

Women's Community-Based Organizations, Conservation Projects, and Effective Land Control in Southern Mexico

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Abstract

This paper examines outcomes for women's effective land control from engagement of women's agricultural community-based organizations (CBOs) with conservation projects in southern Mexico. Through ethnography and interviews with one hundred women in three communities, the author assesses whether women's organization, as a response to availability of project resources, has led to increased access to, and control over, land, as well as gender empowerment. A binary logistic regression model predicts CBO participation and suggests that who participates in these groups is defined in part by the varied position of women within community class and power structures. Women's land access *has* increased through participation in CBOs, but effective land control does not automatically follow. Women differ within and among CBOs in the three crucial aspects of effective land control: participation in control over land-use decision making, over the land's disposition, and over resultant land-based income. The type of CBO and its community position play important roles, with groups functioning outside of ejidal structures leading to greater rates of women's effective control of land and potential.

Keywords: *Mexico, women, land, gender empowerment*

Resumen

Este estudio examina los resultados del control efectivo de la tierra de mujeres dentro de su empleo en organizaciones comunales agrícolas femininas (OCAs) de proyectos de conservación en el sur mexicano. A través de etnografía y entrevistas con cien mujeres en tres comunidades, la autora evalúa si las organizaciones femininas, como respuesta a la disponibilidad de recursos de proyectos, han mejorado el acceso a la tierra y control sobre ella, también de su empoderamiento de género, y si fue así, para cuales de las mujeres. Un modelo binario de regresión logística, pronostica la participación dentro de las OCAs y sugiere que las que participan en estos grupos están definidas por su variada posición dentro de las clases comunitarias y las estructuras del poder. Se nota, que el acceso de mujeres a la tierra ha aumentado a través de su participación en las OCAs, pero el control efectivo no sucede automáticamente. Las mujeres son variadas dentro y entre las OCAs en tres dimensiones: su participación en el control de toma de decisiones respecto a la tierra; su situación relativa a la disposición de la tierra; y en relación a los ingresos obtenidos. El tipo de OCA y su posición dentro de la comunidad son roles importantes, y su relación con grupos que funcionan fuera de la estructura ejidal significa mayor control femenino sobre la tierra y potencialmente mejor empoderamiento de género.

Palabras claves: *Mexico, mujeres, tierra, empoderamiento de género*

Introduction

This paper examines two problems: (a) Has rural women's community-based organization in Mexico's southern Yucatán led to increased access to and control over land? And if so, for which women? (b) If land access and control by women has increased, has this translated into gender empowerment for these women, and by what mechanisms? Several scholars have called for women's collective action, such as the formation of women's community-based organizations (CBOs) in order to increase land access and control (Meinzen-Dick et al. 1997, Rocheleau and Edmunds 1997). Agarwal (1997b), for instance, argues for various collective institutional arrangements, several of which resemble the most common collective means by which women access land in the southern Yucatán. Recent literature also maintains that women are empowered through land access and control (Deere and León 2001, Hamilton 1998, IFAD 2003, Sick 1998, World Bank 2001), and the role of formal land rights in the gender empowerment of women recently has been extensively debated (Agarwal 2003a and 2003b, Jackson 2003 and 2004). Other research relevant to the two problems addressed in this paper includes the state of women's land access and control, the consequences of environmental and development projects on this (Schroeder 1997, Carney 1993), and the effect of income control on women's gender empowerment (e.g. Agarwal 1997a, Blumberg 1995).

This paper defines women's land access and control as follows: Women's *land access* is the ability of an individual woman, or a group of women, to use land for an activity such as crop cultivation. The women's decision making around the use of this land is secondary to that of the individual that owns or controls it. Women's *land control*, on the other hand, refers to a woman's (or group of women's) participation in three key areas of decision making surrounding land as a resource—the immediate use of the land (including what if anything is planted), the disposition of the land in terms of its retention or sale, and the receipt and use of any benefits arising from the land (most importantly, how to spend any money earned or received). This definition draws directly upon work by Agarwal (1994) on women's control of land in Southeast Asia. As land control is often conflated erroneously with the holding of formal land rights, such as land titles, this paper refers specifically to *effective land control* as the successful exercise of control over land-based decision making in these three key areas. An individual or group's control of a land parcel may include one, two, or all three of these aspects.

Agarwal (1994) argues for formal land rights (independent from men) to empower women, and this focus on formal, or *de jure*, land rights strongly influences Deere and León's (2001) recent work on women's empowerment and land control in Latin America. Agarwal contends that independent rights to land improve women's fallback positions¹ or their options, and thereby improve their bargaining position within the household. Since land provides these women with resources and choices, it alters the power relations within the household. Agarwal also argues that the process by which women contest the unequal distribution of land rights can, in itself, transform gender relations. Several important lessons with respect to formal land rights have emerged from gender and resource tenure research of the 1990s. The most relevant of these lessons is the distinction between *de jure* (formal) and *de facto* (actual) rights (Rocheleau et al. 1996, Meinzen-Dick et al. 1997).

