Report

Common Property among Indigenous Peoples of the Ecuadorian Amazon

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Abstract: *Policies promoting conservation of indigenous lands in the Amazon would benefit greatly from a closer examination of the local common property institutions that influence resource use. The goals of this paper are to summarise findings from past research related to common property institutions among indigenous and traditional peoples of the Amazon, and to examine with empirical data, the complex patterns of communal resource management exhibited in a cross-cultural study population in the Ecuadorian Amazon. We find that: (1) the diverse common property institutions functioning among indigenous populations of the Ecuadorian Amazon can be loosely grouped into individual and communal arrangements; (2) conceptions of ownership and rights vary both inter- and intraethnically and; (3) within communities, institutions and the rights they grant vary greatly between different types of resources. Evidence from the literature suggests that indigenous institutions are effective at securing exclusive access and withdrawal rights for community members, but that these institutions are less effective at further managing resources. Our results suggest, however, the existence of diverse management arrangements for a multitude of resources. The growing number of indigenous land conservation strategies demands further research on these complex social institutions to ensure that strategies are both locally appropriate and effective, and thus we suggest several important areas for future research.*

Keywords: common property, indigenous peoples, conservation, Amazon, Ecuador

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INTRODUCTION

The forests of the Amazon basin constitute the world's largest tropical wilderness area (Mittermeier et al. 2003), but despite decades of conservation efforts, recent estimates of forest cover change in the Amazon suggest an increase in rates of deforestation (FAO 2005; INPE 2005). In the face of this loss, conservationists are seeking new strategies and opportunities to protect the largest remaining tracts of forest.

Indigenous peoples have inhabited the forests of the Amazon for millennia. Recently, resurgent indigenous identity and political mobilisations have led to growing roles for indigenous people in local, national and international politics (Perreault 2001,2003; Valdivia 2005). Concurrently, there has been a trend in international environmental discourse favouring 'traditional knowledge' and indigenous agroforestry as models for environmental conservation (Valdivia 2005). This resurgence of indigenous populations has been accompanied by increased legal recognition of indigenous land rights. Throughout the Amazon, indigenous groups have gradually gained legal rights to their ancestral lands. These rights have generally taken the form of three main tenure types: indigenous reserves under which an indigenous group is given legal communal land title to large areas containing multiple communities; community tenure in which communities are given legal title through customary land tenure laws established for colonists; and finally protected areas, under which the state maintains public ownership of land in protected areas but grants legal use rights to indigenous inhabitants (Richards 1997). Through these different tenure types, indigenous lands[1] now encompass the single largest category of protected area in the Amazon. Consequently, indigenous lands have been touted as a critical barrier to future deforestation (Fearnside 2003; Nepstad et al. 2005; Schwartzman and Zimmerman 2005).

The role of indigenous peoples in conservation, however, has been highly debated in the conservation literature and tends to dwell on whether or not indigenous peoples are inherently conservationists (Alcorn 1993; Redford and Stearman 1993a, b; Peres 1994; Carneiro da Cunha and Almeida 2000; Colchester 2000; Terborgh 2000). Critics of indigenous lands as conservation areas assert that dispersed and small population size, 'traditional' procurement technologies, and subsistence economies are what account for ecologically intact indigenous territories (Kramer and van Schaik 1997; Oates 1999; Terborgh 2000; Smith 2001). They claim that as these characteristics change, so too will indigenous environmental stewardship. In contrast, proponents of indigenous lands emphasise that indigenous peoples have unique knowledge and connections to ecosystems (Posey and Balée 1989); that they deter encroachment by outsiders (Alcorn 1993); and that they are key conservation allies (Brechin et al. 2002).

Surprisingly, there has been little discussion in this conservation debate on how communal tenure arrangements and decision-making structures shape Amazonian indigenous peoples' patterns of resource use. Since indigenous lands in

the Amazon are owned collectively, the resources therein may be managed through combinations of local formal rules and informal norms, often referred to as common property institutions.[2] In a review of research on common property institutions and forest governance in Latin America, Richards (1997) concludes that there is little understanding of the common property institutions of forest people and notes that little has been published on the topic.

The goals of this paper are first to summarise findings from past research related to common property institutions among indigenous and traditional people of the Amazon, and second to examine with empirical data the complex patterns of communal resource management exhibited in a cross-cultural study population in the Ecuadorian Amazon. To achieve these goals we briefly discuss the central principles of common property theory and present a basic framework related to property rights for analysis. Next, we summarise the findings from past common property research among indigenous and forest people of the Amazon and identify common findings and patterns. Finally, we use a cross-cultural data set to explore the complex nature of property rights existing among indigenous communities of the Ecuadorian Amazon. We argue that despite the recent focus of conservation groups on indigenous peoples, common property institutions in the Amazon are still poorly understood. Increased focus on these institutions might identify new conservation strategies that both protect successful local resource management institutions and facilitate the emergence of new institutions.

Basic Principles of Common Property Theory

A common property regime signifies the rights and duties of a group of individuals to one another with respect to a resource held collectively, and in much of the developing world, common property regimes may regulate individual use rights to a variety of natural resources (Runge 1986). The concept of group rights differs greatly from the idea of open access characterised by Hardin's (1968) 'tragedy of the commons'. Open access is the absence of well-defined property rights, where access is unregulated and open to anyone. In contrast, common property regimes involve a structured ownership arrangement within which resource users develop management rules, and incentives and sanctions work to ensure compliance (Runge 1986; Schlager and Ostrom 1992; Ostrom and Schlager 1996; Feeney et al. 1998). Common property regimes are considered particularly appropriate for the management of 'common pool' resources (e.g. forests, fisheries and wildlife) (Feeney et al. 1998).

