

Analyzing Institutional Change in Traditional Common-Property Forest Governance Systems

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Abstract

How traditional common-property institutions respond to exogenous change is a critical question for theorists and practitioners concerned with continued conservation of vital forests and the communities that sustain them. This paper examines how the Miskito peoples of Río Plátano, Honduras have responded to agricultural expansion by migrant farmers and ranchers onto their ancestral forest lands. The analysis compares institutional changes in the common-property system of the Miskito in three communities; each with a different history of outside encroachment. The findings demonstrate how outside encroachment disturbs the Miskito common-property system and the disjuncture between institutional changes made by Miskito leaders and those made by the Miskito people in every day decision-making. From the theoretical standpoint, the study offers a detailed empirical assessment of how institutions change when faced with exogenous pressures and illustrates the lack of cohesion in the processes. From a practitioners perspective, the findings identify possible windows of opportunities for facilitating the ability of indigenous peoples to address encroachment and furthermore, suggest some considerations for program and policy initiatives that involve indigenous residents at a later stage in the encroachment process.

Key Words: *agricultural expansion; adaptation; Latin America; frontier forest; indigenous management*

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1. Introduction

In Latin America, frontier forests are a principal conservation concern as these regions contain the last tracts of forest that are of sufficient size to support a full range of native species and remain relatively undisturbed (Bryant et al. 1997). These forests are also frequently the ancestral homelands of indigenous peoples who have governed the regions for centuries, often through a loosely designed system of common-property norms (Grosvenor et al. 1992; Dodds 1994; House 1997; Stocks et al. 2007). In many cases, the common-property institutions of the indigenous residents have sustained large areas of forestland that are, today, biodiversity hotspots (Grosvenor et al. 1992; Stevens 1997; Stocks 1998).

Migrant farmers and ranchers, however, threaten to disturb the traditional common-property system of the traditional residents and forest conservation in the region. In Latin America, agricultural expansion, or the migration of farmers and ranchers to remote forest lands is a leading cause of deforestation in (Bryant et al. 1997; Geist & Lambin 2001). The migrants are often mestizo peoples (peoples of mixed European and indigenous ancestry) who introduce private-property institutions that encourage individual ownership over forest lands and land sales. As new populations and land markets enter these previously remote regions, many wonder if the native governance systems and the forest will persevere (Redford 1991; Richards 1997; Terborgh 2000; Putz et al. 2001; Bremner & Lu 2006).

One of the challenges in forest conservation policy analysis is assessing the existence and dynamics of locally evolved land-use institutions, how they react to exogenous shocks, and how they relate to broader formal forest policies of national and international regimes. To date, we lack a rigorous understanding of whether, or under what conditions, traditional peoples are able to sustain their resource systems (Agrawal, 2001; Dietz et al., 2003).

Río Plátano Biosphere Reserve, Honduras, hereafter “Río Plátano” is an excellent case to explore how traditional peoples respond to new market and demographic pressures that threaten their common-property norms and the future of the frontier forests in the region. Río Plátano was created in 1980 and shortly thereafter declared a World Heritage Site due to its ecological value and species richness. The reserve is a cornerstone of the Mosquitia Forest Corridor that runs from eastern Honduras into northern Nicaragua. Nonetheless, in 1996 Río Plátano was declared a World Heritage Site in danger due, in large part, to deforestation caused by migrant farmers and ranchers. Today, the Honduran government and the native reserve residents struggle to conserve the region.

Critical questions for Río Plátano are how the native residents are responding to exogenous pressures by the migrants to create land markets and private property systems, and how the conservation community might support the peoples of Río Plátano and their common-property institutions. The objective of this paper is first, to provide a detailed analysis of how the predominant native group in the reserve, the Miskito, have changed their common-property institutions in response to the market and demographic shocks produced by mestizo migration to the region and second, to offer recommendations of how the environmental community might support the Miskito common-property system and forest conservation in the region.

2. Institutional Change in Common-Property Systems

A common concern in the conservation literature is whether traditional institutions will fail when confronted with market integration, conflicts between heterogeneous resource users, large-scale resource management, political influx, or demographic change (Ribot 1999; Terborgh 1999; Barret et al 2000; Worah 2002; Dietz et al 2003). Some scholars contend that, faced with increasing land-use pressures and the introduction of a market, traditional common-property systems will evolve into private-property institutions (Demsetz 1967; Redford 1993; Terborgh 1999, 2000). Others however, challenge the assumption that common-property systems necessarily evolve into private-property regimes (Ostrom, 1990, 2005; Ensminger and Rutten, 1991; Richards, 1997). Research on the evolution of property rights has found that when demand for a resource increases or as resource users become more heterogeneous, property rights regimes become more clearly defined, or complete (Ensminger & Rutten, 1991; Taylor and Singleton, 1993; Gibson et al., 2002).

A clear distinction, however, needs to be made between *more complete* property rights and *private-property* rights; more complete rights do not necessarily imply individual private-property rights. For example, in the context of frontier forest governance, the loosely developed property-rights system of the indigenous people may no longer be sufficiently binding when residents are faced with mestizo migrants who have their own land-use institutions that are more connected to mainland market systems. In response to mestizo colonization, some indigenous groups may try to create more formal institutions, or more complete common-property regimes to strengthen their land claims over frontier forests. These institutional changes, however, do not necessarily evolve into a private-property system.

Worldwide there are examples of common-property systems either becoming strengthened or deteriorating in the presence of social, economic and environmental change (Ensminger & Rutten 1991; Ventocilla et.al. 1996; Agrawal 1997; Richards 1997; Schwartzman & Zimmerman 2005). Nevertheless, despite the range of institutional outcomes to change, few researchers have systematically examined the process by which traditional norms and rules evolve to exogenous threats. The mixed response of traditional peoples to shocks to their traditional resource management systems points to the need for empirical assessment of (1) how traditional institutions change and (2) the factors that contribute to robust common-property systems.

In this paper, I identify how the Miskito people in the Río Plátano, Honduras are changing their common-property institutions in response to agricultural expansion in the region. It is important to note that this is part of a comparative study that I conducted between reserves in Honduras and Nicaragua. In other analyses I focus on how the broader protected area policy environment, specifically property right, impacted deforestation in the region and institutional outcomes (see Hayes 2007; Hayes in press). In this analyses, given the broader sociopolitical context that the Miskito of Río Plátano live in, I choose to take an in-depth examination of how continued mestizo migration has impacted the Miskito common-property system and the processes the Miskito have engaged in to change their traditional institutions. I believe a greater understanding of the process of institutional change is imperative given changing social,

economic and ecological conditions that many traditional people face and the threats these changes pose to their traditional common-property systems.

