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Beyond harvests in the commons: multi-scale governance and turbulence in indigenous/community conserved areas in Oaxaca, Mexico

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Abstract: Some important elements of common property theory include a focus on individual communities or user groups, local level adjudication of conflicts, local autonomy in rule making, physical harvests, and low levels of articulation with markets. We present a case study of multi-scale collective action around indigenous/community conserved areas (ICCAs) in Oaxaca, Mexico that suggests a modification of these components of common property theory. A multi-community ICCA in Oaxaca demonstrates the importance of inter-community collective action as key link in multi-scale governance, that conflicts are often negotiated in multiple arenas, that rules emerge at multiple scales, and that management for conservation and environmental services implies no physical harvests. Realizing economic gains from ICCAs for strict conservation may require something very different than traditional natural resource management. It requires intense engagement with extensive networks of government and civil society actors and new forms of community and inter-community collection action, or multi-scale governance. Multi-scale governance is built on trust and social capital at multiple scales and also constitutes collective action at multiple scales. However, processes of multi-scale governance are also

necessarily "turbulent" with actors frequently having conflicting values and goals to be negotiated**.** We present an analytic history of the process of emergence of community and inter-community collective action around strict conservation and examples of internal and external turbulence. We argue that this case study and other literature requires an extensions of the constitutive elements of common property theory.

Keywords: Common property, indigenous/community conserved areas, multi-scale governance, social capital, turbulence.

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1. Introduction

The central purpose of common property theory is to explain the evolution of institutions for collective action (Ostrom 1990), but the focus has been overwhelmingly on the critical enabling conditions for collective action by individual local communities or user groups (Baland and Plateau 1996; Agrawal 2001). Other levels and scales are seen only as supporting in a "nested" fashion the local scale, through "nested levels of appropriation, provision, enforcement, governance" (Agrawal 2001). In this nested world, conflict is best mediated by "availability of low cost adjudication" in "local arenas" (Ostrom 1990; Agrawal 2001, p. 1654). The role of locally devised rules as a part of this process is also central, although this sits uneasily with the frequent reality of the "co-production" of rules at the nested levels of enforcement and governance (Fox 1996; Ostrom 1996). Common property theory is also substantially based on the assumption that user groups or communities are physically harvesting resources from the environment, whether forests, fisheries, pastures or other productive sectors of nature (Ostrom 1990, 2005; Agrawal 2001). A final central element of common property theory important for this paper is that common property institutions function best when there is "low levels of articulation with external markets" (Agrawal 2001).

We have above singled several aspects of the many "critical enabling conditions" (Agrawal 2001) or constitutive characteristics of success on the commons: the locus of collective action, the role of higher "nested" scales, the resolution of conflicts, locally devised rules, physical harvests, and the role of markets. We

do so because we here present a case study of common property management that we argue represents a heuristic, outlier case (George and Bennett 2005) that has characteristics and outcomes not anticipated by traditional theory. We present a case study of multi-scale collective action around indigenous/community conserved areas in Oaxaca, Mexico. We present data and analyze the emergence of collective action at the community, inter-community and higher governance scales and levels (Termeer et al. 2010) and what we call "turbulence" in the case of the Natural Resource Committee of the Upper Chinantla (CORENCHI), a six-community organization in the Sierra Norte of Oaxaca, Mexico (Martin et al. 2010)[1]. This case study is an example of collective action at multiple scales, community and inter-community organizational processes that have established contiguous indigenous/community conserved areas (Borrini-Feyerabend et al. 2004) based on the absence of harvesting and strict conservation on 77% of their 34,908 ha of territory. This process has required integrating rules from multiple scales and extensive negotiations of conflicts in multiple arenas to access government programs and markets for environmental services (Molina-González 2011).

Our case study begins by analyzing collective action at the level of a community, an accustomed focus of attention. Community governance supplies the foundations of trust that permit multi-scale collective action to happen, although communities may be highly turbulent in their decision-making. However, communities may also have "a structure of social interaction characterized by high entry and exit costs and non-anonymous relationships among members" and "multilateral enforcement of group norms" and other elements that can predispose to cooperation and lower the costs of collective action and overcome free-rider problems by direct monitoring and sanctioning (Bowles and Gintis 1998, 2002, p. 434). In Mexico, these possible tendencies are reinforced by the structure of governance mandated by agrarian law, where assemblies of all rights holders are required to meet at least twice a year, although well-functioning communities commonly meet monthly, as in our case study.

We then go on to discuss the little analyzed process of inter-community collective action. As Fox (1996) has noted for Mexico, dense social capital at the community level can be highly segmented spatially. Neighboring communities in many places in the world frequently have histories of conflict and tension over territories and resources. The emergence of inter-community collective action is not the norm since it must "overcome the socially constructed constraints of locally confined solidarities" (Fox 1996, p. 1091). However, despite a few examples (Antinori and Garcia-Lopez 2008; Paudel et al. 2010), inter-community collective action has been little considered in the literature. We then examine the emergence of inter-community or second level community organizations

[1] In 2010 a seventh community joined CORENCHI, but we confine our analysis here to the six communities that founded the organization.

as a key element in strong networks of multi-scale governance (Berkes 2007; Cronkleton et al. 2011; Duran et al. 2011). Multi-scale governance is more often invoked than developed as a concept, but we suggest that multi-scale governance be used to incorporate community collective action, the key link of inter-community collective action, and then larger structures of "supportive external sanctioning institutions", "appropriate levels of external aid" and "nested levels of appropriation, provision, enforcement, governance" (Agrawal 2001, p. 1654), by government, non-governmental organizations (NGOs), and bilaterial and multilateral agencies. This conception assumes the minimalist governance criteria that central governments should not undermine local authority but also include the other levels and scales which are constitutive of management of the commons in the modern cross-scale world (Berkes 2007). This conception of multi-scale governance also includes the coproduction of rules by multiple actors at multiple scales (Fox 1996; Ostrom 1996), including government-provided spaces to develop local rule autonomy, but within a framework where many important management rules originate in formal national and international laws and programs.

