RUPES in Thailand:

Rewarding Community Participation in Managing Environmental Services Provided by a National Park

A case study of DoiInthanon National Park, Chiang Mai, Thailand

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This is a report on findings of an exploratory study conducted in northern Thailand in association with the Rewarding the Upland Poor for Environmental Services (RUPES) project. The RUPES project has been assessing experience with efforts across Asia to test mechanisms for providing rewards for poor upland communities who provide stewardship for natural resources that provide important benefits to downstream and larger national to global societies. Yet its sites include relatively few examples of rewards based on biodiversity as the main environmental service, and there have not yet been any sites located in Thailand.

Thus, this study has sought to explore the potential for further work with an important national park in Thailand related to mechanisms for rewarding local communities helping provide stewardship for its natural resources. Initial interest focused on a mechanism that now provides funds to elected local sub-district governments near the park, based on a percentage of revenues collected by the park from visitors. With this starting point, the study became a more general exploration of how PES-like concepts and mechanisms are or might be useful for national park management at DINP.

The report's structure includes five sections on: 1) contextualization of DoiInthanon National Park (DINP) and its establishment in Thailand's growing protected area system (PAS) and associated distributional issues; 2) benefits, costs and funding of conservation programs in DINP and other parks; 3) current views of PES-like concepts at DINP; 4) new initiatives in eco-tourism at DoiInthanon; and 5) conclusions and recommendations.

1. DINP in the context of Thailand's PAS and related political economy issues

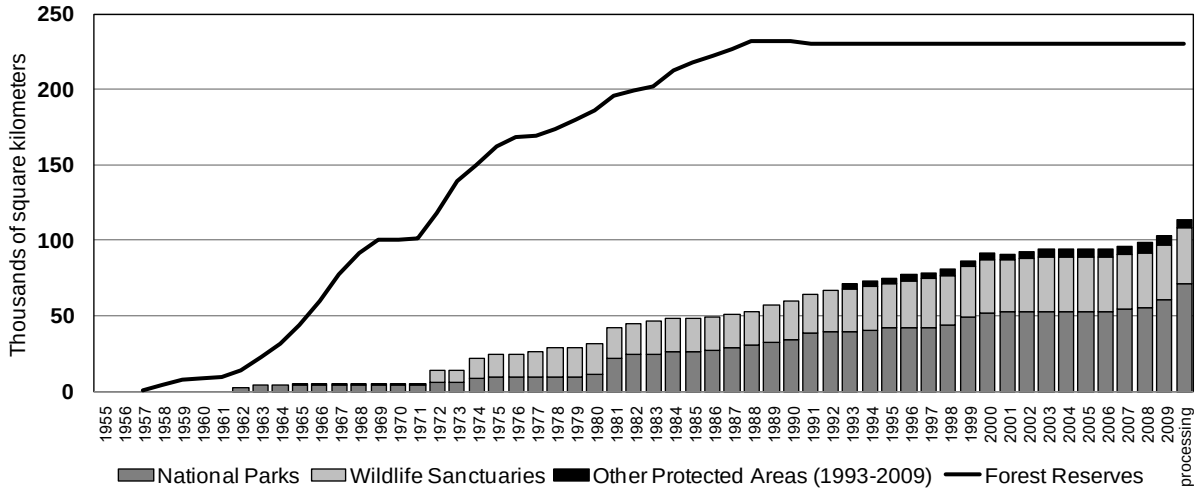
Emergence of Thailand's Protected Area System (PAS)

During the last 50 years, Thailand has built a system of state forest lands that have become a major factor affecting land use and livelihoods in the Kingdom. Progress of major components in this system is charted in Figure 1. Forest reserve status precludes private land ownership and turns users into encroachers. Protected status strictly outlaws any form of resource use other than that authorized by the law applied to declare the area a national park, wildlife sanctuary or other type of protected area (including 'forest park', 'no hunting area', arboretum, or botanical garden). Aggregated area of 'other protected areas' since 1993 is indicated, but since readily available earlier data is incomplete or inconsistent and the total portion of protected areas under these categories is very small, focus here is on reserves, national parks and wildlife sanctuaries.

Building on the basic land law enacted in 1954 that provides the legal basis for a unified system of land tenure and land classification, and earlier laws related to state forest claims and regulation, the state began delineating and designating areas to be permanently reserved for forest. Initial efforts were slow, however, due to conflicts with people claiming already existing locally-recognized rights to use those lands. Thus, specific legislation was passed in 1964 and again in 1968 to strengthen state processes for claiming lands for forest reserves over claims of local households without

compensation, especially in upland areas. As a result, state reserved forest lands grew rapidly until 1988 when they covered nearly half (45%) of the total land area of the Kingdom, including areas with large numbers of upland rural communities and most all mountain ethnic minority villages.

Figure 1. Expansion of Reserved & Protected Forest Lands, 1955-2009



Source: RFD and DNP data

While the primary justification for these reserved forest lands was to provide state forest resources for timber production, there were also acknowledgements by national leaders of efforts by young foresters advocating conservation and protection of important wildlife and ecosystems. This was reflected in enactment of the Wild Animal Reservation and Protection Act of 1960, as well as the National Park Act of 1961. An initial set of national parks was identified and some of these areas were legally designated. However, progress of subsequent efforts to upgrade additional areas of forest reserve lands to protected national park or wildlife sanctuary status that conflicted with massive logging concessions was very slow until environmental issues and needs for conservation began to gain more attention among students and elements of the national elite during the 1970's. This brought especially rapid growth in areas designated as wildlife sanctuaries, but emphasis shifted back to national park expansion during the 1980's as priorities began reflecting depletion of timber resources and revenues, rapid urban-industrial growth, and emerging environmental awareness among the general public. The first national forest policy was declared in 1985, setting goals for both production and protection forest areas, and watershed classification maps began to be developed and expanded.

Catastrophic landslides near the southern boundary of the central region during 1988 then became the trigger event for fundamental change in approaches for managing state-claimed forest lands in all categories. With the disaster blamed on excessive logging in upper watershed forests, in 1989 the government responded to a public outcry led by emerging NGO's by revoking all logging concessions on state-claimed lands (except those to the parastatal Forest Industry Organization) in an act that has become known as Thailand's "logging ban". Then during a military-installed government in 1992, a new Wild Animals Reservation and Protection Act (WARPA) strengthened wildlife management, and was accompanied by a new Forest Plantation Act and a wide-ranging Enhancement and Conservation of National Environmental Quality Act. Environmentalism was clearly becoming the main driver and justification for national forest land management policy.

Thus, further expansion of forest reserve lands was halted, and existing reserves were assessed and classified according to their role and priority for maintaining wildlife and plant biodiversity as well as watershed protection. Policies were very quietly launched to rapidly expand protected area status to all high priority areas. Growing environmental interest groups and activist organizations also started gaining support from government and international sources. By 2000, however, further conversion of forest reserves to protected area status slowed as government listened to complaints from communities claiming longstanding use rights to forest reserve lands being incorporated into state protected forest areas – but final conversion has accelerated again since the 2006 military coup. In an effort to divide and help defuse growing dissent in many rural areas of the Kingdom, many strongly occupied forest reserves in low priority areas were assigned more than 15 years ago to a 'land reform' program for eventual conversion to private household ownership.But not surprisingly, subsequent actual implementation of these processes has been extremely slow. Moreover, only a tiny portion of reserves in the North is affected because watershed classification status of forest reserves in mountainous areas prevents them from consideration for 'land reform' under government policy.

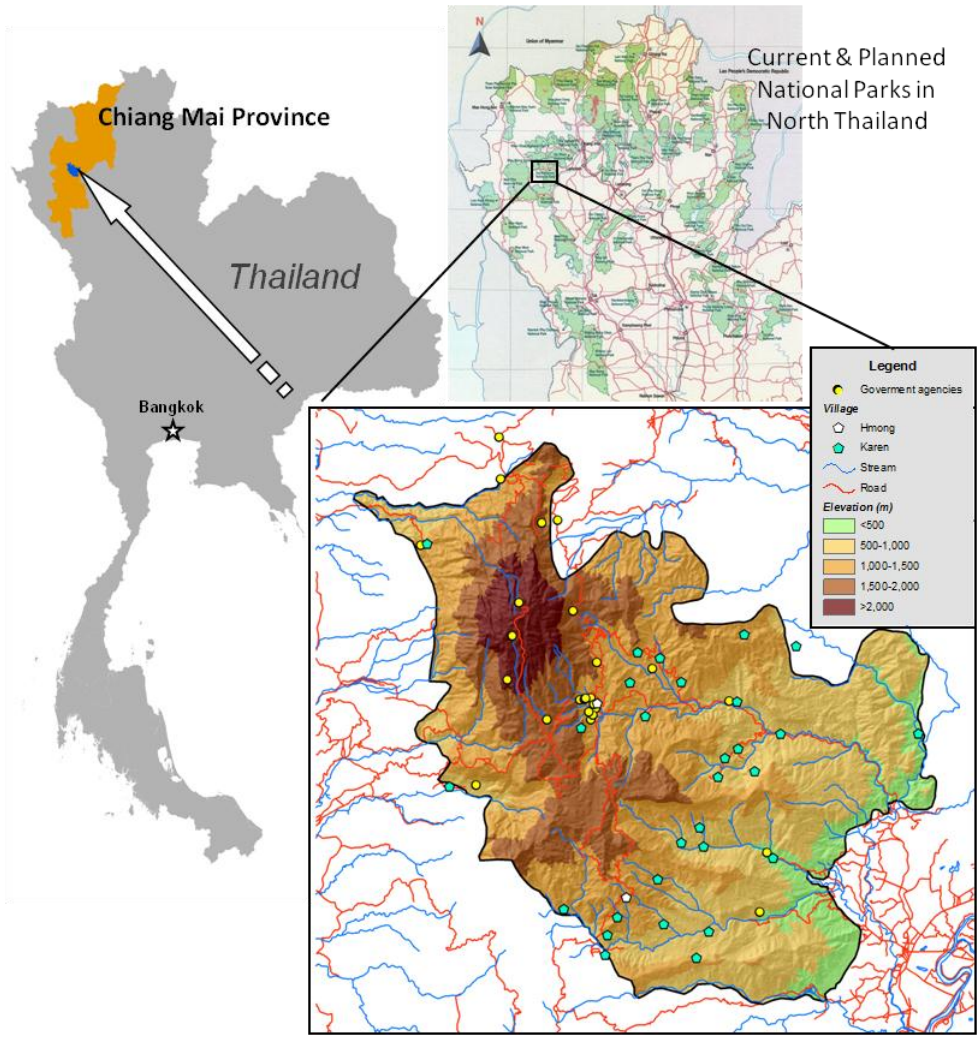
Establishment of DoiInthanonNational Park (DINP)

Since InthanonMountain (DoiInthanon) is Thailand's highest peak and has long been widely viewed as having high levels of both spiritual and ecological significance, it was among the first few areas to be identified as sites for national parks. Initial park boundaries proposed by the state were expanded in 1972 and again in 1975 as its declaration was finalized covering an area of 48,240 ha. The terrain and spatial context of DoiInthanon National Park (DINP) within Thailand and Chiang Mai Province are shown in Figure 2.