Schlager and Ostrom (1992) conceptualise property rights as made up of two components: (1) operational rights and (2) collective choice decisions. At an operational level there are access and withdrawal rights. Access rights are defined as the right to enter a physically defined area, and withdrawal rights refer to the right to obtain or use a specified resource. At the collective choice level, there are management, exclusion and alienation rights. Management

rights refer to the right to create regulations concerning the how, when and where of use patterns by rightful users. Exclusion rights refer to the determination of who has access rights and whether they may be transferred. Alienation rights refer to rights to sell or lease management or exclusion rights. The main difference between the operational level and collective choice level is that at the operational level users simply have rights to access and withdrawal, whereas at the collective-choice level, users participate in governance (Schlager and Ostrom 1992; Ostrom and Schlager 1996).

The sources of rules and norms that create common property regimes are diverse. Rights that originate from the government or are defensible through the formal legal process are referred to as *de jure* rights (Schlager and Ostrom 1992). For example, indigenous reserve boundaries created and recognised by the government may create legally defensible access and withdrawal rights for the residents of the reserve. Rights that originate among resource users either through a formalised local institution or through informal customs and norms are referred to as *de facto* rights (Schlager and Ostrom 1992). While these rights may be indefensible within the formal legal system, they may still be effective at establishing local management rules. *De jure* and *de facto* property rights might complement one another, such as in the case of a government creating an indigenous reserve and allowing local residents to govern resource use. More frequently, however, *de jure* and *de facto* property rights create a complex set of 'mixed arrangements' (Runge 1986) that overlap and sometimes conflict with one another as evidenced by our discussion of property rights in the Ecuadorian Amazon. Using this framework of the types of operational and collective choice rights as well as the ideas of *de jure* and *de facto* property rights, we will review findings on common property institutions in the Amazon.

Common Property Institutions in the Amazon

In the lowlands of the Amazon basin, both indigenous households and other traditional forest people[3] rely upon a wide range of natural resources to develop diverse livelihoods. Households may depend upon combinations of the following: cleared land for small-scale agriculture and ranching, rivers and lakes for fishing; and forests for timber, non-timber forest products, and hunting. Despite communal ownership of land and dependence on common pool resources, we identified surprisingly little research on common property institutions in the context of the Amazon. A review of the Digital Library of the Commons,[4] the largest digital bibliography of publications on common property, reveals only a small set of available studies that document the characteristics of community institutions governing common pool resources in the Amazon.

The existing research on common property regimes in the Amazon can be categorised into two groups according to the type of institutions studied. First,

several authors focus on the creation and/or management of extractive reserves among non-indigenous peoples who practice non-timber forest product extraction (Cardoso 1998; Siqueira et al. 2000; Futemma et al. 2002; Futemma and Brondizio 2003; Kainer et al. 2003; Goeschl and Camargo-Igliori 2006). A second set of authors focus on the management of floodplain lake fisheries, also among non-indigenous peoples of the Peruvian and Brazilian Amazon (McGrath et al. 1993; McDaniel 1997; Pinedo et al. 2000; McGrath et al. 2002; Almeida et al. 2002; Castro and McGrath 2003).

A review of these publications only identified a few shared findings. First, collective action by resource users was in most cases stimulated by an external threat to an important resource. In most of these cases, the goal of collective action was to formalise a common property institution in order to receive legal acknowledgement of *de jure* access and withdrawal rights, and often involved assistance from external non-governmental organisations (churches, workers rights organisations, conservation organisations or rural development organisations). For example, in the case of lake fisheries in the Peruvian Amazon, user groups organised to oppose encroachment by non-local industrial fishing boats that began to intrude upon fishing areas traditionally used only by local communities (McGrath et al. 1993; Pinedo et al. 2000). Similarly, in the Brazilian Amazon, a group of households extracting *açai* fruit from a forest commons organised to collectively purchase land in response to a perceived threat of losing access (Futemma et al. 2002). In the case of the Extractivist Reserve Chico Mendes in the Brazilian Amazon, it was reported that informal and unwritten rules existed among autonomous rubber tappers until the 1970s, and that formal resource user groups were only developed in response to encroachment threats from ranchers and land speculators during the mid-1970s (Cardoso 1998). Rubber tapper user groups mobilised in response to encroachment, which eventually led to *de jure* access and withdrawal rights in the form of a government-owned extractive reserve established for the sole use of the resident rubber tappers.

A second shared finding is that common property institutions in the Amazonian context appear to be most effective at creating and enforcing rules regarding operational rights or those rights defining who can access and withdraw a resource, but less effective at employing management rights to create internal rules regarding how, when and where resources may be withdrawn by rightful users. For example, in the case of a community floodplain fishery in the Peruvian Amazon, the resource institution was active and effective at creating rules, means of monitoring and enforcement to keep outsiders out of the fishery (Pinedo et al. 2000). During an initial period of external threat, when activity and enthusiasm were high, management rights were employed to create rules regarding allowed fishing techniques and seasons (Pinedo et al. 2000). Interest and participation in the institution, however, waned with the dissipation of the external threat and due to internal conflict and reluctance of members to enforce management rights within the group

(Pinedo et al. 2000). Similarly, in comparing communally managed and unmanaged fisheries in the Brazilian Amazon, Almeida et al. (2002) conclude that higher productivity and conservation benefits in communally managed lakes are principally due to the exclusion of external commercial boats and not a result of restraint by local households.