Using the concept of multi-scale governance to incorporate all of the mentioned elements can also serve to step away from the use of the concept of "nested" with its unfortunate connotations of domestic harmony in governance. We propose the term "turbulence" as a characterization of the linked process of support, appropriation, provision, enforcement and governance where actors frequently have conflicting values and goals to be negotiated (Carley and Christie 1992; Means and Josayma 2002; Alcorn et al. 2003). The multiple scale processes of constructing governance are characterized by actors performing in "uncoordinated and dissonant ways in attempting to meet their individual objectives, typically externalizing as many of the costs and internalizing as many of the benefits of their actions as they can" (Carley and Christie 1992, p. 156). The notion of turbulence is related to the idea of power conflict in cross-scale networks (Adger et al. 2005) but is more general, and in our case territorial ownership and some degree of rule-making autonomy within multi-scale governance, as we shall see below, mitigates power differentials. Multi-scale governance is collective and turbulent action that requires both the prior existence and strengthening of trust and social capital at multiple levels and scales from local to international (Adger 2003; Andersson et al. 2005; Termeer et al. 2010; Duran et al. 2011). This conception of turbulent multi-scale governance goes beyond "low cost adjudication" in conflict resolution and embraces the idea that conflict resolution is a process of on-going negotiations between actors in multiple arenas rather than discrete conflicts to be adjudicated. This also assumes increasing confidence on the part of community and inter-community actors to negotiate with and challenge other levels of governance (Alcorn et al. 2003). It presumes community-based management, less of natural resources, than of extensive networks of government and civil society actors and new forms of community and inter-community collective action.

Our case study also requires extensions of common property theory to include collective action around common properties for strict conservation. Ostrom's (2009) framework for analyzing sustainability of social-ecological resource systems focuses on "users" and "harvests" and "products". The implications of common property management focused on strict conservation are not considered. Conservation with little or no extraction does not produce physical harvests, and markets for it are usually framed as "environmental services" to be paid by users in a market or by government beyond the territorial boundaries (Muradian et al. 2010). Realizing income from these sources requires deep involvement in multi-scale governance for the owners of the conserved resource to realize any monetary benefit from the "products". Realizing economic gains from ICCAs for strict conservation may require something very different than traditional natural resource management, and may require a high level of articulation with that most challenging of contemporary markets, environmental services. Sacred groves in India are a traditional expression of commons conservation, but are characterized as threatened precisely because they generate few economic benefits and are not recognized at multiple levels (Chandrakanth et al. 2004).

Our task is to define the constitutive elements (Goertz 2005) of the expansion of common property theory and to tentatively identify the variables which appear to have led to this outcome unanticipated in the literature. It is an example of both community and inter-community collective action around strict conservation, where "harvesting" of any kind is explicitly disallowed, where the realization of economic gains from "conservation" as an ecosystem service can only be realized by increasing sophistication in negotiations with multiple actors.

Our case study also highlights the emerging importance of ICCAs (Berkes 2009; Borrini-Feyerabend et al. 2010; Brown and Kothari 2011; Martin et al. 2011) as a common property management option. The IUCN has defined them as "natural and modified ecosystems, including significant biodiversity, ecological services and cultural values, voluntarily conserved by indigenous peoples and local and mobile communities through customary laws or other effective means" (Borrini-Feyerabend et al. 2004, p. xv). Mexico has been a world leader in the formal recognition of ICCAs, building on its achievements in community forest management for timber production (Bray et al. 2006). Mexico adopted in 2008 a new national protected area category called "voluntary conservation areas" (including private reserves) and recognizes them as part of the national protected areas system (Martin et al. 2010). Mexico's Natural Protected Areas Commission (CONANP) has currently certified 85 communities in a total of 212,580 ha. Of these, 46 certifications (54% of the total) and 108,763 ha (51%) are certified on community lands in the state of Oaxaca[2]. The occurrence of so many ICCAs in Oaxaca is not an accident. Oaxaca is heavily indigenous and historically has had land management practices which tend towards conservation of forest and

[2] http://www.conanp.gob.mx/que_hacemos/listado_areas.php; accessed 8/2/11.

other vegetation cover (Boege 2008). In recent decades, in the Sierra Norte and elsewhere in Oaxaca, a variety of traditional and contemporary community management practices have conserved forests while generating income for local communities (Robson 2007). Oaxaca is also the most biodiverse state in Mexico, but with only 5.2% of its territory under federal protection (García-Mendoza et al. 2004; Martínez-Hernández 2010), and the emergence of ICCAs only provides formal recognition that traditional community practices have conserved forest cover and biodiversity in this area.

2. Methods

2.1. Context and study site

Our study is focused on a group of six Chinantec indigenous communities with membership in an inter-community organization called the Natural Resources Committee of the Upper Chinantla (*Comité de Recursos Naturales de la Chinantla Alta-CORENCHI*), legally established in 2005 with six communities: Santa Cruz Tepetotutla (Santa Cruz), San Antonio el Barrio (el Barrio), San Pedro Tlatepusco (San Pedro), Santiago Tlatepusco (Santiago), San Antonio Analco (Analco) and Nopalera Rosario (Nopalera) (Figure 1). Community lands are contiguous and located in the Upper Chinantla subregion of the Sierra Norte of Oaxaca, Mexico (Figure 1) which form part of the Papaloapan River watershed. The total area is 34,907 ha with 26,770 ha certified as a Indigenous/Community Conserved Areas by the National Commission of Natural Protected Areas (CONANP) by 2011 (Table 1), the largest single block of certified ICCAs in Mexico.

The region has large masses of intact contiguous forests along an elevation gradient from around 200 to over 3000 meters above sea level and includes perennial tropical forest, broadleaf montane rainforest, evergreen cloud forest, and pine-oak-liquidambar forest. Due to biogeographic processes, the complex topography, and climate, the community forests present wide diversity in types, transition zones, and tree communities with high species richness and structural complexity, particularly of patches of *Liquidambar*, *Engelhardtia*, *Cirilla*, and great diversity in the families of Lauracea and Rubiaceae (Rzedowski and Palacios 1977; Meave et al. 2006), and are widely considered to be of very high conservation value. Floristic checklists report around 3000 species of vascular plants with neotropical origins, which is around 12% of the total of flora Mexicana (Meave et al. unpublished). Recently, the landscape has been shown to support jaguars (*Panthera onca*) and other felines (Figel et al. 2011). The region is considering a hot spot of biodiversity (CONABIO 2007). In the zoned agricultural areas there are areas of rotating corn agriculture and coffee plantations that harbor multiple genetic diversity of crops like maize, chili, wild greens, domestic and semi-domestic avocado varieties, and secondary succession trees, among many others (Bost 2009; Hite 2011).

