

# State, commerce and commons: conservation with communities in upper tributary watersheds

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## 1 Introduction

Most of the remaining native forest cover in Southeast Asia is in the mountains. Low-lying areas have already been cleared for agriculture and cities. Most of the options for meeting forest cover targets at larger provincial or national scales are therefore dependent on maintaining and even expanding forest cover in upper tributary watersheds. Much biodiversity, because of loss and fragmentation of native vegetation, over-hunting and logging is no longer realistically available for “sustainable use” types of management. If it is to be conserved then it needs to be protected. In other cases some conservation with use is still a plausible option. Efforts to maintain water quality for downstream uses may also depend on vegetation and land-use upstream. With little left to

preserve in low-lying areas biodiversity conservation objectives are usually focused on public lands in upland, mountainous, areas.

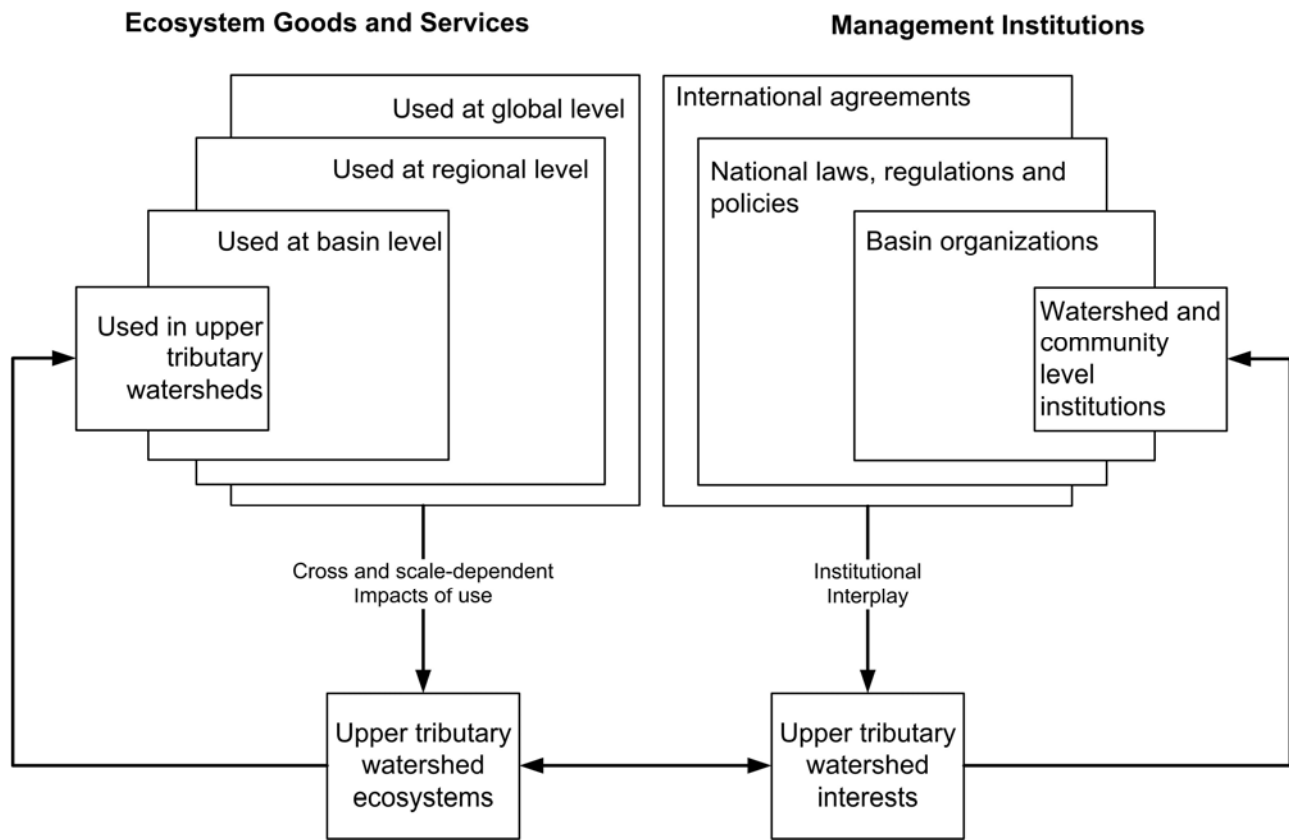
Mountain forests, soils, springs and streams, however, are also important to the farmers who live there. Their livelihoods and land-use systems depend on access to mature and secondary forests as well as fields. Many of the resources they use are common pool (except for paddy rice fields that are usually treated as private property), from various non-timber forest products, through to fish in the streams, and even insects and amphibians in small areas of rice paddy some communities are lucky to have. Paddy rice fields are usually treated as private property.

A common discourse is that conservation of forests, biodiversity and watershed functions should primarily be achieved through protected area systems run by skilled agencies of the state on behalf of the wider public --what we have called a *states knows best* perspective (Lebel et al. 2004). In this view from above, common property *de facto* managed by communities needs to come under effective control of public agencies. This view is promulgated by state agencies with natural resource management mandates and many conservation organizations. The main alternative discourse is that these objectives should be achieved through the empowerment of knowledgeable local stewards who manage landscapes for multiple purposes to meet their own development objectives but in doing so also contribute to broader public goals for conservation – a *locals know best* perspective (Lebel et al. 2004). In this view from below common property systems already established by local communities need to be formally recognized and supported, and other new ones need to be encouraged. This view is promoted largely by grass-root actors and their supporters mostly from non-governmental organizations or academia. Still others argue that markets and guided private sector investments are central to sustainable use and conservation – a *markets know best* perspective (Lebel et al. 2004). In this view from the side it is the private-ness of property rights, or level of clarity, security and exclusivity that is most important. In addition it is argued that, often, these should be invested in firms although they may sometimes also reside with communities or the state.

In practice communities, state agencies and firms interact in complex ways to shape landscapes and their conservation functions. The contribution and merits of each perspective to conservation are arguable, but far from convincingly demonstrated. There are several reasons.

First, upper tributary watersheds provide a diverse range of goods and services to their inhabitants, others further downstream, and to society at broader spatial and multiple temporal scales (Figure 1). Ignoring scale in policy has undermined the effectiveness of ecosystem management interventions at local and broader levels.

**Figure 1. Upper tributary watersheds provide a portfolio of goods and services used and managed by diverse interests at multiple spatial levels.**



Second, the allocation of rights to these goods and services by central authorities has often ignored the livelihoods, needs and rights of ethnic minority communities and other disadvantaged group in the pursuit of both conservation and development objectives. Ignoring institutional and cultural diversity has undermined social justice, reproducing discriminatory practices and resource conflicts.

Third, a biophysical context of intense rainfall events, complex topography, and poor soils in mountain regions, combined with economic and political uncertainties with respect to markets and rights of access, amplifies management mistakes. A poor grasp of uncertainties in setting development and conservation objectives and management plans undermines both social and ecological resilience.