In the case of the Extractivist Reserve Chico Mendes, levels of community organisation and collective action were found to be highest among those communities that were closest to reserve boundaries, had faced threats of encroachment and had participated in the struggle to establish the reserve (Cardoso 1998). It was also reported that once the threat of expulsion from the land faded, the sense of community among the rubber tappers diminished, and that other than internal boundaries defining individual extraction plots, rules governing management were not in place (Cardoso 1998). In addition, the rubber tappers stated a preference for government enforcement of management rules. These findings suggest both the difficulty of enforcing rules and the reluctance of communities to enforce rules internally (Cardoso 1998).

Also notable in our review of the literature on common property institutions in the Amazon was the lack of research on what Richards (1997) refers to as longer-established indigenous common property regimes. We were able to find few studies that had specifically examined either formal or informal indigenous common property institutions (exceptions include: Hartshorn 1995; Richards 1997; Chase Smith 2000; Becker and León 2000; Lu 2001). The formalisation of indigenous federations and community organisations, however, does seem to follow a similar pattern to those discussed above. Collective action and the creation of formalised institutions have tended to be a response to external threats to traditional lands and resources (Benavides 1996; Becker and León 2000), whereas rights within users groups appear to be less formally defined and are more commonly a collection of social and cultural understandings (Lu 2001).

Given the plethora of literature on Amazonian indigenous groups in the anthropological literature, the lack of research specifically on indigenous institutions is surprising. It suggests that Amazonian indigenous common property institutions are either difficult to study or have not yet received sufficient attention. In the following sections, we explore data from indigenous populations in the Ecuadorian Amazon seeking to identify similar patterns as those discussed above.

Background

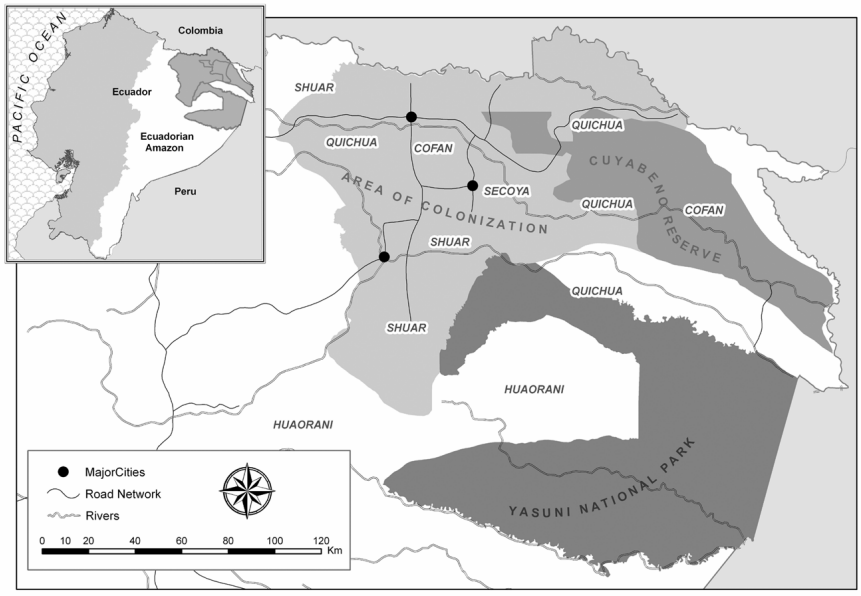
Geographically, Ecuador can be divided into three distinct regions: the coast, the highlands and the Amazon (Figure 1). The Amazon region of Ecuador is part of the Amazon Tropical Wilderness Area and is among the areas with the greatest biodiversity on the planet (Mittermeier et al. 2003). The Ecuadorian Amazon includes parts of the provinces of Sucumbios, Orellana, Napo,

Pastaza, Morona Santiago and Zamora Chinchipe and borders the Andean foothills to the west and the Amazon regions of Colombia and Peru to the north, east and south (Figure 1). For centuries, the Amazon region remained remote and isolated with no road connections to the highlands and just a few missionary settlements and rubber plantations. The region was, however, far from unpopulated. Indigenous peoples including the Achuar, Cofán, Huaorani, Kichwa, Secoya, Siona, Shuar, Záparo and others have inhabited both the riverbanks and forests of the region for millennia.

The isolation of the Ecuadorian Amazon began to change with the initiation of oil exploration. In the 1930s, Shell's initial explorations for oil in the province of Pastaza were unsuccessful. In 1967, however, a joint Texaco and Gulf consortium discovered large oil reserves in the Napo Province of the Northern Ecuadorian Amazon (NEA), and investment in a road network, oil production capacity, and the construction of an oil pipeline during the early 1970s, resulted in a period of rapid development (Sabin 1998; Wunder 2003). Coinciding with this development was a call for land reform policies in the highlands to diminish problems of severe land inequality (Pichón 1992). Government land reform initiatives led to land-titling policies promoting settlement of highland farmers in the Amazon. Hence, the combination of favourable land-titling policies and newly constructed roads facilitated rapid migration of

Figure 1

Map of the study area, with approximate distribution of the five ethnic groups. Note that indigenous peoples are a minority within the zone of colonization



agriculturalists from the highlands to the Amazon (Hiraoka and Yamamoto 1980; Brown and Sierra 1994; Pichón 1997; Walsh et al. 2002).