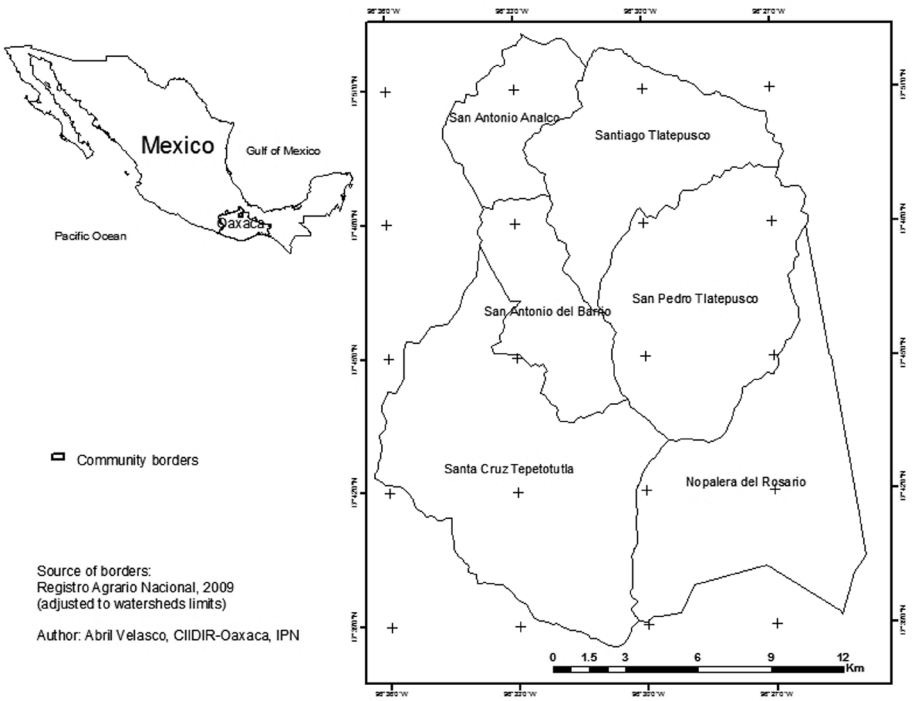

Figure 1: Chinantla study site where six communities analyzed are located the dotted line refers to different municipalities.

Table 1: CORENCHI community territories, ICCA area and PHS areas

Community	Territory[3]	ICCA area (ha)[4]/date[5]	Payment for hydrological services[6]/date[7]
Nopalera del Rosario	5,329.55	4200/2009	2,299.00/2007
San Antonio Analco	2,677.14	2050/2011	1,473.71/2007
San Antonio del Barrio	2,310.82	1500/2004	1,150.98/2004; 400.10/2007*
San Pedro Tlatepusco	6,289.68	5050/2004	2,534.13/2004; 1,443.542/2007*
Santiago Tlatepusco	5,945.60	4300/2004	1,969.05/2004; 852.63/2007*
Santa Cruz Tepetotutla	12,372.80	9670/2004	2,534.67/2004; 1,398.139/2007*
Total	34,907.99	26,770.00	16,056.96

*Additional area for PH.

[3] Source: Official Community Rules (Estatutos);
[4] Source: Ortega del Valle et al. 2010
[5] Dates when documents were made official
[6] Source: Geoconservación A.C.;
[7] Dates when documents were made official

The population density is low, with high percentages of young people, but also heavily impacted by emigration, which has reduced populations and relieved pressure on land. Education levels are low, an average of 4.6 years (INEGI 2005). Most men are subsistence corn farmers with income historically coming primarily from coffee cultivation. In recent years, various government support programs and remittances have replaced coffee as the principal source of cash income (Nieratka 2011). Community governance is a blend of traditional practices and structures mandated by Mexican agrarian law (Bray et al. 2006). The main decision-making body is the General Assembly, and the executor of Assembly decisions is the *Comisariado* (composed of a president, secretary and treasurer) and an Oversight Council (composed of a president and two secretaries) who carry out the decisions of the Assembly (Figure 2). The *Comisariado* and the Oversight Council are elected democratically for three-year terms, although the Assembly can reduce the period for non-performance. Crucially, it is the Assembly that establishes rules for land use and governs access and use of the forest common property, although constrained by agrarian and forest law. Government agencies, non-governmental organizations (NGOs) and multilateral agencies also are important players and we classify them as "local" (normally state-level), "national" (usually with offices in Mexico City), and international (main offices abroad; including bilaterial and multilateral agencies).

The case study was found opportunistically (George and Bennett 2005) with the authors identifying it as an unusual case of collective inter-community action around conservation. We visited the communities several times per year, held informal interviews with external stakeholders and community leaders, including current and past leaders of CORENCHI, and five annual graduate field courses (2006–2011). We also attended at least three CORENCHI assemblies annually from 2008 to 2011 and participated in various community Assembly meetings. We also had access to an extensive gray literature produced by NGOs, government agencies, and conducted 36 semi structured interviews during 2010–2011 with CORENCHI community leaders and additional ones with key external actors, which are more extensively analyzed in Molina-González (2011).

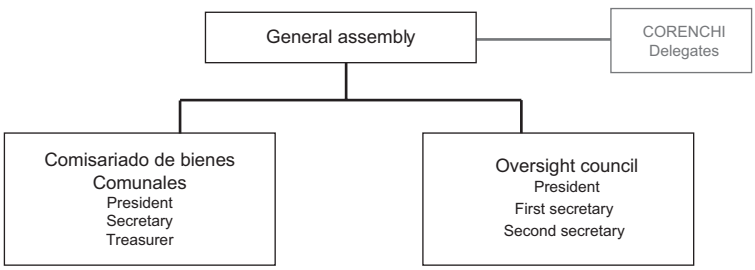

Figure 2: Assembly's basic governance structure mandated by Mexican Agrarian Law. CORENCHI Delegates added in 2008.

3. Results

Our results will consist of (1) an analytic narrative of the emergence of collective action at the community level, inter-community and other levels divided into two periods, 1980–2000 (with some reference to earlier periods) and 2000–2010, and (2) brief analytic narratives of two case studies of turbulence and negotiation of conflicts in multi-scale governance. The first is an example of turbulence internal to the organization at the inter-community scale and the second turbulence between the organization and external stakeholders.

3.1. Period I: 1980–2000

Before the 1980s, the CORENCHI communities were remote, roadless, and had limited interaction with the Mexican nation (De Teresa 2011). In the 1930s, Chinantec communities were so mistrustful that the inhabitants fled to the forest when outsiders came into the community (Bevan 1938). Many of the communities had a history of authoritarian leaders and conflicts with neighbors, with deadly boundary disputes between villages. Informal land use rules existed around corn and coffee lands, but few rules existed on natural resource extraction, because soil and forest resources were abundant and there was a relatively low population. In the 1970s, the first sustained government program in the region other than in public education came from the Mexican Coffee Institute (INMECAFE) which expanded coffee as a cash crop in the community and helped to build trust in outside institutions (Figure 3; Hite 2011). In the early 1980s, another government program, the Rural Food Supply Network (DICONSA), sent an organizer into the communities of the region to establish non-profit communal stores to mitigate erratic and expensive food supplies (Fox 2007). The DICONSA community organizer also established relationships of trust and in the mid-1980s supported members of the communities of Santa Cruz Tepetotutla and Santiago Tlatepusco to establish community development cooperatives that would later become specialized in coffee marketing (Mutersbaugh 2002). In 1990, the disappearance of INMECAFE because of neoliberal reforms and the collapse of the International Coffee Agreement led to a dramatic fall and instability in coffee prices for the last two decades (Bray et al. 2002). This led to: 1) efforts to expand coffee marketing cooperatives at the local and state level with the emergence of a state-wide coordination of coffee producers named as Local NGO-1 (Figure 3) in the 1990s and the development of organic coffee as a higher-value alternative; and 2) a rapid increase in emigration from the communities in search of cash income to replace coffee.