3. Study Area

Río Plátano is one of the most remote areas of Central America as it is geographically and politically isolated from mainland Honduras and mostly inaccessible by car. The reserve encompasses roughly 8,000 km² and contains beaches and lagoons and is dominated by pine savannah and marshes. The interior sector of Río Plátano is a hilly to mountainous region covered by very humid tropical forest (Herlihy 1997; House et al. 2002).

3.1 The Miskito

The Miskito are the principal indigenous groups living in Río Plátano and their origins date back to the 1600s when the Amerindians living in the region began to mix with European colonists, pirates, and African slaves on the shores of eastern Honduras. The Miskito have historically remained fairly isolated and independent from the formal institutions of their respective governments and depend primarily on subsistence farming and hunting for their livelihoods (Dodds 1994; Herlihy 1997).

The traditional common-property system of the Miskito is similar to that of many native peoples in Latin America (Stocks 1996, 1998; House 1997). Although, historically, the Miskito did not develop formal governing structures or land-use rules, the Miskito have managed their forests under a tacitly understood set of norms that provides social, economic, and environmental benefits. The core characteristic of the Miskito common-property system is that all forest lands are held in common and residents share access and use rights to the forests. Forest boundaries are not physically demarcated as forests are considered to be available to all native residents. Most of the interior forest lands are designated for hunting, and occasional timber harvests, and all residents are able to gather timber and non-timber forest products. In addition, land is not bought or sold, as it is to be passed down through the generations (Dodds 1994; Herlihy 1997; Stocks 1998).

In his work on forestry institutions in Mexico, Klooster (2000) highlights the important role that institutions serve in forming community identity (p. 14). Similarly, my own work in the Río Plátano and work by other researchers (Dodds, 1994; Herlihy, 2001) found that Miskito land-use institutions serve to maintain key values and practices that identify what makes a person Miskito. In Río Plátano, the Miskito common-property institutions serve not only to conserve forests and dictate land-use, but also serve Miskito cultural values that include a sense of shared space and a certain degree of equity.

3.2 Agricultural Expansion

Frontier expansion onto indigenous lands in Río Plátano began in the late 1980s and early 1990s. Although Río Plátano was created in 1980, it remained virtually unmanaged until the mid-1990s when the Honduran government in conjunction with international and national conservation and development agencies implemented new

reserve policies. The migrants settle on Miskito homelands by either invading or buying land. In many cases, colonists were initially encouraged by government development programs. In 1995, the Honduran government declared the north-western edge of Río Plátano a region for agrarian reform and encouraged thousands of families to move to the area. Upon arriving at the edge of the reserve, many migrant families moved further inside Río Plátano (IUCN/ORMA 1995; Messen 1995). By 1997 there were approximately 2,200 mestizos living in the cultural zone of the reserve (PBRP 1997/98).

Today, Río Plátano is governed by the Honduran Ministry of Forestry and is divided into three management zones: a core zone for strict preservation; a buffer zone for the mestizo residents; and a cultural zone for the indigenous residents. The cultural zone is under government management and specifically designated for indigenous residents, nonetheless, migrant farmers and ranchers continue to settle on cultural lands as well as in the core zone of the reserve (Hayes 2007).

The migrants disturb the Miskitos' common-property system in two important ways. First, unlike the Miskito who value shared access to the forests and forest products, the mestizo farmers do not recognize the fluid boundaries and common-property institutions of the Miskito. Mestizo farmers and ranchers perceive all lands to be open for appropriation unless they are otherwise physically demarcated (Stocks 1998). Upon arriving in the frontier, mestizos immediately demarcate their landholdings with markings on trees and clearings in order to establish individual ownership rights.

Second, the mestizos introduce an external market for land. Customarily, the Miskito do not sell land. In contrast, the mestizos actively buy and sell land. For the Miskito, the offer of money for land presents a much needed economic opportunity and provides incentives to sell what were previously considered to be part of the communities' lands. The demarcation of private property and the introduction of external market for land challenges the Miskitos' traditional land-use systems.

3.2 Study Sites

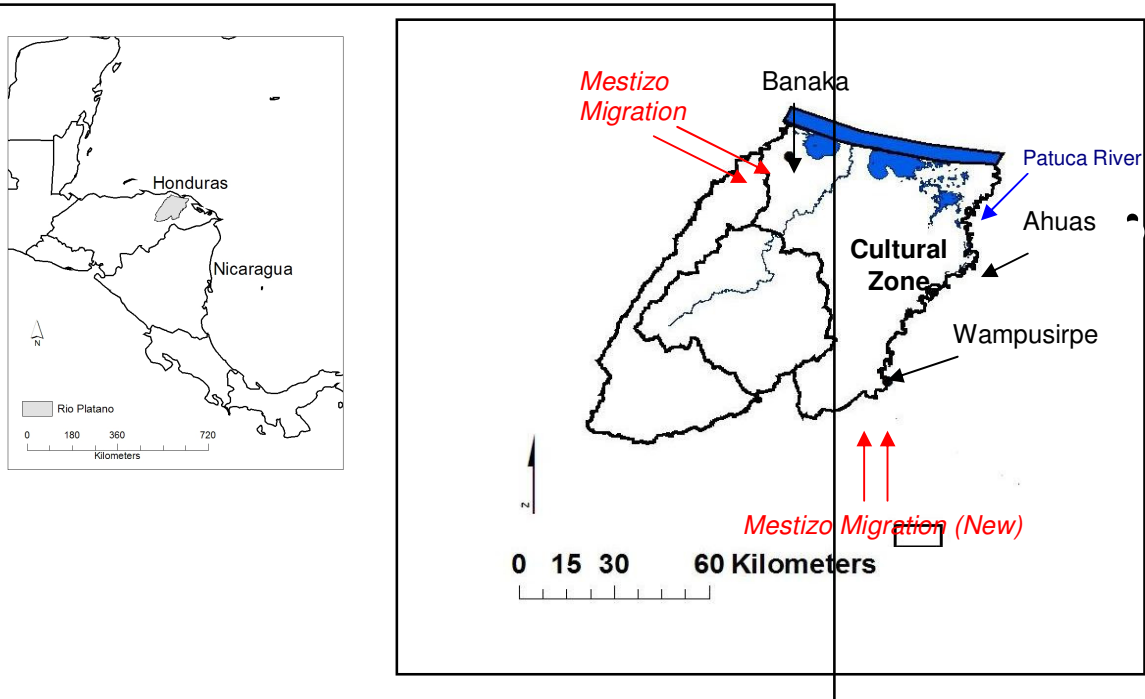


Figure 1. Río Plátano Sites in Relation to Mestizo Migration

Mestizos first began to move into the cultural zone of Río Plátano from the northwest. More recently, mestizo settlers have begun entering from the south. The patterns of mestizo expansion in Río Plátano are such that they allow a comparison between Miskito communities that have experienced mestizo encroachment for different lengths of time ranging from 15-20 years to virtually no encroachment².