The steep elevational gradients and complex terrain of DINP result in a complex mosaic of local ecologies with widely ranging characteristics. Its lowland areasbelow 600 meters in elevation are very warm and very dry during the rain-free season, while in its highlands temperatures can drop as low as -8 C degrees and frosts are not unusual during the cool, dry season; during January, the coldest month, nighttime temperatures average 5.5 C degrees. Accordingly, during most of the year upland areas of DoiInthanon provide a comfortable escape from the heat of the lowlands**.** At altitudes above 1,000 meters, annual rainfall exceeds 2,500 mm, which is at least double the rainfall of the nearby city of Chiang Mai. Even during the November to April dry season there are rare but occasional rains, and areas near the summit can be shrouded in clouds for much of the day. Indeed, persistent mist is an important factor in the ecology of the cloud forest found near the summit that functions as a sub-Himalayan ecological island where many rare and unique species of organisms can be found.

Not surprisingly, justifications for placing areas within DNIP under conservation and environmental protection status include strong emphasis on both biodiversity and sources of important water resources. As indicated in Figure 3, the park includes upper zones within 4 important watersheds (Mae Chaem, Mae Klang, Mae Wang, and Mae Tia) which are all Ping River tributaries that help replenish and refresh main channel flows through the Chiang Mai Valley after its waters have passed through the valley's complex 7-century old irrigation systems, but before they flow into the reservoir formed by the Bhumiphol Dam, which is one of the Kingdom's most important irrigation, electrical generation, and flood control facilities (Thomas 2005). Several substantial waterfalls in DINP attract numerous visitors every year.

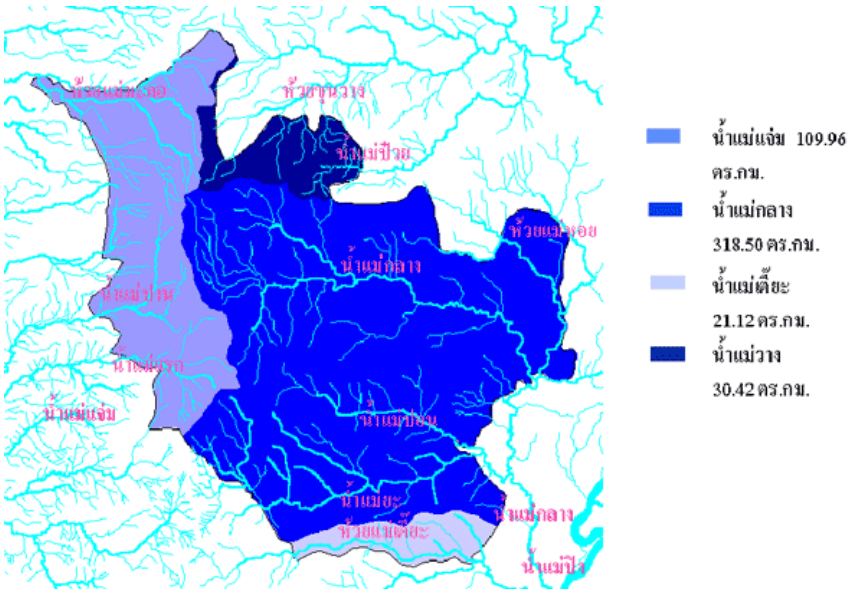
Figure 2. DoiInthanon National Park (DNIP) terrain and spatial context



Source: ICRAF Thailand spatial database; National Park Office 2006

Before DINP's establishment there was a long history of land use by communities living along the north-south ridge that includes Inthanon and separates Chiang Mai Valley from the Mae Chaem Valley to the west. Lowland portions of what is now DINP were at the margins of Lanna Kingdom efforts to begin developing irrigation systems that have supported the productive agricultural systems in the Chiang Mai Valley for centuries, and many farmers in and near downstream portions of DINP irrigate their farms with water from the Ping River system. In middle elevation zones traditional agroecosystems of ethnic Karen communities included small areas of paddy irrigated from mountain streams using their own small weir and canal systems, supplemented by forest fallow rotational shifting cultivation of upland rice and a diverse array of subsistence crops and forest fallow products, as well as sacred groves and patches of protected forest included in their diverse mosaic agroforestry landscapes.

Figure 3: Four watersheds in Doi Inthanon National Park



Then during early decades of the 20th century, opium was being grown in highland areas near or above 1,000 meters elevation, which was promoted by the state opium monopoly that purchased the output through its local unit based in Chomthong near the main entrance of what is now DINP. Ethnic Hmong also migrated into highland areas and began producing opium as a cash crop so that they could buy rice and other necessities that were difficult to produce under the ecological conditions of the highlands. While all ethnic groups participated in the opium production system, after it was outlawed in 1959 and government policy shifted to eradication, publicity campaigns emphasized only the role of highland communities. Then as efforts were underway to establish a national park on Inthanon Mountain, a project was launched under the patronage of HM the King to lead crop substitution efforts to replacing remaining opium with cash crops 'suitable' for the highlands. A major research and extension center of this open-ended project is located in DINP.

Today there are more than 5,000 people living in 31 villages located within DoiInthanon National Park and more than 9,000 people in 39 villages in its buffer zone areas, including Thai, Karen, and Hmong ethnic groups (Flaming et al 2009). Locations of enclave Karen and Hmong villages within DINP are indicated in Figure 2. The general agroecological patterns of settlements tend to differ by ethnic group (Figure 4). In addition to opium replacement, many traditional subsistence-oriented production practices in highland areas have also been replaced by small areas of intensive cash crops including ornamental plants and flowers, as well as strawberries and temperate fruits and vegetables that are sold in nearby market places or produced for the Royal Project. About 80 percent of villagers also collect plants and fuel wood for personal use or for sale, and villagers raise additional household cash by selling garden products and handicrafts to park visitors.

Fortunately, cloud forest areas near the summit of Inthanon mountain escaped most impacts of forest clearing associated with cultivation of opium or other crops, probably because conditions are not compatible with requirements for high crop productivity. Thus,many now believe that problems such as dieback of numerous large old trees may be associated more with development of access roads and facilities. In addition to tourist facilities, a pair of Buddhist chedi dedicated to HM the King and Queen and a military radar station are also significant structures located in this zone.

Figure 4: Ethno-agroecology of settlements in DoiInthanon National Park

(Source: Flaming et. al., 2009)

Distributional patterns and issues associated with Thailand's PAS

The patterns and trends in establishment of reserved and protected area system (PAS) forest lands summarized in Figure 1 help depict the overall scale of and rates at which the Kingdom's natural resources are being allocated to these endeavors. But it is also important to understand that these resource allocations are not distributed evenly across different parts of the Kingdom, and implications resulting from this.

In order to depict these patterns in a manner useful for helping us understand the context of DoiInthanon National Park, Table 1 presents data that are nested from the national level in the far right column (corresponding to data in Figure 1) which is then disaggregated to the left into Thailand's four major geographical regions. The Northern Region is then disaggregated into its lower and upper sub-regions, the latter of which includes Chiang Mai province which is presented for comparison as the area within which DINP is embedded. The spatial context of DINP's location relative to other current and planned national parks in the northern region is also shown in Figure 2.

Beginning with massive areas declared reserved forest, it became clear that the primary site of state forest land claims would be the North region, and especially the Upper North and its Chiang Mai Province. Allocation of land to the PAS has followed the same pattern, especially after the national park areas that are still in the process of final demarcation are finalized, although some of these have been encountering various degrees of local resistance. Impacts on Chiang Mai Province are particularly severe, but the lack of wildlife sanctuary data disaggregated by province in published forestry statistics does not allow the full extent of this component to be quantified in Table 1. Given the North's share of mountainous terrain and its perceived role in providing water resources for the Central Region, it is also not surprising that the distribution of highly restrictive watershed

classification zones 1 and 2 are far higher in the north, and while data are not readily available, maps indicate that sub-regional distribution is similar to other forest lands, thus precluding consideration of any possibilities for significant 'land reform' areas in the upper north.