In the 1990s, the first NGOs arrived in the communities. In the early 1990s, National NGO (NNGO-2), a research-action NGO affiliated with the National Autonomous University of Mexico began carrying out research in the communities of Santa Cruz and Santiago. Later in the 1990s, Local (LNGO-3), supported in part by the US government agency the Inter-American Foundation, began to

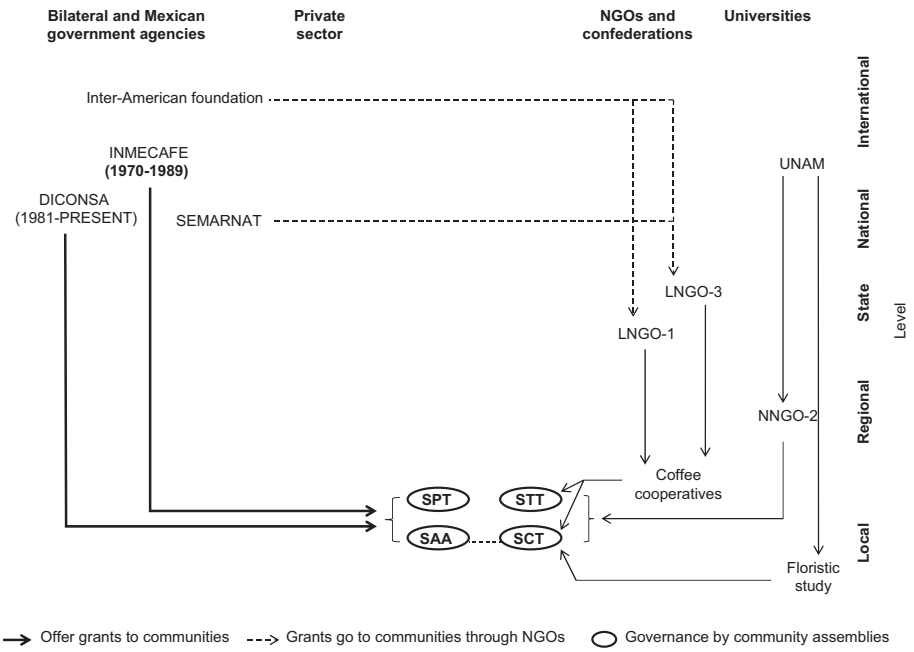

Figure 3: Early Period of Multi-scale Governance in Communities 1980–2000 (INMECAFE= Mexican Coffee Institute; UNAM=National Autonomous University of Mexico; LNGO=Local or State NGO; NNGO=National NGO).

provide training workshops and funds for small projects in domestic industries in several of the communities. The community development cooperative established with support from the DICONSA organizer, composed of only a small percentage of the community, had been seen as a threat by both internal and external political forces in the region and was under constant hostility. However, "In spite of social pressure, the cooperative managed to consolidate itself as a minority organization within the village" (van der Wal 1999, p. 3).

As the 1990s progressed, the cooperative also began to more aggressively promote a position of strong communal cooperation in the Assembly while small-scale cattle ranchers pushed for privatization of agricultural lands, with most community members not choosing sides (Mutersbaugh 2002). Also in the 1990s, LNGO-3 advisors took community leaders for meetings with high state government officials about community needs, particularly on the construction of a road into Santa Cruz, giving them new confidence in dealing with government (CAMPO 2005). From 1993 to 1996 botanical researchers from the Universidad Nacional Autónoma de México (UNAM) carried out fieldwork in Santa Cruz and hired local guides, some of whom began to gain an understanding of the scientific and ecological value of community forests. These guides would later emerge as

some of the most forceful early leaders of the CORENCHI organizational process. Thus, by 2000 community leaders had gained new confidence in dealing with outsiders, had begun to see some external benefits flowing, and began to gain a new appreciation of the conservation value of their forests, and that conservation might be used to generate income to reduce emigration. However, continued deep mistrust in the Assembly was also a recurring theme in interactions with outsiders. It should also be noted that the evolution of collective action at the community level was in a sub-coalition of community members in the production cooperative, with community efforts focused on road building and bringing in electricity, but none of these had a conservation focus. Figure 3 indicates that external actors who helped influence community governance began to appear, but at a much lower density than would occur in the subsequent decade.

3.2. Period 2: 2000–2010

Beginning around 2000, growing international concern over degradation and deforestation brought new national and international attention to the large intact forests of the Chinantla, and resulted in a rapid expansion in the number of external actors interested in the region, and a corresponding much greater density of the support networks in multi-scale governance (Figure 4). We will continue to focus on processes in Santa Cruz as the first leader of CORENCHI.

By the late 1990s, earlier informal community rules for forest conservation (such as leaving large stands of *Pinus chiapensis* standing in the agricultural areas) were joined by a new sensitivity to environmental management brought by organic coffee production (Molina-González 2011). In 1999 they proposed a project for sustainable logging in the forests, as was practiced in many other communities in Sierra Norte (Bray 1991). A government program suggested that before logging it would be useful to carry out a land use planning exercise called a Community Territory Land – Use Zoning (*Ordenamiento Territorial Comunitario* – OTC) (Anta et al. 2006). Thus, in 2000 a Mexican government-World Bank program called the Program for Conservation and Forest Management (PROCYMAF) funded a Oaxaca NGO (LNGO-4) to carry out the OTC for Santa Cruz. In the following year the same NGO produced a logging management plan. This was halted after one year both because of government concerns about logging the environmentally protected *Pinus chiapensis* and the fact that a community leader absconded with funds, causing the community to lose interest in physical harvests from the forest. In the meantime, the simmering dispute in the community between the proponents of community collective action and the cattle-raising privatizing faction continued, and in 2003, for the first time, the community elected a slate of leaders who were strongly identified with the communal faction and who had become imbued with a sense of the ecological importance of their common property forests through their work with the UNAM ecological researchers.