The 1964 Law of Fallow Lands, classified large portions of the Amazon as 'unoccupied', despite the fact that they were occupied and used by indigenous populations. This law allowed colonists to claim 50 hectare plots of 'unoccupied land' along roads and also promoted deforestation by requiring proof of 'improvements'[5] in order to establish legal land titles. At the beginning of this period, there were no specific laws protecting the land and resource rights of indigenous peoples, which caused frequent clashes among indigenous groups, colonists, oil companies and the government over land and resource rights. One of the indigenous responses to these conflicts was the creation and mobilisation of united regional indigenous organisations as well as ethnic subfederations throughout the Amazon. The Kichwa, Shuar, Cofán, Secoya and Huaorani all organised into ethnic federations with the principal goal of securing land rights (Benavides 1996).

In the midst of varying levels of encroachment by settlers and oil companies, the mechanisms the federations used to secure land rights varied both inter- and intraethnically. Many communities worked with their federations and through the government land-titling agency to legalise communally titled territories of varying sizes, usually containing a single settlement or community. The result is a mosaic of communal indigenous territories intermixed with colonist settlements, as is the case for Kichwa, Shuar, Cofán and Secoya communities (Figure 1). In some cases, groups of Shuar from the Southern Amazon and some Kichwa have taken advantage of these titling policies to themselves colonise 'new areas', which has resulted in intermittent conflicts between indigenous groups. In contrast, the Huaorani, the most isolated of the groups, have gained rights to large Huaorani territories that contain multiple settlements. In these large territories, the borders of individual communities may be socially recognised but are not usually clearly delineated (Lu 2001). The borders of the larger territory, however, are fiercely defended with both signs and threats of violence.

The joint processes of oil development and agricultural colonisation have transformed much of the central region of the NEA into a landscape of dense roads, colonist farms and rapidly growing urban areas, the largest of which, Lago Agrio, has a population of 34,000 (INEC 2003). The rapid changes in the NEA have had profound impacts on the local indigenous populations, including changing settlement patterns, changing livelihood strategies, and increasing interaction with markets (Vickers 1994; MacDonald 1999; Borman 1999; Sierra et al. 1999; Rival 2002; Rudel et al. 2002). While the indigenous populations are experiencing rapid change, they are not experiencing population decline. In fact, the indigenous population of the Ecuadorian Amazon is growing rapidly due to high fertility (Bremner and Bilsborrow 2004; McSweeney and Arp 2005) and now numbers 150,000 inhabitants, one-third of the total population of the region (INEC 2003). In fact, the indigenous

population in the Ecuadorian Amazon is now approximately equivalent in size to the indigenous population of the much larger Brazilian Amazon (Kennedy and Perz 2000).

In 2001, Billsborrow and Holt, seeking to expand upon their past research in the region, began an interdisciplinary research project focused on the demography and land use of indigenous populations in the NEA. The five groups chosen for the study, the Kichwa, Shuar, Cofán, Secoya and Huaorani, vary substantially in terms of linguistic affiliation, history of contact and integration into the market economy (Holt et al. 2004), but all depend to some degree on shifting agriculture as a key component of their livelihoods. Indigenous households typically cultivate several small plots in forest clearings with cassava, bananas and corn being the subsistence staples, a portion of which may be sold at market (Gray et al. 2005). Coffee and cacao are the main cash crops grown, and additionally, some indigenous households have adopted small-scale cattle ranching. Non-farm employment is an important livelihood activity for many households, and employment occurs most commonly with oil companies whose activities are located in or near indigenous territories. Hunting and fishing are still common in communities near forested areas and rivers; however, most households have replaced traditional techniques with modern implements such as shotguns. The household consumes the majority of the catch, though game is occasionally sold at markets or nearby oil camps. Other important livelihood strategies include the raising of small animals (i.e. chickens, pigs and fish), selling of handcrafts, participation in tourism, and the sale of timber and other forest products.

The Kichwa are the largest, most diverse group and have an estimated population of 85,000. Their population is widely dispersed, and many communities are near towns with schools and markets, while other communities are spread out along the length of the Rio Napo to the border with Peru. The Kichwa practice mixed livelihood strategies focused on a combination of small-scale subsistence and commercial agriculture, as well as fishing, hunting and timber harvesting.

The Shuar have an estimated population of 45,000 and primarily inhabit the southern Ecuadorian Amazon. The Shuar communities in the study area have migrated from the southern Amazon and have claimed land using similar legal mechanisms as colonists. As such, most Shuar communities are along roads and Shuar livelihood activities are highly market oriented including: commercial agriculture, cattle and employment with oil companies.

The Cofán have a population estimated to be fewer than 1000 and occupy just a small portion of their ancestral lands, which included Amazon regions of Northern Ecuador and Southern Colombia. The Cofán are now limited to just six communities, three of which are included in the study population. The largest Cofán community is close to a road and not far from Lago Agrio. In the early 1980s a group of Cofán sought to distance themselves from the encroachment pressures of colonists and oil companies and chose to move to a remote settle-

ment within the Cuyabeno Faunistic Reserve (Borman 1999). Thus, the Cofán in the Cuyabeno still practice hunting, fishing and small-scale subsistence agriculture, while the Cofán of communities close to Lago Agrio, have incorporated cash crops, employment and commerce into their livelihood.