Scale, heterogeneity and uncertainty together represent significant challenges and opportunities for meaningful community involvement in conservation. Such involvement is sorely needed because management by state agencies alone has again and again been plagued by governance failures, in particular, corruption, lack of transparency and poor accountability. Authorities in remote and insecure areas where conservation increasingly takes place have distorted the potential benefits from investments, markets and political reforms for development in these same areas. Bad governance has allowed narrow, powerful, interests to determine land- and water-uses while taking away access to those in the most need for direct use and with often the best incentives for sustainable use and conservation.

In this review we explore these questions for upper tributary watersheds in montane mainland Southeast Asia, covering Northern Thailand, and parts of Vietnam, Lao PDR, Cambodia, Myanmar/Burma and Yunnan province of China.

Apart from some larger valleys, the upland areas we are primarily concerned with are usually far from the “mainstream” in national economic development priorities and concerns. Formal businesses and industry, apart from those involved in primary resource extraction and exploitation,

like timber harvesting or hydro-power generation, are few. Historically most upland policy has been framed in terms of national security and identity or “wars on drugs”. More recently the environment has become both a goal and tool for achieving other objectives.

Conflicts over community versus state-based approaches to conservation of biodiversity in upper tributary watersheds invariably generate politics of scale, position and place (sensu Lebel et al. 2005). To understand and address these we need to dissect arguments about the correct levels of management, in particular, goals, indicators and interventions. This means looking at interests and governance processes as well as the specifics of mountain ecologies and resources (Figure 1). Are there important cross-scale interactions in ecological processes? Do certain institutions through the way they construct or reinforce scale dis-empower already marginalized or otherwise disadvantaged groups? Is there a middle ground, where bottom-up and top-down approaches can meet and be effective and the private sector can be part of solutions?

Apart from the obvious differences with scale we also need to unpack the often growing heterogeneity of interests within communities, among state agencies and the diversity of expanding business interests in these areas. Moreover, as regional and global markets penetrate further and further up the valleys new opportunities and uncertainties for management and livelihoods are created. Free trade agreements can overnight shift opportunities and challenges to competitiveness for farmer’s crops. In the past few years several bilateral agreements between China and the smaller south-east Asian nations have been signed. The impacts on upland agriculture are potentially huge as these areas had because of their relatively cooler temperate climates some advantages in supplying low-lying capitals and other major cities, which they may now lose to much bigger producers in China.

Four rights - to timber, land, forests, and water – have been at the core of most conflicts about how conservation objectives might be achieved in broader regions which must also support livelihoods. Their histories are intertwined. Changes to formal property rights, especially for land, timber and forest products have since colonial times been tools for exploitation rather than securing livelihoods or meeting conservation objectives. New rules and regulations frequently bundle goods and services obtained from land that were previously separate. Forests provide many common pool resources.

The institutional, cultural and political context in which rights to goods and services from watersheds are defined, defended and reformed are critical to both conservation and social justice in development objectives (Daniel & Lebel 2006; Lebel 2005). Rights of access and use to goods and services from forest ecosystems often depended on more fundamental entitlements such as citizenship, political voice, safety and access to markets and employment themselves.

The main body of this review is organized as follows. Section two steps through several common models for conservation illustrating each with experiences from watersheds in montane mainland southeast Asia. In doing so it highlights some of the variety of roles of state, firms and communities in management. Sections three, four and five focus more specifically on what theory and practice have to say about the roles of scale, heterogeneity and uncertainty on various ways of involving communities in conservation. The paper concludes with some practical suggestions for strengthening approaches to conservation and development in upper tributary watersheds. (Agrawal & Ostrom 2001) (Steins 2002; Steins & Edwards 1999)

## **2 Conservation with communities**

Communities engage in conservation of common pool resources for several reasons, including: continuation of traditional practices that happen to be low impact or sustainable, as an adaptive response to degradation or decline in a critical resource, and as a strategic position to secure other rights. States, likewise, seek support of communities for their conservation efforts for a variety of reasons including: to carry out management at levels and in places where their own agency staff are unable, to strengthen acceptability of measures, and because they support idea of those with a stake in a resource having an incentive to manage well. How communities engage with state authorities

and firms – under what rules – can have major implications for the effectiveness of those conservation efforts. In this section we look more closely at how different “co-management” strategies have performed.

**Table 1. Seven ways communities engage in conservation.**

<b>Approach</b>	<b>Rationale</b>	<b>Community role(s)</b>
Zonation	Productive agriculture and plantation forestry are not compatible with conservation. Segregate land-uses.	Large, but controlled in buffer areas. Small in core protected zones
Benign land-use	Productive usually ecologically complex land-use systems like agro-forestry can serve to some extent both production and conservation goals. Integrate land-uses.	As farmers using either traditional rotational or modernized variants of poly-culture high (for agriculture) diversity systems.
Forestry	Community forests which combine native and domesticated trees. Timber harvesting not allowed or very restricted.	Large as labor for planting or fire management, but maybe modest in terms of direct use benefits.
Crop substitution	Better and more intensive and permanent agriculture will release other secondary forest and swidden for re-growth and conservation	Farmers increasingly engaged with wider commodity markets and technological innovations in agriculture.
Watershed organizations	Multi-stakeholder bodies can help with land- and water-use planning and negotiate between multiple local, as well with external, interests.	As participants along with state and private sector representatives in decision-exploring, and sometimes also making, implementing and monitoring activities.
Marketing NTFPs	Diverse range of non-timber resources can be sustainably harvested without loss of range of services associated with logging.	Harvesters, and as partners in, or parts of value-added businesses based on these forest-derived commodities.
Ecotourism plus	Aesthetic tourism creates alternative non-consumptive use value out of well conserved landscapes and these may exceed benefits derivable from agriculture in difficult growing and marketing locations.	As tour guides, providers of home stay, and other tourism-related small businesses.

## **2.1 Zonation**

States generally approach community engagement in conservation through spatial land-use planning. Thus we have, protected areas, wildlife sanctuaries, forest reserves, concessions, special project areas, watershed zones, buffer zones and multi-purpose areas, and so on.

At one extreme communities are forced to resettle, give-up land, and coerced into forest replanting and protection roles with little say in where or how this is to be done. Participation is viewed by

authorities in instrumental terms rather than as a right. Villagers become little more than free or cheap labor for “joint” forest or watershed conservation management .

The Thai state’s expansion of “protected areas” has resulted in villages losing housing areas, farmlands, swidden fallows and commons, as well as resulting in both forced and involuntary displacement of local communities all over Thailand (Vandergeest 1996; Vandergeest & Peluso 1995). The 1993 Thai Forestry Sector Master Plan (TFSMP) document targeted the expansion of 42 national parks and 31 wildlife sanctuaries to be added to the 119 existing conservation areas. Current estimates indicate that the creation of new protected areas would require 3.3 million hectares (Wittayapak 1996).