This paper argues, based upon empirical field research, that *de jure* land rights are not the primary mechanisms at work for women's gender empowerment in the southern Yucatán, since women's formal land rights are not only limited by local land tenure patterns and opportunities, but they also do not always translate into effective land control, or actual land-based decision making. Agricultural women's CBOs, on the other hand, present an avenue for land access and potential control widely available to rural

women. However, this avenue is constrained by the nature of the Mexican state-established institutional structure through which most rural women's organization occurs. In the southern Yucatán, *effective* land control appears to be most reliably achieved through women's organization of alternative types of CBOs that, in Mexico, are positioned independent of local community governance and external to male-dominated community power. Results of the study described here indicate that land control *can* empower women, but the way in which land control is defined, how it is linked to conservation processes through women's CBOs, and the nature of the CBOs themselves are crucial to understanding this potential connection. Formal rights over land, *per se*, have done little to empower women; rather, it is women's participation in decision making over land and land-generated benefits, and in conservation project benefits through certain CBOs, that offers a nascent transformation of gender relations.

Research methodology

This study was undertaken in the Calakmul municipality, in southeastern Campeche, Mexico, in the region surrounding the Calakmul Biosphere Reserve (Figure 1) (Primack et al. 1998, Turner et al. 2004). It was carried out in cooperation with the Southern Yucatán Peninsular Region Land Use/Cover Change Project (the SYPR Project),² which seeks to understand land-change in the region and the consequences for the well-being of the human-environment system (Turner et al. 2004). Fieldwork was undertaken in 2002 within the context of more extensive dissertation field research in forty-one communities directly surrounding the Reserve (Figure 2) (thirty-eight of which are *ejidos*,³ governed by Mexican agricultural reform law, and three of which are private smallholder communities).

In each community the researcher interviewed key leaders, including those of active agricultural women's CBOs. This process established community-level data on women's community-based organization, the existence and status of women's group land parcels, and the proportion of female versus male *ejidatarios*⁴ or smallholders. The researcher then selected three *ejidos* as case studies (Valentín Gomez Farias, Ricardo Payro, and Cristóbal Colon) to represent the range of agricultural women's CBO activity in the region. Some basic characteristics of these communities are summarized in Table 1. Valentín was selected for its regionally well-known and well-funded women's CBO, Ricardo Payro was selected for its high level of women's group activity (three different formalized women's CBOs active in 2002), and Colon, with its moderately active women's CBO, was selected for its resemblance to many other *ejidos* in the study area.

In the three case study *ejidos*, the researcher interviewed the primary adult female from a random sample of 100 households, drawn from a list of all resident households in the three communities, to obtain detailed information on household members' gender and land relationships, including gendered patterns of household decision making and agricultural participation. The sample was stratified first by community and second to include a roughly equal number of women participating in women's agricultural CBOs and women not participating. Sample stratification elements were appropriately weighted when combining data from more than one element (for example, when combining data from all three communities). In the three case study *ejidos*, the researcher also interviewed all willing resident *ejidatarias* (n=15, out of seventeen total), or women formally holding *ejidal* land rights; however the data from these interviews were not combined with the random sample household data and these results are reported separately when relevant.