Figure 1 shows the principal Miskito study communities: Banaka, Wampusirpe and Ahuas. The sites were chosen to examine the impact of outside encroachment on resident land-use practices and institutions. The regions share similar geographies and levels of market integration, but each region has a different history of mestizo encroachment. Each study community is only accessible via boat or small plane and the residents are not connected to commercial markets. Residents are primarily subsistence agriculturalists, although some men harvest timber for small-scale sale within the region, and others may work part of the year as divers for the lobster boats along the Caribbean coast.

Banaka, located in the northwestern corner of the reserve, has experienced the longest history of mestizo migration. Colonists began migrating to Banaka in the later 1980s and today, the community lies directly in the path of the ever expanding agricultural frontier. Banaka lies on a plain along Banaka Creek that flows down from the surrounding mountains and the study area encompasses roughly 155 km². In January 2006 there were 269 people living in 50 houses in the immediate community of Banaka. The majority of the residents in the village of Banaka are Miskito; however, the hillsides surrounding Banaka are populated by mestizo residents. In total, there are approximately 65 houses in the foothills surrounding, and the majority of the residents have settled in the region since 1998.

Wampusirpe did not begin to face mestizo expansion until late 2003. Wampusirpe is located the Patuca River and encompasses roughly 246 km². In 2005 there were 1,873 people and approximately 260 houses in the region. When I visited the region in August 2003, residents reported that mestizo colonists had not yet moved into the area. However, since 2004, at least eight new colonist families have settled in Wampusirpe,

² In the research design it is important to note two possible limitations. First, ideally, Ahuas would be a pure "control," isolated from all mestizo influences and following customary Miskito land-use practices. There are a few mestizo men in Ahuas that came with the Honduran military in the 1950s, married Miskito women, and stayed and are not considered colonists. They have generally adopted Miskito land-use customs. The second limitation is the introduction of the chainsaw in all communities. Residents state that some Miskito people began using chainsaws to cut trees and clear land in the mid-1990s. In order to take into account the difference between institutions aimed at controlling mestizos and institutions aimed at controlling the chainsaw, I asked interviewees to specify why they preferred a particular land-use institution (Was it to prevent mestizo encroachment or a Miskito neighbor from cutting forested land, or possibly some other reason?). In interviews, chainsaw use was more of a concern in Ahuas than in Wampusirpe or Banaka.

and in discussions with some of the recently arrived settlers, they indicated many of their relatives would soon move to the region.

As of April 2006, Ahuas had not experienced mestizo colonization. Ahuas covers roughly 236 km² and, according to the 2001 census, total population for the region is 6,039 and approximately 235 houses (INE 2001, PBRP, 1997/98). 97% of the population is Miskito (INE, 2001).

Ahuas is located farther north of Wampusirpe and, has thus far, remained relatively sheltered from encroachment pressures. As colonists move in from the west and the south, they have found lands in other regions before reaching Ahuas. However, this may soon change. Residents are aware that outsiders are encroaching on Miskito lands in Río Plátano and although many expressed concern that colonists might reach Ahuas, they did not perceive outside encroachment to be an immediate threat.

4. Methods

4.1 Identifying Institutional Change

I apply the Institutional Analysis and Development (IAD) framework to analyze how institutions, both formal and informal, have changed in response to the disturbances introduced by mestizo migrants (Ostrom 1990, 2005). Institutions are defined as the rules, norms, and strategies that shape our decisions and our interactions (Ostrom 1990). Institutions are important indicators of how a traditional community responds to a disturbance because they are considered to be stable and often presumed to change only if some event disrupts the equilibrium and shocks the system (North 1990; Knight 1992).

According to Ostrom, an institutional change is “a change in any rule affecting the set of participants, the set of strategies available to the participants, the control they have over outcomes, the information they have, or the payoffs” (1990, p. 140). In this analysis I am particularly concerned with property rights changes that alter the set of participants and their land-use options and the payoffs or sanctions associated with these options. I use the definition of property rights and distinction between strategies, norms, rules to assess institutional change in the Río Plátano, and I draw on definitions of robustness and resilience in the literature on social-ecological systems to evaluate the outcomes of the changes.

In Río Plátano, the common-property institutions are shaped by both the collective choice decisions of the Miskito leaders and by the individual day-to-day decisions of the residents. Schlager and Ostrom (1992) distinguish between five different property rights related to resources operating at two decision-making levels: operational and collective-choice. These five rights include the ability to access, withdraw, manage, exclude, and alienate a resource. At the operational decision-making level, individuals are entitled *access to* and *withdrawal from* a resource system. Decisions made at the operational level do not determine rules about resource use. Those with collective-choice decision-making rights are entitled to make rules that *exclude* others and make *management* decisions that determine future access and withdrawal rights and potentially define zones for use patterns and change the physical layout of the resource (such as demarking boundaries in diverse ways). *Alienation* is also a right decided at the

collective-choice level and entitles one to sell or lease access, withdrawal, and management rights.

These bundles of rights may be expressed through a series of strategies, norms, and rules. Following the work by Crawford and Ostrom (1995), in this study, a rule is differentiated from a norm by the level of collective decision making required and a formal sanctioning process. A rule requires some degree of collective decision making where participants consciously craft what an individual must, may, or may not do, and expressly stipulate what will happen if an individual does not comply with the ordinance. In contrast, a norm is more informal. A norm is often a tacit understanding of customs that guide an individual's behavior by stating what an individual should or should not do. A norm is not consciously crafted and does not have a formal mechanism for monitoring and sanctioning non-compliance. However, norms are supported by informal monitoring and sanctions such as community gossip, shunning, and other communal incentives. A strategy is the most informal institutional statement. It specifies what is customary, but it is not enforced by either formal or informal sanctioning. It could be considered to be followed because others have generally found that the institution "works," but it is not necessarily the only acceptable behavior or decision.

