WHOSE WOODS ARE THESE? COUNTER-MAPPING FOREST TERRITORIES IN KALIMANTAN, INDONESIA

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Forests are repositories of great wealth and ecological importance; politically, they are much more than that. Forests are often located in critical spaces that states want to control: international border areas as well as zones which might be deemed "sensitive" because of either their political-ecological importance or sociological composition. Historically, forests have also been the outposts of "outlaws" and "outcasts" and the base for many an opposition force to imperialistic powers – from 10th century "China" to 14th century Java to 20th century Peru and Vietnam (Menzies, 1992). Forest mapping was embraced early by emerging European states, first for establishing political boundaries and later for management (Kain and Baigent, 1992:132, 210).

Mapping of forest resources is therefore an intrinsically political act: whether drawn for their protection or production, they are drawings of a nation's strategic space. Forest maps pinpoint the location of valuable and accessible timber and mineral resources (Buisseret, 1992:99) and are used for zoning protection of fragile, steep, or biologically diverse areas. Forest maps have been an important tool for state authorities trying to exclude or include people within the same spaces as forest resources; maps increase state control over spaces which are sources of social unrest and valuable resources (Menzies, 1992). Mapping facilitates large-scale accumulation strategies that work to forest dwellers' disadvantage, and consolidates state control over politically sensitive areas such as border zones (Girot and Nietschmann, 1993).

This paper examines the origins, implementation, and implications of

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forest mapping in two different forms in Kalimantan, Indonesia. In Indonesia, forest maps have been an important tool of state land managers and supporting international institutions, such as the FAO, the World Bank, Worldwide Fund For Nature, and the International Union for the Conservation of Nature. In response to two decades of intensive industrial timber exploitation and the Indonesian government's superseding of customary forest rights through official planning and mapping efforts, an alternative or "counter" mapping movement has begun. Local activists, with international and sometimes government assistance of various sorts, are using sketch maps to delineate and formalize claims to forest territories and resources their villages have traditionally managed. In some cases they are matching their sketch maps to points on the Global Positioning System (GPS) and the official Indonesian forest planning maps using sophisticated software (Sirait, et. al; 1994; Momberg, 1994).

The goal of these efforts is to appropriate the state's *techniques* and *manner of representation* to bolster the legitimacy of "customary" claims to resources. The practical effect is far-reaching: the use of maps and a highly "territorialized" strategy redefines and reinvents customary claims to standing forest resources and harvestable products as claims to the land itself. The case accordingly emphasizes the dynamic nature of customary and statutory forest law, both of which can be reinvented as new "traditions" when changing political economies and technologies permit (Hobsbawm and Ranger, 1983). The case also raises some questions about the control of power when NGOs and other local groups utilize high technology empowerment strategies.

The remainder of this paper is divided into three sections. First, I review the recent literature on mapping politics. Most of this literature focuses on state politics and the uses of maps for establishing inter-state claims on territories, securing international boundaries, and other national-level territorialization strategies involving maps. Sub-national or alternative mapping strategies and their potential for confronting hegemonic government maps and map agencies have been largely ignored (cf., Orlove, 1989; Aberley, 1993; Fischer, 1994). In the second section, I give a brief history of forest mapping carried out by the Indonesian government for land use planning purposes. I also examine the changing, sometimes conflicting roles of international and domestic capital, intellectual resources, and development aid in this territorial process. In the third section, I describe the emergence of two distinct counter-mapping strategies in Kalimantan: one initiated by expatriate anthropologists and geographers working through organizations such as the Worldwide Fund for Nature and the Ford Foundation, and the other initiated by local NGOs who sometimes contract international experts to make maps of village territories. In each case, I explore the political alliances behind the local mapping efforts and the specific technical and political objectives of each enterprise. In the final

section, I consider the theoretical significance of counter-mapping strategies, in particular whether territorialization constitutes a freezing of property rights that could undermine the gains won through the appropriation of the new geographical tools wielded by the state, or a contemporary reinterpretation of evolving customary rights that increases local people's capacity to respond to the increasing territorialization of state and international resource management strategies (Vandergeest and Peluso, 1995).

The Politics of Mapping

> Maps . . . exert a social influence through their omissions as much as by the features they depict and emphasize
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> (J. B. Harley, 1992).

A plethora of publications on the history of mapping and its place-specific political contexts and impacts have recently appeared (see, e.g., Harley, 1989, 1992; Buisseret, 1992; Kain and Baigent, 1992; Wood, 1992). These are paralleled, indeed far exceeded, by the virtual explosion of literature on the social relations of spatiality, the spatial relations of social life, and the political economy of space.(see, e.g., Giddens, 1984; Smith, 1984; Gregory and Urry, 1985; Soja, 1986; Cosgrove and Daniels, 1988; Harvey, 1989; Lefebvre, 1991).[1]

Much of the "politics of mapping" theory is based on local/national histories in early modern and contemporary Europe and in the colonized "New World" (including the USA and Canada, with some attention to Europeanized Latin American localities). It accordingly fails to capture the distinctiveness of contemporary Third World mapping politics. The most intensive state mapping initiatives arrived on the "scenes" of the Third World with global capitalism firmly entrenched and in advanced stages, particularly in the "tigerish" economies of East and Southeast Asia. The advanced stage of mapping technology at which both national mappers and local "counter-mappers" have entered the game is also relevant insofar as using the new tools both raises the stakes of resource mapping and offers new political openings for resource users. These factors combine to make this episode in the political economy of mapping exciting, timely, and precedent-setting.

Harley (1989:278), Kain and Baigent (1992), and others have contended that cartography and mapping are uniquely sources of power for the powerful (cf., Wood, 1992). However, if maps can be seen as one of many "authoritative resources" that states mobilize to consolidate their own power (Giddens, 1984, cited in Harley, 1990:279), then local groups' appropriation of the technology of mapping may help to counterbalance or

at least offset the previous monopoly of authoritative resources by the state or capital.[2] This requires understanding the social and political contexts within which maps are used by local groups. Just as inclusion and exclusion are powerful political tools used by states and state-legitimated organizations to control and allocate resource access (Harley, 1988, Menzies, 1992), local groups can claim power through mapping by using not only what is on a map, but what is *not* on it. One effect of having multiple maps of a single forest, for example, could be to challenge the accuracy of a "standard" map used for planning.

An important element of such a challenge to state authority to create maps is the re-insertion of people on resource maps. Individual homesteads, settlements, and villages are routinely excluded from maps of private and state land holdings. This practice grew out of efforts of sixteenth and seventeenth century estate holders to "know" and manage lands held within their extensive domains, to enclose or privatize land from the commons, or of states' attempts to claim jurisdiction over wildlands or resource-rich areas (Harley, 1989:292). In practice, this was sometimes accomplished by artistic stylizing of settlements while trying to precisely represent the location of trees and areas of forest ownership (Daniels, 1988:61; Kain and Baigent, 1992:130; Wood, 1992). When court authorities established legal precedent by accepting the validity of maps in land disputes (as illustrated in Kain and Baigent, 1992:8, 102, 317), the role of maps as tools of the powerful was enhanced.