The Secoya also have a very small population estimated to be under 1000 and have experienced heavy pressure in their lands from colonists, agribusinesses and petroleum companies. The Secoya are now settled in just five communities in the Ecuadorian Amazon, though there are several Secoya settlements in the neighbouring Peruvian Amazon as well. The Secoya have been the recipients of several development projects in recent decades, which has influenced several aspects of their culture and livelihoods (Vickers 1994). Cattle ranching and credit programmes, for example, were introduced to the Secoya through a development project over a decade ago and as a result, market-based activities continue to dominate their livelihood strategies today.

Finally, the Huaorani have a population of approximately 1600 and still occupy approximately one-third of their traditional territory. This group was the last to be contacted by missionaries in the 1950s due to their reputation as fierce and violent warriors. While the Huaorani were traditionally seminomadic people who lived in dispersed kin groups, the influence of missionaries, who promoted schooling and built airstrips, led to larger permanent settlements that have now existed for several decades (Rival 2002). While the Huaorani still depend largely on subsistence hunting, fishing, gathering and small-scale agriculture, they also now interact regularly with markets and urban centres. In addition, Huaorani males are very active in oil company employment, which has become an important source of cash income for nearly all Huaorani households.

The historical context and on-going conflicts between indigenous communities, colonists and oil companies suggest that securing *de jure* access and withdrawal rights to exclude outsiders has and continues to be an important focus of indigenous political organisation in the NEA. Currently, several communities are in the process of formally marking the boundaries of community lands using global positioning system (GPS), signposts and land clearing. For example, among the Huaorani, access rights are protected rigorously not at the community level but at the level of the ethnic group, and there are current efforts to mark boundaries of traditional Huaorani lands using GPS.[6]

Besides boundary issues, access and withdrawal rights have also been an important point of contention between communities and oil companies. Under Ecuadorian law, the state retains subsurface mineral rights on all land. Thus, indigenous groups possess access and withdrawal rights to surface resources, while oil companies can lease subsurface rights from the government. This has led to a relationship between oil companies and the indigenous in the NEA that is often depicted as adversarial. Oil companies usually will negotiate access with communities by providing infrastructure (schools, roads and

electricity) and services to community members in exchange for acquiescence to oil activity on indigenous lands.

METHODS

Data collection consisted of two phases of fieldwork: an ethnographic study in eight communities followed by a household and community survey in thirty-six communities. For the ethnographic study, ethnographers were trained for 2 weeks and then assigned to live in pairs (a man and a woman) in each of the eight communities for 5 months. For this first phase, communities of all five ethnicities were selected based on their location, population size, familiarity to the research team based on personal visits and willingness to participate. Data collection during the ethnographic phase included: formal interviews on demographics, agricultural production and resource use, household economics and socio-economic attitudes and values, time allocation study, household economic diaries and post-hunt interviews. In addition, a focus group was conducted with several community leaders in each of the eight communities. During the focus groups, participants were asked questions related to property rights and resource use. First, participants were asked how households and individuals select the location of agricultural plots. Next, rather than ask whether specific rules existed regarding use of land and resources in the community, participants were questioned on actual practices related to hunting, fishing and use of forest products. For example, participants were asked if they could hunt or fish anywhere they wanted and with any techniques they chose. If the respondents answered no, they were asked to further explain any restrictions. These questions sought to identify any rules or norms related to possession of land and use of resources. While participants were not asked specifically about community institutions, the focus groups sought to reveal the presence of different types of common property arrangements.

Following the completion of the ethnographic phase, survey data were collected from communities and households selected through a two-stage sampling procedure. Controlled sampling (Kish 1965) was used to select twenty-eight additional communities that ensured adequate representation of the five largest ethnicities (Kichwa, Shuar, Huaorani, Cofán and Secoya, respectively) and included heterogeneity of location (accessibility), infrastructure and population size. The number of communities of each ethnic group was chosen to be roughly proportional to population size.

Rather than sampling all households in each chosen community, we interviewed a maximum of twenty households[7] per community to reduce wide variations in sample size by ethnicity or community since the number of households in a community varies from five to over fifty. Consequently, households in the thirty-six selected communities were sampled according to two rules. In the ten larger communities, twenty-two households per community were randomly sampled based on a sampling frame (a map of the com-

munity) prepared by the field supervisor and community leaders showing the location of each occupied dwelling. In all the other communities (twenty-six), which had at most twenty-two households, all households were included in the sample. The final sample consisted of 564 households, and the refusal rate was under 10%, which is low considering indigenous communities that often resist research efforts and are highly mobile.

Interviews were conducted in Spanish separately with the male and the female heads of each household by male and female interviewers, respectively.[8] In the few cases where participants did not speak Spanish,[9] interpreters were used to conduct the surveys. The household head's questionnaire covered household location, origin and migration of head, land tenure and use, production and sale of crops, any raising of cattle or other large animals, non-farm employment, hunting and fishing, technical assistance and credit, perceptions of environmental contamination and attitudes and aspirations for children's education and permanence in the community. Besides covering the same topics in connection with migration origins, the environment and aspirations, the spouse's questionnaire included a household roster listing all members of the household (by age, sex, education, marital status, etc.), out-migration from the household, household assets and fertility, mortality and health. If either the female or the male head of household was absent due to death, divorce or migration, both questionnaires were implemented with the person available to ensure complete data collection for each household.