The distinction between a norm and a rule is particularly telling. When something that was once a norm, such as the prohibition of land sales, becomes a rule, it suggests that tacit understanding between community members is no longer sufficient and that the particular resource now holds enough value that it warrants the costs associated with collective action to define a rule and its respective sanctions. Similarly, a norm shifting to a strategy may mean that the values and attitudes that once supported the norm are no longer prevalent in the community and that the institution is now merely a custom to be practiced if one so desires.

The robustness of the Miskito common-property system depends on whether the institutional design of the system, and adaptations to that design, enable the Miskito to resist mestizo invasions and market pressures. Anderies et al. (2004) define robustness as "the maintenance of some desired system characteristics despite fluctuations in the behaviour of its component part or its environment" (citing Carlson & Doyle 2002). They, and others, emphasize that the robustness of a system depends on past adaptations which may either help or hinder the system to withstand new perturbations and uncertainties (Anderies et al. 2004; Young et al. 2006).

Drawing on the works by Young et al. (2006) and Smit and Wandel (2006), I define adaptations as the changes that the Miskito make in their land-use rules, norms or strategies to adjust to mestizo encroachment. I consider the Miskito common-property system to be robust to mestizo encroachment if adaptations enabled the residents to maintain the core characteristics of their institutional system in the face of mestizo market and land-use pressures. These core characteristics are: (1) forests are held in common by all native residents who share access and use rights and, (2) land is not bought or sold.

4.2 Data Gathering

Data were gathered from site visits during 2003-2006 in accordance with International Forestry Resources and Institutions (IFRI) protocols. IFRI is a validated framework to enable scholars to examine the impact of diverse ways of owning and governing forests

on protection and management activities and their consequences on forest condition (CIPEC 2004). In each community, I conducted individual and group interviews with a purposefully select sample of indigenous leaders and residents, government officials and non-government personnel in the cultural zone of Río Plátano. The interviews were semi-structured and aimed to gather information on community and region-wide responses to mestizo migration and the current organizational and institutional activities of the Miskito peoples in each reserve. I also gathered archival data on reserve activities and the policy processes.

In addition to the semi-structured interviews conducted at the regional level, in each community I conducted interviews and administered a structured questionnaire to households. I administered the questionnaire to approximately half of the total number of households in Banaka, and roughly twenty percent of the households in Wampusirpe and Ahuas. The sample population was selected based on the geographic location of each house and gender.

The questionnaire aimed to compare the responses to mestizos made by individual Miskito households in each community and assess the robustness of their respective common-property systems. It was based upon previous interviews with Miskito elders and leaders about their land-use customs and some of the challenges they perceived from mestizo migration. The questionnaire asked (1) if residents believed that their community was able to prevent mestizos from entering their lands; (2) resident willingness to sell land to a mestizo; (3) preference for communal forest lands or individual forest plots that prohibit communal use, and (4) use of fences. I further corroborated the questionnaire findings with interview responses from Miskito elders, community forest guards, and community leaders. As stated earlier, I consider the Miskito common-property system robust if residents continue to share access to the forest lands and refrain from land sales.

5. Findings

Institutional Statement	Configuration of Property Rights for Forest Governance
	<u>Access</u>
NORM	All natives (loosely defined) may access all lands.
	<u>Withdrawal</u>
NORM	All natives (loosely defined) may withdraw forest products.
	<u>Exclusion</u>
NORM	No one may exclude Miskito from forested lands.
	<u>Management</u>
NORM	First to farm in forest retains management rights to plot.
	<u>Alienation</u>
NORM	Miskito do not sell land.

Table 1. Traditional Miskito Common-Property Configuration for Forest Governance

Table 1 shows the traditional Miskito common-property configuration for access and use of the forest lands. The table serves as a reference by which to examine how the institutions have changed. I divide the institutional findings between collective-choice decisions that are being made by Miskito leaders and the operational-level activities and attitudes of the residents in the Miskito communities. The findings illustrate that the Miskito system is in a state of flux as the mestizo migrants introduce private property norms that specify the right of the individual to exclude others from forest lands and to sell land. Findings show that while at the collective-choice level the Miskito are developing rules to strengthen their common-property rights to the Mosquitia, individual actions and attitudes at the operational level are less cohesive.

5.1 Institutional Dynamics at the Collective-Choice Level

Customarily, Miskito land-use decisions are made at the household level, and few, if any, decisions are decided by the community at the collective-choice level. In 1976, however, the Miskito began to organize themselves into a political organization. At this time several leaders in the Miskito community created the organization “Unity for the Mosquitia” (MASTA) in order to unite the Miskito peoples and defend their cultural heritage. Today, MASTA is an umbrella governing body that consists of four indigenous federations within Río Plátano.

The creation of the indigenous federations in Río Plátano and the umbrella organization MASTA is a substantial institutional change for the Miskito people. In Río Plátano, MASTA federations demand legal recognition of their common-property rights over the Mosquitia, including the ability to exclude, manage, and determine alienation rights over their homelands. Although MASTA does not have formal jurisdiction over Río Plátano, in an effort to assert their dominion over their homelands and restrict mestizo migration in the region, MASTA has defined, and is trying to establish, a set of de facto land-use rules with respect to access and use rights to their communal lands in the Mosquitia. MASTA and its respective federations have drawn on the traditional land-use norms of the Miskito and have collectively established two rules to further define their common-property rights to the region and prohibit mestizo occupation of their lands³:

1. Exclusion: No mestizo settlers are permitted to settle in the cultural zone of Río Plátano.
2. Alienation: Miskito are prohibited from selling land to mestizos.

In order to enforce these rules, each regional MASTA federation within Río Plátano is responsible for creating a land vigilance committee to monitor mestizo encroachment and Miskito land sales. Any illicit activities are to be reported to the MASTA which, in turn, is expected to coordinate with AFE-COHDEFOR and/or municipal governments to further investigate and enforce the rules. In practice, however, the rules are only sporadically applied in the Miskito communities.