Not all people were excluded from forest maps at all times, however, and the inclusion of people was also a mechanism for exerting control. The location of settlements and their relationships to the feudal manor or cities have been important pieces of information to be included on maps. From the 16th century on in Germany, for example, elites claiming forest or agricultural resources, as well as the labor of peasants living within those territories, began to clamor for a change in the demarcation of the frontiers of their power from blurry zones to clear boundary lines marked in the field and on a registered map. Large estates had maps made that showed resource rights, especially hunting rights, but also rights to graze or collect wood (Kain and Baigent, 1992:123–24). As the types of rights to land and resources changed in importance, maps became more explicit means of controlling resource access. Thus in Norway from the seventeenth century, maps were used to settle disputes over both individually-held and common lands; in the eighteenth century, hunting, grazing, mining, and woodcutting rights were mapped (Kain and Baigent, 1992: 105–106).

Contrary to the conclusion on hegemony that Harley draws from his extensive research on the politics of mapping (1989:301), maps can be used to pose alternatives to the languages and images of power and become a medium of empowerment or protest. Alternative maps, or

"counter-maps" as I call them here, greatly increase the power of people living in a mapped area to control representations of themselves and their claims to resources (see, e.g., Orlove, 1989). Local people may exert control directly by making their own maps or entrust a representative of their choice, such as a local NGO, to perform the task. Counter-maps thus have the potential for challenging the omissions of human settlements from forest maps, for contesting the homogenization of space on political, zoning, or property maps, for altering the categories of land and forest management, and for expressing social relationships in space rather than depicting abstract space in itself (cf. Sack, 1983; Lefebvre, 1991; Vandergeest and Peluso, 1995). Counter-mapping can be used for alternative boundary-making and "to depict strategies of resistance: where to block . . . unwise development, to identify landscapes that have been damaged, to describe alternatives to the incremental destruction of sustaining habitats" (Aberley, 1993:4).

An analogous challenge to elite power historically was the secularization of the language of print. The replacement of Latin manuscripts with books, pamphlets, and newspapers written in the vernacular languages of Europe (and subsequently replacing colonial newspapers with those in local or lingua franca languages in Asia and other places) revolutionized the lives of millions of people (Anderson 1991:37–40). This "vernacularizing thrust of capitalism" (Anderson 1991:39) was the outcome of a technology transfer – the medium of print – and a shift in its orientation from an elite, limited audience to the masses (potential consumers). If we understand maps and cartography as part of an elite language of the powerful, then could we interpret the teaching of mapping skills to local people to be a new form of empowerment? In other words, is the process of counter-mapping a "vernacularization" of maps of a similar caliber? Although it is difficult to imagine the spread of mapping skills as having anywhere near the impact of the spread of print and the capacity to read, there are several ways in which counter-mapping can have a major impact.

I would argue that while counter-mapping has some potential to transform the role of mapping from "a science of princes" (Harley, 1988: 281), it is unlikely to become a "a science of the masses" simply because of the level of investment required by the kind of mapping with the potential to challenge the authority of other maps. Investment in specialized computers and software and knowledge will make the costs of mapping prohibitive for *most* local people, particularly in poor areas. This of course creates openings for new types of power relations around the control and knowledge of mapping technologies, both in local class relations and in the relationships between NGOs and local villagers. However, although there will necessarily be gatekeepers involved in the mapping enterprise, there are multiple ways that gates can be kept. What ultimately may be

more important for the "masses" is not the technology itself, but the content of the maps produced and the way the knowledge and information on the maps is distributed.

Another question must be asked in the course of re-representing claims to resources and formalizing them in the terms of the state as formal property rights. Whereas abstract space on a map represents merely state claims to power rather than a state capacity to enforce its claims, local people's actual control may be enhanced by exclusion from the map. When the degree of state surveillance increases, e.g., because of an increased value of resources or because of a reduction in resources located elsewhere, local people's inclusion on the map is more desirable. Once mapping begins, however, a new locus of negotiation and potential conflict over resource claims takes center stage – the allocation of resources and ostensible settlement of claims among local users by establishing boundary lines between individuals' claims. The process of mapping almost forces the reinterpretation of customary rights to resources *territorially*, thereby changing both the claim and the representation of it from rights in trees, wildlife, or forest products to rights in land.[3]

Indonesian Forests and Forest Mapping

In Indonesia, prior to the early 1970s, when the government developed a plan for the management of Outer Island timber resources, state forest management and planning was concentrated in Java (Peluso, 1992). In Kalimantan, forest land use planning effectively began with the passing of Basic Forestry Law No. 5/1967,[4] which empowered the national government to control, manage, and administer all state forest lands (Barber, 1989; Zerner, 1990). Until 1966, Indonesia's first president, Sukarno, had pursued economic policies oriented toward domestic self-sufficiency, shunning most foreign investment, particularly by the "Western" (Europe, North America, Australia) capitalist countries. When Suharto took over as president in 1967, he immediately set the stage for foreign investment and capitalist development, with the passage of Foreign Investment Act no. 1/1967, representing a major reversal of economic and foreign policies from those of the previous regime. Foreign logging industries from Japan, the Philippines, the USA, and Europe were granted timber concessions, called HPH (*Hak Pengusahaan Hutan* – Permit for Forest Industry) in the Outer Islands (Manning, 1972). At the end of 1989, some 561 concessions were in operation, 294 of them in Kalimantan (FAO/GOI, cited in Potter, 1995). Untold numbers of concessions had long since folded, after having extracted and exported hundreds of thousands of cubic meters of timber.

The first of three mapping episodes directed at "forest management"

in Kalimantan accordingly consisted of notoriously inaccurate and secretive concession locations. Anecdotal evidence indicates that these maps revealed border conflicts, multiple permitting of territories, and illegal entry of one concession operator onto the concessions granted another. They ignored the physical conditions of the forest itself in designating these concession areas for timber production and whether competing claims and forms of management were already in place. A 1990 FAO study, which found 57.9 million hectares of forest had been allocated to HPHs for 43.3 million hectares of production forest, i.e, forest designated for commercial timber extraction, gives hint of the gravity of these problems (Pramono, 1991:16, cited in Moniaga, 1993:134–35).