Several questions specific to land use and property regimes were asked in the head of household questionnaire. First, participants were asked whether they had land to cultivate, and then were asked whether the land they cultivated was their own land or community land. Next, those people reporting their own land were asked whether the community recognised the boundaries of that land. In addition, these respondents were asked how they had received their land and whether they could sell their land. These questions sought to explore the nature of property rights in the communities. More detailed information was then collected on various land uses including: agriculture, cattle, timber and non-timber forest products, hunting and fishing.

Finally, a community-level survey was implemented with village leaders in each community. The questionnaire covered a variety of topics including: land title history, hunting and fishing resources, population (number of households as well as in- and out-migration), community infrastructure, location and access to external facilities (markets, health centres, secondary schools, etc.), contact with other communities, and contact with outside organisations and individuals.

While the research project and data collection were not explicitly focused on examining common property institutions, the wealth of data allowed us to explore the nature of property rights among these groups and compare findings with past research in the Amazon.

RESULTS

Access and Withdrawal Rights

Using the framework on common property rights discussed earlier, we looked for evidence of institutional arrangements with relation to ownership, access and withdrawal rights within the indigenous communities. Critics of efforts to spatially define property suggest that individuals may have varying understandings of the meaning of property and boundaries (Walker and Peters 2001), and similarly, we expected to find little consistency in response to our questions about whether the land that people cultivated was their own land or that of the community. Surprisingly, however, there was a great deal of consistency both within communities and within three of the ethnicities regarding the nature of land property rights. Table 1 shows that in both Secoya and Shuar communities households have clear notions of possessing their own land despite the communal land title. In contrast, Huaorani households conceive of the land that they cultivate as communal, suggesting a different notion of their individual property rights. The results for Kichwa and Cofán are mixed, with some communities exhibiting a communal notion of access and withdrawal rights and others exhibiting an individual notion of these rights. Out of the thirty-six communities in which surveys were collected, only a single Kichwa community had a large discrepancy in how individual households conceive of land ownership.

The consistency of responses within communities suggests the existence of *de facto* institutional arrangements, since not a single household in the study reported legal individual land title. Thus in the simplest of categorisations, the indigenous communities can be divided into those with (1) individual withdrawal rights to communal lands, and (2) those with communal withdrawal rights. In communities practicing individual property arrangements, large tracts of land ranging from 20 to 200 hectares have been divided among households, and although total cleared area is only on average 4.6 hectares per household, the rights to the remaining land area are maintained by the household. In contrast, in communities with communal property arrangements, households only gain withdrawal rights to the lands they have cleared and cultivated, which are significantly smaller than those of individual arrangement households, 1.9 hectares.[10] Once abandoned, withdrawal rights revert back to the community, though households often maintain the rights to fallowed lands and perennial fruit trees (Lu 2001).

Table 2 compares characteristics of households and communities of the two withdrawal arrangement categories.[11] First, as noted above, households in the individual arrangement communities have significantly greater cultivated areas than households in communal arrangement communities. Table 2 also reveals that communities practicing communal arrangements are significantly further away from urban centres than communities with individual arrange-

Table 1

How households conceive of their property rights by ethnicity and community (community names eliminated for confidentiality)

	Cultivate their own land	**Cultivate community land**
Kichwa	78.8%	20.8%
KI1	15	1
KI2	21	0
KI3	22	0
KI4	16	0
KI5	13	1
KI6	6	13
KI7	1	17
KI8	19	1
KI9	5	0
KI10	5	0
KI11	21	0
KI12	19	0
KI13	2	16
KI14	21	0
Secoya	100%	0%
SEC1	16	0
SEC2	19	0
Cofán	36.5%	59.6%
COF1	19	0
COF2	0	19
COF3	0	12
Shuar	96.2%	3.8%
SHU1	9	1
SHU2	8	1
SHU3	6	0
SHU4	5	0
SHU5	6	0
SHU6	12	0
SHU7	10	0
SHU8	22	0
SHU9	18	2
SHU10	5	0
Huaorani	2.5%	95.1%
HUA1	0	3
HUA2	0	10
HUA3	0	14
HUA4	0	12
HUA5	0	7
HUA6	2	10
HUA7	0	21

n = 509 (236, 35, 52, 105, 81 for the groups, respectively).

Table 2
Comparison of households and community characteristics for individual and communal withdrawal arrangements

Variables	Individual arrangement	Communal arrangement
Household cultivated area (hectares)	4.6	1.9
Community distance from urban (km)	38.8	84.1
Community population size (persons)	254	173

ments. This result is largely a product of the Huaorani communities all being far from urban centres. Finally, the communal arrangement communities have a larger mean population size than individual arrangement communities. The significant differences raise the question: Are the different arrangements a response to different characteristics and contexts or are the observed differences a product of the institutional arrangement? Unfortunately, with cross-sectional data such as this we are unable to address this question.

Questions about hunting reveal that *de facto* withdrawal rights for other resources usually do not overlap exactly with agricultural property rights. For instance, in two Shuar communities and three Kichwa communities that practice individual withdrawal rights in relation to land, hunting is practiced not just on one's own lands, but rather on any lands in the community. In contrast, in the two Secoya communities and several Kichwa communities, hunting is only practiced on one's own lands and within the community reserve, and is not permitted on another person's land without permission.