Since much of the area for the new national parks and sanctuaries is located in north Thailand, the implications for the upland communities, particularly ethnic peoples, living and farming in “protected areas” declared as national parks, wildlife sanctuaries and watershed areas are huge and tensions involving farming communities fighting state forest land classification have become increasingly frequent. According to state forest policy, up to 53 percent of the forest land in the north could be declared off limits for agriculture and various other traditional resource uses. The proposed expansion of the protected area systems will enclose the land of approximately 2,700 villages. Most of these inhabitants are ethnic minority farmers, many of whom lack Thai citizenship (Poffenberger 1999). For example, the creation of Suthep-Pui National Park in 1981 included all the residential and cultivated areas in Mae Sa Mai , a Hmong community in the Mae Sa watershed in north Thailand. The Royal Forest Department’s (RFD) reforestation practices also pose a large threat to swidden fallows and upland areas used as commons by villagers (Neef et al. 2000). In Mae Sa Mai, for example, the RFD took-over 480 hectares of village lands for planting pine and eucalyptus trees.

Protected areas are often unable to regulate or strictly prevent local use of forest areas due mainly to not including local communities in their management. Since 1991, Vietnam’s forest policies have closed off access to forest-dependent communities and relocated forest dwellers to buffer zones. However, the relocated forest dwellers often continue to use the protected areas due to their traditional reliance on the forest for subsistence and cash income.

Even more seriously state agencies cannot regulate operations of larger firms and actors. In Thailand the main authority responsible for protecting forests, has been unable to prevent logging and deforestation of the forest areas under its control after the logging ban as illustrated by the Salween logging scandal (Daniel 2005).

In northern Vietnam, Dzao ethnic communities resettled to buffer zones on the boundaries of Ba Vi National Park in northern Vietnam continue to collect fuelwood, fodder, lumber, and other building and handicraft materials, medicines, wild foods, resins, and dyes inside the park areas. It is now clear that the Dzao and other buffer zone communities need to be included in the forest management. (Sowerwine et al. 1998)

The expansion of protected and restricted use areas is also carried out in the name of upper watershed protection. Watershed classification has been used as a policy tool to cut across and override other categories. This classification has been of great importance to conflict and security issues at the rural-forest interface in mountainous regions, especially in northern Thailand. “Watershed” as a construct of the state is used to justify control of upland resources (Laungaramsri 2000). Although proportions of land in classes with severe restrictions appear modest at national level, this proportion increases rapidly in the upland areas. For example, although only 26 percent of the nation’s land falls into Class 1 and Class 2 (the most limiting land use restriction categories), the proportion in these classes is twice that for the northern region and the Ping River watershed and increases to about 90 percent in the Mae Chaem watershed, a major tributary of the Ping River (Suraswadi P. et al. 2005).

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When the state leads and dominates decision-making about management, and community involvement is little more than as labor, the terms “co-management” and “community-based” management are a deceptive re-labeling of conventional coercive practices.

## **2.2 Benign land-use systems**

Despite rhetoric to the contrary most state agencies with mandates for forest, land and water management fail to reach or need the support of communities if there is to be any kind of active management. The persistence of, or return to, community-based management activities, may be important to conservation if those practices were benign, limited in scope or good examples of sustainable use.

The traditional agricultural systems of highlanders from different ethnic origins are based on rotational cultivation, with upland rice and maize on sloping land, paddy rice production in the valleys and cash crops (and formerly poppy), as well as livestock production for the farmers' cash demand (Rerkasem et al. 1994). Swidden agriculture can be accompanied by moving the cultivation area while the settlement remains, or moving the settlement so that there is no permanent village location or boundary but the community migrates with the availability of land. Fallow-swidden ecosystems require substantial indigenous, local and practical knowledge to manage. The length of fallow periods, fire management and land preparation practices have important implications for forest regeneration.

Fallow forests that are part of the swidden rice cultivation cycle of upland communities cover large parts of montane mainland Southeast Asia. Secondary forests, which regenerate on the fallow swiddens, are rich in tree species and complex with respect to stand structure (Schmidt-Vogt 1998). Some traditional practices thus have and could plausibly play a role in conservation.

Swidden cultivation, however, is actively and widely discouraged by officials in favour of clear spatial segregation of forest and agricultural land-uses. In part this is because state classification systems find it difficult to incorporate swidden systems with its mosaic of different-year fallows and secondary forest areas some of which subsequently also are transformed into upland rice fields and then back again into fallows (Laungaramsri 2002; Roth 2004). As a result traditional land-use systems, and landscapes in response, are changing (Ruankaew 2004; Suraswadi & al 2005).

## **2.3 Forestry**

The enforcement of regulations and resolution of conflicts when they are broken or contested under local institutions can be highly effective, especially when the challenges to a system of property rights come from within the community making and enforcing the rules. There are many examples of community-based regulations, some long-lasting, and others that have come into being as a response to challenges by authorities to improve local forest management practices (Daniel 2005; FER 2005; Poffenberger 1999; Pratuang Narintarangkul Na Ayudhya 1996).

There are at least four ways by which households gain access to land for agricultural purposes in areas designated as forests by national governments. First, and simplest was that they were there using the land before it was designated as protected forest. In this context there may be diverse local systems of property rights to land, timber and non-timber products. Second, an important norm in rural Thailand (and elsewhere) is that unused farmland is yours if you settle and use it. Degraded forest land may have this characteristic after logging or prior but temporary settlement and use. Local norms may further regulate land-uses. Third, land may be encroached upon by extending boundary markers and clearing beyond original land documents. This may be followed by “alteration” of title document to match actual land-use through legal or semi-legal or corrupt means. Finally, there are various land reform programs which can result in title being given to farmers.

State support may be critical for local institutions to function. Approximately 15,000 people live in the buffer zones of the Virachey National Park in Ratanakiri province in northeastern Cambodia, live in the buffer zone of, the largest protected area on the mainland of Southeast Asia (Ojendal et al. 2001) . This includes Brou, Brou Kavet and also Kreung, Tampuen, Lun Kachok, Lao, Khmer and Chinese. The entire southern portion of the buffer zone is given as forest (logging) concession to the Pheapimex Company. Meanwhile, the markets for natural resources in the area have grown in the context of little pre-existing institutional controls on harvesting and use in place because they weren't needed at low levels of extraction and consumption. Things are changing with illegal logging and commercial opportunities for forest products like Malva nuts. Now confusion, uncertainty and conflicting claims to rights to timber, wildlife, fish and other forest resources abound. Restraint within communities is hard to enforce because outsiders are not bound by these agreements or affected by social sanctions. The intervention of a level authority above that of the commune, that is the state, is needed. However, the presence of the private logging concession poses further difficulties for regulation of conservation in the buffer zone.

The tolerance and granting of a role for communities in natural resource management may be selective and temporary. Community forestry, or example, has often and ultimately, been about every thing but access and rights to "forests".