³ These rules echo those made by the Biosphere Project. However, attempts to apply the rules are completely separate from any Biosphere Project activities. In interviews, several residents were unfamiliar with the Biosphere Project and its respective rules. They did, however, know of MASTA’s rules prohibiting mestizo settlements and land sales.

5.2 Institutional Evolution in the Miskito Communities

In Río Plátano each of the three communities have been charged with creating a land vigilance committee to monitor mestizo encroachment and land sales. Furthermore, residents in each of the communities are asked to support the MASTA rules. Findings on the activities of the land vigilance committees and operational day-to-day decisions in the three communities, however, demonstrate the fragility of the new common-property rules.

5.2.1 Land Vigilance Efforts

In Ahuas, where mestizos have yet to enter, the regional federation has not created any type of land vigilance committee and is not actively organizing residents to consider how they might address the problem of mestizo encroachment. Ahuas leaders say that they are concerned with the possibility that mestizos might invade their communal lands, but to date, that has not happened.

In contrast, in Wampusirpe and Banaka, the communities' respective regional federations have individually organized land vigilance committees to monitor encroachment activities. In both cases, however, these committees were organized after mestizos began moving into their respective regions. Furthermore, the land vigilance committees' activities vary in effectiveness and consistency over time.

Wampusirpe's land vigilance committee is the most recent. The committee formed circa 2003 in response to an increase in colonist activities in the region. Committee members state that the group has been relatively successful in getting colonists to leave forested lands that they had appropriated. Group members noted, however, that thus far they have been less successful in prohibiting land sales to mestizos.

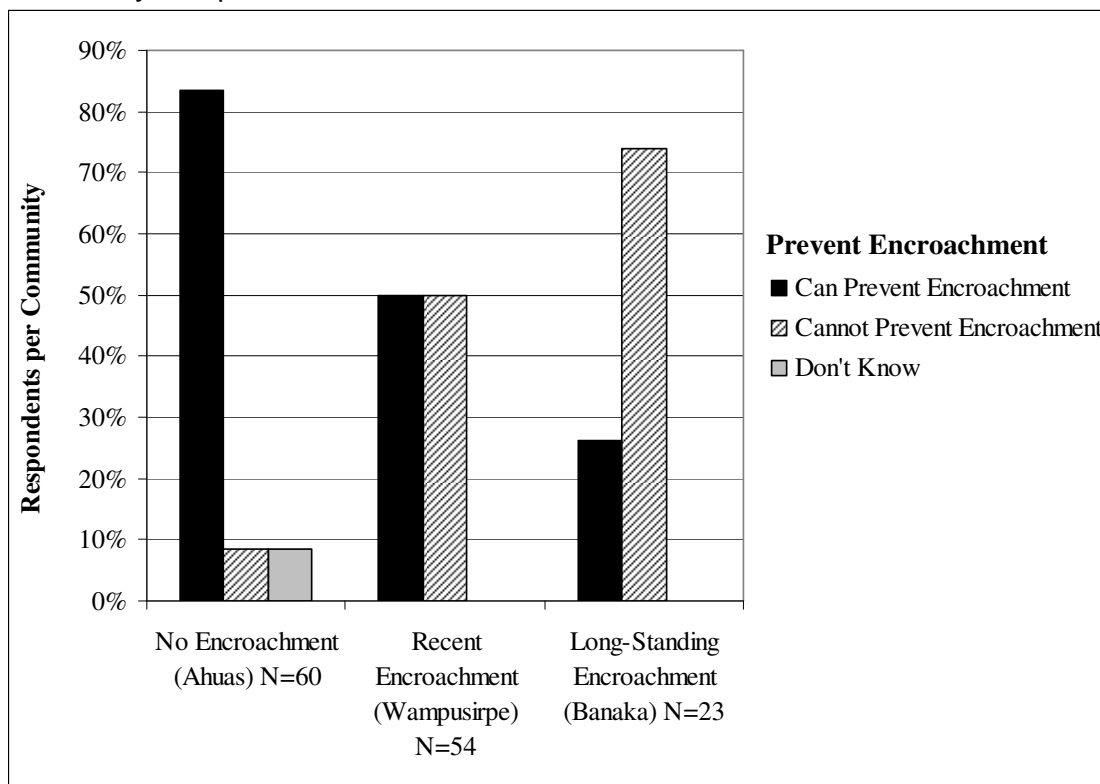
Of the three study sites, Banaka has the longest history of encroachment and the longest history of attempts to control mestizo migration. The history of efforts to control mestizo migration in Banaka illustrates the frailty of the common-property system and new institutions to support it. Upon learning of mestizo encroachment onto lands surrounding Banaka, residents organized a land vigilance committee to monitor their lands from mestizo encroachment. While all vigilance activities were voluntary, a Honduran NGO, MOPAWI, supported the organizational development of the committee. Banaka residents reported that until the mid-1990s, the group was relatively successful.

In 1995, however, the Honduran government encouraged thousands of farmers to colonize a region along the northwestern edge of Río Plátano, close to the western border of the cultural zone. According to residents, many of these farmers pressed farther into the cultural zone and into the foothills surrounding Banaka. In interviews, the original members of the Banaka land vigilance committee reported that, at that time, they felt discouraged and asked for greater governmental support in order to control the onslaught of colonists. That support never materialized. In the late 1990s, the Banaka land vigilance committee dissolved.

Since June 2004, MASTA and the Honduran NGO MOPAWI have tried to reinvigorate the Banaka land vigilance committee and encourage members to monitor and enforce the rules to prohibit land sales. As of 2006, the vigilance committee was

flailing. Community residents and several members of the new committee were pessimistic about the ability to keep colonists out and prevent land sales. Furthermore, Banaka residents' stated that the community was divided over land sales and that many families have since sold land to colonists.

The deterioration in community confidence in their ability to control mestizo encroachment and thereby sustain their common-property forest governance systems is reflected not only in reports by the respective land vigilance committees, but also in residents' attitudes about whether the community can control mestizo encroachment and the subsequent actions they take to defend their lands. Figure 2 shows the results from a questionnaire statement with respect to whether the community can prevent mestizo encroachment. The graph and cross-tabulation results demonstrate the relationship between history of encroachment and perceptions of whether the community can prevent mestizo encroachment.