These maps were replaced between 1981 and 1985 when provincial foresters collaborated with colleagues in agriculture, public works, and agrarian affairs, to develop plans and maps. This second set of state forest maps was called the Consensus Forest Land Use Plan (TGHK, or Tata Guna Hutan Kesepakatan) (Moniaga, 1993:134; Potter, 1995:12). Six forest land use categories were determined, on the basis of physical topographic characteristics, potential for soil erosion, rainfall, and slope. Once again, no account was taken of local people's previous claims to these lands, nor of existing vegetative cover (Potter, 1995:12). The six categories included nature reserve/conservation areas, protection forests, limited production forests, normal production forests, convertible forests,[5] and unclassified lands.

The third and most recent state attempt to map forests in Kalimantan and other "outer" islands of Indonesia is the Regional Physical Planning Programme for Transmigration (generally known as RePPProt), a collaborative effort between the GOI's Ministry of Transmigration and the Land Resources Department of the Overseas Development Administration (ODA) in London. The maps are part of a larger regional planning effort, which in the case of Kalimantan is to involve the resettlement of millions of people from Java, Bali, and Lombok and the creation of agricultural estates – principally for palm oil and rubber. The labor for these estates will be drawn from both immigrant and locally born populations.

Using Landsat data and aerial photographs, actual land use cover is being mapped and the areas included in different forest land use categories are being reconsidered. The discrepancies between the earlier TGHK maps and the RePPProt maps are striking, as illustrated in Table 1.[6]

These latest planning maps also include settlement areas around urban areas and villages, cultivated fields outside of these settlements and planned forest areas. The maps underestimate, indeed, lack knowledge of, forest-based populations' claims to and management of forest territories, as well as their actual patterns of forest and agricultural land use. For example,

Table 1 Comparison of TGHK (1987)[7] and RePPProt by Classification (million hectares)

Forest classification	TGHK	RePPProt
Nature Reserves/Conservation forest	14.59	18.42
Protection forest	22.53	20.25
Normal Production forest	15.39	19.79
Limited Production Forest	30.74	10.77
Convertible Forest	16.24	76.64
Unclassified Forest	48.02	1.63
Total Area	147.51	147.50

Source: GOI, n.d.:32

> shifting cultivation is considered as a 'non-permanent' use of the land, although it is recognized that this may not agree with the views expressed under local customary rights. The villages associated solely with this extensive form of land use are not permanent in the long term, although some may remain on the same site for 10–20 years or more before moving elsewhere. (RePPProt West Kalimantan Executive Summary:30).

The notion that villages practicing shifting cultivation inevitably move is outdated and historically correct for only a subset of the groups labeled shifting cultivators in Kalimantan. Recent research has shown that many groups in West Kalimantan have remained settled for several hundred years. Moreover, their land management techniques include not only protecting forest but also creating it (Peluso, 1993; Padoch, 1994).

The RePPProt planners have not completely ignored their lack of knowledge of customary systems, but they have neither emphasized their importance in the executive summary, nor made recommendations about what to do for the purposes of their map-making exercise. The following comments are buried in Volume 1 of the main report.

> For development purposes, land should not only be suitable; it must also be available, unconstrained by existing uses or claims. The Land Use/Forest Status maps at 1:250,000 scale show where shifting and settled cultivation occur, hence the general intensity of use. *They do not show boundaries of customary land use or tribal areas, although these are essential for detailed planning* (GOI, n.d.:Vol 1:51; emphasis added).

The executive summary recommends further studies of customary rights, land use, and land ownership, because,

> many of the identified recommended development areas in-
> clude shifting cultivation, regrowth, scrub or grassland. These
> may or may not be used or claimed under some form of local
> rights. Problems of compensation can be minimized by studies
> before implementation (GOI, n.d., Executive Summary:40).

Planning is apparently proceeding without further consideration of these local institutions. Much of the forest considered "Convertible" encompasses large areas of community forests long protected by local peoples (Momberg, 1994; Sirait et al., 1994; *Kompas*, 1993). The allocation of these forests to plantation managers, transmigration planners, and other development planners proceeds according to the map.

Not only do planners *not* know the boundaries and types of customary rights and claims of local people, they are not even sure how many people there are. Estimates of forest dependent peoples in all the Outer Islands ranged as follows:

> The MOF stated in 1985 there were 1.2 million swidden
> agriculturalists [households] (around six million people total)
> using an area of 9.3–11 million ha of forest lands (Harahap,
> 1991:3). Another source stated that in 1960 an estimated 35.4
> million ha of land was being used by 3.8 million families
> of swidden agriculturalists (Djajadiningrat 1990:172). The
> RePPProt study team estimated that as of 1991 there were
> 1,199,970 families of swidden agriculturalists using 11, 402, 300
> ha of forest land (Pramono 1991:Table 4.9). Poffenberger (1990)
> estimated that there are 30–40 million people living in and near
> 143 million ha of forest lands in the Outer Islands. . . . [he]
> recently doubled this estimate to 60 million people (Moniaga,
> 1993:135).

Both in Indonesian law and by verbal consensus, Indonesian planners recognize that extensive systems of customary law and practice *(hukum adat* and *hak ulayat)* exist throughout Indonesia, and often overlap with forest territories and resources claimed by the state, though they have no maps or other documents formally indicating their extent. Forest Law No. 5 states that the rights of indigenous peoples to land and resources covered by *adat* should be respected, except when these conflict with national or the (undefined) "public interest." Essentially this means that by law national development initiatives and planning, such as that represented by the RePPProt, can override customary practices, laws, and claims, in the interests of the "public" represented by the state. Earlier legal efforts were made to erase some of the ambiguities of the dual Indonesian law imposed under Dutch colonialism. Basic Agrarian Act No

5/1960, for example, was meant to replace the dual system of *adat* and statutory law by providing legal rights to all Indonesian citizens. All land was to be registered according to this law, so the status of ownership was clear and treated legally under a single system, common to all parts of the country. The enormity of such a registration system notwithstanding, the Act has had little impact on most of the land in Kalimantan, where many people have not even heard of it (Moniaga, 1993:139).

Territorial Claims and Counter-mapping

Mapping by government land-use planners focuses on the land itself. In other words, maps are part of a larger resource management strategy with a strong territorial component (Sack, 1983; Peluso, 1992a; Vandergeest and Peluso, 1995). This represents a shift from an emphasis on the control of the resources on the land (in the case of forests) and of the laborers needed to extract those resources (Peluso, 1992a) to a territorialized strategy emphasizing the control of land itself.