Table 1. Regional distribution of the PAS & associated indicators, 2009

	Chiang Mai	Upper North	Lower North	North Region	Northeast Region	Central & East Regions	South Region	Whole Kingdom
Forest Land Reserves								
sq.km.	19,541	68,469	43,406	111,875	55,333	34,889	28,183	230,281
% area	*97.2*	*79.8*	*51.8*	*65.9*	*32.8*	*33.6*	*39.9*	*44.9*
Protected Area System 2009	*43.7%*	*26.5%*	*31.2%*	*10.6%*	*21.4%*	***	*22.1%*	
established National Parks								
sq.km.	5,721	17,614	14,322	25,200	11,075	12,806	11,243	60,324
% area	*28.5*	*20.5*	*17.1*	*14.9*	*6.6*	*12.3*	***	*11.8*
to become new National Parks								
sq.km.	3,411	7,775	1,130	8,905	344	412	1,213	10,874
% area	*17.0*	*9.1*	*1.3*	*5.2*	*0.2*	*0.4*	***	*2.1*
established Wildlife Sanctuaries								
sq.km.	*na*	11,350	5,980	17,329	5,455	8,049	6,096	36,929
% area	*na*	*13.2*	*7.1*	*10.2*	*3.2*	*7.7*	*8.6*	*7.2*
other established protected areas **								
sq.km.	279	790	751	1,540	1,096	1,010	2,910	5,383
% area	*1.4*	*0.9*	*0.9*	*0.9*	*0.6*	*1.0*	*4.1*	*1.0*
Protected watershed zones								
Class 1 *% area*	*na*	*na*	*na*	33.0	7.9	17.0	16.8	18.1
Class 2 *% area*	*na*	*na*	*na*	15.1	2.9	6.7	11.3	8.3
Forest Cover								
2009 *sq.km.*	16,672	60,857	34,297	95,154	27,705	30,187	19,137	172,184
2009 *% area*	*82.9*	*70.9*	*40.9*	*56.1*	*16.4*	*29.1*	*27.1*	*33.6*
2005 *sq.km.*	15,385	57,299	32,082	89,381	25,335	28,614	17,671	161,001
2005 *% area*	*76.5*	*66.7*	*38.3*	*52.7*	*15.0*	*27.5*	*25.0*	*31.4*
Population Density 2009								
Persons / sq.km	*81*	*66*	*73*	*69*	*127*	*206*	*125*	*124*
Total 2009 GDP per capita								
US$ / person	$ 2,410	$ 2,063	$ 2,078	$ 2,071	$ 1,330	$ 8,021	$ 2,788	$ 3,940
Total Land Area								
sq.km.	20,107	85,852	83,792	169,644	168,854	103,901	70,715	513,115

*** Other areas include Forest Parks, Non-Hunting Areas, Arboretums, & Botanical Gardens*

**** Areas of established & new national parks in the South include marine parks with substantial non-terrestrial areas*

Sources: DNP & RFD data; National Park Office 2006

Despite all the public campaigns proclaiming environmental crisis that have been conducted by government agencies and environmental groups while PAS expansion has been quietly proceeding in a quite non-transparent manner, it is instructive to note that data from the Department of National Parks, Wildlife and Plant Conservation (DNP) itself show significant increases in forest cover in all regions of the Kingdom during 2005-2009, and especially in the upper north where forest cover now exceeds 70 percent of the land area, and in its Chiang Mai Province where well over 80 percent of

land is now covered by forest. State agencies may well claim that such increases in forest cover actually result from their successful (and righteous) campaigns to 'induce' changes in land use practices and patterns. The distribution of benefits and costs of these changes, however, as well as related political economy issues, are seldom mentioned and even taboo topics for state agencies.

Table 2. Regional & Chiang Mai shares of national resources & sectors, 2009

% of Kingdom total	Chiang Mai	Upper North	Lower North	North Region	North-east Region	Central & East Regions	South Region	Whole Kingdom
Percent Share of Kingdom's:								
People:	2.6	8.9	9.6	18.5	33.8	33.8	13.9	100
Land area:	3.9	16.7	16.3	33.1	32.9	20.2	13.8	100
Forest reserves:	*na*	*na*	*na*	48.6	24.0	15.2	12.2	100
Forest cover:	9.7	35.3	19.9	55.3	16.1	17.5	11.1	100
2009 PAS:	*na*	**32.7**	**13.5**	**46.2**	**15.7**	**19.4**	**18.7**	**100**
Parks – current:	*9.5*	*29.2*	*12.6*	*41.8*	*18.4*	*21.2*	*18.6*	*100*
Parks – in process:	*31.4*	*71.5*	*10.4*	*81.9*	*3.2*	*3.8*	*11.2*	*100*
Wildlife sanctuaries:	*na*	*30.7*	*16.2*	*46.9*	*14.8*	*21.8*	*16.5*	*100*
Other protected areas:	*4.3*	*12.0*	*11.4*	*23.5*	*16.7*	*15.4*	*44.4*	*100*
2009 Total GDP:	**1.5**	**4.6**	**5.0**	**9.5**	**11.5**	**69.2**	**9.8**	**100**
Agriculture GDP:	*2.2*	*7.8*	*13.0*	*20.9*	*21.5*	*26.8*	*30.8*	*100*
Manufacture GDP:	*0.5*	*2.7*	*2.2*	*4.8*	*5.2*	*86.3*	*3.7*	*100*
Trade GDP:	*1.6*	*4.5*	*5.3*	*9.9*	*16.4*	*66.4*	*7.4*	*100*
Real estate GDP:	*2.2*	*6.0*	*5.1*	*11.1*	*13.8*	*64.0*	*11.1*	*100*
Hotel-restaurant GDP:	*3.3*	*4.1*	*0.8*	*4.9*	*4.7*	*79.9*	*10.5*	*100*
Education GDP:	*3.0*	*9.2*	*9.2*	*18.4*	*33.1*	*33.9*	*14.6*	*100*

Source: DNP data & NESDB data

In order to help further clarify regional distributions within the Kingdom, Table 2 provides data on the percentage share of each of our nested regions of several key overall national attributes and values. These distributions help us understand why, for example, the central region is seen as by far the most urbanized, industrialized (including agriculture), developed, wealthy and thus powerful region of the Kingdom, while the South emphasizes high-value agriculture and tourism, and the Northeast has a high rural population with lower-value agriculture, significant trade, and relative poverty. It is also clearer why the North – and especially the upper north – is seen as relatively sparsely populated and home to forest, parks, wildlife, some tourism, and little else other than some agricultural crops not widely produced in other regions.

Since these distributions suggest some significant regional differences that might relate to different patterns of local livelihood opportunities, constraints, and comparative advantage, Table 3 shows the 16-sector economic structure of each of our nested regions according to the percentage share of each sector. Thus, it is clear that the current drivers of the very strong economic dominance of the central-east region are manufacturing and trade along with related services, while in the south agriculture and fishing combine with modest levels of manufacturing and trade to dwarf the highly-touted coastal tourism sector. The relative poverty of the Northeast is indeed associated with its reliance on low value agriculture, some manufacturing and trade; while the relatively high share of education may appear to suggest efforts to strengthen human resources that provide low-wage labor for industrial sectors in other regions, in reality it simply follows from the low values of other sectors

and close links between education and population levels (Table 2). Within the North, the lower north has a stronger economic emphasis on agriculture than the upper north where manufacturing and tourism have somewhat greater shares. Since manufacturing in the upper north has a strong focus on Lamphun province, however, the economy of Chiang Mai emphasizes a fairly balanced combination of modest levels of agriculture, trade, manufacturing and tourism.

Table 3. Structure of regional & Chiang Mai economies, 2009

% of region total	Chiang Mai	Upper North	Lower North	North Region	North-east Region	Central & East Regions	South Region	Whole Kingdom
2009 GPP/GRP:	*100*	*100*	*100*	*100*	*100*	*100*	*100*	*100*
Agriculture, forestry,	17	20	30	25	21	4	29	10
Fishing	0.3	0.5	0.5	0.5	0.5	0.7	8	1.3
Mining & quarrying	0.3	4	6	5	1	3	3	3
Manufacturing	12	20	15	17	15	42	13	34
Trade & repair	16	14	15	15	20	14	11	14
Financial services	5	4	3	4	4	4	3	4
Hotels & restaurants	11	4	1	2	2	6	5	5
Electricity, gas, water	2	2	1	2	2	4	3	3
Transport &communic	7	5	3	4	4	9	5	7
Real estate & renting	3	3	2	3	3	2	3	2
Construction	5	4	4	4	4	2	3	3
Government/defense	7	7	6	6	7	4	5	5
Health & social work	4	4	3	4	3	1	3	2
Education	9	9	8	8	13	2	7	4
Privatehh employees	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.1
Other services:	0.7	0.8	0.8	0.8	0.5	1.6	0.9	1.4

Source: NESDB data

Thus, when we consider readily available alternative livelihoods and forms of employment that might attract people – either adults or younger generations – located in areas where most lands have been declared part of the PAS and strong and increasing constraints are being imposed on agriculture and other traditional forms of land use, current economic opportunities within Chiang Mai Province do not appear to provide strong attractions beyond trade, handicrafts and tourism. And since most people in mountain areas being placed under protected status are members of ethnic minorities, access to new livelihoods may be further constrained by language, culture and prejudice.

2. Benefits, costs and funding of national park conservation programs

Benefits and beneficiaries

Establishment and expansion of the PAS is justified through articulation of the benefits these areas provide in terms of natural resources and environmental services, with emphasis on biodiversity, watershed functions, carbon stocks, and esthetic/social functions. Forest and environmental agencies and advocates argue that these benefits are important for local communities. And indeed, a recent study developed estimates of benefits to local communities from conservation at DINP that total US$ 1.27 million per year, based mainly on locally perceived increases in availability of water resources and non-timber forest products, along with increased skills, knowledge and improved sense of security that they will not be completely evictedfrom the area (Flaming et al, 2009).

But motivation and support for establishing, expanding and maintaining national parks and other components of the PAS is mainly based on widely perceived conservation benefits that accrue at river basin, national and global levels. The same recent study of benefits from conservation at DNIP estimated benefits valued at US$17.2 million accruing to the national level, as well as a conservative estimate of another US$1.12 million in benefits at the global level (Flaming et al, 2009). Moreover, supporters further argue that society benefits from national parks in many ways beyond ecological services, including recreational, educational and psychological benefits to both Thai and foreign visitors, and even foreign exchange earned from international visitors to protected areas and the multiplier effects they have on associated facilities and businesses.

Park and Agency Costs

There are also various types of costs associated with establishment, expansion and management of protected areas. The most publicized types of costs are those incurred by government park management agencies, which emphasize salaries, construction and operating expenses required to run their programs and activities. Titles of budget programs of the Department of National Parks, Wildlife and Plant Conservation (DNP) since it was split from the Royal Forest Department in 2002 to operate all conservation programs on PAS lands are shown in Table 4. While initial budgets put overwhelming emphasis on resource conservation and development, there were also much more modest supplementary budgets to support research and the development and promotion of tourism associated with the PAS. Minor programs then shifted to emphasis on biodiversity, as well as on people's participation in natural resource and environmental management, especially in areas where pre-existing communities had become classified as 'encroachers' living in illegal settlements located within or near expanding protected areas and were being blamed as the main cause of forest fires, soil erosion, destruction of forest and biodiversity, and watershed degradation. Budget allocations to specific national parks, however, are not available in the agency's published statistics documents.