With the support of LNGO-4, the new leadership took the OTC and began to try and develop community statutes, local rules required by national agrarian

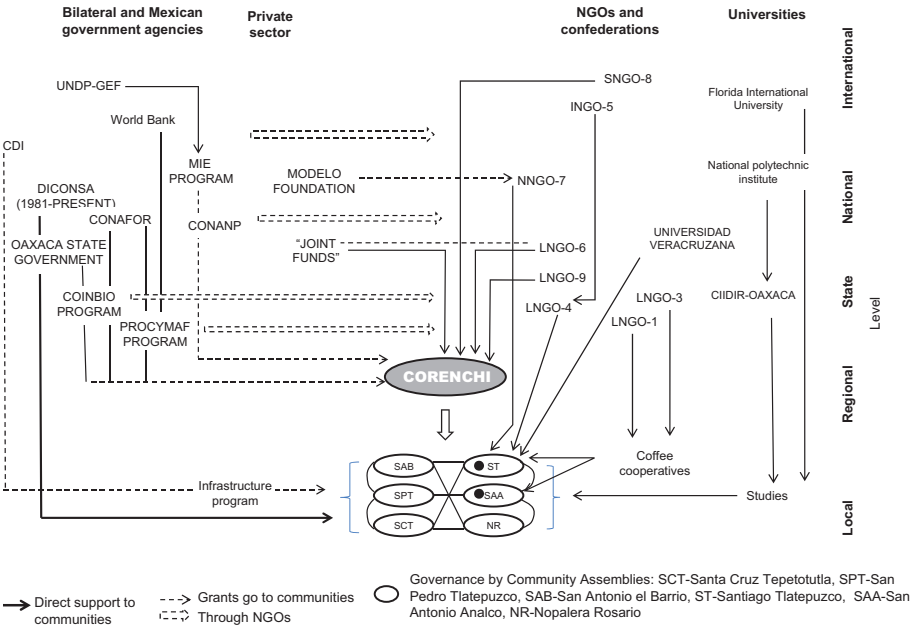

Figure 4: Multi-scale Governance in Communities during period 2000–2010 (UNDP-GEF= United Nations Development Program-Global Environmental Facility; MIE=Integral Ecosystem Management; CDI=National Commission for Indigenous Development; CONAFOR=National Forestry Commission; SNGO=Small International NGO; INGO=International NGO; NNGO= National NGO; LNGO=Local or State NGO).

legislation, as a foundation for more systematic land use planning, beginning the period where community assemblies were largely focused for the first time on the common property forest. In 2002, multilateral interest in the Chinantla manifested itself when the Global Environmental Facility (GEF) funded the Mexico office of the United Nations Development Program (UNDP) to carry out projects in natural resource management in three regions of Mexico, including the Chinantla, through a program called Integrated Ecosystem Management (*Manejo Integral de Ecosistemas*-MIE) (2001–2009). MIE issued a call for proposals to NGOs for work in the region, and the newly formed Local NGO-6, won the proposal to start work in three communities, Santa Cruz, el Barrio, and Santiago. During this period, the more development-oriented LNGO-4 began to reduce its presence in the community, and the more conservation-oriented LNGO-6, with funding from MIE, began to assume a more prominent role as a community advisor. The new community leadership was strengthened in its belief in the inherent value of conservation and its perception that conservation could produce income to counteract emigration due to continued instability in coffee prices. They had come

to believe in the conservation value of their forests and made the bet that ecological value could be translated to market value. Santa Cruz was thus very open to working with LNGO-6, and continued formalizing the OTC through community statutes, with support from PROCYMAF. Thus, government financing of an NGO supported the communities in devising local rules within a framework of national agrarian law. Because the small-scale cattle ranching interests remained strong, there were stormy discussions in community assembly meetings for two years over zoning of pasture lands and rights to hunt (with the communal group arguing that wildlife was in decline due to overhunting), areas in which communities had local rule-making autonomy. Santa Cruz finally adopted statutes in June, 2003 that called for restrictions on all harvesting from what it now defined as a 9670 ha ICCA (78.2% of its total territory of 12,372.8 ha; see Table 1). The statutes prohibited agriculture and hunting and called for a strict protectionist policy of "no extraction of plants, animals, fruits, seeds … timber and firewood" in the conservation area and required all community members to establish firebreaks around their corn fields, among other environmental measures. In the same period, and contrary to the welcoming reception in Santa Cruz, LNGO-6 found deep suspicion in el Barrio, as well as continued tensions over boundaries between Santa Cruz and el Barrio. LNGO-6 proposed to Santa Cruz leaders that el Barrio leaders be invited to one of the workshops to discuss the OTC and the statutes, and Santa Cruz reluctantly agreed. The leaders of el Barrio were impressed by the discussion and requested an OTC and statutes for their community, which was also carried out with funding from PROCYMAF.

As Santa Cruz began to mature in its proposals, two new federal government programs opened up new opportunities. First, Mexico's National Protected Areas Commission (CONANP) established a new program of certification of ICCAs. Also in 2004, Mexico's National Forest Commission (CONAFOR) launched a new payment for hydrological services program (PHS) (Muñoz-Piña et al. 2008; Nieratka 2011) which would make cash payments for conserving forests in watersheds. Despite deep concerns from some community members afraid that the program would imply losing control over their community lands, Santa Cruz, el Barrio, Santiago, San Pedro agreed to both programs. LNGO-6 had initially met with resistance and mistrust from the other communities in early meetings. But when leaders from Santa Cruz began accompanying them, relations and acceptance improved, and historical inter-community tensions were reduced. Subsequently, in 2003 LNGO-6 used the same methodology of carrying out an OTC and developing community statutes in the communities of San Pedro and Santiago.

In the case of Santa Cruz, the conservation strategy had emerged from nearly two decades of struggle over the direction of community leadership, but first el Barrio and then the other two communities, after the initial mistrust, were rapidly convinced by Santa Cruz leaders and the promise of material benefits. By 2004 the other three communities had carried out OTCs and had adopted very similar statutes to those in Santa Cruz that required strict conservation in their newly defined ICCAs. In late 2004, as a result of both community leadership and the

work of LNGO6, the first four communities signed a "Regional Community Agreement for the Conservation of the Natural Resources of the Perfume and Santiago River Watersheds", signaling a new era of trust, social capital, and multi-territorial governance between the neighboring communities and new interactions with NGO and government actors at higher scales. The agreement committed the four communities in the two neighboring watersheds to a community-based regional management plan with the same strict restrictions against extraction that were first contained in the community statutes elaborated in Santa Cruz. These community-imposed restrictions went beyond anything required in the ICCAs or the PHS program, neither one of which prohibited hunting, for example. The ecological discourse, and clearly deep belief, on the part of some of the CORENCHI leadership is exemplified by the following quote, where they fashion a discourse of conservation continuity with traditional practices, "Our ancestors left as a legacy the value of community conservation. In our community the labor of natural resource conservation transcends the generations. The forest for us is the "cradle of the jaguar', where bird songs are born and every kind of wildlife exists. So taking care of the pheasant's habitat, the red brocket deer, jaguar, armadillo, woodcocks, is to take care of our territory" (CONAFOR 2010).