The introduction of a tea company with imported plants altered property relations in Akha communities in Payapri (Sturgeon 1997). Tea was planted as part of community forestry. As it became major source of income over-storey trees were thinned and plots of land become associated with particular households. Villagers are technically required to ask permission from RF representative and pay a fee before cutting trees. With good timing of activities and a good meal they could avoid having to pay the fee. Swidden lands, however, were taken over by RFD for reforestation mostly with pines. Villagers were paid to protect saplings and allowed to continue to plant upland rice while trees were small (Sturgeon 1997). Once the trees were mature, the RFD reclaimed the land and trees and the villagers could no longer plant rice.

#### **2.4 Crop substitution**

One strategy proffered by many actors is that conservation of native vegetation and wildlife might be achievable through "better" use of existing agricultural land. In general this is viewed as intensification and shifts to higher-value crops, but may also mean the opposite, for example, when the crop was opium, or high value means high pesticide and herbicide use. What constitutes "better" is contested.

A common strategy of farmers in trying to prevent land claims of state forestry officials is to plant fruit trees or tea, as it was believed that forestry officials would not claim land that has already been planted with perennial crops. Another response was to convert rainfed swidden rice fields or fallows to permanent paddy fields or cropping systems. However, in most cases the farmers are not fully aware of, do not have enough time to adapt, or lack knowledge about the new farming practices such as fruit production, and thus these practices end up providing poor yields and insufficient economic returns. But many villagers often continue to stick to these practices to deal with the constant threat of forestry officials laying claim to their lands as well to demonstrate their own efforts at "environmental awareness" in the hope to not to be expelled from their upland settlements (Neef 2001).

Coffee like tea discussed earlier has potential to be grown along with trees, be labeled "as forest", and thus, contribute to "conservation". However, coffee (like pine plantations) uses a lot of water. Like plantations of tea, coffee's value (to processors) is greatly increased by processing. In Om Koi District of Chiang Mai VPP Coffee has revived a modest coffee production industry two decades after a UN project first brought, unsuccessfully, coffee to the hills. VPP has worked closely with state agencies to acquire land and is supported because the program could be used as a way of resettling people living in the uplands in watershed areas managed by the Royal Forest Department.



In Son La province, one of the three provinces in northwest Vietnam in the Da River (Song Da) watershed bordering Laos and China, the Hmong ethnic communities on the upper mountain reaches are dependent on corn cultivation as well as upland rice farms, bananas and taro (Chung et al. 1998). The Hmong derive cash income from collecting and selling cinnamon bark from the forests. The cinnamon sells for VND 2,500 (US\$0.23) per kilogram in local markets and men and children can collect up to 30 to 40 kilograms in a single trip. After the state ban on poppy farming, Hmong started planting apricot seedlings which seem well-adapted to lands formerly planted to poppy. However, the watershed protection and crop substitution programs are being bogged down as forest management is shifted from the traditional systems to the government-sponsored household forest protection scheme (Chung et al. 1998).

The expansion of rice, rubber, pulp-and-paper trees, palm oil, sugar cane, corn and other major agricultural crops for domestic consumption and export has made a large and direct contribution to loss of native forests across Thailand over the past century. All the coastal plains, apart from a few wetland forests, and mangrove fringes, and most of the wider valleys and foothills have been converted. Since then core areas have then been re-converted again to urban-industrial uses. Agricultural policies including the expansion of irrigation and land reform have played an important role in facilitating this development, so much so that by the 70's the rural-forest interface had literally retreated into the hills.

The expansion of commercially-oriented agriculture into upper tributary watersheds was inevitable given constraints on swidden-rotation practices and the many opportunities provided by better road, health and education access. Cash crops became a way out of a difficult political situation for many upland farmers. Aspirations reasonably rose and could rarely be met by state-driven projects. Entrepreneurs, however, sometimes did better and developed new channels to access markets for credit, labour and their commodities. These market-led changes have transformed both landscapes and societies. Simple stereotypes, if they were ever accurate, about upland forest guardians, hillside farmers, or forest destroyers completely miss the point in contemporary rural Thailand (Walker 2004a). Livelihoods and households no longer fit any such easy classification with substantial seasonal and more permanent migration for employment in cities, industry and other larger-scale agricultural enterprises. One of the consequences is rapid declines in fertility, which in northern Thailand fell to below replacement in the mid-80's, opening up opportunities for both upland farmers and cross-border migrant labour to enter low-paying low-skill agricultural jobs (Walker 2006).

### ***2.5 Watershed and river basin management organizations***

Concerns about downstream impacts of land- and water-use in upper tributary watersheds have driven both local watershed networks as well as been an underlying rationale for larger scale management initiatives like the introduction of larger river basin organizations.

But we need to point out that one of the most urgent "scale" issues relating to upland forests have been about "lowland" water demand in the dry season.

### ***2.6 Marketing non-timber forest products***

When forests have been already logged of valuable timber, or what fragments are left are designated for preservation, livelihoods may be re-focused exclusively on non-timber forest products. Although this may help reduce illegal logging and habitat conversion for agriculture, extractive use of non-timber forest products can create its own challenges for conservation efforts, both of the common pool resource of value, and other users of forests such as wildlife.

In Nam Pehng village in Oudomxay province in northwest Lao PDR, a project for NTFP conservation ended up supporting a rice bank to address the needs of the community - mainly upland Lao Theung from the Khamou Ou, Leua and Rok ethnic groups - for food security (Donovan et al. 1998; Ingles & Hicks 2002; Ingles & Karki 2001; Morris & Ketpanh 2002). The rice bank built trust in the NTFP conservation project, allowed more time for village conservation activities, and

also reduced threat of NTFP over-harvesting. The project also subsequently addressed forestland allocation, domestication trials and marketing of the bamboo and other NTFPs. Village forests in Nam Pheng cover a total area of 648 ha, or 46.5 ha per household in 1998, including 515 ha of bitter bamboo forest.

Yunnan's Diqing prefecture was forced to stop timber production and start harvesting of NTFPs mainly commercially valuable Matsutake mushroom for sale due to a "logging ban" imposed by the central government (Jun 2005). Eventually, market arrangements proved more decisive in arranging NTFP collection and conservation (Jun 2006a, b).

### **2.7 *Eco-tourism and alternative livelihoods***

Use of common pool resources in forest lands may be halted and livelihoods switch to uses that do not require high consumption of local natural resources for example aesthetic eco-tourism. Resources may then be treated as club or public goods. Livelihoods that are not based primarily on agriculture or forestry activities but are plausible in forest upland areas are few and may depend on high levels of inputs from outside.

The Huai Poo Ling Watershed Network established several years ago by Karen ethnic communities in the Huai Poo Ling subdistrict in the Mae Samat Watershed in northern Thailand's Mae Hong Son is active in raising environmental awareness especially regulating hunting and gathering. The network has initiated a community-based tourism (CBT) network that brings extra income along with weaving. It is possible that the success of the CBT activities could strengthen the forest conservation work of the Huai Poo Ling Watershed Network.

