by the Thai state's recognition of the potential for serious environmental problems. A renewed emphasis on management (represented by the "bulge" in the management phase) emerged from the state largely in response to the horrific pollution incidents from 1992 to 1994 and increasing demands from residents of the river basin for effective governmental action on water quality and other basin issues.

What this brief foray into the history of state intervention in the Nam Phong makes clear is that in seeking to find balance between the oftentimes contradictory goals of environmental husbandry and economic development (claims of "sustainable development" notwithstanding), the Thai state has yet to demonstrate any significant commitment to its role as resource steward. The proposed Action Plan for the Nam Phong must be analyzed in this light. It represents the state's continuing search for an effective mechanism through which to manage natural capital, and a partial response to the collective actions taken by basin residents in the desire to secure their livelihoods in the face of ecological degradation. Meanwhile, the basin's biophysical evolution has become more and more "fixed" as a result of the Nam Phong's status as impounded river.

2. What kind of resource management regime for what scale?

The importance of scale in the calculus of cooperative resource management schemes becomes clear when considering that in local socio-ecological systems, "the scale of the problem is much smaller than the jurisdiction of the relevant national government," while at inter-state and global levels "the scale of the problem exceeds any government's jurisdiction" (Keohane and Ostrom 1994:413). In the case of Nam Phong, there exists no management entity (e.g., basin authority) that corresponds to the geographical scale of the basin. Not that the presence of such an entity would guarantee sustainable resource use and effective co-management, but it would perhaps eliminate some of the jurisdictional and coordination problems among agencies concerned with resource management.

Questions of scale figure prominently in the formation of co-management regimes in other ways. As the spatial scale of the management system increases, chances are greater that the system will include more and more resource users—industries are a prime example— whose principal frame of reference is *not* the bounded system of common-pool resource(s) (i.e., the river basin). Their "allegiance" in terms of effective resource use will likely belong to a different system (national or world markets), one more beholden to economic and political criteria that reward simple extractive activities. In a more encouraging vein, negotiations over "scaling-up" management regimes for common-pool resources pushes these types of difficulties to the fore. In struggling to deal with the formulation of sets of rules to regulate the water use of industries in a way that satisfy other resource users (small-scale farmers, urban residents) *and* meet some criteria of sustainability on a basin-wide scale, the Action Plan is in some ways expanding the scope of co-management to include not only state and civil society actors, but market actors as well.

Finally, if promotion of the river basin as appropriate management unit and co-management as a viable regime was emanating solely from state agencies, the prospects for ecologically sustainable and socially just resource management in the Nam Phong basin would be bleak in the short-run and nil in the long-run. Resource degradation and environmental politics in Thailand have together reached a point where effective management will demand genuine input from local-level resource users. Thus I conclude with what is arguably an encouraging trend, even if it remains in the early stages of gestation. The Nam Phong Ecological Recovery Project, instrumental in raising awareness of pollution problems in the river, is undertaking several projects throughout the basin focusing on village-level organizations in both the upstream catchment zone and in the villages near Phoenix. NGO workers, while understaffed and with few resources, are actively encouraging joint village-NGO projects in the upland areas (concerned with land degradation) and campaigns near Phoenix (focused on water pollution) to assume a "basin approach" in both their livelihood practices and in local politics. In this fashion, a linking of local ecological knowledges helps transcend some of the scale dilemmas and local-level political support necessary to push forward genuine co-management policy and practice becomes broadened out.

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