In 2005, the two neighboring communities of Analco and Nopalera, who had also initially shown great mistrust of external actors when first approached about the effort, but were won over by persistence efforts by a Santa Cruz leader, signed the agreement and formed CORENCHI, making it a six community organization with a total 34,907 ha, of which 26,770 ha are under strict community protection (Ortega del Valle et al. 2010), and as of 2011 all six certified as ICCAs by CONANP. The objectives of the organization included the "strengthening of the communities to conserve and rationally use their natural resources for the benefit of its families through seeking financing" and establishing agreements with government agencies and international organizations, clearly signaling the goal of obtaining funding through interactions and negotiations with external actors at multiple levels. The most important immediate result came from the Mexican government's PHS program. By 2007, a total of 16,056 ha were receiving payment under the PHS (Table 1). The PHS program has resulted in substantial flows of financial resources into the CORENCHI communities and CORENCHI founding leaders saw these payments as validating their strategy of conservation as a way to "harvest" financial resources for their conservation initiatives. For example, the communities of Santa Cruz and San Pedro received some US$570,000 dollars apiece during the 2004–2010 period and, although not large on a per capita basis, these payments have had a significant poverty alleviation effect (Nieratka 2011). The program gives contracts for five year periods and it has now been renewed once, but there are uncertainties about its future to be discussed further below. In addition to the PHS program, the CORENCHI communities have received myriad smaller income generation, food production, and ecotourism project support from the national indigenous agency and a state government biodiversity program called COINBIO (Figure 4).

As the organizational and ecosystem management accomplishments of CORENCHI became known, other actors entered the picture. CONANP recruited the philanthropic arm of Mexico's largest brewery, whose plant on the Papaloapan River drew water from this watershed, to do work in the community. The brewery foundation (Fundación Modelo) supported a National NGO (NNGO-7) to develop ecotourism in Santa Cruz, financing the building of a cabin and equipment and training for guides. In 2007, a small international NGO (SINGO-8) also began working in the region on participatory video, community research, training on ICCA management, and some advocacy issues. Researchers were also attracted and field courses and student research were carried out from US and Mexican universities (Figel et al. 2011; Hite 2011; Molina-González 2011; Nieratka 2011; Velasco 2011), among others. Figure 4 shows the very high-density of multi-scale support which emerged to help CORENCHI govern its land use at the community and regional level. However, the coming together in collective action and multi-scale governance of multiple actors in government and civil society has not been so much "nested" as turbulent with frequent conflicts and negotiations. CORENCHI leadership has had to become increasingly sophisticated at negotiating these conflicts. Of many possible instances, we will now briefly review two cases of turbulence, one which we will term internal, around establishing the rules for leadership of CORENCHI and the second, external, around an effort by CONANP to convince the communities to agree to the declaration of a Biosphere Reserve in addition to the ICCAs.

3.3. Internal turbulence: establishing and maintaining rules of leadership for CORENCHI

CORENCHI's founding statutes established that the leadership of CORENCHI would be composed of the Presidents of the *Comisariado* of each community, modeling other inter-community organizations in Mexico, but that they would serve two year terms (instead of three). Thus, for the first year or so of its existence CORENCHI was administered by the six *Comisariado* Presidents, who had elected the leader of Santa Cruz with a long trajectory as a cooperative leader and strong conservation beliefs, as its President. However, there emerged a timing problem. The new CORENCHI leader was ending his period as the *Comisariado* of Santa Cruz in 2007, but still had another year to go as CORENCHI President. By the statutes, he could not continue as President of CORENCHI if he was not President of the *Comisariado*. This leader was considered by LNGO-6 to be a key person in the early success of CORENCHI, and it could be damaging to the young organization that he leave. So it was proposed at a meeting in June, 2007 that the statutes be revised to allow the soon-to-be former Comisariado to continue on for one more year as CORENCHI President. However, opposition arose from the small-scale cattle ranching interests among the Comisariados. This led to a protracted period of discussion, negotiations, and tension within CORENCHI and with their advisors over what the rules of leadership of the organization would

be, an arena where they had autonomy in decision-making. After six months of discussions and conflict resolution workshops convened by MIE, the UNDP program, a proposal from MIE suggested that CORENCHI be composed of four delegates from each community, elected by the community assembly (Figure 2), and that the CORENCHI President be elected from those delegates, to side step the problem of coordinating the service periods of the Comisariado Presidents. The delegates would not hold any other office in their communities, and community Presidents would participate with a voice but no vote. These new leadership rules were incorporated into the statutes at a December, 2007 meeting where the new President was a delegate from Santa Cruz who proved to be an able leader, and that also decided to dedicate 5% of the funds received from PHS to CORENCHI expenses, giving it an economic foundation. Thus, a multilateral organization and a local NGO were key in supporting CORENCHI to develop new governance rules to resolve the leadership crisis.

3.4. External turbulence: community conserved areas or biosphere reserve?

NGOs had long seen this part of Sierra Norte as a candidate for the declaration of a Biosphere Reserve given its extensive intact blocks of cloud and montane tropical forest (Bray 1991). CONANP along with LNGO-6 had initially promoted the concept of ICCAs among the communities of CORENCHI and, as we have seen, CORENCHI accepted the CONANP certification of their ICCAs beginning in 2004 (Table 1). Nonetheless, as early as 2005 the Oaxaca office of CONANP began proposing the idea of a Biosphere Reserve in the Chinantla, arguing that it would receive greater resources and international prestige. By Mexican environmental law, ICCAs are granted by a process of certification that is in principal initiated by the communities and does not require a decree. A Biosphere Reserve, on the other hand, can be proposed by the government and requires a Presidential Decree, although community consultation is also legally required (LGEEPA 1988). CORENCHI was initially interested in the idea, and even sent a letter to the national Director of CONANP in 2005 expressing an interest in the possibility of a Reserve decree. The process would develop over the next four years and would become filled with tension and splits between government agencies and CORENCHI's supporting NGOs over the issue of a decree. In the first years, the CORENCHI leadership was generally convinced that it would bring greater benefits to their communities, but as the proposal developed and came closer to reality splits among the external actors over the wisdom of accepting a decree drove the community assemblies to become more concerned that a Reserve would cause them to lose control or possession of their lands. CONANP sent a local consulting NGO (LNGO-9) into the CORENCHI communities to try and convince them of the advantages of a Biosphere Reserve in a series of meetings in late 2008 and early 2009. MIE, which had initially opposed the decree, eventually sided with CONANP in promoting it.