The introduction of new policies and regulations should take into consideration significant transitions in pressures for land-development as a result of on-going demographic and market-led changes in rural-forest interface areas. In some locations the incentives for expansion of farm-lands into forest areas is falling and opportunities may arise for significant increases in more mature forests, especially where prior swidden-based land practices mean that seed-banks and soils may allow such returns. There may be no need for "tough stances" as urban and other lowland employment opportunities are acting as de facto policy. It is acknowledged that in other locations more favourable to market-based agriculture or tourism incentives for non-forested land-uses may increase. These realities of place could be taken into account in land-use planning and zoning rather than adopting a narrow viewpoint from very high up which sees everything near a hill or with a tree on it as "forest land" (Daniel & Lebel 2006).

### **2.8 *For pleasure and culture***

Local rather than tourist-visitor reason for keeping forests as places to live in and near. Not just benign land-use practices.

So far we have given hints to the variety of roles, rights and responsibilities that exist when conservation is done with communities. In this and the next two sections we will look more closely at why conservation and sustainable use can be hard to achieve. We highlight issues of heterogeneity and scale by asking, simply, what is being conserved, by whom, and why?

## **3 Heterogeneity**

The firm, the state, the community are fictions.

There is no unitary state. What one agency does is often at cross-purposes to and undermines what the next is up to. While one state agency is bent on re-locating people from near forest-rural margins, another can be providing schools and health centres.

There is no unitary community. One household is living of tourism, while the next subsists on crops grown in swidden fields and other items gathered from secondary forests. Men and women, older and younger people in the same household have different interests in how resources are used and

managed. Communities are not just foresters or farmers they may also be construction workers, prostitutes, maids and tour guides. They may be peddlers of local handicrafts and traditional herbal medicines.

There is no archetype of the firm. The impacts of investments and marketing activities of firms are hugely variable. Some expand their activities into areas that would have been best left as forests and leave tomorrow, whereas others help intensify land use in sustainable ways. Foreign firms which make village level contracts to grow a particular high-valued crop represent a distinct opportunity and challenge from the community-grown ecotourism and home-stay project. Firms may not even be a single entity but comprise a “chain” of commercial activities involving both social kinship networks and middle-men.

The state, the firm and the community are not homogenous classes of actors. The consequences of heterogeneity of interests for co-management efforts are important and not necessarily negative.

### **3.1 Conserving what?**

Uniform application of land policies and property rights systems by states results in poor fits with ecological and social contexts everywhere.

In implementing Vietnam’s 1993 Land Law, the Son La District government worked with the Chieng Hac Commune to allocate upper watershed forest plots to households for protection. But although legally administered by the commune, the upper watershed forests were already being used and shared among the eleven villages in the commune under the supervision of village members from their respective territories. Formerly, the *Xampa*, a village elder coordinated forest protection. It is now not clear how forest management would continue in the transition from the traditional to the commune-system. Moreover, the Da watershed has 23 ethnic groups each with unique and distinctive resource-use systems and production strategies. Government policies and programs are thus facing the need to offer a variety of supportive programs together with increased local authority over forest lands. (Chung et al. 1998)

Co-management arrangements, rather than being context-specific and tailored to local needs, may follow a conventional blueprint usually consisting of marking off park boundaries, exclusion of communities into buffer zones and reforestation with fast-growing species.

Co-management in the Ba Vi national Park in Northern Vietnam, for instance, excluded communities into a “buffer zone” and promoted “reforestation” but ignored the rich ethno-botanical knowledge of the Dzao ethnic community. In Yen Son Commune where the Dzao were resettled, each family was given small plots of forest lands 0.5 to 4 kilometers from the village where *Acacia* and *Eucalyptus* species were planted. But the Dzao find the trees useless especially since the paper mills are too far away to make it economically viable. The Dzao people continue to enter the forest for collecting NTFPs especially medicinal herbs and plants. Bringing the Dzao community and their ethno medicinal knowledge into the park’s planning process would not only support the Dzao’s subsistence livelihood as well as their significant role in providing health care services in the region but also meet national conservation goals. (Sowerwine et al. 1998)

In the Mae Samat Watershed, the Karen ethnic community villages in Huai Poo Ling subdistrict in Mae Hong Son province practice rotational farming. Although the community uses the land in terms of customary tenure, officially the lands come under state forest reserve with some of the swidden fields located in the adjacent Mae Surin National Park. The village is a member of the community-based tourism (CBT) network (see earlier section). The community has measures for conservation of the forests since both their farming livelihoods as well as the CBT activities – which mainly promote forest trekking, nature trails and so on - depend on the forests. But rather than negotiating co-management efforts with the communities, the forestry officials continue to place pressure on the community’s swidden practices. (Interview with the President of the Hui Pu Ling TAO Council, 28 January 2006)

Community- and co-management initiatives vary widely in what they say they are trying to conserve and use. Targets and indicators of actual performance, as for state-dominated initiatives, are rare, lack independence or are unreliable. Both observers and participants seem more intent on 'marketing' particular projects or approaches than on improving performance. Thus these arrangements can end up working at cross-purposes to the purported aims of the resource management policy or program.

### **3.2 By and for whom?**

Conservation is carried out for the benefit of many different actors, sometimes depending on the sacrifices and labor of others who are not properly compensated. In our view conservation projects involving communities should only be considered successful if they meet a reasonably negotiated compromise between multiple, partially competing, objectives for conservation of particular components of biodiversity, natural resources and other ecological services, without further exacerbating social injustices.

By these criteria most projects purporting to involve communities in conservation in the mountain regions of Southeast Asia have failed. However, some promising instances emerge where both market mechanisms and the state could support local community use of common pool resources (and revisiting such instances over regular periods of time could also provide valuable lessons about the resilience and sustainability of the practices and the common resource).

Collection and marketing of the Matsutake mushroom – a valuable NTFP export to Japanese markets – in Yunnan province became a crucial activity where communities worked both with the state and market mechanisms to conserve the resource.

After timber revenue declined in Yunnan, local communities increased their dependence on the commercially valued Matsutake mushroom. As the Matsutake industry developed, the government gradually de-emphasised timber felling in its forest policy and became aware of the need for NTFP management. In response, the provincial government issued policy directives to local governments to improve management of the Matsutake resource; in 1999, the central government listed Matsutake as an endangered resource warranting protection. However, the new government management regulations are also aimed at ensuring sustained use of the Matsutake through responsible collection and harvesting methods. Although no specific firm is involved, the matsutake marketing involves a "commodity chain" of various actors involving both social network/kinship relations and middlemen/exporters. Marketing of the product is also not purely linear but consists of many back and forth marketing activities among different social actors. However, mushroom management is tending towards greater "individualisation" due to the market forces and ambiguity with property rights. Jun (2005) states that rather than individualising their resource use, local communities have initiated variable and adaptive local actions in a collective sense for self-governance over Matsutake collection. (Jun 2005)

In Omkoi district in northern Thailand, cash crops were introduced as part of the highland "opium substitution" programs. Cabbages, tomatoes and cattle and later coffee are income earners in Omkoi district (Garden et al. 2005). But since 2005, the new and growing competition with farm products from China (and the Free Trade Agreements signed by the regime of Prime Minister Thaksin Shinawatra) has threatened agriculture in northern Thailand and particularly the special niche that upland farmers in Thailand have enjoyed.