State land use planners recognize the following categories of local people's (i.e., not state) land and forest management: shifting cultivation (which they never call swidden), permanent cultivation (defined as continuous cultivation of at least one crop per year on wet or dry fields), thatch/brush/secondary growth. However, they only recognize local people's *territorial* rights to areas they define as "permanent cultivation" (GOI, n.d., Executive Summary:30). Forest planners recognize people's *adat* claims to certain forest trees and plants producing products such as rattan, fruit, honey,[8] illipe nut,[9] resins (damar), and rubber, even when these occur in state-claimed forest territories. State recognition of individual trees in the forest, however, does not translate into recognition of villagers' claims to portions of the forest *as territorial entities*. In fact, exactly the opposite is true: certain species and individual claims to them are recognized in part to allow the state to claim the forest as territory and to allocate exploitation rights (to corporations, not to villages, as a general rule) as it sees fit. Such rights include rights to harvest timber (through concessions) and rights to convert the forest to plantation tree cropping, whether oil palm, rubber, or pulpwood species (in the case of lands categorized "Convertible Forest"). The drive to maintain territorial sovereignty also reflects efforts by state managers to distribute the jurisdictions among themselves – e.g., land parcels are transferred from forest production to forest protection or conservation agencies, to transmigration and resettlement authorities, or to the Department of Plantations.

Government officials refer to Dayak[10] agriculture as "shifting agriculture" (*perladangan berpindah-pindah*), a pejorative term dating back to the colonial period. In practice, the system is more rotational than shifting.

As mentioned above, some groups have hardly shifted at all. It is note-worthy, however, that shifting cultivation areas were grouped by RePPProt mappers with areas of scrub, regrowth, and grassland, all of which are "considered available for development planning" (Executive Summary:31). That local people's territorial forest rights are not recog-nized is evident in the significant increase in lands included in the cate-gory of "Convertible Forest" (see table).

Local Counter-mapping Initiatives and Territoriality

Two different counter-mapping strategies have been developed in re-sponse to this situation. The first is through efforts of outsiders working for international organizations. They have suggested mapping as a way of clearly depicting and protecting local claims to territory and resources to a government that in the past ignored them. The second has been initiated by Indonesian NGOs who request or contract the services of key international groups to learn the uses of counter-mapping strategies to document forest uses, claims, and population distribution. Both strategies involve 1) the uses of low and high technology mapping techniques necessitating villagers' formation of political alliances with international NGOs and foreign experts, and 2) the assertion of specific and permanent territorial claims to resources. The key theoretical questions about the impacts of counter-mapping on resource control are to what degree new notions of territoriality reflect older ones; how the reinvention of these traditions benefits or works to the detriment of customary practice, law, and resource distribution; and how the intervention of NGOs (whether locally, nationally, or internationally based) affects the villagers' access to and control over forest resources.

Before I discuss the two types of counter-mapping initiatives, some background is needed on the ways territorial and non-territorial strategies have been part of customary Dayak forest and land management strate-gies. In both the past and present, Dayak forest and land management strategies have included territorial and non-territorial components. Swid-den cultivation, practiced by most rural Dayaks, imparts territorial rights. Once old growth forest has been cleared, territorial rights are vested in either the clearer's direct descendants or in the clearer's longhouse/ village (see Appell, n.d.). Swiddening, for many swiddening groups, is a form of rotational agroforestry, practiced on a relatively broad regional basis, and involving the management of not only swidden fields but also of swidden fallows in multiple stages of development, including standing forests. Indeed, because of ancestral territorial rights and labor input considerations, many Dayak swiddeners prefer to make their swiddens in secondary forest rather than primary forest (see, e.g., Jessup, 1983; Mackie, 1986; cf. Colfer, 1983).

Dayak forest managers differentiate activities within different types of forest, although they do not always establish rigid land use categories. Recent research among Land Dayaks in West Kalimantan, for example, has shown that villagers manage a range of forest types, each with different origins, species compositions, uses, and dominant sets of property relations. Borders between land use types are blurred; uses overlap (Padoch, 1994; Peluso and Padoch, 1994). These forest management categories are neither understood nor recognized by state forest managers and other government officials.

In swidden fallows of different ages and in other types of forest, Dayaks actively manage production of both timber and non-timber products, with "rules" guiding access rights varying widely across and within groups. Rights to specific products, such as clumps of rattan or individual resin-producing trees, are held by individuals who find, plant, protect, encourage, or otherwise manage them. Rights to sources of forest products (e.g., the trees which bear coveted fruits or nuts, caves where swiftlets build their nests, or rattan clusters from which canes are cut), are inherited, often bilaterally, so that both male and female siblings may obtain equal shares of their parents' resources (Appell, n.d.; Weinstock, 1979; Peluso, 1995). Although access to and management of these resources are not discussed in terms of territoriality, their management is partially territorial, in the sense that once planted or otherwise claimed, others may not clear these plants to use the land where they occur. This situation gives implicit territorial control to the individuals and groups who claim trees and other forest products.

These systems have changed in response to shifting market opportunities, and more recently, to the large influx of immigrant settlers from other parts of Indonesia.[11] International markets have stimulated extraction and production of forest and agroforestry products in Kalimantan for at least two thousand years, with the demanded products ranging from camphor, to incense wood, birds nests, resins, latexes, rattan, and wildlife (Peluso, 1992). Both planned and spontaneous migration of other Indonesian peoples to the island has increased pressure on the land, and will soon make the Dayaks a minority group in their own homeland.

Counter-mapping as a Joint Forest Management Strategy

One of the two counter-mapping strategies described here has been applied in the Kayan Mentarang Reserve. The Kayan Mentarang Reserve, set within the mountainous territory along the East Kalimantan-Sarawak border, was gazetted in 1980. Culturally and biologically diverse, it contains potentially important archeological remains and is home to 12 distinct ethno-linguistic groups. With elevations ranging from 200 to 2,500 meters and a tropical moist climate, the reserve is highly diverse at the

landscape level: at least five forest types have been identified. Species diversity is also high: including some 500 species of orchids, 24 species of rattan, over 50 traditional rice varieties, 96 mammal species, and some 200 species of birds, including 7 species of hornbill. Many of these plants and animals are also locally important for subsistence or sale, and have national/international importance – either for trade, protection, or both.

Since approximately 1990, the Worldwide Fund for Nature, The Indonesian Department of Forest and Nature Conservation (PHPA) and the Indonesian Institute of Sciences have been cooperating to develop a long-term conservation program in this 1.6 million hectare reserve, one of the largest in Asia. Their activities include an inventory of the reserve's extensive human and natural resources, documentation of local knowledge and resource management systems, and, most recently, efforts to record this information on maps. The maps are intended to

> form the basis of talks for identifying customary forest tenure boundaries in order to assess how indigenous ways of organizing and allocating space might support or conflict with the objectives of forest protection, for evaluating different means of coordinating indigenous resource management systems with government-instituted systems of management, and as a basis for formal legal recognition and protection of customary forest tenure arrangements (Sirait et al., 1994).