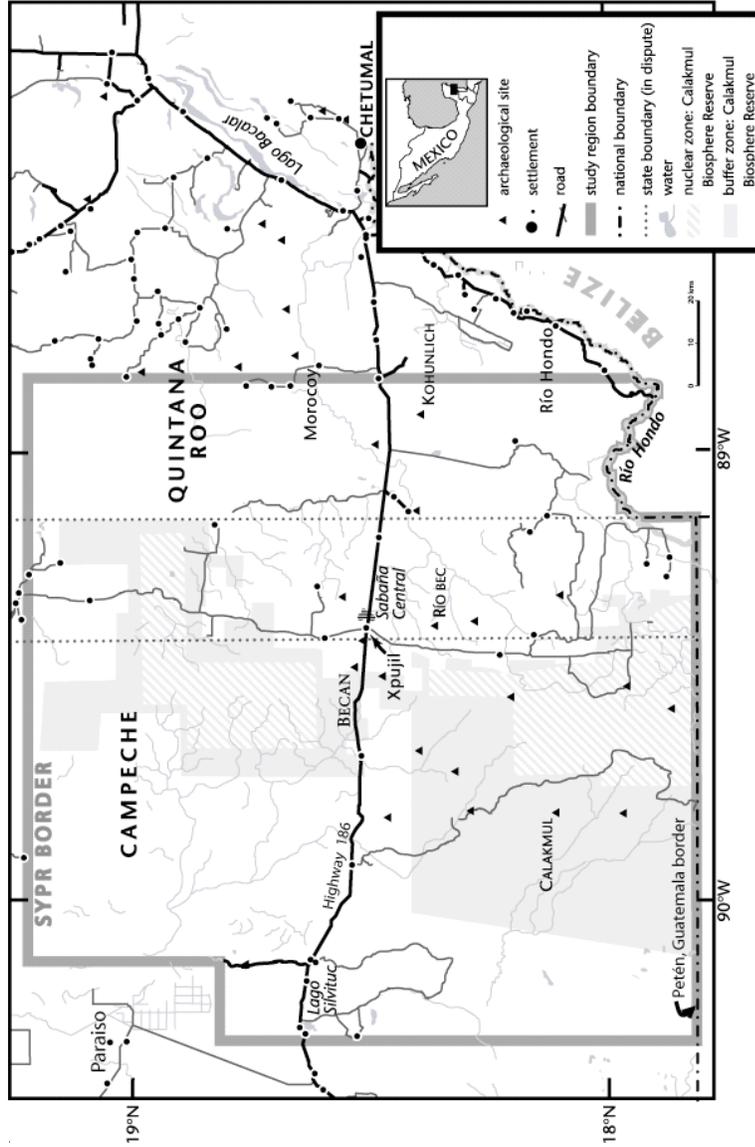


Figure 1: The Calakmul Biosphere Reserve, SYPR project research area, and surrounding region (source: Turner et al. 2004).

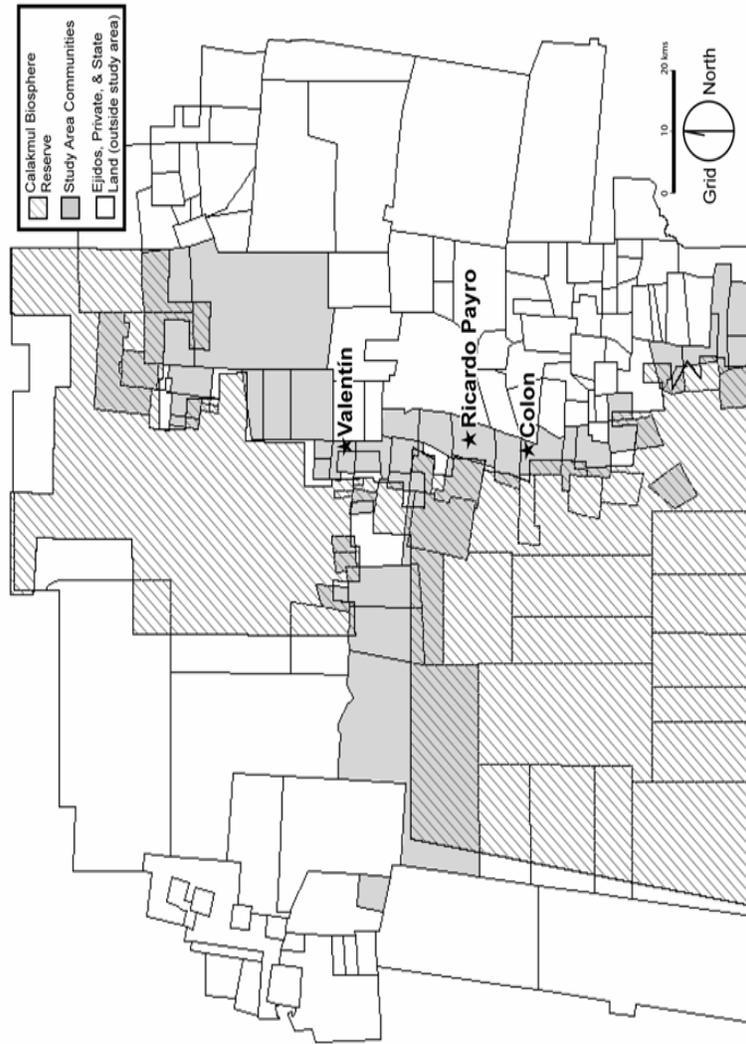


Figure 2: Forty-one Calakmul ejidos and private communities surrounding the Calakmul Biosphere Reserve make up the study area.