Table 4: DNP overall government budget by programs, 2003-2009

millions of US$

DNP Budget Program	2009	2008	2007	2006	2005	2004	2003
Nat Res Conservation & Development						226	224
Balancing of Nat Res Utilization & Conservation	260	272	274	255	240		
Protect & Utilize Biodiversity			1	2	1		
Nat Res &Env Management with People's Participation				5	7		
Tourism Promotion &Development						8	6
Research						10	7

Note: US$ values all calculated using 2010 exchange rate

But since the 2006 military coup, minor programs have been eliminated and all budgets are now consolidated under the single program on 'balancing' natural resource utilization and conservation. This appears to be accompanied by a gradually shrinking overall budget with even less transparency in overall agency mandate, priorities, directions or programmatic resource allocations. Publicity campaigns, however, still emphasize the agency's role in defending protected areas against threats from encroachers, poachers, and impacts of local enclave and nearby communities, and in national parks improving facilities for visitors and reducing impacts such as pollution caused by both visitors and enclave villages.

Local Community Costs

While public relations programs of forest agencies and environmental NGOs seek public support to help mobilize funding support for park and agency management costs, there is much less public discussion of costs incurred by enclave and nearby communities, in terms both of direct costs they incur and of the livelihood opportunities that are foreclosed. Yet it is the often poor, rural communities living within and around PAS lands that typically incur much of the costs of conservation.

Indeed, the recent study of benefits and costs of conservation at DINP and neighboring areas developed estimates of DINP conservation costs incurred by local communities that total US$3.63 million per year, which is nearly three times the estimated value of benefits accruing to local communities (Flaming et al 2009). They found locally perceived costs to be largely associated with reduced access to land, timber and non-timber forest products, as well as with restrictions on development of infrastructure such as roads and electricity. They also perceive significant additional costs to be associated with increased conflict within and among communities, as well as decreased sense of security in conducting (or longer-term investing in) various types of livelihood activities.

Our own rapid assessment studies of villages in and near DINP indicate that while costs associated with conservation may be higher for enclave villages, they are also still quite significant for various buffer zone villages due to increasing levels of restrictions placed on their land use and livelihoods. Thus, enclave villages feel they are actually lucky to have better access to livelihood opportunities such as eco-tourism, crops under the Royal Project, and some jobs working for other institutions.

Our findings concur with conclusions by Flaming et al (2009) that clearer understanding of the political economy associated with distributions of various types and magnitudes of benefits and costs is essential for addressing complex relationships between conservation and poverty that are particularly relevant in light of the existing national political climate, as well as conservation policies and future plans to continue expanding the protected area system, especially in the upper north.

Funding mechanisms to meet PAS costs in National Parks

The costs of managing DINP and other national parks are met through the government's centralbudget, as well as by fees paid by park visitors (Figure 5). Neither source, however, is seen as able to provide sufficient resources to dealwith the costs and problems faced by national parks.

Despite government rhetorical support for environmental programs, central budget allocations for managing the PAS appear quite limited in their ability to compete with budget allocations to other government policy priorities, such education, public health or the military. Thus, DNP budgets have been stable or slowly shrinking, and dominated by staff costs and investments in system expansion, with less than 20 percent of funds available for overall operating costs (Table 5) of the more than 100 and still increasing parks providing more services for growing numbers of visitors.DINP officials, like colleagues at other parks, see this as a major constraint on efficient park management.

Park entrance fees appear to have some potential for directly contributing funds to help meet management costs (Table 5). Currently the fees are channeled into the Thai government's general funds (Figure 5). In order to help compensate for some of the costs incurred by local communities, relevant local Tambon (sub-district) Administration Offices (TAO) are authorized to receive an

aggregate share of 5 percent out of the total fees received by the park to support community activities and environmental maintenance services. Funds from DINP revenues actually received by local TAO during recent years appear to be considerably less (Table 6), however, which suggests the government may be accounting for some other budget appropriations from these funds.

Figure 5: Basic revenue & budget channels for activities in DINP

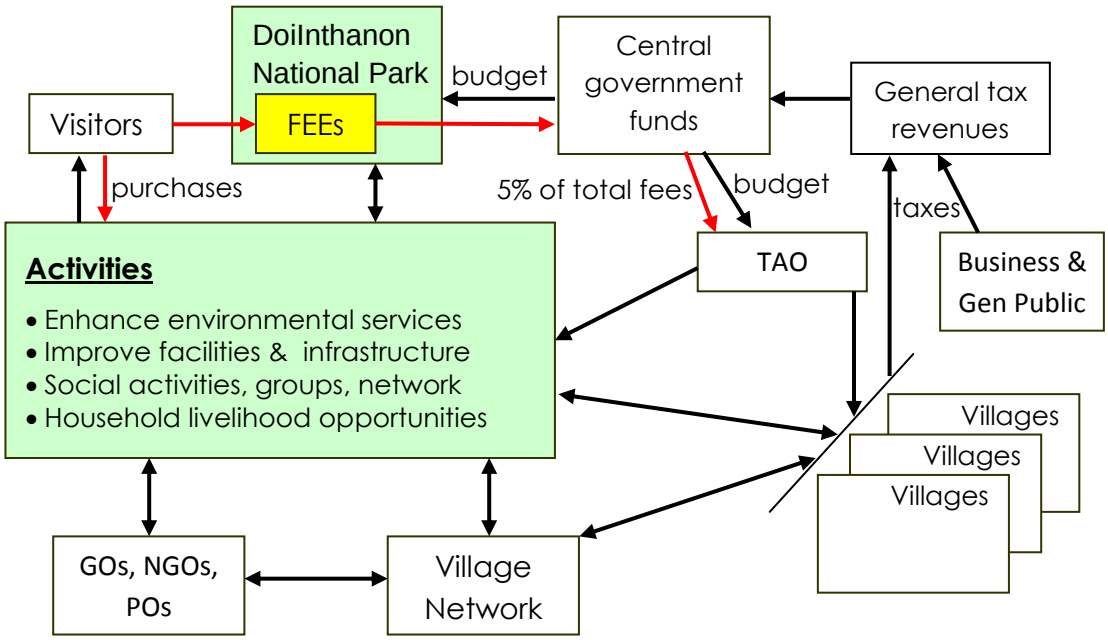


Table 5: DNP's overall state budget for PAS management by expense category, 2003-2009

	Nat Park Revenue *million US$*	DNP Budget *million US$*	Percent Share of Total Budget					
			Permanent Salaries	Wages & labor	Operating costs	Invest in Facilities	Subsidies	Other
2009	14.2	260	22%	32%	17%	20%	0.3%	9.2%
2008	16.0	272	24%	31%	18%	23%	0.2%	4.7%
2007	14.6	276	24%	30%	15%	26%	0.2%	5.5%
2006	11.4	257	24%	33%	14%	30%	0.4%	0.8%
2005	10.3	248	28%	28%	14%	30%	0.1%	0.4%
2004	12.1	244	28%	27%	14%	30%	0.1%	1.2%
2003	10.1	237	28%	26%	13%	30%	0.1%	2.2%

Note: US$ values all calculated using 2010 exchange rate *Source: DNP data*

Table 6. Central government allocations of revenues from DINP to local TAOs, 2007-2010

year	Total Funds for TAOs	% prev year park revenue	Major local TAOs			Minor local TAOs		
			no.	annual rate	sub-total	no.	annual rate	sub-total
2010	$ 11,579	1.59%	2	$ 5,150	$ 10,299	3	$ 427	$ 1,280
2009	$ 16,413	1.68%	2	$ 7,566	$ 15,133	3	$ 427	$ 1,280
2008	$ 17,076	1.61%	2	$ 7,898	$ 15,795	3	$ 427	$ 1,280
2007	$ 12,859	1.77%	2	$ 5,789	$ 11,579	3	$ 427	$ 1,280

Source: Local TAO staff

While annual budget allocations to local sub-districts may appear very small, past revenues from entrance fees were extremely low when, for example, in 1998 parks typically chargedonly 5 Baht per person. Revenues then began increasing after a two-tiered entrance fee system began charging foreigners 200 Baht per person, while locals paid 20 Baht (Table 7). After the 2006 military coup rates were doubled to a 400/40 Baht fee structure during 2007-08, but then returned to the 200/20 rate in 2009, as reflected in visitor and revenue data. The foreign visitors whose inflated fee payments raise average revenue rates per person are still primarily of European-derived ethnicities (Table 8). Recent visitor rates have also been affected both by the world economy and by political conflicts within the Kingdom.

Table 7. DINP Park Visitors and Park Revenues, 2000-2010

Fiscal Year*	Park Visitors		Revenue *(US$)*		Portion from fees collected for				Portion from Donations
	number	% foreign	per visitor	Total	Entrance	Lodging	Services	Penalties	
2010*		11.5%		$ 755,881	97%	2.4%	0.12%	0.01%	0.06%
2009	440,232	10.5%	$ 1.65	$ 726,863	97%	2.7%	0.05%	0.03%	0.08%
2008	364,216	13.4%	$ 2.69	$ 978,343	96%	4.3%	0.12%	0.01%	0.04%
2007	504,404		$ 2.11	$ 1,062,886					
2006	433,843		$ 1.67	$ 726,084					
2005	492,950		$ 1.46	$ 720,075					
2004	479,890		$ 1.43	$ 688,466					
2003	383,806	7.3%	$ 1.60	$ 613,091					
2002	472,730	5.5%	$ 1.23	$ 583,245					
2001	524,028	4.9%	$ 0.83	$ 437,549					
2000	662,586	8.6%	$ 0.51	$ 340,824					

**Fiscal year is from October 1 of previous year through September 30 Note: US$ values all calculated using 2010 exchange rate*
Sources: DoiInthanon National Park Office (2008-2010) ; DNP data (2000-2007)

Table 8: Numbers and sources of recent visitors in DoiInthanon National Park

Year	Total Visitors	Thai	Other Asian	European-American	Middle-East
2010*	179,697	88.5%	0.8%	10.7%	0%
2009	431,145	89.5%	0.9%	8.8%	0.8%
2008	388,222	86.6%	0.5%	11.0%	1.9%

**Data for 2010 is for the period of January-June only Source: DoiInthanon National Park Office*

Another strategy for mobilizing additional funds for national park management focuses on soliciting donations from park visitors. One study indicated that more than 80 percent of tourists visiting DINP said they would be willing to contribute to conservation efforts at DoiInthanon (Jak 2000). There appear to be numerous tourists who claim they would have made a donation if they only knew where and how to so. But other tourists were skeptical that their donations would be used efficiently and expressed concerns about the potential for corruption. It is interesting to note in Table 7 that while the value of donations is now relatively very small, it is substantially more than penalties received from enforcing park regulations.