With funding from the Ford Foundation, a sub-project within the reserve area was established, called the "Culture and Conservation" project. The goal of the project was to record oral histories, indigenous knowledge, and village dynamics related to resource management. The mapping component was added at the suggestion of a colleague at the Environment and Policy Institute of the East-West Center. Using a method developed by Fox (1990), sketch maps of local land use and resource territories were constructed. Sketch maps reflecting local people's ways of talking about resources and their claims to them were combined with points on the GPS. A geographic information system was used to match field data with data on official land use and topographic maps. In this way, the counter-mapping agencies hoped to identify territorial conflicts, establish resource use boundaries, and better understand the ways local people conceptualize their resources.

In a paper reporting on the initial results of this exercise in one village, participants from the WWF, the Directorate General of Forest Protection and Nature Conservation, and the East-West Center discuss some basic aspects of the exercise. These include village land tenure and inheritance, the nature of individual and community decisions about resource use, and the ways that villagers have dealt with outsiders seeking access to

local resources (Sirait, et al., 1994). They then compare their results to those of the Forest Department as reflected in the TGHK maps which first appeared in 1984. The RePPProt maps were not used, despite their higher accuracy, because the foresters were not happy with their results – the greater accuracy reduced the amount of territory under their control (Fox, 1994). Some of the relevant details of the case follow.

Prior to the gazetting of the reserve and the allocation of other uses by the Forest Department, the villagers kept a majority of their lands (66 percent or 11, 844 ha) in two protected forests, one to be used only by the village council when wood and other products are needed for village development projects, the other to be kept for product extraction by widows and orphans (Sirait, et al. 1994:10, 12). Other human use of these lands is relatively rare. Another 31 percent (5,419 ha) of the village land is standing forest, used for collecting firewood, construction wood, resins, fruits, and other non-timber forest products by all the villagers (Sirait, et al. 1994:12).[12] Only four percent (631 ha) of the village land is under swidden cultivation, but this figure includes swidden fallows under various management regimes including fruit tree groves and rattan gardens (which are typically interspersed with a variety of planted and self-sown species in swidden fallow forests).

In sharp contrast to the locally produced maps, the land uses on the TGHK maps show no regard for current village uses or claims. On the basis of these maps, and with no ground checks, government forest planners allocated more than 50 percent of the village's land – mostly its standing forest – to two external users: the Kayan Mentarang Reserve and a timber concession. The reserve includes land classified as protection forest and convertible forest; the timber concession includes land classified as convertible forest and limited production forest. More than half the village's protected forest falls within the reserve or within another adjacent protected forest area. Twenty-five percent, however, falls either in the concession, in convertible forest not yet allocated, or in limited production forest (Sirait, et al. 1994: 415, Table 1). All of the village's cultivated land is in either the reserve or the concession area (Sirait, et al. 1994: 416). Note that such an aberration does not benefit the timber concession or the reserve because lands under village agriculture contain neither mature hardwood species for logging nor the species intended for protection. Moreover, were the villagers to prevail in a decision over whose maps to use, the outcome would be more standing forest than the government has presently planned.

The question raised by these discrepancies is whether the counter map has a chance of recognition by the government. This requires thinking about the changes that would have to be made in the government's current uses. Two major things need to happen to give the villagers' total jurisdiction over their forest. First, the status of the Kayan Mentarang

Nature Reserve would need to be changed to a National Park or a Biosphere Reserve, in order to allow some "traditional" uses of the forest by local people. This would in effect allow the recognition of local people's customary rights. However, since the counter-map was made, a request to change the reserve's status was put forth. A concurrent request by the logging company for permission to build a road through the proposed park to the timber concession led the Minister to turn down both (Fox, pers. comm., 1995).

The second change required would be to alter the forest concession agreement. This would entail changing the boundaries of the concession, a much more expensive and contestable task than changing from one conservation status to another. If villagers were allowed to control the whole conversion forest area, but none of the production forest, they would only regain a quarter of the territory usurped by the concession. The other alternative is for the villagers, the concessionaire, and the Forest Department to work out a management plan. A recent government ruling has placed the burden on the concessionaire "to recognize the existence of customary land and reach a consensus with the villagers about its management" (Sirait, et al. 1994: 416). In practice, very few timber companies have actually carried out this new requirement. In virtually all cases, conflicts over territory, resource rights, and road building continue apace. Loggers still retain a great deal of power both at a personal level through individual dealings with government officials and through their connections with the Directorate General of Forest Production, the most powerful Department in the Ministry of Forestry.

Despite initial difficulty in surmounting such obstacles, the "Culture and Conservation" mapping project has several factors operating in its favor. First, as it is one of the biggest contiguous reserves/parks in Asia, developments within it are likely to have an important impact regionally, particularly if it successfully integrates people into the planning process and the majority of local people feel they have benefited after implementation. Second is the participation of international institutions with a history of involvement in and influence on resource management policy in Indonesia.[13] Some of these programs have emphasized taking the needs of local people into account. A key question, however, is whether the Worldwide Fund for Nature (WWF) in particular will be willing to make commitments to a conservation strategy that gives local people a strong or even dominant voice in determining how and what to conserve. Even though this village's track record so far has been congruent with most of the goals of WWF in the reserves it manages, the organization has not historically opted for such "radical" people-oriented conservation strategies. A third element in the mapping project's favor is the appropriation of the government's own mapping methods and planning tools, including the topographic map series and the GPS. Indonesia has invested consid-

erable funds in GIS technologies, satellite technology, and computerized resource management tools; acquisitions that now make the state somewhat vulnerable to counter-mapping strategies. Moreover, when peasant groups meet government mappers on their own ground, as it were, their efforts have greater legitimacy than if the maps were simple sketches.

Finally, counter-mappers have allies within the Indonesian state itself. The Ministry of Forestry has been involved in reserve planning and oversight since the beginning, including at least some discussions concerning the roles and status of indigenous peoples living in or adjacent to the park. The agency most involved has been the Directorate General of Forest Protection and Nature Preservation, as reserves and parks fall under its jurisdiction. A paradox exists here in that this Dirgen has relatively little influence *within* the MOF, especially compared to the Dirgen of Production, but has perhaps the greatest and most visible *international* support from mainstream international conservation NGOs. As forests and their protection will likely retain a place on the world political stage for some time, the choices made in this reserve could serve as precedent elsewhere, at the same time giving the beleaguered MOF some relief from the attacks made frequently on its production and protection policies.

Counter-mapping Strategies Initiated by Local NGOs

Both structurally and in terms of goals, mapping projects initiated by local NGOs unfold somewhat differently. In Kalimantan, as in parts of eastern Indonesia, several local NGOs have requested the services of mapping experts to teach and aid them in mapping village land use. The relationships between the NGOs and their international supporters differ from those engaged in the co-mapping strategy described above. These NGOs work autonomously: they do not share management of the project with government agencies, or with internationally-based NGOs like WWF. The NGOs hire the experts (sometimes the same individuals working in the project described above) with funding that they apply for on their own (but often from some of the same sources as those mentioned in previous section). Besides working in communities around a particular reserve, the NGOs may also work in various members' home villages and in forest areas around those.