	Valentín Gómez Farias	Ricardo Payro	Cristóbal Colon
Date established ^a	1973	1980	1980
Territory size (ha) ^b	1,500	5,001	4,604
Total population ^c	264	585	379
Total number households	46	135	79
Total number ejidatarios (both male and female)	28	97	82
Female proportion of ejidatarios	7%	9%	15%
Percent households without ejidal rights	43%	48% ^d	22%
Number of established women's groups	1	3	1
Standard ejidal parcel size (ha)	20	40	50
Percent population speaking an indigenous language ^e	10%	4%	34%
Sample Data			
Households in sample	24	50	26
Percent households cultivating land, not including women's CBO group land	73%	82%	94%
Percent households cultivating women's CBO land	44%	55%	24%
Average household domestic appliance count ^e (household wealth indicator)	3.2 (2.3 SD)	2.8 (1.9 SD)	3.2 (1.8 SD)
Average household value of housing materials index ^f (household wealth indicator)	6.8 (1.9 SD)	7.1 (1.4 SD)	6.6 (1.4 SD)

Table 1: Basic characteristics of the three case study ejidos, 2002

a. Based on year ejidal land grant solicited (Klepeis 2000).

b. 2000 national census data (INEGI 2002).

c. The following appliances were counted—stove, refrigerator, radio or stereo, television, blender, clothes washing machine, and sewing machine.

d. Estimate based on sample data.

e. This study created a simple housing materials index based upon the construction materials used for the home's roof, walls, and flooring. The index's value reflects the cost of various materials and ranges from a minimum of 3 (traditional palm roof, sapling walls, and dirt floor) to a maximum of 9 (lamina roof, cement walls, and cement floor).

Over the course of 2002, the researcher interacted with the five established women's CBOs in the three case study ejidos, combining participant observation with group activities modeled on participatory rural appraisal (PRA) techniques. Interview data from the sample of 100 households were analyzed employing univariate and multivariate statistical techniques, and these results were interpreted with the help of insights gained through the ethnographic and PRA-based research, as well as through the qualitative findings from open-ended interview questions with the women from the randomly-selected households.

Conserving forest in Calakmul

The communities surrounding the Calakmul Biosphere Reserve are relatively young, most having been established since the 1970s by migrants from elsewhere in Mexico (Klepeis 2000). These migrants arrived as individuals and families, and for the most part succeeded in receiving collective ejidal land grants from the Mexican state—most prior to the establishment of the Reserve. These farming families are poor, with few opportunities for wage labor outside of agriculture, and they engage in a mix of subsistence and cash-crop farming (Vance 2004).

The land grants consisted of transferring tracts of state land to groups of individuals, referred to as ejidatarios (or *ejidatarías* if referring to women only), under the terms of federal agricultural reform laws. Local community and land governance is carried out by an ejidal assembly made up of these individuals. Ejidal land rights were conferred primarily on men, under the notion of men as both household heads and farmers who would exercise these rights for the benefit of their families (Arizpe and Botey 1987). Although it is currently possible for women to hold ejidal land rights even if their husbands also hold these rights, the great majority of ejidatarios are still men. A few ejidos in the study area have retained fully collective land management, but most ejidos have assigned specific land parcels to the individual ejidatarios. It has become legal to sell ejidal rights only recently as ejidos move towards “certifying” these rights under the 1994 Article 27 revisions to Mexico’s agricultural reform law; yet in reality there has long been an active informal market for the transfer of these land rights between individuals, and therefore the informal sale of land.

In 1989, as a result of increasing international conservationist pressure, Mexico created the Calakmul Biosphere Reserve, giving rise to tensions between farmers and larger initiatives seeking to reduce deforestation within and adjacent to the Reserve (Haenn 2000, Turner et al. 2001). Mexican state and non-governmental conservation efforts identified expanding agriculture and traditional swidden practices as the primary threats to maintaining biodiversity and forest cover within and around the Reserve. As a result, many of the surrounding communities have experienced considerable conservation and development project attention (Klepeis and Roy Chowdhury 2004, Primack et al. 1998). Throughout the 1990s, Mexican environmental agencies and NGOs focused on projects that attempted to achieve both conservationist and community development goals, channeling resources primarily through community-level groups, including both men’s and women’s CBOs. Projects have had two main thrusts: first, to diversify local livelihood strategies (especially agricultural production), decreasing pressures on forests; and second, to change agricultural practices (both intensifying cultivation and adopting “green” or alternative farming practices) to be more harmonious with conservationist goals.

Conservation-oriented agricultural projects fall primarily into three overlapping areas: the “sedentarization” of the *milpa* (milpas represent the swidden cultivation of maize, traditionally intercropped with other cultivars, largely for subsistence use), the diversification of agricultural production, and the cultivation of fruit trees and commercially valuable hardwoods. Projects include the planting of nitrogen-fixing legumes (*Mucuna pruriens*, known locally as *nescafé*, and *Canavalia ensiformis*), the mechanization and improvement of fields, and the establishment of agroforestry plots.⁵ Projects can provide payment for labor, funds to purchase materials, and/or the materials themselves. Cash may be in grant form, particularly the NGO support, but increasingly Mexican agencies are providing project funds as loans, with repayment required before new credit-based project funds can be accessed.