Table 9. Visitor & revenue levels at sample national parks in Thailand's PAS

		Park Visitor revenue rate			Park Visitor area intensity			Park Revenue area intensity		
	area	*US$ / person*			*persons / hectare*			*US$ / hectare*		
Region & sample national parks	*sq km*	2005	2007	2009	2005	2007	2009	2005	2007	2009
Upper North Region sample overall	**4,457**	**0.53**	**0.81**	**1.15**	**6.5**	**5.6**	**3.9**	**3.48**	**4.51**	**4.55**
DoiInthanon NP	**482**	**1.46**	**2.11**	**1.65**	**10.2**	**10.5**	**9.1**	**14.94**	**22.05**	**15.08**
DoiSuthep-Pui NP	261	0.17	0.19	0.37	74.9	59.9	26.9	12.37	11.34	9.84
Huai Nam Dang NP	1,252	1.05	1.74	1.73	1.4	1.3	2.4	1.45	2.19	4.13
DoiFahhompok NP	524	0.72	1.36	0.97	2.1	1.5	2.5	1.51	2.02	2.42
Chae Son NP	768	1.57	1.80	2.54	1.8	1.8	1.5	2.81	3.17	3.71
DoiLuang NP	1,169	0.70	0.68	0.43	0.4	0.3	0.6	0.28	0.23	0.27
Lower North Region sample overall	**3,039**	**1.07**	**1.80**	**1.39**	**1.4**	**0.9**	**1.4**	**1.45**	**1.62**	**1.96**
KhlongLan NP	300	0.69	1.67	1.02	6.2	3.2	6.0	4.26	5.33	6.08
PhuHinRongKla NP	307	1.70	2.92	2.79	3.2	2.3	3.0	5.42	6.75	8.25
ThungSalaengLuang NP	1,262	1.40	1.43	1.56	0.6	0.5	0.6	0.90	0.77	1.01
DoiLuang NP	1,169	0.70	0.68	0.43	0.4	0.3	0.6	0.28	0.23	0.27
Northeast Region sample overall	**3,105**	**1.49**	**2.00**	**2.41**	**4.6**	**4.3**	**3.7**	**6.88**	**8.53**	**9.02**
KhaoYai NP	2,166	1.56	2.07	2.58	4.0	4.0	3.5	6.29	8.34	8.94
PhaTaem NP	340	0.59	1.23	1.06	6.7	4.9	6.0	3.93	6.03	6.43
PhuRuea NP	121	1.21	2.05	1.90	9.5	6.8	10.3	11.52	13.97	19.58
PhuKradueng NP	348	4.64	4.86	5.79	2.3	1.8	2.0	10.65	8.91	11.58
KhaoPhraWihan NP	130	0.91	1.11	0.47	11.0	11.0	0.8	10.07	12.23	0.38
Central+East Regions sample overall	**4,380**	**1.11**	**2.17**	**1.46**	**4.0**	**3.1**	**3.6**	**4.50**	**6.66**	**5.27**
NamtokPhlio NP	135	0.69	1.41	1.01	33.9	30.0	35.6	23.42	42.39	36.03
Erawan NP	550	1.54	2.86	1.86	7.1	5.9	7.3	10.90	16.98	13.52
KhaoLaemYa-MuKoSamet NP	131	1.05	2.17	1.66	41.3	28.2	22.2	43.41	61.16	36.97
Mu Ko Chang NP	650	1.08	1.90	1.11	3.5	1.9	3.9	3.72	3.70	4.28
KaengKrachan NP	2,915	1.57	3.18	1.95	0.5	0.4	0.6	0.84	1.27	1.09
South Region sample overall	**1,381**	**2.02**	**3.07**	**2.22**	**3.9**	**3.9**	**3.9**	**7.86**	**11.90**	**8.74**
AoPhang-nga NP	400	2.71	4.57	3.46	4.0	4.8	4.5	10.74	21.87	15.46
Than Bok Khorani NP	104	1.06	2.17	1.58	3.2	8.7	10.0	3.36	18.84	15.83
KhaoLuang NP	570	0.60	1.27	0.89	3.0	1.6	1.6	1.84	1.98	1.47
Nam Tok Yong NP	205	0.55	0.59	0.40	4.4	3.7	4.2	2.44	2.20	1.70
Mu KoAng Thong NP	102	5.71	4.72	3.84	8.0	8.6	7.8	45.68	40.60	29.97
Overall sample of 25 NP's	16,361	1.02	1.63	1.63	4.3	3.6	3.3	4.39	5.93	5.46
All Thailand NP's aggregated	60,324	0.77	1.20	1.26	2.2	2.0	1.9	1.71	2.43	2.35

Source: DNP 2009

How visitor and revenue levels at DINP compare with those of other parks is indicated by data in Table 9 from a substantial sample of national parks in Thailand's PAS. This cross-regional sample of 25 quite well-known national parks for which disaggregated data on tourism and revenue levels for 2005-2009 are readily available covers a total of just over one-fourth of the area of all land under national park status (including areas still in the process of final demarcation).But parks in our sample also account for nearly one-half of all national park visitors and about two-thirds of total national park revenues. Average visitor and revenue levels for the entire national park system, as well as for sample parks at regional and overall levels, are shown for comparison.

While there is clearly great diversity among parks and market responses to the various services and facilities they provide, entrance fees bear no relation to the services andfacilities available at a specific national park, or to the level of demand for those services and facilities. Some are concerned that increasing total national park revenues associated with higher entrance fees and greater shares kept to support operations at the park where revenues are generated may tempt some government

leaders to push for further rapid expansion of the national park system. If this happens,their main fear is that excessive amounts of funding may eventually be generated for conservation at a few very popular and often smaller national parks, while less funding would be available for less popular but more ecologically important sites. Although more constructive and sophisticated approaches to determining, setting and managing entrance fees for national parks have been proposed (Adis 1998, 2001), only minor applications of some aspects of such principles appear to have been attempted.

3. PES[1]-like concepts at DoiInathanon National Park (DINP)

There is a degree of awareness among staff from ministry (MoNRE) to forest department (DNP) to national park (DINP) levels regarding growing international discussion and debate about approaches and systems to provide payments or rewards for local communities, households, or other stakeholders who supply natural resource stewardship that helps maintain or even enhance the quantity and/or quality (and thus value) of environmental services those resources provide. Growing ministry to national park office interest in 'PES-like' mechanisms appears related to various factors, such as: (a) perceived needs for new terminology to help attract more sources of funds; (b) some feelings (but not open discussions or admissions) of guilt about how local and especially mountain ethnic minority communities have been treated since the state decided to appropriate lands where they live without recognition or compensation; (c) perceived needs to reduce park management costs by mobilizing assistance by local communities; (d) fear of local resistance or even political unrest resulting from perceived injustices and inequities; (e) recognition that efficient and effective management cannot be achieved without more equitable and participatory processes involving local communities and stakeholders. In any event, this range of motivating factors are resulting in growing acceptance of needs to join international trends toward providing payment, reward, compensation, co-investment, or other forms of incentives to local communities in return for their active participation in natural resource stewardship (van Noordwijk&Leimona 2010; Milder et al 2010; Swallow et al 2009; Neef& Thomas 2009).

How these concepts are interpreted and applied so far, however, tends to vary somewhat from international literature and experience. As Flaming et al (2009) have pointed out, DINP is an example of a highly state-managed national park – in contrast to neighboring Ob Luang National Park, which uses a more co-management type of approach – that has relatively high revenues from tourists (visitors), as indicated in Table 9. Thus, it should not be too surprising when "PES-like" concepts used by park officials (as outlined in Figure 6) have these types of orientations and concerns reflected in key elements of their approach. For example:

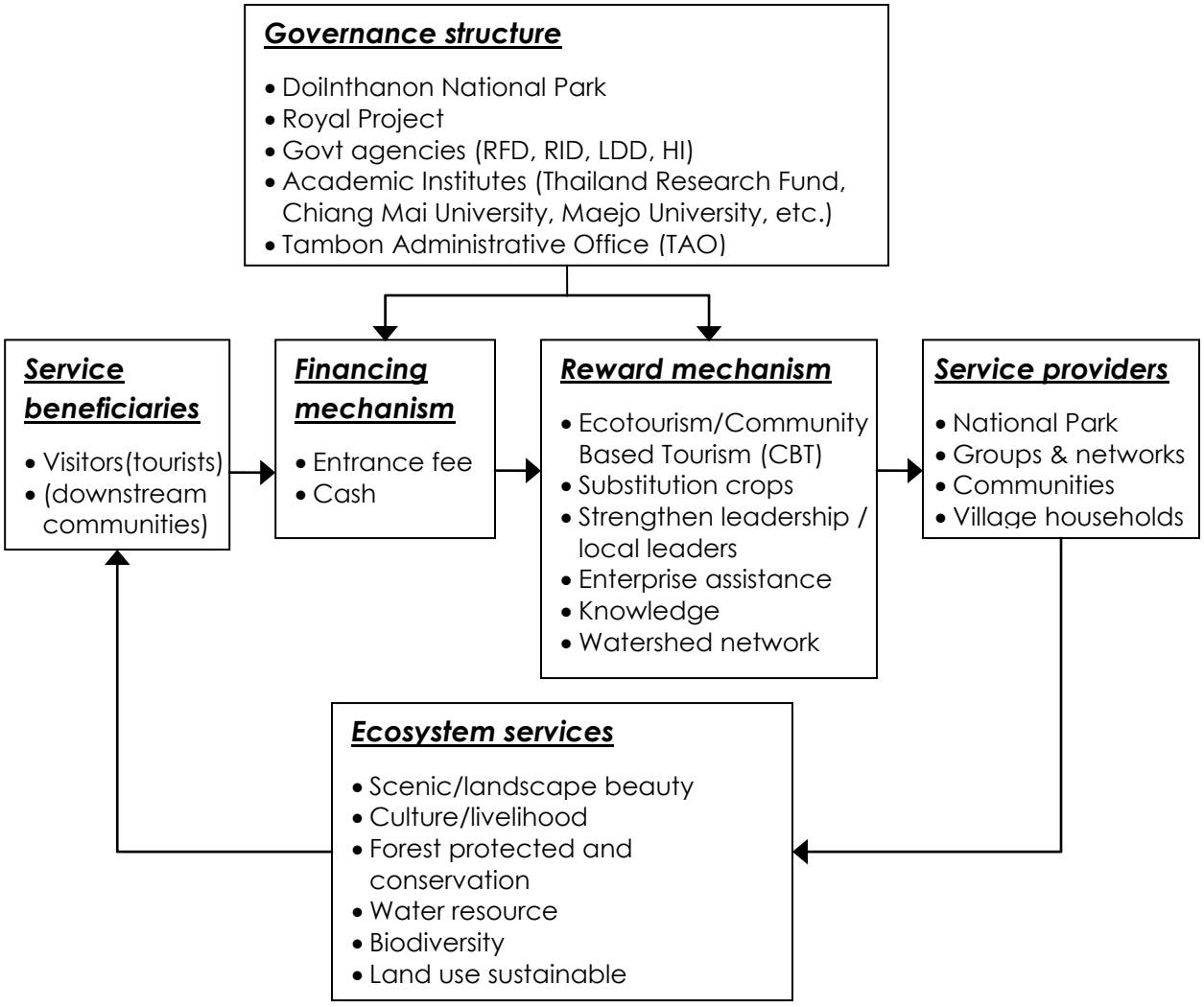
Governance structures

As state management systems tend to be quite rigidly bureaucratic with emphasis on upward rather than downward accountability, governance of arrangements related to rewards for environmental services tends to be dominated by officials and experts closely linked to the state. Since DINP Office leadership has responsibility for all activities in the park, for which they must be answerable to their superior officers in Bangkok, they maintain paramount authority and control over any PES-like activities. There is, however, a substantial history of park-approved activities and projects aimed at helping upland poor in enclave villages to improve their farming and land conservation practices, conducted by the Royal Project, by other government agencies likethe Royal Forest Department,

[1] PES = payment for environmental services

Royal Irrigation Department, Highland Institute, and Land Development Department, as well as by state-linked institutionslike universities and the Thailand Research Fund.Thus, PES-like governance structures are seen as focusing on top-down leadership by these actors, with some participation by local government as represented by TAOs, which tend to be brought in to meet various state regulation requirements, as a means of helping assure cooperation by local leaders, or because they can help provide pressure from communities outside the park to induce enclave communities to follow 'recommendations' by state agencies and their experts. Given state bureaucratic structures, regulations, and incentives, including approved sources of expert opinions, current notions of PES-like mechanisms and activities need to operate under arrangements with this type of orientation.

Figure 6: PES-like rewards for environmental services as perceived by DINP Office



Benefits and beneficiaries of ecosystem services

A substantial amount of both academic and especially grey literature is emerging that seeks to articulate the huge benefits to humanity and future generations of conservation in general, as well as for Thailand and even DINP in particular. While this makes substantial contributions to increasing environmental awareness and motivation, it is of only limited relevance for PES-like mechanisms. Thus, the study by Flaming et al (2009), despite its limitations, has made significant contributions to

movement toward the type of analyses needed to help clarify the still muddled understanding of benefits and beneficiaries. First, study estimates indicate conservation benefits of DINP accruing to national to global levels are many times greater than benefits to local communities. Yet beneficiaries from larger river basin (Thomas 2005, 2006) up to national levels appear to be excluded from any explicit consideration in current discussion of any PES-like mechanisms at DINP. It could be argued, however, that national benefits and beneficiaries are included to the extent that PES-like rewards are financed from general tax revenues, either through agency budgets or through subsidies to Royal projects or institutions like the Thailand Research Fund.

A second important contribution of the Flaming et al study is its use of estimates to quantify the magnitude of perceived local benefits from DINP conservation programs, as well as the magnitude of perceived costs incurred by local communities. This provides a basis for quantification of three key relationships: (1) local costs are far greater than local benefits in the eyes of local communities; (2) a major portion of local benefits is in the form of perceived improvement in water resources that accrue primarily to lowland ethnic northern Thai villages; and (3) most of the perceived local costs accrue to upland ethnic minority villages and households. Moreover, as the study admits, perceived lowland water resource benefits are likely to be substantially inflated by half-truths and myths (Walker 2002, 2004) that have been major factors in the barrage of 'educational' campaigns to which lowland communities in the Chomthong area have been subjected for about two decades. As these campaigns have received various endorsements from senior figures in Thai society, and have been accompanied by at times very confrontational actions and demands for relocation of all minority villages out from DINP, it is quite credible that they would perceive substantial benefits from DINP conservation programs. The degree to which these benefits are biophysical or psychological or political, however, is another question.

As a reflection of the lack of clarity and/or other options, however, current PES-like concepts focus their notions of 'beneficiaries of environmental services provided by the park' almost exclusively on 'tourists' who are park visitors willing to pay for these benefits through entrance fees and other fees for park services, as well as for goods and services related to ecotourism provided by the park and local communities.

Service providers

Given their position of state-assigned authority, DINP leadership sees the park as the main provider of environmental services, with supporting roles played by relevant groups and networks, local communities and village households. And since only the National Park has legally recognized rights to use or manage any natural resources within DINP boundaries, this approach is a legal necessity. Group or individual business ventures within the park require formal or informal approval or endorsement by the park, and some operate on a concession basis. Although some payments are received by local sub-district governments (TAO) from DINP tourist (visitor) revenues through their state budgets, these local TAO are not seen as direct providers of any services.

Reward mechanisms

Current ideas view PES-like rewards as complex and interdependent, which is at least partially due to confusion and lack of clarity about what is being provided as a reward and to whom and for what. As indicated in Figure 6, PES-like reward mechanisms basically appear to be outputs of projects that are designed and initiated by the park, either on its own or in collaboration with other royal authorities, state agencies, research or academic institutions, or other state-approved independent

organizations, sometimes with a role for local government, networks or groups. Moreover, it is often difficult to discern any ways in which these 'mechanisms' differ from projects being implemented prior to use of 'PES concepts'. Specific examples of these types of rewards are shown in Table 10.

Table 10: Project activities seen as "rewards" for local communities

Project / Activity	*Support operation agency*	*"Rewards"*
A. Direct benefits from access or livelihood opportunity *(real impacts on income & returns to labor?)*		
Development of infrastructure: roads, irrigation system, and electricity supply	Royal Irrigation Department, Tambon Administrative Office, Land Development Department	improved access to transportation, water, and energy
Coffee production	Royal Project	potential income from agriculture livelihood opportunity
Organic vegetable project	Royal project, Mae Klang Watershed Management Unit, and Inthanon National Park Office	potential improved income and food supply from agriculture livelihood opportunities
Rainbow Trout Fish Project	Fisheries Department	potential income from aquaculture livelihood opportunity
Training Local Guide	DoiInthanon National Park Office	improved skills for potential ecotourism livelihood opportunities
B. Potential benefits from awareness, concepts, ideas, knowledge*(education cum indoctrination?)*		
Exchange of knowledge - a study visit in the community and outside communities	Thailand Research Fund	Acquisition of knowledge to help develop their own village
Ecotourism or Community Based Tourism (CBT)	Thailand Research Fund, DoiInthanon National Park Office	Village enterprise based on conserving natural resources, traditional culture, and livelihoods
Environment and Natural Resources Youth Camp	DoiInthanon National Park Office	Camping experience, ideas & knowledge for youth & their role in conserving soil, water, forest ecology, wildlife, & environment
C. Indirect benefit from environmental context& less conflict *(+cost-sharing or labor compensation?)*		
Forest Restoration Project	DoiInthanon National Park Office, Royal Project, Upper Mae Klang Watershed Network, and Mae Klang Watershed Management Unit	Increasing forest area and biodiversity (any cost-sharing or labor compensation?)
Fire buffer zone	DoiInthanon National Park Office, Upper Mae Klang Watershed Network, and Mae Klang Watershed Management Unit	Forest protected from fire (any cost sharing or labor compensation?)
NRM & environment activities: fire buffer zone, aquatic conservation area, cleaning village, improving water ecosystem (dam, tank, etc.)	Upper Mae Klang Watershed Network under Mae Klang Watershed Management Unit, Royal project, DoiInthanon National Park Office	Conserved and improved water & watershed "ecosystem" (any cost-sharing or labor compensation?)
Land development projects	Land Development Department	Sustainable land use promotion (?)

Source: field survey, October, 2010

The table arranges these rewards into three broader groups. The first group includes projects that seek to improve infrastructure providing access to transportation, water or energy, or that seek to provide specific livelihood activities that can increase household incomes and/or returns to labor.