However, during the same period, the CORENCHI leadership approached the small international NGO (SINGO-8) that had begun working in the region in 2007 and asked for some legal advice. SINGO-8 hired a lawyer who met with the Santa Cruz community assembly to discuss the legal implications of a Reserve, after that SINGO-8 and LNGO-6 discussed the issue in the other communities. SINGO-8 adopted a strong advocacy position against the decree. LNGO-6, which had been the principal advisor and supported by CONANP, entered into a crisis in its relationship with CONANP over its more moderate opposition to the decree and other issues. Some CORENCHI leaders were also taken to visit the Reserves in the states of Veracruz and Chiapas. From these visits they took away that the figure of the "Director" in a Biosphere Reserve would have had too much control over their rights to resources on their land. This was a confused and turbulent period with pressure from CONANP to accept a Biosphere Reserve, the CORENCHI leadership torn between CONANP and the fears of the community assemblies, and confused and tense relations between NGOs and NGOs and government agencies. Things came to a head at the 9th World Wilderness Congress in Mérida, Yucatan in November, 2009, when CORENCHI leaders announced publicly the sense of the assemblies that they did not want a Reserve decree. A month later, at a CORENCHI meeting in one of the communities, officials who had pushed the Reserve concept publically apologized to CORENCHI. The CORENCHI decision has been respected and there has been no further talk of a Biosphere Reserve for the region.

4. Discussion

We suggested in our introduction that CORENCHI presented an outlier case study within the literature on common property natural resource management. It is a case where communities managing their common property engaged first in turbulent collective action at the community level, and second in turbulent collective action at the inter-community level that overcame long-standing mistrust, to maximize benefits from a strategy of *not* harvesting from their forest common properties. They eventually placed their territories under a regional community coordinated management plan, and sought income from conservation through intensive articulation with extensive network of external actors at multiple scales, where relationships were also turbulent (Figure 4). This strategy derived both from the internalization of ecological notions of ecosystem value on the part of some leaders and the fact that the communities were losing population due to the instability of coffee prices beginning in the late 1980s. Conservation was perceived by some community leaders as a strategy to replace lost coffee income, but one that required a high level of articulation with external sources of funding. Emigration was perceived as a threat to community life, but it also reduced pressure on agricultural lands, lowering the opportunity costs for conservation. In response to the opportunities for conservation and its possible economic benefits, the external actors around the CORENCHI communities have come together in a frequently

conflictive and turbulent process to help the communities achieve the goals of both conservation and higher incomes. Conflicts were resolved in both local and national arenas, such as an international conservation congress, not through "adjudication" but through intense discussions and negotiations in contexts of constant turbulence. It is a measure of the resilience of the communities that the process has continued moving forward despite all of the turbulence (Folke 2006; Magis 2010).

The rules which are governing this process have been produced both by government agencies and by the communities. The basic governing institutions at the community level are mandated by agrarian law, including the requirement that they have community statutes, but are also informed by much older community traditions. The rules governing ICCAs and the PHS program come from above and the communities have had to adapt to their requirements, with some confusion and turbulence over exactly what the requirements are. The communities however, had the space to write community statutes which responded to the majority interests at the time and have had to evolve and adjust rules around leadership of CORENCHI, with no guidance in the laws as to how to structure the leadership, but with support from a multilateral organization and a local NGO, a case of the co-production of governance (Ostrom 1996). One of the significant consequences of this inter-community collective actions was to improve the "fit" between the ecosystems and the management structure, placing the forest territories of the six contiguous communities under similar management rules, creating a form of regional common property (Folke et al. 2007).

The process remains highly vulnerable to external shocks. The PSA program is undergoing a policy transition to try and create markets for hydrological services rather than direct government payment, and is now focusing on the mechanism of "Joint Funds" (*Fondos Concurrentes*). Previously, funds came from a tax on water users nationally as well as World Bank and Mexican government sources (Muñoz-Piña et al. 2008) but funding at those levels is not likely to continue. In the *Fondos Concurrentes* approach the government contributes 50% to a fund for a given region and downstream users or other interested stakeholders contribute 50% (Nieratka 2011). In 2010 CORENCHI communities received their first payment through this mechanism but it is not yet clear if it will allow for payments to continue at the same levels they have until now. There are also uncertainties around the policies surrounding the ICCA program. A May, 2008 amendment to the environmental law (LGEEPA) provided legal support to the ICCAs and incorporated them formally into the national protected areas system, but the regulatory framework has not been established as of early 2012.

As well, minorities in a few of the CORENCHI communities remain opposed to the strict conservation policies that came from both the government programs and community statutes, and continue to agitate in the assemblies for the now-denied right to place corn fields in fertile soils in the PHS area and to carry out subsistence hunting in the ICCA. Tensions over these issues have been raised by

the fact that SINGO-8 has taken a strong advocacy position for this minority in public settings. As well, recent research in one of the CORENCHI communities has suggested that the cumulative impact of the rules on corn field location and hunting associated with the PHS and ICCA programs have reduced food sovereignty and could lead to a decline in traditional knowledge of hunting and the territory (Ibarra et al. 2011). However, the community has the right to abrogate the PHS contract and change the community restrictions on hunting, so these tendencies are reversible, if the community chooses. There has already been one case in Mexico where a community has asked for its ICCA to be revoked because of opposition by a minority of community members over rights to locate agricultural fields in the area (Schmidt 2010), and this possibility cannot be ruled out in some of the CORENCHI communities. For now, the majority of the community assemblies appear to support the strict conservation programs, whatever its trade-offs. Figel et al. (2011) carried out 156 interviews in four CORENCHI communities and found that 93% of respondents support the conservation initiatives. Nieratka (2011) found in a survey of two of the CORENCHI communities that 72% of a sample felt that payments from the PHS program were worth the restrictions placed on forest use. It is clearly the PHS program that has provided the most significant economic incentive for the six communities to undertake and maintain collective action around strict conservation (Nieratka 2011). However, this variable alone does not explain the emergence of inter-community collective action. Since 2004, the PHS program has made payments to over 5400 communities and private land owners in Mexico (CONAFOR 2010), and CORENCHI appears to be the most mature and geographically extensive case of community collective action connected to the program.