Women are included in projects in response to state and international gender equity concerns, but without any intention of challenging existing gender roles and relations (Mingo 1996, Pinto and Villagomez 1995). Most emphasis on women in projects has been within the confines of socially idealized roles in reproduction and production within and around the home (such as handicraft or patio-garden production), with some notable exceptions. Some women's CBOs with access to farmland (either through group ownership or, most commonly, through access to ejidal land designated for the women's use) have received project funds or payments for labor that would not otherwise have been available to them (e.g., for planting nitrogen-fixing legumes to improve soil). These women have effectively mobilized CBOs to gain access to conservation funds flowing into the region. There is also a growing agency emphasis on funding projects with women's CBOs as a direct result of men's accumulation of project debt during the 1990s (Radel 2005).

Women and land in Calakmul

Land provides the primary source of livelihood for most households in the region. Land access translates into subsistence production and can translate into income generation through production and sale of cash crops, primarily jalapeños, and through receipt of state agricultural support payments (e.g. PROCAMPO payments).⁶ In the communities surrounding the Reserve, land access can also translate into income generation through its leveraging of conservation project funds. The household-land relationship is a fundamental one, shaped by the almost universal local vision of land both as a productive asset and as a means to project-based and governmental support income (*apoyos*). Households are not, however, homogenous units (Dwyer and Bruce 1988, Folbre 1986). Individual family members can have quite different relationships to land, depending on numerous factors including gender and age. Formal land rights (either land titles or ejidal land rights) tend to be held by men. For example, in the study area's thirty-eight ejidos, only 205 out of 2,086 (10%) of the current ejidal rights holders are women (*ejidatarias*).⁷

In the southern Yucatán, women participate significantly in agricultural production: on the ejidal parcel of a member of their own household (the "household" parcel), on women's group land, in the patio-garden around the home, and as wage laborers harvesting jalapeños on neighbors' parcels. For example, in 65% of households working a household ejidal parcel (in most cases, the husband's parcel), the woman participates in agricultural field labor, and in 42% of the households, this labor extends beyond harvesting (the task in which women are most likely to participate and the one in which women are traditionally expected to participate). This participation does not translate into effective land control. Agricultural labor participation, land access, formal land rights, and effective land control must be distinguished each from the other.

In the southern Yucatán, formal land rights are often held by women who have little effective control over that land—the land is held in their names by husbands and fathers for legal and convenience purposes. In the case study ejidos, six of the seventeen (35%) total resident women ejidatarias are part of married couples in which both the man and woman hold ejidal land rights. These dual-rights frequently occur when the man purchases a second ejidal land right in his wife's name, as any single individual can hold only one ejidal land right. Other ejidatarias hold land rights when a husband cannot hold these rights (because, for example, he previously relinquished ejidal rights), or when he finds it inconvenient to do so (because, for example, he does not want to attend the mandatory ejidal meetings and would like to send his wife instead). These rights are officially in the woman's name, but often she exercises little to no effective control over that land, as it is *de facto* her husband's land.

When it comes to linking land to gender empowerment, a more useful consideration than formal land tenure, or in this case the possession of an ejidal land right, is *effective land control*—emphasizing the three aspects of land-based decision making participation and control outlined earlier. This follows Kabeer's (1999: 435) understanding of women's gender empowerment as a process by which women "who have been denied the ability to make strategic life choices acquire such an ability" and, by including consideration of land-generated income, more clearly links to the established relationship between income and gender empowerment (Agarwal 1997a, Blumberg 1995, Engle 1995).

In the case study ejidos, 50% of the ejidataria women reported that land-use decision making power for their land resides with their husbands, while 25% reported themselves as the sole decision-maker and 25% reported shared decision making. This does, however, compare favorably with land parcels held in men's names, where 91% reported men making land-use decisions alone.⁸ All the ejidataria women reported participating in control of any *income* resulting from land held officially by them, even if not involved in decision making. In addition, formal land rights potentially do protect women from outright loss of land in cases of divorce or separation, as stressed by Deere and León (2001). Despite these potentially positive effects of ejidal land rights, these rights should not be conflated with effective land control. In addition, the number of women with these formal rights is low (only approximately 8% of women over age 18 in the three case study ejidos are ejidatarias)⁹ and will continue to be low into the foreseeable future as most ejidos have stopped distributing new rights. Today, women desiring ejidal land rights or private land titles must purchase them. Purchase is out of reach for most women. Consequently, women who desire their "own" land—independent of husbands and sons—most frequently turn to agricultural women's CBOs.