Likelihood ratio 39.362, $p = 0.000$

Figure 2. Comparison of Attitudes on Ability to Control Encroachment by Community Encroachment History

The results suggest that the longer a community is exposed to mestizo encroachment, the less likely it is that community residents will believe that the community can prevent mestizo colonization of the region. The likelihood ratio value from the chi-square test of independence shows that there is a statistically significant relationship between a community's experience with encroachment and residents' attitudes with respect to their ability to prevent mestizo settlements. Ahuas residents, who have yet to experience mestizo migration, are most confident in their ability to control mestizo settlements.

However, several residents in Ahuas were not sure whether they, in fact, needed to keep out mestizos. It is also important to note that many Ahuas residents responded to the question as more of a hypothetical situation of whether they wanted mestizos in the region. Ahuas residents frequently stated in response that no, they did not want mestizo residents and that yes, they *would* prevent them from moving to the region.

In contrast, Wampusirpe residents who began experiencing mestizo migration within the last five years are divided over whether they are able to prevent mestizos from settling in their communities. In Wampusirpe, several residents stated that the community can prevent mestizo encroachment, but they are choosing not to. These residents expressed frustration over recent land sales by Miskito residents to mestizo settlers and noted that although he or she does not want mestizos living in the region, there is nothing to prevent a neighbor from selling land.

Finally, Banaka residents, with the longest history of encroachment, were the most likely to state that the community is incapable of preventing mestizo migration. In Banaka, 14 of the 23 respondents stated that they could not prevent mestizo migration to the region.

5.2.2 Institutional Change in Individual Land-Use Decisions

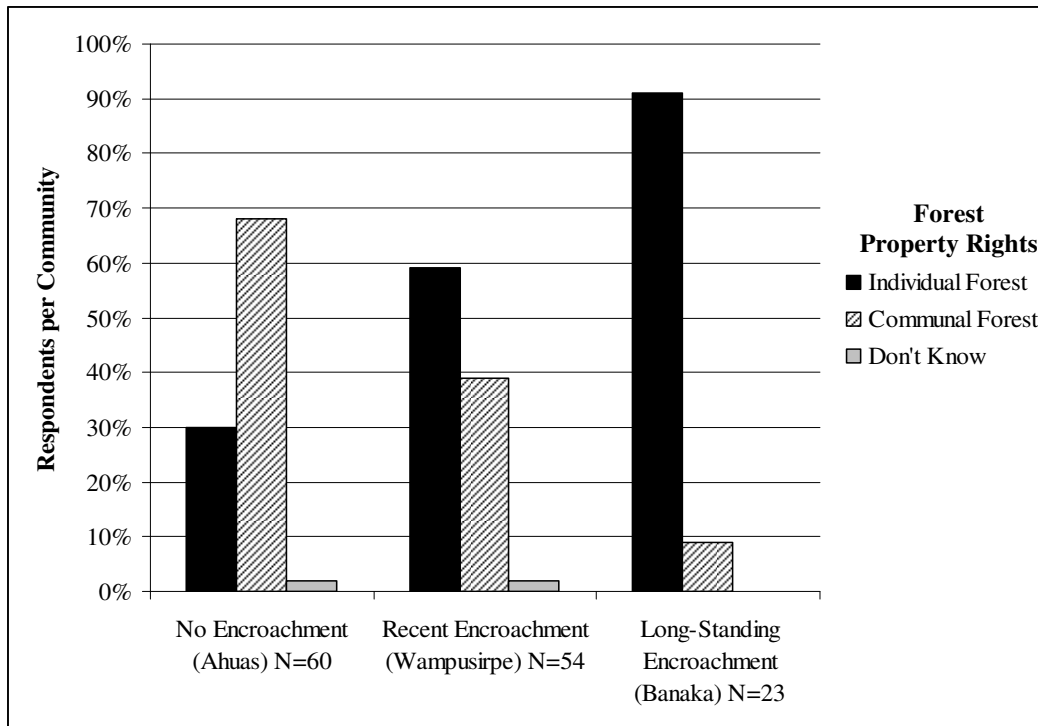
As residents perceive the inability to protect their traditional forest governance practices, despite the common-property rules enacted by MASTA, many begin to adopt mestizo private property institutions. Three of the principal changes include the adoption of private forest reserves, use of fences to delimit property ownership, and land sales.

5.2.2.1 Forests

In response to a questionnaire statement about use rights to the Mosquitia forests, 131 out of the 138 total respondents interviewed in the three study sites stated that the forests are only for the Miskito or native peoples. Many emphasized that Miskito land-use norms allow all residents to use any part of the forest and that residents at times travel to forests lying near neighboring communities to look for specific timber or other forest products. In contrast, among mestizo colonists, clearing a strip of land around a forest area is a commonly accepted practice that denotes ownership. While many respondents said that the mestizos do not have right to the forest lands and that it goes against Miskito custom to claim individual or family forests, in their day-to-day practices many Miskito are straying from the customary shared access rights to the forest and adopting the mestizo institutions that demonstrate individual property rights to forests.

The questionnaire asked residents whether they agreed with having a private family forest that was physically demarcated. According to the scenario, the forest would be only for that particular family and the owner could prohibit other Miskito from using the forest resources within the family's private reserve. Figure 3 graphically illustrates the results and presents the chi-square test findings that show that encroachment and the preference for a privatized individual forest are positively associated. It is more likely that a resident in Banaka prefers privatized forest lands than a resident in Ahuas or Wampusirpe. In Banaka, 21 of the 23 households interviewed stated that they had their

own forest that was physically demarcated and specifically designated for their own family's use. In contrast, in Wampusirpe just under half of the residents interviewed stated that they had or wanted a private forest for their families. And in Ahuas, only 18 of the 60 respondents supported owning a private forest.



Likelihood ratio = 29.439, $p = 0.000^4$

Figure 3. Comparison of Forest-Ownership Preferences by Community Encroachment History

Those respondents in favor of individual forests frequently stated that any land that is not clearly occupied may be taken by another. Whereas residents in Ahuas expressed concern over timber harvesting, Wampusirpe and Banaka residents who supported private forests said that by physically demarcating a forest they could ensure that no mestizo would invade and that a Miskito neighbor would not sell the land. In Banaka, several residents recounted earlier times when they had gone up into the hillsides to cut mahogany for boats and found mestizo settlers restricting their access to the residents' prime forest lands. Banaka respondents stated that they have created their own forest reserves so that their families and their children will have places to hunt and gather timber products.