We also looked for evidence in our data of other types of withdrawal rules that regulate hunting, fishing or the harvesting of forest products. The only source of information we collected that revealed such regulations were the open-ended interviews conducted with community leaders during the ethnographic phase of data collection. In the two Kichwa communities studied, leaders reported no specific restrictions on practices related to hunting, fishing or the harvesting of forest products other than limiting the use of barbasco, a plant-derived toxin used for fishing. The Secoya community appeared to have several formalised rules limiting withdrawal rights. Fishing restrictions include: the use of barbasco, chemicals or dynamite. In relation to forest products, the Secoya reported that they may sell timber from personal lands but must receive permission from the community assembly and must return a portion of the profits to the community. In addition, timber harvesting in the communal reserve is not permitted, although several members of the community mentioned that the most valuable tree species have already been removed.

The Shuar community, in contrast, appears to have few limitations on withdrawal rights. Timber sale decisions are made by individuals, do not require community approval, and timber profits are not shared with the community.

The only practice the Shuar report limiting is the use of barbasco. The interviews with Huaorani community leaders did not reveal any limitation of withdrawal rights for Huaorani households other than the aforementioned exclusion of outsiders.

Finally, the Cofán community reported extensive de jure management rules related to hunting and fishing practices due to their location within the boundaries of a national park. The rules of the national park also restrict all timber harvesting. It was not clear whether all withdrawal restrictions were a result of the externally imposed park regulations or whether a community-level institution had also contributed to the limitations.

Management, Exclusion and Alienation Rights

Data collection was limited regarding the functioning of common property institutions, and as a result, we have little information on how management, exclusion and alienation rights are exercised in these communities. For instance, we do not know the origin of reported limits on fishing practices in the Secoya and Kichwa communities. The management decisions may have been made by the community as a whole or may have been created by a specific leadership group. We do, however, have some information about alienation rights with respect to agricultural lands.

Leaders in all thirty-six communities were questioned about the rights of households to sell their access and withdrawal rights to agricultural land, the practice of which is referred to as alienation rights (Table 3). Among most ethnic groups, alienation rights remain in the hands of the community assembly or community leaders and the sale of access and withdrawal rights to land is not permitted. The Shuar, however, differ greatly, as the sale of access and withdrawal rights to land is permitted and practiced in several communities. In all cases, the sale of these land rights is permitted solely to other Shuar, and in most cases, sales require the approval of the community assembly. This practice of alienation rights by individuals is further evidence of the *de facto* individual withdrawal rights practiced by the Shuar, who perceive of their land as having an economic value that can be traded and transferred.

Despite the lack of alienation rights, several communities report that children or other family members may inherit personal lands. These communities include the Shuar, Secoya, Kichwa and even Cofán, who envision lands as communal. In earlier research on Huaorani communities, Lu (2001) determined that the Huaorani also pass down the rights to lands they clear and fruit and palm trees they cultivate.

DISCUSSION

The history of the formation of indigenous federations with the goal of gaining legal land title is consistent with the idea that common property institu-

Table 3

Operational and collective choice rights by community

	Access rights	**Withdrawal rights**	**Alienation rights**
Kichwa			
KI1	Yes	Yes	No
KI2	Yes	Yes	No
KI3	Yes	Yes	No
KI4	Yes	Yes	No
KI5	Yes	Yes	No
KI6	Yes	Yes	No
KI7	Yes	Yes	No
KI8	Yes	Yes	No
KI9	Yes	Yes	No
KI10	Yes	Yes	No
KI11	Yes	Yes	Yes[a]
KI12	Yes	Yes	No
KI13	Yes	Yes	No
KI14	Yes	Yes	No
Secoya			
SEC1	Yes	Yes	No
SEC2	Yes	Yes	No
Cofán			
COF1	Yes	Yes	No
COF2	Yes	Yes	No
COF3	Yes	Yes	No
Shuar			
SHU1	Yes	Yes	Yes[b]
SHU2	Yes	Yes	No
SHU3	Yes	Yes	No
SHU4	Yes	Yes	No
SHU5	Yes	Yes	Yes[c]
SHU6	Yes	Yes	Yes[c]
SHU7	Yes	Yes	Yes[c]
SHU8	Yes	Yes	Yes[c]
SHU9	Yes	Yes	Yes[b]
SHU10	Yes	Yes	Yes[b]
Huaorani			
HUA1	Yes	Yes	No
HUA2	Yes	Yes	No
HUA3	Yes	Yes	No
HUA4	Yes	Yes	No
HUA5	Yes	Yes	No
HUA6	Yes	Yes	No
HUA7	Yes	Yes	No

[a]Can sell land to a community member or outsider with community approval.
[b]Can sell land to a community member or outsider who is Shuar with community approval.
[c]Can sell land only to another community member with community approval.

tions in the Amazon are primarily mobilised in response to threats of encroachment by outsiders. As such, Ecuadorian indigenous communities have secured *de jure* withdrawal rights to their land, though encroachment is still common. Despite securing their legal right to land, community institutions are still mobilised in response to threats. Currently, this is manifested in the Ecuadorian Amazon through boundary demarcation, disagreements with oil and timber companies and conflicts between indigenous groups over land.

Our review of the literature suggests that Amazon common property institutions are most effective at creating operational rights related to access for community members but less effective at creating withdrawal regulations and collective choice rights. The results from the Ecuadorian Amazon, however, reveal diverse institutional arrangements and *de facto* internal rules regarding withdrawal rights to various resources and alienation rights for land.