The growth of women's agricultural CBOs

In 1971 Mexican agricultural reform law began requiring ejidos to set aside a land parcel for women, organized into a *Unidad Agroindustrial de la Mujer* (UAIM) or Women's Agro-Industrial Unit, to facilitate women's access to land without challenging the fundamental gendered division of agricultural labor and decision making (Arizpe and Botey 1987, Buechler and Zapata 2000, Stephen 1997, Zapata 1996). Since then, many women have formed UAIMs to take advantage both of the UAIM parcel and of a changing variety of state development funds available to UAIMs for productive activities. The availability of governmental and NGO funds for conservation-oriented projects around the Calakmul Biosphere Reserve, starting in the 1990s, has encouraged the continued activity of existing women's CBOs such as the UAIMs, and stimulated the formation of new ones throughout the region. Most of the women's CBOs take the form of the state-sanctioned UAIMs, but alternative groups have also been organized (Table 2), as outlined below. Almost all groups seek project financing for their members.

The organization of alternative women's groups results in some cases from women being excluded from their ejido's UAIM (see below) and in other cases, from their residence in a private smallholder community (where UAIM formation is not possible). Some of the alternative groups are ephemeral, forming along networks among women when group status is needed to apply for a particular project benefit, and then disappearing again. Others become more permanent CBOs and seek legal status either as *Sociedades de Solidaridad Social* (SSSs) or as *Sociedades Productivas Rurales* (SPRs). Achieving legal SSS or SPR status requires the cash necessary to register the group in Campeche (a day's bus ride away), creating a cost barrier that limits both SSS and SPR formation. These costs, although low (covering paperwork and travel expenses for the CBO president), are significant to women with little to no access to cash. In the forty-one communities

surrounding the Reserve, there are only a few women's SSSs and SPRs (Table 2). Some of these CBOs do not cultivate land, focusing instead on other agricultural activities, such as raising livestock (sheep or cattle) or bee keeping. The members often carry out production activities individually and join together for credits, technical assistance, and marketing. Only one SSS and one SPR cultivate land parcels within the forty-one communities studied, both within the ejido Ricardo Payro.

Both the initial 1971 agricultural reform law governing UAIMs and local ejidal practices set UAIM membership criteria, frequently limiting membership to women whose husbands held ejidal land rights as ejidatarios, excluding ejidataria women and *pobladoras* (women from households with no members holding ejidal land rights). These exclusions effectively continue in many ejidos, although current law extends membership rights to all adult women. In the thirty-eight Calakmul ejidos studied, the majority of UAIM members in 2002 were wives of ejidatarios (Table 2). Membership in the alternative CBOs, on the other hand, is slightly more diverse.

	Women's SPRs and SSSs	UAIMs
Total of each type women's CBO	6	28
Communities with women's CBOs	5	28 ^a (74% of ejidos)
Women's CBOs cultivating land parcel in 2002	2	18
Land parcel size of cultivating CBOs	10 ha	12 to 203 ha
Percent of CBO members who are ejidatarias	8%	5%
Percent of CBO members who are wives of ejidatarios	64%	79%
Percent of CBO members who are pobladoras	28%	16%
Total women participating	161	705 ^b

Table 2: Women's organization in forty-one Calakmul communities surrounding the Calakmul Biosphere Reserve

a. Six of these UAIMs were self-identified as inactive in 2002.

b. This is 36% of the women over age eighteen in the 38 ejidos (based on 2000 national census data, INEGI 2002).

These CBOs differ from the UAIMs in several other aspects as well. They develop around a common goal of improving household production and/or income, not unlike the UAIMs, but they tend to have a greater sense of group identity and frequently have a more coherent vision of how to achieve their goal. Almost always, a single woman plays a crucial leadership role. Most importantly, SSS or SPR status allows the group to act independently from the ejido in which the women live, granting them independent control of any project funds the group achieves. This contrasts with the UAIMs, which are formally part of the ejidal system and often find themselves subject to the authority and control of the ejidal assemblies. The SSSs and SPRs stand outside the ejidal system, more readily operating as independent entities. Thus, unlike the UAIMs, these alternative women's CBOs more easily achieve independence from the male-dominated ejidal struc-

tures. A total of five different women's agricultural CBOs were active in 2002 in the three case study ejidos—three UAIMs, one SPR, and one SSS. These five groups have experienced different histories of formation, external support, and group activity (Table 3).

The regional network of conservation agencies and NGOs identify the UAIM in Valentín as a model “green” women's CBO. The current group was reformed in 1992, through the encouragement of male ejidal leaders, following the disintegration of an earlier effort in the 1980s. The Valentín UAIM formed specifically to access and benefit from various conservation and development projects, particularly agroforestry projects. During the 1990s, the women received project support from some fourteen different governmental and NGO agencies (including international environmental NGOs such as the Nature Conservancy), facilitated by the consistent and active leadership of a professional agronomist and environmental educator. The twenty hectares of the ejidal UAIM parcel have been subdivided among the participating families into one-hectare plots, and agricultural practices vary from plot to plot. “Green” practices such as agroforestry and the planting of nitrogen-fixing legumes as green manures exist mixed with and side-by-side the application of chemical pesticides and fertilizers. Plots have a monetary market value based on the number and quality of trees, and sales do occur (recently one plot sold for 6,000 Mexican pesos).¹⁰