In all communities, those respondents who did not prefer individual forests were adamant that it violated Miskito traditions to restrict access to forested land. Many emphasized that different forest products grow in different regions and that all Miskito deserve equal access to these products.

⁴ Likelihood ratio is based on a 2x3 table with the don't know responses left out of the analysis

5.2.1.2 Propagation of Fences

Another trend toward more restrictive property rights regimes is through the use of fences. Fences may appear fairly innocuous, yet many Miskito residents note that traditionally the Miskito do not fence their lands because anyone may access all lands. Fences are a visible demonstration of property rights and a mechanism for enforcing boundary rules. In interviews, many Miskito residents complained that the mestizos restrict Miskito access by fencing their lands (and actively monitoring their property). However, more Miskito families are beginning to fence their lands.

Table 2 shows a statistically significant relationship between encroachment and the use of fences. As with the other institutions that support greater privatization of the land and its resources, fencing is most popular in Banaka, where 20 of the 22 respondents agreed with fencing one's land. This response may be due, in part, to the geographic layout of Banaka and the fact that the agricultural plots are planted closer to the communal living areas than they are in Wampusirpe or Ahuas. Many Banaka residents, however, have also begun to adopt the mestizo practice of permanent pasture lands. In addition to keeping their cows out of the crop lands, some residents noted that part of the reason to fence is to define ownership over one's land.

Table 2 Cross-Tabulation of Encroachment and Use of Fences

	No fences	Yes fences	Total
No Encroachment (Ahuas)	30	25	55
Recent Encroachment (Wampusirpe)	26	27	53
Long-Standing Encroachment (Banaka)	2	20	22

Likelihood ratio 6.058, $p = 0.000^5$

Fencing land and maintaining permanent plots is not as prominent in Wampusirpe and Ahuas. In Wampusirpe and Ahuas, opinions are evenly split over whether to fence agricultural lands. In both regions, residents expressed concern that fencing would restrict resident access to community lands, and community leaders and elders, in particular, worried that fencing would allow a few wealthy residents to claim all of the prime land. Nevertheless, many also noted that with the acquisition of cattle, fencing is becoming more important in order to protect crop lands.

5.2.1.3 Alienation Rights: Land as a Market Commodity

Given the chance to gain immediate access to money from land sales, have the Miskito become integrated into the mestizo land market? In questionnaire responses, the majority of the residents (125/140 total respondents) stated that land sales to non-

⁵ Likelihood ratio is based on a 2x3 table with the don't know responses left out of the analysis

natives causes problems for the entire community. Many Miskito stated that, in their opinion, mestizos generally do not make good neighbors. The attitude of general distrust of mestizos did not vary much by community.

Nevertheless, land sales to mestizos persist. Community leaders and land vigilance committee members frequently commented that one of the greatest difficulties in controlling mestizo encroachment is in convincing their own community members not to sell land to the colonists.

Table 3 Comparison of Willingness to Sell across Communities

	Sell to Mestizo	Not sell to Mestizo	Total
No Encroachment (Ahuas)	20	38	58
Recent Encroachment (Wampusirpe)	17	37	54
Long-Standing Encroachment (Banaka)	9	14	23

When asked whether they would sell land to mestizos, approximately one-third of the respondents in each site stated that they would sell land to mestizos. Table 3 shows a comparison of the willingness to sell across communities. The willingness to sell land clearly facilitates encroachment and defies MASTA land-use rules. There is not a statistically significant relationship between willingness to sell and encroachment. However, Banaka and Wampusirpe residents are more likely to have actually sold land to a mestizo than residents in Ahaus. A community leader and former community forest guard in Banaka reported that approximately 25% of the community landholders had sold land to mestizos over the past ten years. Similarly, almost half the residents in the one community in the Wampusirpe region reportedly sold land to mestizos in the past year.

The problem of Miskito land sales to mestizos demonstrates the difficulties the Miskito face in uniting their communities in the protection of Miskito common-property rights. In many interviews residents expressed concern over the community conflict caused by land sales. Many of those who said they would sell land stated that they have no other source of income and that land sales are a quick way to make money, particularly when there is a familial crisis such as illness. They stated that they would sell land to mestizos because Miskito do not have money and that mestizos pay better prices. Other community members, however, were quick to criticize those who sell land. Many noted that the sales are only temporary solutions and that, ultimately, the family is left worse off because they have lost at least some of their agricultural lands. Some residents commented that they thought that those Miskito who sell land should have to leave the Mosquitia and wished that there were stronger punishments for land sales.

6. Discussion

Can the Miskito property-rights arrangement and their respective institutional adaptations to mestizo migration be considered part of a robust common-property system? The findings from this study highlight the conflict and tension that mestizo migration produces with respect to land use in the region. The Miskito property-rights regime has neither collapsed nor remained completely robust in response to mestizo encroachment. Rather, within the regional federations of MASTA, there is some self-organization and adaptation of rules to strengthen the Miskito system, but many of the collective-choice rules have not been fully applied or respected within the communities.

An important distinction is between institutional change occurring in MASTA and the institutional changes occurring within the Miskito communities. MASTA has taken the common-property norms of the Miskito and created two important rules: an exclusionary rule that prohibits mestizo settlements and a rule that explicitly forbids land sales. The creation of property-rights rules to restrict mestizo encroachment and prohibit land sales support the core functions of the common-property system by attempting to ensure continued communal access to Miskito homelands. The individuals living in the Miskito communities, however, are less united in their support for these new land-use rules, and some individual residents are adopting mestizo institutions such as private forest reserves and fences and a willingness to participate in the mestizo land market.

The community-level studies suggest that, when mestizos begin to by and occupy Miskito ancestral forests, a community's first response is to create institutions to maintain Miskito common-property customs in the face of mestizo encroachment. This initial self-organization and activity gradually fades, however, as the land vigilance committees fail to protect Miskito common-property rights and Miskito residents begin to adopt mestizo institutions to protect their subsistence needs and provide for their families.

If we envision a graph with investment in institutions and activities to bolster Miskito common-property institutions and control outside encroachment along the y-axis and encroachment over time on the x-axis, it should appear that as encroachment continues, investment in activities to support the Miskito common-property system initially increases and then decreases as encroachment persists. The resulting graph might look something like an inverted U.