The degree to which these project outputs will actually be seen as rewards depends, of course, on the success of these activities in actually increasing incomes and improving livelihoods. The second group of projects claims to provide rewards that are somewhat more general, unclear and uncertain, by focusing on increasing more generic types of knowledge; examples are exchange of knowledge with (selected) communities elsewhere, information on community-based or eco-tourism, or a youth camp that might be seen as fun and interesting or as indoctrination, depending on content, attitudes and processes. The third group claims to provide benefits that are even more indirect by saying that the rewards are providing precisely the kinds of environmental services from which river basins and broader levels of society have been found to benefit far more than local communities. Given the supporting agencies involved with this third group, however, it appears that these are projects specifically aimed at meeting the demands of primarily lowland northern Thai communities of the lower Mae Klang in the Chomthong area. It is thus unclear how such projects provide rewards for upland communities (other than reduced intimidation) unless upland communities receive some type of labor compensation or at least cost-sharing (co-investment?) from project sources.

As these examples indicate, PES-like rewards are not based on clear rights or tenure, so that even decreased intimidation or threat of eviction can be seen as a reward of increased sense of security. Moreover, other than the funds going to local governments (TAO), there appear to be no direct payments other than perhaps as hired labor under a project. Thus, the main rewardsavailable for local people living in this protected area are non-monetary, in forms such as outputs of these types of projects. Given this situation, it is quite interesting that current rewards seen by villagers as most attractive are the activities related to ecotourism conducted by other agencies both in and out of the national park, and especially those supported by the Thailand Research Fund (TRF).

It is also important to note that there is no long-term or ongoing commitment to continue providing any of these rewards, so the element of conditionality is basically absent. The only exception might be the current payments being made to TAO through the central government budget. Although these funds appear to have no conditionality or clear restrictions, it could be argued that there is an implicit market-based conditionality because it is calculated as a percentage of park revenues. But as recent events indicate, park revenues can drop due to political or other unrelated events. And given the low amounts actually paid to TAO, this linkage is probably not very strong. Indeed, some would say these payments are more like either 'guilt money' for how local communities have been treated, or 'bribe money' to help assure cooperation from or at least minimum conflict with local communities. But since actual amounts paid are so small, they are of little significance either way. Moreover, even if conditionality was seen as important and desirable, measurement and monitoring of environmental services appears to usually be half-hearted, incomplete, biased or absent.

Financing mechanisms

Mechanisms to finance PES-like arrangements at DINP are currently seen to focus on park fees (mostly entrance fees – Table 7) paid by visitors (now called tourists), as well as their cash purchases of goods (food, souvenirs, etc.) and services, particularly those associated with eco-tourism.

While national level (taxpaying) beneficiaries appear to be excluded from analyses, consideration of state budgets that are seen to be used by and for state agency-directed programs are based on justifications of project outputs that are being portrayed as rewards (as in Table 10). Although there were efforts during recent years to develop river basin and sub-basin organizations with potential for providing a forum and mechanisms for natural resource management on broader scales (Thomas

2005, 2006), bottom-up participatory approaches to river basin management were ended after the 2006 military coup. Given the current political context, other financing options are not apparent.

4. Ecotourism at Doi Inthanon

Tourism has been a significant aspect of DoiInthanon National Park since its inception. The vast majority of tourists at DINP are Thai visitors (Table 8) who come to enjoy the scenery, relax with friends, and most make a pilgrimage to the summit of Mount DoiInthanon, which has spiritual significance associated with its being the highest peak in the country. The mountain also has historical symbolic significance as it was renamed after the last King of the Chiang Mai portion of the by then waning remains of the Lanna Kingdom from 1870 until his death in 1897, five years after his domain was formally annexed by the Siamese Kingdom and one year after Siam established its Royal Forest Department to manage revenues from teak logging concessions in the north. His ashes are located near the summit of the mountain, as are the two large and much more recent NapamaytanidolChedi (Thai pagodas) built by the military in honor of the 60th birthdays of the current Thai monarchs HM the King and HM the Queen, respectively. The summit also has a visitor center and nature trails, as well as a military radar station that is off-limits to the public. Given the central significance of its mountain peak, DINP is often referred to as "The rooftop of Thailand".

In addition to pilgrimages to the mountain peak with its monuments and cloud forests, many visitors go to one or more of several wild and quite dramatic waterfalls in the park. Moreover there is a growing number of both international and Thai visitors who come to the park to view and experience aspects of the impressive biodiversity that can be found in the park, which is particularly well known for its bird and plant diversity. Various short and long-term ecological studies and research projects are usually underway as well, although it has become much more difficult to obtain permission for research activities during recent years, especially for studies involving foreigners.

Local communities that became enclave villages within DINP when it was established in the 1970's have found themselves increasingly embedded and enmeshed in the growing and evolving dimensions of tourism at DINP. These villages were initially targeted by programs and projects launched in the name of opium crop replacement, but which also sought to end traditional forest fallow rotational forms of shifting cultivation practiced by ethnic Karen villages in the area. Some of the replacement crops that appeared successful during early years of this program suffered when their export markets were captured by competitors at more advantaged locations, while production of other promising crops could not be expanded to meet critical minimum scales of production due to land use restrictions imposed by the state. Numerous households have been able to produce specialty crops for the Royal Project that markets its products at upscale stores and shopping centers in major urban areas and airports, as well as directly to upscale hotels and restaurants. The Royal Project's research and development center located in DINP near the park headquarters and a major set of enclave villages, has emphasized maximum intensity and minimum land use as evidenced by the numerous plastic greenhouses, as well as breeding and tissue culture propagation of ornamentals, and now growing low-chemical or organic vegetables. During recent years downstream communities near DINP, especially in the Mae Klang watershed, have been expanding their irrigated orchards and increasing their demand for irrigation water from streams that flow out of DINP. This has led to politicized serious confrontations demanding relocation of ethnic minority villages out from the boundaries of DINP, as well as various activities under the third set of projects listed in Table 10.

Local enclave communities also experienced improved access to outside society through roads, education and public health services, which has also helped them understand how minimal their access is to some types of infrastructure and services relative to other places. At the same time, improved roads brought increasing numbers of visitors and tourists into areas where they live. Although many lowland Thai have long looked down on mountain ethnic minorities with considerable disdain, they also gradually became aware of the fascination that many international tourists found in many of the interesting and colorful aspects of the culture and traditional livelihoods of many of minority communities. Indeed, mountain minorities became a major factor in attracting international tourists to northern Thailand. This led to some very blatant forms of exploitation of minorities in some areas that international visitors began to find distasteful, but during more recent years minorities have obtained more recognition and basic rights, and have begun to be treated with somewhat more dignity. This is beginning to open a new set of tourism activity opportunities that can complement natural diversity by providing a focus on cultural diversity (Figure 7) through real engagement with members of local communities rather than simply treating them as objects for amusement or entertainment (also known as the 'human zoo' approach).

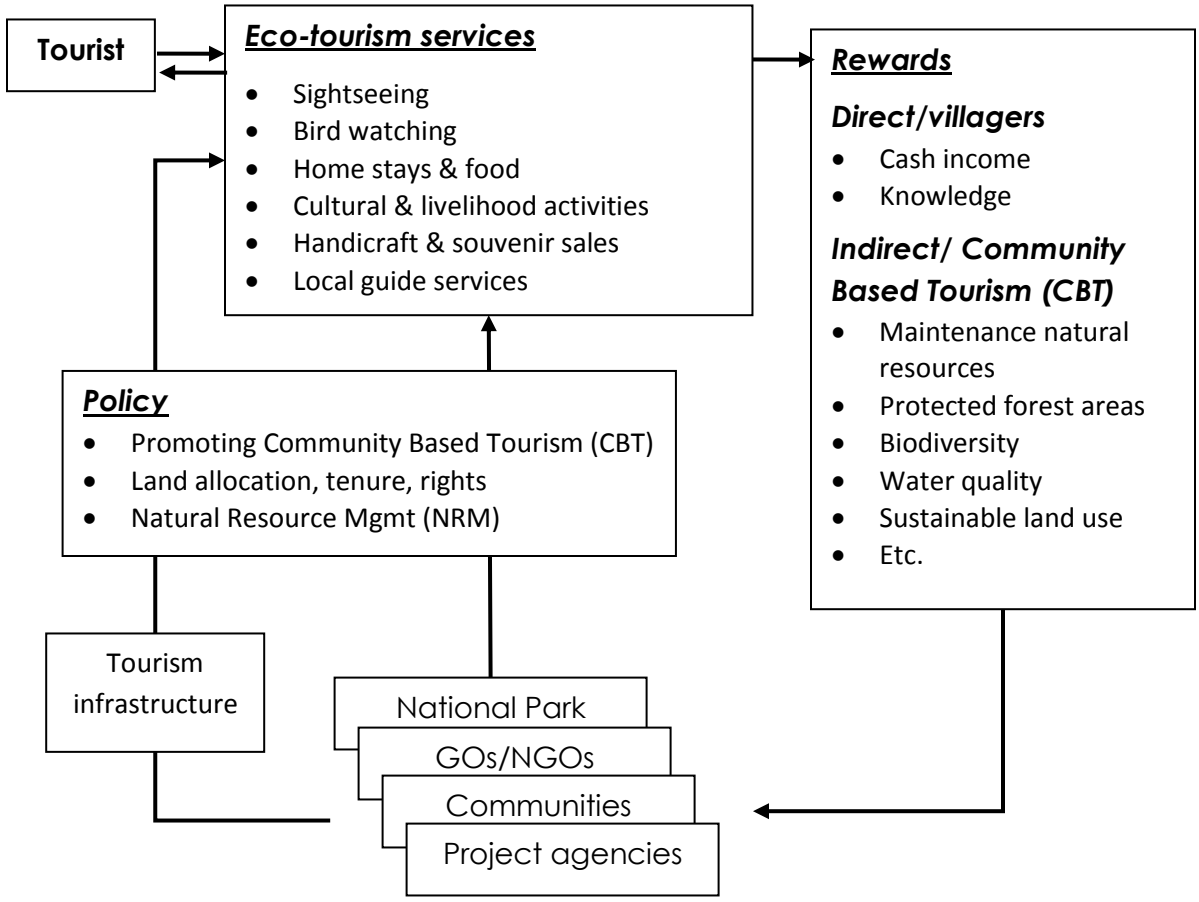
Figure 7: Natural and cultural diversity in Doi Inthanon National Park

To their credit, forest conservation agency (DNP) officials assigned to leadership positions at DoiInthanon National Park (DINP) have been actively engaged in discussions and development of ideas about how further development of eco-tourism might help address several key issues and problems in the park. As a result, DINP has been able to become an important pilot case study for

promotion of eco-tourism (or *"Thong TiowChueangNiwet"* in Thai)as a means to strengthen the national park's conservation programs and activities. Promotion includes officially-endorsed cooperation and a clear policy directive from DINP that allows enclave villagers inside the park to share benefits and pursue innovations in the use of environmental services.