Some of these NGOs' goals in mapping include documenting current and historical land uses and claims as well as locating and counting forest-dependent populations by ethnicity. In doing so, they intend to legitimate claims to areas that have not already been "converted" into production forests or plantations. They also hope to counter the impact of the national census which inadequately represents the diversity of local populations and therefore works against local claims formerly protected

by customary law (*adat*). *Adat* is generally defined or represented as the customary "laws" developed by the members of various sub-ethnic groups. However, the notion of *adat* as aboriginal customary law is itself problematic, largely because its forms and rules have been interpreted, written, and rewritten by Dutch scholars and anthropologists, and most recently by government officials seeking to homogenize variations of practice and understanding of these rules within the various sub-ethnic groups. As discussed further below, these inherent problems with the concept have not been generally acknowledged by the villagers themselves or by the activists assisting them. *Adat* as an institution has generally been romanticized as the way resources were locally managed prior to the rise of foreign investment and forest industry in the 1960s. While *adat* embodies local "traditions" and resource management practices, it is also a dynamic institution which has repeatedly changed in response to forces impinging on particular localities from the "outside," such as markets and other political-economic influences.

The nationalistic thrust of Indonesian policy over the past 50 years has emphasized the homogenizing aspects of national unity, at the expense of the country's rich ethnic diversity, although both phrases are part of the nation's motto ("Unity in Diversity"). The number of people heir to particular ethnic identities, therefore, has become an important and scarce bit of information. When the central state's mechanism for counting citizens does not differentiate them by ethnicity, the geographic extent of local claims remains unclear. Ethnic diversity and identity, expressed among other ways, through resource management and control strategies, and codified by *adat*, is an important aspect of what these local NGOs wish to document. Relating population figures to forest maps is thus a first step in understanding where conflict might arise between claimants with aboriginal or historical claims and newcomers to the local scene, including both newly settled migrants and government-sponsored resource exploitation projects. In a less formal, but no less territorialized manner, the NGOS want to help local people document their claims to the resources within particular lands and the rights to convert forest to other land uses, as they did for centuries before the nationalization of forest land.

Local NGOs are also trying to learn more effective ways to use available data such as census data. Systematic data collection and analysis has not been a strength of many NGOs until very recently. By improving their research capacity and their familiarity with the data generated for other purposes (such as the data in the census), they will enhance their legitimacy amongst both the international groups which support them and government agencies.

Both mapping strategies described above necessarily involve more educated, often urbanized members of these subethnic groups, representing

"local" situations of which they may no longer be a permanent part. The technology being used necessitates this – at least in these early stages. Moreover, they are providing a voice from these localities which has been missing from previous representations of these forested spaces. The more detailed these maps become, however, the more important will become the question of which local voices are represented.

Discussion and Conclusion

Counter-mapping is a uniquely late-twentieth century phenomenon, made possible in part by both technological developments and the last decade's push toward participatory politics and management strategies. This paper presents two means by which local people are gaining access to the tools of the powerful – maps and mapping technologies developed by and for state international resource planners and managers – and shows how they are using them to legitimize their claims to land and resources. Regardless of their future success or failure in changing state policy and state maps, however, the cases raise several critical theoretical issues. Most critical, perhaps, is the potential maps have for "freezing" the dynamic social processes which are referred to as "customary law." Secondly, will an independent strategy to map and claim resources fare better than an inclusive one that works with government forest agencies and international environmental groups with a strong presence in Indonesia?

   As Foucault, Anderson, Giddens and others have discussed, the use of a new medium of expression, in this case maps, to express social relations has transformative power.[14] The fear of "freezing" custom is not a new argument for Indonesia (or the former Dutch East Indies). Many writers have argued that the codification of customary law, the writing down of oral traditions, the legalizing of flexible law codes, generally resulted in "freezing" these traditions, taking away their characteristic flexibility, and therefore changing their very nature (Lev, 1985; cf. van Vollenhoven in Holleman, 1981). Similar arguments were made in colonial debates about customary law in Africa as well (Moore, 1986). In some ways, we have seen how this is so: particularly in the reification of *adat* by some contemporary NGOs as a timeless, local system, unaffected by the turbulent political economic changes of the past.

   Since mapping is the visual or representational aspect of the "writing" of custom, it too can be accused of affecting the flexibility of land use and claims to resources. Certain common land and forest uses may not be clearly defined or separable from local viewpoints. Long-term rotational agroforestry strategies, for example, are not easily accommodated on maps (although they could be by using some types of GIS). Moreover,

future uses are difficult to predict, given local people's responsiveness to changes in the political-economic and environmental circumstances in which they find themselves. The question is whether maps will *preclude* future changes that ignore the information on the map. I think the answer to this question in terms of land use is no: maps may or may not be a covenant, despite the current fascination with them as a planning tool. Whether a user will harvest all or some of the rattan on his or her land all at once or gradually, whether they will plant rice, stringbeans, or rubber and fruit, are decisions unlikely to be made solely on the basis of the lines on the map. Once a group's map is empowered by both state recognition and local acceptance, the map can become a tool for negotiation of local land use controls – separating protection forest from agricultural land, for example. But empowerment should also bring the ability to change the map, to renegotiate its terms, and to alter the contents of what may remain somewhat abstract space at a larger scale. In addition, many of the boundaries on the ground are unlikely to remain as strict and clear as they will appear on maps. Maps may influence the direction and impact of change, but change, like flexibility, is an important part of customary practice or law. Like customary rules transmitted orally, or even like written customary or statutory laws, maps can be changed as practice, use, and values change, or as rights are transferred between generations or out of the hands of the original holders. Such change has been observed in Thailand's forests, where national forestry maps are changed yearly because people continue to live in and convert the forest, despite the neat management categories the government has repeatedly mapped out (Vandergeest and Peluso, 1995). Moore (1986) has shown that both the codification of customary law and the superimposition of statutory legal systems on customary systems creates new windows of opportunity for people to take advantage of multiple systems of claiming resources. In addition to formalizing some past claims, counter-maps will set in motion new dynamics for making claims to the forest.

Not all local people will be happy with these changes. One change which a majority may regard as beneficial may be the transformation of more nature reserves to biosphere reserve or national park status, either alternative allowing more human use. However, some people may use the establishment of boundary lines between and within villages as a permanent indicator of private property rights. Detailed local maps which serve as alternatives or precursors to cadastral maps would increase flexible options of one person at the expense of another. Local maps will also transform blurry boundaries between forest villages to fixed ones, another potentially contentious issue (see, e.g., Peluso, 1992).