This inverted U is demonstrated in the comparison of activities and attitudes with respect to land use and encroachment in Ahuas, Wampusirpe, and Banaka. At time zero (no encroachment), the Miskito common-property institutions are functioning. But, the traditional institutions require minimal investment because, for the most part, they are understood and complied with by the Miskito population. They have not been challenged. Ahuas could be considered to be at time zero with respect to encroachment. Although Ahuas residents are optimistic about their ability to prevent mestizo migration, to date in Ahuas, there is no committee organized to monitor and enforce land-use rules, and residents have very little understanding about their formal tenure standing.

Following along the timeline of mestizo encroachment, when the common-property institutions are first challenged by mestizos, the Miskito organize land vigilance committees and create boundary rules, thereby contributing to the robustness of their property-rights system. Wampusirpe could be considered to be at this point of

encroachment and at the height of the organizational and institutional actions to prevent outside encroachment. But, the success of these new organizations and institutions is, in part, hindered by decisions by Miskito residents, namely the decision to sell lands. Land vigilance committee members in Wampusirpe can recall cases where they prevented colonists from moving in, but they also point to plenty of examples of new colonist settlements and incidents of Miskito land sales to mestizos.

Finally, Banaka lies farther along the encroachment timeline. Investment in common-property institutions to thwart mestizo migration begins to decrease as mestizos continue to migrate into the region and as residents lose faith in the effectiveness of collective-choice activities in stopping encroachment. Miskito residents stop participating in the land vigilance committees and some adopt mestizo property-rights institutions to defend their lands.

Residents of Banaka were the least likely to think that the community could control mestizo encroachment. Banaka residents are also the most likely to have adopted mestizo property-rights institutions to define their landholdings. Twenty-one of the 23 respondents approved of having private forest holdings and many of those said that they currently maintain private forests. Similarly, Banaka residents were the most likely to approve of the use of fences and the most likely of the three sites to prefer individual land titles. Furthermore, approximately 40% of the Banaka respondents stated that they would sell land if there were dire need, and many pointed out a neighbor that had in fact, recently sold land.

The institutional changes within the Miskito communities show how some of the principle land-use norms are changing, and highlight the spectrum of institutional changes occurring in the region. While some Miskito are making efforts to change the traditional norms to rules that explicitly support the Miskito common-property system, others are instead altering the norms around access, exclusion, and alienation so that they concur more with mestizo private property institutions. In Río Plátano, the Miskito land-use system illustrates the dynamic dimensions of institutional change; dynamics that continue to evolve in response to exogenous, and endogenous, changes in the social, economic and ecological conditions in the region.

7. Conclusion

The Miskito of Rio Platano are tackling a difficult task of addressing new markets and demographic pressures presented by the mestizo settlers. They have received minimal support from the Honduran government to address agricultural expansion in the region. the study shows that traditional peoples first response to threats to their common-property system is to enact rules to define more complete property rights to defend their traditional common-property system; not, to succumb to private property institutions. The institutional analysis of change within Miskito communities demonstrates, however, that change is not necessarily linear or cohesive. The dynamic processes unfolding in Rio Platano enhances our understanding of how traditional land-use institutions change when faced with exogenous pressures and suggest some lessons for external actors wishing to support traditional common-property institutions.

First, the disjuncture between the institutional changes produced by MASTA and those changes occurring in the communities illustrates the need to carefully analyze

decision-making levels and community dynamics with respect to institutional change. Although Miskito community residents and the Miskito leaders both initially expressed desire to enact more complete property-rights rules to support their common-property systems, the day-to-day decisions of the Miskito has not necessarily cohered with the rules proposed by the Miskito leaders of MASTA. From a policymaker and program perspective, the gap between leaders' decisions and individuals' actions should caution against assuming that what leaders say represents what individual do. Any external actors considering how to support the Miskito in defense of their common-property system and continued forest conservation need to be aware of the division between the rules created by MASTA and the day-to-day decisions made by the Miskito in their respective communities. It is not enough to assume that changes and actions taken by the Miskito leaders necessarily translate into changes in day-to-day decisions in the Miskito communities. Support for the common-property system will require gaining the confidence of the community members in their abilities to defend their lands and in the ability of their leaders to not only create, but also enforce, their common-property rights.

Second, the results from the study highlight not only the disjuncture between decisions made by Miskito leaders and those by the residents in the communities, but also the growth of discord within the Miskito communities. In the Miskito communities of Río Plátano, institutional change has followed the path of an inverted U. Prior to direct exposure to mestizos, communities do little to bolster their common-property institutions. Once mestizos begin to move in, however, the community organizes to enforce exclusionary rules and condemn land sales. These activities, nonetheless, appear to deteriorate if community members are unable to continually resist mestizo encroachment. The findings from this institutional process suggest that there may be a pivotal "window of opportunity" when property-rights policies might be most effective.

For example, conditions in Wampusirpe appear to indicate a "window of opportunity" for a organizational capacity building programs, monitoring and enforcement support and an appropriate and property-rights policy to work with indigenous residents to protect their forest and their respective institutions. Residents in Wampusirpe recognize the problem of encroachment, and have begun to organize and seek support for their institutions to prevent mestizo encroachment. In contrast, Ahuas has not yet reached the stage where residents recognize the problem of mestizo encroachment and are willing to undergo some costs in organizing to prevent mestizo encroachment.

Unfortunately, residents in Banaka did not receive much external support when they requested it in the mid-1990s. Today, there is a considerable degree of conflict between residents of Banaka, particularly with respect to land sales, and many community members stated a lack of confidence in their ability to defend their lands. This is not to suggest that it is impossible to revitalize and strengthen the common-property regime in Banaka. But, given the failures that the residents have experienced, the tensions within the community, and the numbers of mestizos now living in the area, we need to be realistic about the challenges such communities present. Maintenance of the common-property system in Banaka (if such maintenance is still desired) would require a lengthy process to revitalize community confidence in residents' governance abilities (and in each other), and negotiations with mestizos living in the region. Future research is needed to see how such a process might evolve.

The struggle of the Miskito residents to defend their lands while maintaining their common-property rights and meeting their subsistence needs is a process occurring in many communities worldwide. The Miskito common-property system has not completely collapsed, nor has it remained robust. The study findings point to the importance of examining the complexity of institutional change within traditional communities in order to better understand how policies and programs might support their common-property systems and the ecological resources they manage.

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