A group of women in Colon formed their UAIM in 1983. As of 2002, the group had received very little project support, none of which had come from conservation agencies. The twenty hectares of the ejidal UAIM parcel are subdivided and individually assigned to members, but the size of plots varies by year with the number of women participating, and has in some years been as small as a quarter hectare. In 2002, cultivation was spotty, with only roughly half the parcel cultivated, and much of this land was planted in chili or immature papaya, with the considerable participation of the members' husbands. Despite internal organization challenges and frustrations, the Colon UAIM continues to function, primarily as a mechanism for the women to continue receiving PROCAMPO payments for the cultivation of the UAIM parcel, and because of the enduring hopes the women have of receiving more significant project support in the future.

The UAIM in Ricardo Payro formed in 1980, after women in the ejido were informed of the existence of the ejidal UAIM parcel through the visit of employees of the Agricultural Reform Ministry. Since then the only consistent monies received by UAIM members as a whole have been the PROCAMPO payments. Formerly these payments were distributed among the women, but in 2001 and 2002 the group chose to invest the payments in the subsidized purchase of fencing and grass seeds for the parcel, with the intention of establishing pasture on the twenty UAIM hectares. As of 2002, prospects of this appeared poor, due to growing disagreement within the group and concerns about the adequacy of the fencing materials and the type of grass seeds. In 2002, each woman member was assigned 0.375 hectares and although the parcel was

	Year (approx.)	Valentín UAIM	Colon UAIM	Ricardo Payro UAIM	Ricardo Payro SPR	Ricardo Payro SSS
Group formation	1992	1983	1980	1997	2000	
	Male ejidal leadership	Group of women	Group of women	Current CBO president	Current CBO president	
Membership	16	15	33	9	2	
	Wives of ejidatarios					
	0	0	0	5	0	
	Ejidatarias					
	3	3	11	14	18	
Land	19	18	44	28	20	
	Total					
	20	20	20	10	10	
	Amount (ha)					
	ejidal UAIM parcel	ejidal UAIM parcel	ejidal UAIM parcel	group-owned	borrowed	
Type support received	subdivided	subdivided	subdivided	collective	collective	
	collective status	subdivided	subdivided	collective	collective	
	Conservation projects	yes	no	yes	yes	
	PROCAMPO	yes	yes	no	no	
Other projects	yes	yes	yes	yes	yes	
	yes	yes	yes	yes	yes	

Table 3: Basic characteristics of women's agricultural CBOs in three case study Calakmul ejidos, 2002

cleared to qualify for the PROCAMPO payments, much of the land was never planted.

In 1997, a woman in Ricardo Payro formed her own group, after the local UAIM required her to relinquish UAIM membership when she became an ejidataria following abandonment by her husband. She invited other UAIM-excluded women (ejidatarias and pobladoras) to join, and in 1999 the group achieved SPR status under the name, *Sociedad Mujeres Campesinas para el Desarrollo Sostenible* ("Farming Women's Society for Sustainable Development"). Collectively, the women purchased ten hectares from a local ejidatario. Since its formation, the SPR has been consistently successful in procuring projects, building a reputation in the region as an effective "green" women's group. Over their first five years as a group, they have received a constant flow of support for activities, including planting trees and nitrogen-fixing legumes, raising sheep, mechanizing half their parcel for chili cultivation, applying organic fertilizer, purchasing a rotary cultivator, and establishing an earthworm-composting operation. Much of their success can be attributed to the skills of their leader, and more specifically her ability to secure resources by articulating sustainable development discourse and cultivating contacts in the growing Calakmul conservation network.

A somewhat antagonistic relationship exists between this SPR and the Ricardo Payro ejidal assembly. The SPR president has expressed that ejidal women, including ejidatarias, are excluded from many external resources (*apoyos*) flowing into the ejido. In turn, the SPR's success in capturing conservation funding has bred jealousy within the ejido and has led to ejidal assembly attempts to manage or control those funds. To date, the SPR has successfully resisted these attempts.

In 2000 a second alternative women's CBO formed in Ricardo Payro, modeled on the success of the SPR. This group registered as a SSS and negotiated access to a ten-hectare parcel, by borrowing the land from a local ejidatario under an agreement to share with him a portion of all project funds received—a sort of "project-sharecropping" agreement.¹¹ As of 2002, the women members of this SSS had received support for plot mechanization and for "sedentarization" of their parcel. Forming a women's group, with an expectation (recognized within the ejido) of receiving external support, allowed these women—none of whom are members of households with ejidal land rights—to access land. It is not clear that an offer to lend ten hectares would have been forthcoming without the expectation of shared project monies.