For the Karen community in Omkoi, production systems are an integral part of forest conservation with their swidden and paddy fields providing many NTFPs; the households also depend on forests for food as well as planting useful species within the forest and managing naturally regenerating species.

State officials view the expansion of farming as an important cause of deforestation in Omkoi, while farmers, on the other hand, view cabbage and tomatoes as a necessary cash-based agricultural activity. The "*conservation versus development debate is played out beyond village levels*",

(Garden et al. 2005) particularly between the Royal Forestry Department (RFD) and the local government body, the Tambon Administration Organisation (TAO). While the TAOs in Omkoi are trying to improve roads and the village water system, the forestry department discourages construction activity.

Land-use planning for conservation needs to be re-conceptualized as a process of negotiation rather than the current norms of something that can be done remotely by experts from topographic maps and imagery. It is unreasonable to expect that the main issues arising out of the classification of forest land-uses can be resolved by better classifications and zoning regulations. Classifications reflect the interests of those who build them. Instead land and forest zoning in “forest-rural” interface should be arrived at through negotiations. To do so would be to both reflect current realities of on the ground tenure system that is often “flexible and relaxed” and that the best outcome from both livelihood and environmental perspectives might sometimes be co-management arrangements between authorities and land users which could only arise through such negotiation. Two-way accountability, basic rights to livelihood and compensation should be part of the negotiation tools.

## 4 Scales

Attempts to manage these multi-user, multi-level, partially common pool resources can be difficult because of several kinds of scale challenges (Table 2).

**Table 2. Scale challenges in the management of common pool resources in upper tributary watersheds and how communities might respond to them.**

<b>Scale situations</b>	<b>Possible community responses</b>
<i>LOCAL NEGLECT</i> : A sound policy or management strategy at larger spatial level is not adhered to by local community to ultimately the detriment of that communities' resource access.	Explore and discuss "neglect" claim made by authorities-experts-outsiders for validity. Improve understanding of underlying reasons for "neglect" and suggest ways to address.
<i>OVER-USE</i> : Over use leading to degradation from within resource user group irrespective of wider regulations and advice.	Adapt and refine CPR uses; exert greater local control or prohibitions against outside use.
<i>DEMO-VILLAGE</i> : A very effective co-management arrangement facilitated by NGO or community organization cannot be up-scaled	Explore incentives to show and train others.
<i>EVIL OUTSIDERS</i> : An otherwise effective local management regime for a resource is not respected by and cannot be enforced upon outsiders	Seek legal, monitoring or sanctioning assistance from a higher level state authority
<i>ROVING BANDITS</i> : One community or state takes action to conserve its resources well and in doing shifts the problem elsewhere	If the community is a victim of such a situation they could also take quick action forcing the "roving bandits" on.  They can learn what happened by visiting "earlier" areas and sites.
<i>LOST STAKES</i> : States in their enthusiasm for intervention can take away access and management roles from the very local user groups with largest stake and interest in conserving a resource.	Argue case of self-interest in conservation and therefore for expanded role, in community-based or co-management arrangements.
<i>AGGREGATE IMPACT</i> : Aggregate impacts of reasonable management actions at local level "equate" to non-sustainable, risk of non-recoverable situation at a broader level.	Dialogue and negotiate at higher spatial level on fair ways to reduce overall use.
<i>SURPRISING X-LEVEL</i> : Local actions have surprising impacts at other levels which are more than just aggregations. Or vice versa. For instance landscape structure impacting pollination of orchards and fields; introduced animal or plant displacing native species that otherwise uses landscape.	Learn about higher level influences and/or impacts.  Bargain for compensation for losses of use and/or investments in exploring alternatives.

- We are particularly interested in understanding how communities (grassroot actors) link up to higher level administrative levels and wider networks, for example, to support market integration or favored models for managing forest, land and water resources as commons.

#### **4.1 Challenges from below**

*Local neglect, over-use, and demo-village* are three variants of scale challenges that arise from limitations of particular communities either to manage their own resources or to have their successful approaches taken up by others. External intervention and support by state, non-state and private sector actors may be helpful to speed up learning processes. The knowledge of experts can be useful input into the activities of educators to build understanding and trust of alternative management options. Firms ultimately play a crucial role by demonstrating the plausibility of profits in alternative resource uses, for example, with new technologies or crops and in taking demonstration situations subsidized by state or non-governmental agencies and making them available through normal and more far-reaching market channels.

External intervention in a non-timber forest project undertaken in Oudomxay province located in northwest Lao PDR involved the expert knowledge of agencies such as the National Agriculture and Forestry Research Institute (NAFRI) and the World Conservation Union (IUCN). Designed as an Integrated Conservation and Development Project (ICDP), the project organised an “NTFP marketing group” for bitter bamboo that comprised a series of meetings for villagers and project staff to get information including on ecological information, analyse problems and decide on a management structure. The village also elected members and agreed on regulations as well as planned and implemented the project.

The marketing group helped set the dates of the harvesting season each year based on the ecological characteristics of each NTFP. The households sold their fresh bamboo shoots directly to a “Group Committee” at the end of every collection day. The Group Committee then sold them on a larger scale to traders. Generally, the individual collector takes 85–90 percent of the final sale; the remaining 10–15 percent is put in an NTFP fund. Between 1998 and 2000, the NTFP Fund had grown to 17 million kip (approx. USD 1,700) from the sale of bitter bamboo and cardamom. The fund was used to support community projects such as the rice bank (mentioned earlier) and the village water supply system (Donovan et al. 1998).

In Omkoi district of northern Thailand, a coffee firm plays an important role in village cash cropping. VPP Progressive Ltd. aims to produce 20 tons of roasted coffee daily using raw material mostly from Omkoi. VPP built its regional center in Omkoi around 2002, and used the research extension experience of a former Royal Project official considered to be one of the most knowledgeable experts on coffee in Thailand. VPP also recruited staff from officials with experience in working on highland agricultural extension projects (Garden et al. 2005).

#### **4.2 Challenges from above**

*Evil outsider, roving bandits, and lost stakes* are difficulties that arise from external challenges to local management institutions. As the problems arise from outside the solution is either about strengthening excludability through local actions like monitoring and sanctions or by leveraging support for this from more powerful actors that operate at larger scales. In the lost stakes situation it is about re-gaining a stake in the resource, usually meaning access, responsibilities for management and some decision-making powers. Government policies can support efforts to address these challenges by improving accountability mechanisms including monitoring changes at spatial levels beyond that of individual communities. Industry associations, certification schemes and standards can make it difficult for firms with poor practice records to get established in first place.