Park officials and associated experts and specialists from other institutions claim they want to allow local villagers to lead these efforts, and to provide cooperation based on mutual understanding. Park officers are offering to train and educate local villagers who are interested in providing tour guidance for visitors. They hope this approach will contribute to more success because local villagers can benefit from tourism, which reduces conflicts with park officials regarding illegal forest usage such as wildlife hunting. It should also bring more awareness and cooperation from local villagers regarding protection of natural resources in the park, and decrease livelihood dependence on agriculture, which may help to reduce conflict with downstream communities outside the park.

Figure 8: DINP perceptions of PES-like aspects of ecotourism



One dimension of how this pilot case study is being conceived and promoted within the context of DNP, the ministry and the environmental conservation community is based on perceptions that it is a PES-like reward for local communities who collaborate in protecting and managing natural resources in the national park. They argue this will help expand ecologically-based tourism while also promoting culturally-based tourism. A preliminary notion of their approach is outlined in Figure 8, which also helps identify some of the ambiguities in perception of what a PES-like approach entails.

DINP park staff say they see eco-tourism as based on four key components: protected areas, local people, appropriate infrastructure, and tourists. These components are all more or less included in Figure 8. Both services and infrastructure associated with eco-tourism must be conducted through policies declared by the national park, which is a legal reality. The various actors involved in providing the services and infrastructure, however, are grouped together at the bottom with no clear indication of relationships among them. Moreover, the direct rewards going to villagers include cash income from providing services, as well as knowledge. But does the knowledge come from training by park officers and experts? If so, is that paid from income from tourists, either from park fee revenues or from some share of other income from services provided to tourists? Or would it come from the park's central budget? The same kind of questions would apply to financing of tourism infrastructure. But it is the indirect rewards that may appear particularly unclear, since these are basically the same as the overall benefits perceived as justifying the establishment of national parks – and it has already become apparent that these benefits primarily accrue to wider levels than local communities. While it might be useful to argue that maintenance or even improvement in ecological conditions would assure or improve the marketability of eco-tourism in the park, it does not appear to be particularly useful to view this as a 'reward' or form of compensation to local communities.

Perhaps it might be more useful to view eco-tourism as more of a distinct market-based enterprise, where tourists are willing to pay (or not) an amount appropriate for the satisfaction they receive from the environmental and cultural experience they have at the park. This amount may be split among an overall entrance fee, and various optional costs of activities, accommodations, food, etc. The ability of this enterprise to remain viable and provide reasonable livelihoods for those involved with the system will depend on the quality (and perhaps quantity) of the experiences provided for tourists relative to what gives them a sense of satisfaction, as well as perceptions of equity in how benefits and costs are allocated among those working in the system.

Since the quality of the environmental experience that the tourist will be paying for is presumably linked with maintenance of natural resources, forest area, biodiversity, water, etc, then if these are allowed to become degraded tourists will no longer be willing to come and pay for the experience. Thus, conditionality is finally introduced into the system, but through a real market mechanism rather than a government agency payment in cash or kind. And at the same time, if the enterprise is unable to provide a reasonable livelihood for those engaged in its operation and maintenance, then it will no longer be viable and conditions will return to the kinds of conflict and inequity we have now.

If seen from this point of view, then it might be possible to articulate more systematically the current and potential roles of various actors and stakeholders in the system. For example, the state acting through the national park office might see themselves as a co-investor in building appropriate physical infrastructure as well as human resources required by the system, especially during its establishment phase. It might also help provide (perhaps in association with appropriate outside experts) monitoring services to help assure environmental legal standards are being met, and perhaps even certify achievement and maintenance of higher environmental and socio-cultural standards that might help attract high quality tourists. There might even be activities or areas where a phased approach could be planned, such as where food or souvenir shops that are currently operated by relatives or close associates of park staff might change as people in local communities become more capable and experienced, and perhaps evolve into more diverse and equitable arrangements.

Promising local initiatives already include a self-regulatory instrument at Ban Mae KlangLuang and associated networking among communities that have resulted in formation of a network committee to oversee local rules and regulations for tourism management and natural resource conservation that are seen as necessary in order to achieveviable and sustainable eco-tourism. These rules and regulations seek to control or prevent unacceptable negative environmental and socio-economic impacts from tourism and enhance local economic development.

5. Conclusion and recommendations

Mount DoiInthanon is a well knownand very ecologically diverse provider of environmental services that also has spiritual and historically symbolic significance in the Kingdom of Thailand. Thus, DoiInthanon National Park (DINP) is a prominent feature of the very extensive reserved forest lands and still expanding protected area system that within the last 50 years has come to dominate land use in northern Thailand, and especially its Chiang Mai province. As its natural teak timber stocks have been logged to exhaustion, and opium revenues vanished after it was outlawed and eradicated, environmental services still retaining attention of national policymakers now include watershed functions, biodiversity, and scenic beauty that can attract tourism, with perhaps some as yet still unclear interest in carbon stocks. Thus, the state is seeking to rapidly expand Thailand's protected area system (PAS) to have high ecological connectivity in its coverage of all upland and highland portions of river basin watersheds in especially the upper north region of the Kingdom.

The local people living in this area since long before the government established DINP have tried to assert their land use rights. But since they are nearly all members of mountain ethnic minorities, even their rights to citizenship – much less traditional rights to use land – were initially unrecognized. Yet rather than evict them completely, the state allowed them to remain in enclave villages where they were 'induced' to change their land use practices in directions led by Royally-initiated projects. Now that a new generation speaks Thai language and has obtained citizenship, and at least some forestry officials have begun to have some insights into various strong points of some minority cultures, there has begun to be some recognition that perhaps alliances can be built with local communities to more efficiently and effectively manage the national park. In some enclave villages small areas of land that have long been irrigated paddy fields have even been cut out of the park and returned to local ownership, but local rights to access and all other village areas and land and resource use still remain unrecognized and officially illegal, and some are subjected to intimidation by lowland groups.

Efforts under government-supported programs conducted by the Royal Project, the Thailand Research Fund (TRF), and academic institutions such as Chiang Mai University (CMU), Maejo University (MJU) and Kasetsart University (KU) have sought to help DINP enclave communities develop livelihood elements such as new cash crops, fruit trees, agricultural technology, household marketing, handicrafts, and environmental conservation. But all these efforts have faced serious constraints, and many enclave villagers claim park officials still do not understand their livelihoods and related problems. It is perhaps instructive that after many years these supporting institutions are now converging in recommending exploration of community-based eco-tourism as an important way forward. Moreover, potential development of tourism becomes even more attractive when considering the increasingly dramatic lack of alternative livelihood opportunities particularly for ethnic minorities in mountainous areas of especially the upper north region of the Kingdom. And DINP has responded by launching a pilot case study of community-based eco-tourism with both environmental and cultural dimensions.

In what initially appeared to be an indication of some willingness by the state to help compensate some of the costs being incurred by local communities as a result of establishment of Thailand's protected area system (PAS), local sub-district governments (TAO) having constituencies that include villages within national park boundaries and buffer zone areas are authorized to receive annual supplements to their budgets from the central government that in the aggregate total no more than 5 percent of the revenue payments received from the specific national park in their area. It has become clear, however, that these payments are not PES-like in nature, in that they are paid to an entity that is not considered a provider of environmental services, there appears to be no conditionality or restrictions on how funds are used, and amounts actually received by TAO in the vicinity of DINP appear to total less than 2 percent of previous year park revenues. Moreover, many consider these as more like 'guilt money' or 'bribe money' payments that are quite political in nature.

Although DINP senior staff do not include national park revenue-sharing with local governments in their notion of PES-like mechanisms, they are seeking to portray many other lines of park activity and projects as fitting within a PES-like framework (Figure 6). Despite the various types of motivations underlying these efforts, it is encouraging to see national park staff and conservation agency officials seeking to develop and work with this type of conceptual framework. There are still considerable ambiguities, however, in their understanding of what should be considered as a reward and to whom and for what it should be made, as well as in relationships among various institutions and actors, especially in the context of government bureaucratic policies, processes and politics.

The most interesting and promising area for potential further exploration of PES-like mechanisms and activities at DINP clearly appears to be work related to further development of eco-tourism. It is particularly striking that our study found a clear convergence of interests and recommendations for future directions from DINP leadership and officials, from local communities and village leaders, and from supporting institutions that have been working with various lines of project activities within DINP for several to many years. Indeed, the DINP pilot case study has already begun under supportive park polices that have already been announced, and there seems to be substantial enthusiasm from all key actors. But given the current description and portrayal of their approach as indicated in Figure 8, there are still substantial ambiguities and issues that will need to be resolved.

Thus, findings of this study suggest that PES-like rewards for providing environmental services in DoiInthanon National Park could benefit from further supporting studies that employ a more enterprise-oriented approach to conceptualization of the mechanism, as indicated above in section 4. This approach could help to clarify all the key elements and relationships of the PES-like mechanism and how it can meet the tests of being realistic, voluntary, conditional and pro-poor, and includes the essential components of a clearly identified PES market, workable PES processes and relationships, and a suitably supportive institutional environment.

Indeed, the basic nature of the approach here is to seek development of a real market-based mechanism to mediate relationships between the community-based service providers and the service buyers (tourists). Appropriate supporting and co-investment roles can then be identified for the park and other institutions, including initial infrastructure and human resource investments, as well as monitoring and assessment of the real impacts of the approach and mechanisms on both the environmental services provided by the park and the livelihoods of households and communities employed by the system. Given the bureaucratic and political context of Thailand at this time, this type of movement toward a more market-based approach that requires a minimum level of reliance on state processes appears to be the most promising and innovative option available.

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