We do not know why inter-community collective action stimulated by the PHS program apparently did not emerge elsewhere in Mexico. Here we can only propose some tentative independent variables that had consequences for land use and the community pursuit of a conservation and multi-scale governance strategy in the CORENCHI case. These include (1) the collapse and subsequent instability of coffee prices that caused emigration, (2) the role of emigration in reducing land use pressure and lowering opportunity costs for conservation, (3) the emergence of visionary, ecologically informed leadership that became convinced of the environmental value of their forests beyond any immediate utilitarian value, but who were also focused on articulating with new sources of funding from conservation, and (4) the arrival of national and international programs that emphasized and provided varying economic incentives for conservation, primarily from the PHS, but also from various other smaller sources of support. The process that emerged from the interaction of these variables built upon the social capital at the community level, increasing trust between leaders, and leaders who could communicate that trust to the more mistrustful assemblies, and outside actors. In an evaluation of experiences in collective action (or "self-organization") of communities that had won the Equator prize, Seixas and Davy (2008) argue that the six key elements

to success were: (1) involvement and commitment of key players (including communities), (2) funding, (3) strong leadership, (4) capacity building, (5) partnership with supportive organizations and government, and (6) economic incentives (including alternative livelihood options) and that initiatives "opportunistically evolve in a multi-level world, in which local communities establish linkages with people and organizations at different political levels, across different geographic scales and for different purposes" (Seixas and Davy 2008). These elements track the independent variables and the dynamics of the CORENCHI experience, although the outcomes of inter-community collective action for strict conservation, and the centrality of capacity to negotiate at multiple levels in turbulent settings, are not analyzed in the Seixas and Davy (2008) sample.

5. Conclusions

In our conclusions we will move beyond the particulars of our heuristic, outlier case study (George and Bennett 2005) and use it to propose an extension of some of the constitutive elements (Goertz 2005) of concepts of common property management and success on the commons, and some of the possible outcomes that can characterize it. This proposed extension incorporates not only the current case study but similar strands of thinking and empirical research that emerge from recent literature. These include the phenomenon of inter-community collective action (Antinori and Garcia 2008; Paudel et al. 2010) and that the dynamic multi-scale nature of contemporary commons management is not captured by the concept of nested levels of appropriation, provision, enforcement, and governance (Agrawal 2001). Contemporary commons management, when rights have been defined or are in a process of definition, takes place in a context of turbulent multi-scale governance where communities, governments, NGOs, and international organizations must constantly negotiate the rules and resolve conflicts on the fly over governance of harvests, territories, market access and government subsidies, and monitoring and enforcement of co-produced rules at multiple levels (Alcorn et al. 2003; Berkes 2007; Seixas and Davy 2008; Cronkleton et al. 2011).

Table 2 represents an effort to show how traditional common property theory may be extended to take into account these empirical realities of contemporary commons management. In the first column we find listed the factors or core subsystems (Ostrom 2009; Agrawal 2001) which provide a first level of the definition of the central elements of successful common property management. In the second column, we present a summarized listing of the secondary elements or "critical enabling conditions" synthesized by (Agrawal 2001). In the third column we present the new constitutive elements that we proposed based on the CORENCHI case study and other recent literature cited above, and in the final column new outcomes which can define success on the commons.

Table 2: Proposed new elements and possible outcomes for common property theory

Factors or core subsystems	Constitutive elements or enabling conditions	New elements required by CORENCHI case study and others	New possible outcomes
Resource system characteristics	Small size, well-defined boundaries, low levels of mobility, Storage of Benefits, Predictability	Perception of conservation value of resource by external actors, Ability to limit or prohibit physical harvests, Possibility of benefits from external actors for conservation	Strict Conservation and Environmental Services
Group characteristics	Small Size, Clearly defined boundaries, Shared norms, Past Successful Experiences, Appropriate leadership, Group member interdependence, Endowment heterogeneity, Homogeneity of identities and interests, Low levels of poverty	"Group" expanded to include collective action by neighboring communities or communities in the same region, Leaders who understand possible benefits of multi-scale governance	Inter-community collective action around individual commons, creating a regional commons, in a context of multi-scale governance
Relationship between resource system and group	Overlap between user group residential location and resource location, fairness in allocation of benefits from common resources, low levels of user demand, gradual change in levels of demand	Low opportunity costs for conservation	Strict conservation and environmental services
Institutional arrangements	Rules are simple and easy to understand, Locally devised access and management rules, Ease in enforcement of rules, Graduated sanctions, Availability of low cost adjudication, Accountability of monitors to users	Local communities and inter-community organizations have spaces within larger frameworks of regulatory law to shape specific local rules, Communities develop capacity to negotiate conflicts with multiple actors in turbulent settings	Coproduction of rules. Sophisticated negotiation and conflict resolution skills
Relationship between resource system and institutional arrangements	Match restrictions on harvests to regeneration of resources	Ability to maintain rules of strict prohibition on harvests	Strict conservation and environmental services

Table 2 Continued

Factors or core subsystems	Constitutive elements or enabling conditions	New elements required by CORENCHI case study and others	New possible outcomes
External environment	Technology: low cost exclusion technology, time for adaptation to new technologies; low levels of articulation with external markets, gradual change in articulation with markets, State: central governments should not undermine local authority, supportive external sanctioning institutions, appropriate levels of external aid, nested levels of appropriation, provision, enforcement, and governance	Capacity to intensely engage and negotiate with external market and governmental actors to realize benefits from conservation or productive activities, Ability to create new institutions and organizations that facilitate interaction with multiple actors at other scales.	Turbulent, multi-scale governance

(First and Second Column modified from Ostrom 2009; Agrawal 2001).

Expanding the number of variables and possible outcomes in common property research does not make the analytical task any easier (Agrawal 2001). The case study we have presented here adds some new elements that can constitute common property theory:

- that the resource has value for strict conservation and generation of environmental service
- that there are possibilities of realizing that value through extensive networks
- that communities and inter-community organizations can establish rules for strict conservation with no physical harvests within a framework for coproduction of rules at multiple scales
- that collective action can crucially take place at the inter-community level, providing an efficient link with other levels and scales of governance
- that visionary leaders can overcome locally confined solidarities, and that conflicts are not adjudicated but negotiated in complex, turbulent settings at multiple scales.

It also proposes new outcomes that can define success on the commons, particularly strict conservation for environmental services and inter-community collective action. Turbulent multi-scale governance based on communities can be a general setting, an independent variable or an outcome depending on the analysis carried out. We finally suggest that single case studies continue to be relevant when they expand our understanding of the universe of variables and outcomes that contribute to success on the multi-scale commons (Agrawal 2001; George and Bennett 2005).

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