A second, related, issue has to do with the transformation of customary rights to forests. Dayaks have always made claims to territories, bounded by river systems, ridge lines, and other natural cues. However, such

territoriality has had more to do with rights to use resources within a particular territory than with the extent of territory and its exact boundary lines. Some land use categories might be structurally impossible to allocate as individual territory. For example, territorializing rights to mature fruit forests (*tembawang*) would undoubtedly lead to conflict. In these social forests, multiple descent groups claim ancestral rights to fruit, resin, and trees. Virtually every tree has a set of owners which differs from the set claiming the next tree (Peluso, 1993, 1995). Thus, the degree of detail in mapping claims within the village becomes important, particularly in seeking ways to represent resource claims which cannot be territorialized.

In general, however, the use of maps requires the re-definition of customary forest rights which emphasized standing forest resources and products to an emphasis on the territory itself. The broad land use categories on the map delineate some of the territories that existed previously but were never formally recognized or drawn. However, by purposely making maps "empty" or "homogenous space," counter-mappers can reduce the potentially negative effects of such a territorialization. In other words, communities can retain the most internal flexibility in interpreting and changing land uses if individual rights within the village are not mapped. While broad land use categories such as protection forests, *tembawang*, or agricultural areas may be mapped, the detailing of individual claims to trees or other resources within them could lead to local conflict. Leaving out the details of resource use within each category allows local people much more freedom to determine individual or descent group rights of access and to change management practices (Fox, pers. comm.).

In sum, although mapping has until now been peripheral to the politics of customary rights and forest access, its role is likely to increase. Mapping is a tool that speaks a language both national and international resource planners and managers can understand. Given the drive in Indonesia and elsewhere in Southeast Asia to zone land uses, such as production forests, agricultural lands, and areas of urban settlement, and parallel efforts to register private lands in cadastral surveys, the use of maps to recognize the bounds of community-controlled resources is an appropriate and timely tool. Indeed, communal or group-held properties are among the only categories of land that the government has never really mapped, nor does the government have concrete plans to do so. Because RePPProt planners have stated the need to understand customary claims to the resources and lands mapped under their auspices, counter-mappers could incorporate government planners into their own plans.

The main purpose of the maps described here is to document and establish boundaries between forest villagers and external claimants, from the local point of view, and to re-claim for local people some of the

territory being appropriated by state and international forest mapping projects. Local notions of territoriality have had to change as extensive land-based projects have threatened them; they will change further with mapping. Yet, given the alternate futures – of not being on the map, as it were, being obscured from view and having local claims obscured, there almost seems to be no choice. Both in forest mapping and generally in Indonesia's natural resource politics, local people's views and claims have not been adequately recognized, and even more rarely accepted on their own terms. Some translation is needed into the terms of those who would claim them. Maps give local people the power to do so.

Acknowledgements

Notes

1. At the 1993 annual meetings of the Rural Sociological Society, virtually half the panels treated the integration of spatial relations into various paradigms of contemporary social theory.
2. This task remains open to the more powerful environmental groups, the NGO elites, and begs a detailed analysis of political configurations beyond the scope of this paper. Moreover, given the newness of the NGO movement in Indonesia, such an analysis would be inappropriate at this time.
3. Ironically, a state may be more prone to include local people's uses of forests the more transformatory these have been. Standing mature forest, for example, is most frequently dubbed "natural" and is thus subject to claim by the state, even when local people's manipulations may have led to the forests' current form. Such manipulations are invisible to the average forest planner or mapper (Peluso, 1993; Padoch, 1994).
4. Based on Article 33 of the 1945 Indonesian Constitution.
5. A convertible production forest is forest land which can be converted to smallholder or plantation agriculture after logging. Operations in normal production forests are to employ selective logging techniques and remain under forest cover.
6. Moniaga (1993:135) also provides a table on this with slightly different statistics.
7. The 1987 figures for TGHK have been converted to a scale of 1:250,000 from the original TGHK maps drawn at 1:500,000 scale, in order to match the RePPProt maps and recommended changes. The change of scale resulted in approximately 1% increase in area.
8. Honey is not produced by the tree, obviously, but in Kalimantan certain species of honeybees build their huge nests along the branches of certain tree species.
9. Illipe nut is an oil seed processed and sold as cocoa butter.
10. The indigenous or autochthonous peoples of Borneo (comprised of Indone-

sian Kalimantan, Malaysian Sarawak and Sabah, and Brunei) are collectively called Dayak and Punan/Penan. Though the Dayak peoples of Borneo have a wide variety of rituals, customs, social organization, and even resource management practices, they share some patterns of resource management. For the sake of consistency, my remarks here refer only to Dayak peoples, although they may be also relevant for some settled Punan and some rural Malays.

11. Some of these settlers have come as a result of planned government resettlement projects (transmigration), or contract labor schemes, others have come spontaneously, to take advantage of formal and informal employment opportunities.

12. Though not mentioned in the paper, it is assumed that the various products are subject to a variety of locally defined and sanctioned access rights.

13. For example, the Ford Foundation, The Worldwide Fund for Nature, and the East-West Center.

14. For example, the use of matrikel maps in Denmark beginning in 1844 facilitated the shift of the locus of rights from groups of people with use rights to land and resources to rights in the land itself. This focus changed other practices related to resource access rights. For example, *ejerlal,* which meant " a community of villagers" [with certain use rights in land] became a concept attached to the land under discussion not the people with access rights to it (Kain and Baigent, 1992:91).

References

Aberley, D. (1993) *Boundaries of Home: Mapping for Local Empowerment.* Gabriola Island, B.C.: New Society Publishers.

Anderson, B. R. O'G. (1991, first printing 1983). *Imagined Communities: Reflections on the Origins and Spread of Nationalism.* London: Verso.

Appell, G. N. (n.d.) Observational procedures for land tenure and kin groupings in the cognatic societies of Borneo. Unpublished manuscript.

Barber, C. V. (1989) "The State, the Environment, and Development: The Genesis and Transformation of Social Forest Policy in New Order Indonesia." Unpublished PhD dissertation, University of California, Berkeley.

Buisseret, D. (Ed.) (1992) *Monarchs, Ministers, and Maps: The Emergence of Cartography as a Tool of Government in Early Modern Europe.* Chicago: University of Chicago Press.

Colfer, C. (1983) Change and indigenous agroforestry in East Kalimantan. *Borneo Research Bulletin* 15: 3–20, 70–86.

Djajadiningrat, S. (1990) *Kualitas Lingkungan Indonesia 1990.* Jakarta: Kantor Menteri Negara.

Fischer, A. (1994) Power mapping: New ways of creating maps help people protect their landscapes. *Utne Reader* 65: 32–35.

Fox, J. (1990) Sketch mapping as a diagnostic tool in forest management. In Mark Poffenberger (Ed.) *Keepers of the Forest: Land Management Alternatives for Southeast Asia.* Westport: Kumarian Press 119–133.