When the problem is across states regional environmental agreements may be needed but these will often be challenged by liberalized investment and trade regimes.

Local governance over forests and land thus comes up against state land classification that may end up working in counter purpose to local interests and result in the degradation of the resource base that the laws were actually aiming to protect. For instance, state classification of protected forests areas on village lands results in alienation of village people from their traditional resource base whether by physical relocation of communities or through central government law enforcement. Subsequently, villagers may engage in environmentally destructive practices that they would not have engaged in previously. As local users and managers, they had an interest in maintaining the sustainability of the resource; but once village use is deemed “illegal”, what historically “was treated carefully as a community-managed resource may degenerate to a virtually uncontrolled common access resource” (Wittayapak & Dearden 1999) (Neef et al. 2006) (Kitjewachakul et al. 2004) (Santasombat 2004)

The roving bandits problem (Berkes et al., unpublished manuscript) is illustrated by the history of logging bans in the region. After the 1989 logging ban the Thai government basically exported its logging practices to the neighbouring countries of Laos, Cambodia, and Burma/Myanmar by promoting a wood import policy and requesting logging concessions for Thai companies in these countries. The logging of neighbouring country forests has contributed to illegal logging operations in Thailand’s forests, particularly along the borders and caused further deforestation (Project for Ecological Recovery 1992).

The ethnic Kroeng community have established the Yak Poy community forest covering an area of 5,500 ha in O' Chum district in Ratanakiri province in northeastern Cambodia but are fighting for recognition from higher-level state authorities. The six Kreung villages mainly practise swidden farming as well as collect resin, rattan, traditional medicine plants, mushrooms, wild fruits, bamboo shoots, wild vegetables, honey, and wildlife.

The community forest was established together by local authorities and the local NGO, the Non-Timber Forest Products (NTFP) in the province. Each village in Yak Poy sends one representative to the community forestry central committee with elections held for chief, deputy chief and so on.

However, the continued status of the community forest is under threat since it is located inside the logging concession given to the Hero timber company. While the ethnic head of the village, commune, district, provincial authorities, and other institutions recognize the community forest, the community is yet to get recognition from the Department of Forestry, Wildlife and Fishery of the Ministry of Agriculture, Forestry and Fishery. The local community wants their community forest to be recognized by the law so that it is not taken over by logging companies. (Sothea & Kolvira 2000).

For many of these challenges it is imperative on states to establish secure channels where corrupt and unfair practices by well-connected can be exposed and challenged safely. Land reform and re-classification schemes are fraught with difficult to challenge cases of corruption and “special deals”. Villagers and smallholder farmers are often in no position to take on or challenge these actions as the security and judiciary have not protected them well. The land acquisitions of politicians and senior officials need to be open for public scrutiny otherwise land reform schemes will often be misdirected.

### **4.3 Surprises in between**

Our final cluster of situations involve strong cross-level interactions. The *aggregate impact* situation is similar to the *roving bandits* in that multiple locations are impacted but the point here is that the individual community-level changes may all be reasonable from a local sustainability and use perspective but in aggregate cause unintended negative impacts. Impacts that may be observable at broader levels from lower level changes include: losses of global biodiversity, alterations to flood water and sediment regimes in lower reaches, deltas and coastal seas, so on. Conversely, larger scale changes like landscape fragmentation may have impact on species composition within local habitats.



In the Ob Luang National Park in northern Thailand, ethnic communities such as the Hmong and Karen were already living there before it became a protected area. Subsequently, they live in an area under strict conservation and have been granted specific areas within “excluded zones” where they can cultivate for their livelihoods. However, these areas are still officially under the state although permanently occupied and cultivated. The communities face pressure from the park authorities to limit their agricultural land resulting in intensification of agricultural practices. (Feer et al. 2005) The agricultural intensification could be causing potentially serious ecological impacts on the larger scale and at multi-levels extending across the watershed landscape.

The protected area system and its accompanying restrictions on land-use could be causing ecological impacts on the larger scale and at multi-levels extending across the watershed landscape.

The point is that in complex situations multi-levelness cannot be ignored. Multi-level processes and institutional support is needed for deliberating and negotiating trade-offs, compensation and transfers. (Lebel 2004); (Barrett et al. 2001)

## **5 Uncertainties**

Social and ecological uncertainty is the normal context in which management by and with communities takes place in upland areas. Actors often make use of or otherwise take into account in their strategies key uncertainties, whether these relate to issues of access, livelihood security, political change or information and knowledge.

### **5.1 Livelihood insecurity**

Livelihood insecurity is often the most serious uncertainty for households when their communities engage in community conservation initiatives. Changes to trade regimes effect market development and the competitiveness of crops, tourist destinations, and other products like handicrafts and woven textiles.

Low or fluctuating agricultural commodity prices pose a challenge to upland farming security. Hmong and Karen cabbage farmers, when asked about the biggest constraint to cabbage farming, mostly talk of the low (and falling) prices. Located inside the forest conservation zone of Ob Luang National Park, the Hmong and Karen plant cabbage (along with upland rice, coffee and onions) but can sell it only to two buyers in the lowland of Chomthong district along with the many small highland producers. The two buyers in Chomthong collude to set a low price and not compete with each other. Meanwhile, pressure from park officials on village land-use is leading to cash crop intensification. The intensive farming, although bringing income and material benefits, is resulting in overall livelihood insecurity due to adverse effects such as decline of soil fertility and soil erosion as well as high cost of inputs and mounting debts (Feer et al. 2005).

Uncertainty also arises because of changes in resource access. In some upland areas lack of formal tenure represents a serious source of uncertainty, whereas in others local institutions may be as secure as conventional legal documents for private property even through common property arrangements that result in much more fluid patterns of use of specific areas over time.

Conventional land titling efforts may not always be the most appropriate way to secure livelihoods at the current rural-forest interfaces in Thailand (Daniel & Lebel 2006). The bundling and simplification of property rights may undermine efforts at sustainable use. A strong emphasis on private individual ownership of land and all the things on it bundles property rights for different forest and land products and services which in many communities are handled by separate institutions. Local communities often distinguish between paddy land, edible plants, insects and animals that live in paddy, upland rice, successional fields and various timber and non-timber products that come from re-growth and older forest areas. Moreover, common property arrangements may apply to a resource in one region, but not in other, depending on things like scarcity and mobility of that resource. For example, we have observed that clumps of certain bamboo species can be owned by households or trees by individuals within a larger “community

forest” area, whereas in another location where bamboo is common it’s use is essentially unregulated.