Each of the communities exhibited a clear notion of a property rights arrangement, which in the simplest categorisation can be grouped into those with individual withdrawal rights and those with communal withdrawal rights. Common property arrangements range from those that closely mirror private property systems (i.e. the Shuar, where households can even buy and sell the communally titled land they have been apportioned), to those that do not recognise land as belonging to individuals or households and appear to place few restrictions on withdrawal rights.

Within this range of common property arrangements, however, there does not appear to be a clear spectrum related to the formalisation and functioning of common property institutions. For example, the Shuar appear to have the most formalised system of rights related to timber and land, but have few regulations related to hunting. Whereas, the Cofán who have few rules related to agricultural lands, have abundant restrictions related to hunting, fishing and timber. It is likely that the diverse arrangements are a product of different histories of settlement and contact, cultural values, interactions with the larger society, demographic pressures and economic patterns.

We can identify some interesting differing characteristics between individual and communal arrangement communities, but the results provide us with little insight into the development of the different types of systems or their resilience to environmental, social and economic changes. Furthermore, the results only document the existence of these institutions and do not assess the effectiveness of the *de facto* rules and norms governing withdrawal rights. Thus, little can be concluded about the ability of indigenous institutions to monitor use and enforce rules of non-compliance. As a consequence, our review of the literature and our results raise more questions than are answered, and as such we feel compelled to suggest a set of future research questions in relation to Amazonian indigenous common property institutions. First, can the collective action necessary to maintain a common property institution be sustained once threats of encroachment are diminished? This question is primarily related to asking what the goals of the institution are and whether the goals evolve or are static. Second, to what extent do

Amazonian indigenous institutions create rules and norms that are effective at limiting withdrawal rights by members? If the enforcement of internal rules is consistently found to be a challenge, we must ask, what types of arrangements facilitate compliance and enforcement and can external organisations provide support that would ease these challenges? Third, how resilient are current indigenous institutions given the complex changes occurring in the Amazon in terms of indigenous livelihoods. There is already some evidence of a few indigenous leaders acting in their self-interest and illegally selling off timber rights or privately negotiating access with oil companies without community knowledge or acceptance.

It is hardly surprising that several of these questions are central research points raised in recent reviews of the larger body of common property literature (Agrawal 2001). What is evident, however, is that knowledge of the common property institutions in the Amazon is still largely undeveloped despite their role in managing almost a quarter of the Amazon.

Focusing on identifying the goals of indigenous common property institutions can identify opportunities for alliances between indigenous groups with similar goals and between indigenous groups and external organisations with complementary goals. Focusing on the effectiveness of internal management rules and norms will help determine whether indigenous institutions have the capabilities necessary to meet their goals and could identify opportunities for assisting these institutions. Finally, focusing on the characteristics that allow communities to maintain effective institutions under pressures of demographic change, technological change and integration to the market can help institutions to adapt and assess how their goals must evolve with the changes they experience.

The increasing focus of conservation organisations on the role of indigenous populations in Amazonian conservation further underscores the importance of addressing these research questions. The coming decade will likely see millions of dollars invested in different conservation projects with indigenous federations, reserves and communities. Without an adequate basis of knowledge on the existing common property institutions, these projects face two pitfalls. First, institutions may be undermined by inappropriate projects that fail to assess existing systems of rights and promote alternative systems at the expense of the community. And second, money may be wasted on ineffective projects that fail to assess the goals of local institutions and conflict with the functioning of local institutions. A greater focus on these common property institutions may support both community and conservation goals.

Notes

1 Indigenous lands refer to areas held under legal title by groups or communities as well as areas held by the state for the exclusive use of indigenous populations.

2. An institution may be defined broadly as ‘regularised practices (or patterns of behaviour) structured by rules and norms of society, which have persistent and widespread use’ (Scoones 1998).

3. The rubber tappers of Brazil are the most well-known group of traditional forest people but similar groups of non-indigenous peoples whose livelihoods are forest based are found throughout the Amazon region.
4. The Digital Library of the Commons is a searchable bibliography of common property research developed by Common Property researchers at the University of Indiana.
5. Improvements were realised almost exclusively through clearing of existing forests.
6. It is unclear whether the efforts to mark communal boundaries have been initiated by communities themselves as a response to encroachment threats or whether they have been initiated by external organisations. Efforts to delineate territorial boundaries of indigenous and traditional peoples' lands are not unique to the Amazon. This strategy, often referred to as 'countermapping', has been growing in prominence globally and refers to the use of maps to protect local peoples land rights, which is counter to the historical employment of maps in the subjugation of local peoples (Peluso 1995; Poole 1995; Walker and Peters 2001).
7. Allowing for a possible 10% refusal rate, this meant selecting a sample of 22 in the larger communities.
8. A female head of household is defined as either the woman in a female-headed household or the spouse of a male head of household.
9. The majority of interviewees spoke Spanish; however, some elderly interviewees as well as female heads of household among the Cofán and Huaorani did not speak Spanish.
10. The difference in means is statistically significant at $\alpha = 0.05$ according to ANOVA tests.
11. We are unable to conduct a multivariate analysis of these characteristics due to the insufficient number of communities. The ethnic group patterns suggest that cultural factors play an important role in the institutional arrangement and thus are related to any differences seen in the characteristics between the two groups.

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