Giddens, A. (1984) *The Constitution of Society.* Berkeley: University of California Press.

Girot, P. and B. Nietschmann (1993) The geopolitics and ecopolitics of the Rio San Juan. *Research and Exploration* 8: 52–63.

Government of Indonesia (GOI) (n.d.) Regional Physical Planning Programme for Transmigration (RePPProt). Jakarta: ODA and Departemen Transmigrasi.

Gregory, D. and J. Urry (1985) *Social Relations and Spatial Structures.* New York: St. Martin's Press.

Harahap (1991) Pemanfaatan hutan dalam mensejahterakan masyarakat. Jakarta: Paper presented at Seminar on Economic Democracy in the Forestry Sector, WALHI.

Harley, J. B. (1988) Maps, knowledge, and power. In D. Cosgrove and S. Daniels (Eds.) *The Iconography of Landscape.* New York: Cambridge University Press, pp. 277–312.

Harley, J. B. (1989) Deconstructing the map. *Cartographica* 26: 1–20.

Harley, J. B. (1992) *History of Cartography.* Vol. 1. Chicago: University of Chicago Press.

Harvey, D. (1989) *The Condition of Postmodernity: An Enquiry Into the Origins of Cultural Change.* Cambridge, MA: Basil Blackwell.

Hobsbawm, E. and T. Ranger (Eds.) (1983) *The Invention of Tradition.* Cambridge: Cambridge University Press.

Holleman, J. F. (Ed.). 1981. *Van Vollenhoven on Indonesian Adat Law: Selections from "Het Adatrecht van Nederlandsch-Indie Vol. 1, 1918."* The Hague: Martinus Nijhoff.

Jessup, T. (1983) Why do shifting cultivators move? *Borneo Research Bulletin* 13: 16–32.

Kain, R. J. P., and E. Baigent (1992) *The Cadastral Map in the Service of the State: A History of Property Mapping.* Chicago: University of Chicago Press.

Kompas (1993) Hutan Adat Jelmu Sibak Dijadikan HTI Trans. 18 September: 8. Jakarta.

Lefebvre, H. (1991) *The Production of Space* (trans. D. Nicholson-Smith). Oxford: Blackwell.

Lev, D. (1985) Colonial law and the genesis of the Indonesian State. *Indonesia* No., 40.

Mackie, C. (1986) "Disturbance and Succession Resulting from Shifting Cultivation in an Upland Rainforest in Indonesian Borneo." Unpublished Phd dissertation, Rutgers University.

Manning, C. (1972) The timber boom in East Kalimantan. *Bulletin of Indonesian Economic Studies* 7: 30–61.

Menzies, N. K. (1992) Strategies of inclusion and exclusion in China's forest management. *Modern Asian Studies.* 26: 719–733.

Momberg, F. (1994) Participatory Tools for Community Forest Profiling and Zonation of Conservation Areas: Experiences from the Kayang-Mentarang Nature Reserve, East Kalimantan, Indonesia. Paper presented at the Borneo Research Council Third Biennial International Conference, Pentavank, July 1–14.

Moniaga, S. (1993) Toward community-based forestry and recognition of adat property rights in the Outer Islands of Indonesia. In J. Fox (Ed.) *Legal Frameworks for Forest Management in Asia: Case Studies of Community/State Relations.* Honolulu: East-West Center Occasional Papers of the Program on Environment, pp. 131–150.

Moore, S. F. (1986) *Social Facts and Fabrications: "Customary" Law on Kilimanjaro, 1880–1980.* Cambridge: Cambridge University Press.

Orlove, B. S. (1989) "Maps of Lake Titicaca: The Politics of Representation in Encounters between Peasants and the State in Peru." Unpublished manuscript.

Padoch, C. (1994) The woodlands of Tae: Traditional forest management in Kalimantan. In W. Bentley (Ed.) *Forest Resources and Wood-Based Biomass Energy*

as Rural Development Assets. New Delhi: Oxford and IBH Publishing Co. Ltd. 307–314.

Peluso, N. L. (1992) *Rich Forests, Poor People: Resource Control and Resistance in Java.* Berkeley: University of California Press.

Peluso, N. L. (1992) The ironwood problem: (Mis-)management and development of an extractive rainforest product. *Conservation Biology* 6: 210–219.

Peluso, N. L. (1993) Coercing conservation: The politics of state resource control. *Global Environmental Change* 4(2). 199–217.

Peluso, N. L. (1994) Fruit trees and family trees: property rights, ethics of access, and environmental change in West Kalimantan. Under revision for *Comparative Studies in Society and History.*

Peluso, N. L. and C. Padoch (in press) Changing resource rights in managed forests of West Kalimantan. In C. Padoch and N. L. Peluso (Eds.) *Borneo in Transition: People, Forests, Conservation, and Development.* Kuala Lumpur: Oxford University Press.

Poffenberger, M. (1990) *Keepers of the Forest: Land Management Alternatives for Southeast Asia.* Westport: Kumaraian Press.

Posey, D. (1985) "The Kayapo Indians and indigenous forest management. *Human Ecology.*

Potter, L. (1995) Forest degradation, deforestation, and reforestation in Kalimantan: Towards a sustainable land use? In C. Padoch and N. L. Peluso (Eds.) *Borneo in Transition: People, Forests, Conservation, and Development.* Kuala Lumpur: Oxford University Press.

Pramono, H. (1991) A Brief Review of Forest Land Use and Deforestation in Indonesia. Jakarta: Unpublished draft report to WALHI.

Sack, R. D. (1983) *Human Territoriality: Its Theory and History.* Cambridge: Cambridge University Press.

Sirait, M., S. Prasodjo, N. Podger, A. Flavell, and J. Fox (1994) Mapping customary land in East Kalimantan, Indonesia. *Ambio* 23 (7): 411–17.

Smith, N. (1984). *Uneven Development: Nature, Capital, and the Production of Space.* Oxford: Basil Blackwell.

Soja, E. W. (1989) *Postmodern Geographies: The Reassertion of Space in Critical Social Theory.* New York: Verso.

Vandergeest, P. and N. L. Peluso (1995) Territorialization and the Thai State. *Theory and Society* (in press).

Weinstock, J. A. (1979) "Land tenure practices of the swidden cultivators of Borneo." Unpublished master's thesis, Cornell University.

Wood, D. (1992) *The Power of Maps.* New York: Guilford Press.

Woodward, D. (1989) Representations of the world. In R. F. Abler, M. G. Marcus, and J. M. Olson (Eds.) *Geography's Inner Worlds.* Newark: Rutgers University Press.

Zerner, C. (1990) *Legal Options for the Indonesian Forestry Sector.* Jakarta, Indonesia: United Nations Food and Agriculture Organization.