Efforts to provide formal title invariably benefited the poor farmers. A recurrent challenge for the land administration authorities is to keep land made available through various schemes, such as SPK certification, in the hands of farmers and not well connected politicians or wealthy land speculators. Corruption, unfair practices and poor environmental management outcomes have arisen from past efforts at applying formal tenure arrangements of the state to plantations, tourism resorts and agricultural lands in forest reserve areas. Another factor is those lands most easily re-classified so that the land reform office could issue title is often among the most degraded and thus poorly suited for immediate use by agriculture.

The conventional logic that land tenure security enhances sustainable land and forest management is challenged by experiences in many parts of Thailand. For example, although ethnic minority groups do not often have access to permanent land use rights, long-term investment in land resources are common practice (Neef et al. 2000). Rather than hoping for a perfect melding of various land and forest administrative procedures and laws, we suggest that the problems at the rural-forest interface may be usefully looked at as one rather of guiding constructive interplay among semi-independent sometimes redundant institutional arrangements (Lebel 2005). The advantages of such a perspective is that it is more flexible, can be made more appropriate to local social and ecological contexts, and consequently is likely to be more adaptive to changes wrought within and from outside to those situations.

## **5.2 Incomplete decentralization**

The final important transformation for the forest-rural interface underway is political and incomplete. According to the Decentralization Act of 1999, government agencies (including Department of Local Administration, Community Development Department, Office of Policy and Planning, Ministry of Science, Technology and Environment and the RFD) have undertaken a process of decentralization wherein many responsibilities are shifted to the Tambon Administration Organization (TOA). Some of the activities given top priority for decentralization include: activities in the forest reserves (except in the protected areas); forest fire suppression and control; and community forestry. However, concerned agencies and officers are still unclear whom specifically among local administration organizations will be empowered and to what extent. (Makarabhirom Year not known)

The 1992 Tambon Administration Organization Act (TAO) strengthens the role of village governments in forest use and decision-making. Article 45 in the 1997 Constitution provides traditional communities with the right and duty to manage resources where they live. These reforms have not yet fully transformed practices with the current decade seen as a “period of transition” by most agencies.

Thus in effect, while contradiction exists between the principles in Thailand’s forest and land laws and local reality, measures of flexible interpretation and field-level implementation by officials have also ensured local people’s livelihoods are not unduly threatened (Wataru 2003). At the same time, however, the administrative flexibility is *ad hoc* and dependent on the goodwill and personal attitude (or whim) of the local officials. This means that the *legal* status of the farmers who are often blamed as “illegal encroachers” of forest land continues to be insecure and needs to be resolved especially for those communities who have been settled before the designation of national forest reserves or national parks.

## **5.3 Information deficits**

In most conflicts around the rural-forest interface it is disadvantaged groups which need the most assistance. They often lack the access to critical information which is in the hands of state agencies, well connected firms and non-governmental organizations. The state should provide additional funding for independent legal support and advisory services that target disadvantaged individuals

and communities. Non-governmental organizations are often well placed to facilitate and build capacity for better information access. This should help them find channels through which to challenge, for example, proposals to extend protected area systems into lands they cultivate, and to otherwise alter land classifications and boundaries. A multi-lingual, low-education and gender sensitive communication and outreach approach is essential component of such a service.

Knowledge uncertainties arising out of the complexity of impacts of use on the long-term sustainability of that resources as well as side-effects on other uses plague management of watershed ecosystem goods and services.

These complexities allow erroneous beliefs to persist for long periods. Thus, several significant myths persist with respect to the causes of “deforestation” and its impacts. The temporary removal of small patches of forests in mosaic landscape of secondary succession stages is still believed to historically be the underlying cause of forest cover loss, disastrous floods and droughts by many lowland Thai people. The scientific basis for such sweeping claims is next to zero. On the other hand, quite a lot has been learnt about impacts of vegetation, plantations, agricultural fields and forests on hydrological functions in small catchments that may be of practical significance in local land and water management by both state authorities on public lands and farmers and foresters in de facto private or shared private lands. (Forsyth 1996, 1998) (Bruijnzeel 2004)

Research-informed assessment processes of both social and environmental consequences of current policies are needed. These should be conducted in ways that the bureaucracy, general public, land managers and other stakeholders can scrutinize and comment on evidence and interpretations. Democratizing expertise through deliberative processes is likely to lift understanding of key issues important to both livelihood security and conservation of forest biodiversity. Although assessment processes are most typically carried out at national levels, there is also a lot of promise and some existing experience in facilitating dialogues and land-use planning at more local watershed levels at the rural-forest interface. Some of the best examples have been the work by ICRAF, CARE and local government and non-government organizations in the Mae Chaem watershed of Chiang Mai province(Thomas 2005a; Thomas et al. 2000; Thomas et al. 2004). Such activities are also a helpful background to more bottom-up processes of basin management in areas beyond the rural-interface and merging into rural- peri-urban landscapes (Thomas 2005b).

Progressive institutional reform on land categories and the procedures by which transfers occur between classes is unlikely without first building greater trust among farmers and officials in the bureaucracy on the one hand, and greater understanding among researchers and officials on the other. Assessments and other deliberative exercises should help generate this while they also help bring together, critically and reflectively, different sources of knowledge. The media also has a role and should be encouraged to help reduce discrimination based on ethnicity, gender and class, which act as fundamental barriers to social change.

Uncertainty does not in itself undermine conservation. In fact it may be very helpful to conservation efforts. The real problem is treating social and ecological systems as highly predictable and knowable and trying to plan and manage on that basis. This is what turns the next dry season into a drought or the next monsoonal rains into a flood disaster.

## **6 Conclusion**

Conservation in the uplands no longer takes place beyond the reach of state and market. The investments and activities of firms are increasingly important to how land is developed and conserved. Communities seeking a role in conservation and use of natural resources will often need the state – a state they previously had to resist or avoid – to ensure all actors are accountable for their activities.

In this paper we have highlighted several reasons why joint conservation initiatives by states, communities and firms are difficult. First, the actors involved, not just those from the community, have different interests, skills and objectives. Second, upper tributary watersheds provide goods

and services which are used at different levels, some local, some more broadly. Third, uncertainties of access, impacts of use, and management interventions for multi-use, multi-level, partially common pool resources are large. Nevertheless, there are indications that meaningful partnerships can emerge given reasonable governance conditions.

Land, including forestry and agriculture, water and conservation policies and institutions are inextricably linked when it comes to development in upper tributary watersheds. In these diverse cultural and ecological settings, better conservation and livelihood outcomes would result from revising formal institutions in ways that allow greater local flexibility within broader management guidelines, indicators and targets. For example, we believe this will often, but not invariably, mean moving in the direction of local tenure systems, re-opening the possibility of common property management for some components, and different arrangements for goods and services people depend on for their livelihoods.

The continued broadband application of uniform highly bundled, private rights vested in individuals to a small part of an otherwise “public” upper tributary landscape, on the other hand, will achieve neither environmental conservation nor livelihood security objectives. (Brosius et al. 1998; Forsyth 2003; Walker 2004b, 2006)

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