Who participates in the women's agricultural CBOs? A binary logistic regression model for three case study ejidos

Based on univariate cross-tabulation findings and insights from the ethnographic components of the study (Radel 2005), a binary logistic regression model for participation in the women's CBOs in the three case study ejidos was constructed, using characteristics of the women and their households to predict each woman's participatory status (is she a CBO member or not). The goal was to identify and model the most important variables, generalized across communities and CBOs, that determine a woman's CBO participation and therefore her access to land and conservation project benefits through the mechanism of the CBOs. Four characteristics of the women and their households were incorporated into the model: in which ejido the woman lives, her ejidal status, whether or not she participates in field labor on a "household" parcel, and an indicator of the household's wealth. A count of domestic appliances¹² was selected as the household wealth indicator for the model.¹³ Table 4 details basic descriptive statistics or frequencies for these variable. Univariate analysis by ejido and the individual histories of women's CBO organization in each ejido (Radel 2005) indicated the need to account for ejido differences in how a woman's ejidal status and her household's count of domestic appli-

ances affect women's CBO participation.

		All Three Ejidos	
		Participants (n=55)	Non-participants (n=45)
Ejido of residence	Valentín	.14	.19
	Ricardo Payro	.69	.40
	Colon	.16	.42
Woman's ejidal status	ejidataria	.07	.16
	ejidatario wife	.56	.46
	pobladora	.37	.38
Woman participates in household agricultural field labor	yes	.71	.43
	no	.30	.57
Domestic appliance count (household wealth indicator)	mean	3.2	2.9
	SD	2.3	1.6

Table 4: Cross-ejido descriptive statistics or frequencies for women's CBO membership predictor variables

These variables were allowed to interact with the ejido of residence, in order to account for these inter-ejido differences. Table 5 lists and describes the resultant model variables. The interviewed women's own identification of barriers to their participation suggested that a lifecycle variable (like the age of her children) would be a significant predictor of women's CBO participation across all ejidos. Women spoke of the difficulties of managing both membership and household/childcare responsibilities, but many found ways to surmount these challenges with the assistance of other family members, including extended family members. The interview data did not indicate a correlation of any single lifecycle variable with CBO membership.

Table 6 highlights the results from the binary logistic regression. The combined three-ejido model is relatively weak, explaining only about 30 percent of the variance (pseudo $R^2=.33$).

A logistic model generates probabilities that are then used to predict group membership—in this case, whether or not a woman is a member of a women's agricultural CBO. Although the model does a fairly good job of correctly predicting group membership, with correct predictions in about 70 percent of the cases, examination of the residuals indicates some problem with the model's fit to the sample data as 7 percent of the standardized residuals have an absolute value greater than 2 (although none of the residuals have an absolute value greater than 2.5). With these caveats kept in mind, the following regression results merit discussion.

	Model Variable	Description	Notes
Ejido of residence	ejido(1)	Dummy variable codes for whether or not the woman resides in Valentín	Residence in Colon is the reference category.
	ejido(2)	Dummy variable codes for whether or not the woman resides in Ricardo Payro	
Domestic appliance count x ejido	Domestic appliance count x ejido(1)	Interaction variable measures count of domestic appliances in household if woman lives in Valentín	The count of domestic appliances serves as a household wealth indicator.
	Domestic appliance count x ejido(2)	Interaction variable measures count of domestic appliances in household if woman lives in Ricardo Payro	
Woman participates in household agricultural field labor	Woman participates in household agricultural field labor	Dummy variable codes for whether or not woman contributes field labor on an individual plot cultivated by someone in her household	--
	woman's ejidal status(1) x ejido(2)	Interaction dummy variable codes for whether or not woman is an ejidataria in Ricardo Payro	
Woman's ejidal status x ejido	Woman's ejidal status(2) x ejido(1)	Interaction dummy variable codes for whether or not woman is the wife of an ejidatario in Valentín	Pobladora status is the reference category.
	woman's ejidal status(2) x ejido(2)	Interaction dummy variable codes for whether or not woman is the wife of an ejidatario in Ricardo Payro	

Table 5: Variables for a three-ejido (n=100) binary logistic regression model to predict participation in women's agricultural CBOs

	B	Exp(B)	p-value (Wald statistic)
constant	-1.39	.25	.01**
woman participates in household agriculture	1.05	2.86	.04**
ejido	NA	NA	.02**
ejido(1)	-2.66	.07	.20
ejido(2)	1.60	4.97	.02**
domestic appliances x ejido	NA	NA	.24
domestic appliances x ejido(1)	.62	1.86	.10
domestic appliances x ejido(2)	-.08	.93	.66
woman's ejidal status x ejido	NA	NA	.45
woman's ejidal status(2) x ejido(1)	2.54	12.71	.11
woman's ejidal status(1) x ejido(2)	6.62	745.91	.72
woman's ejidal status(2) x ejido(2)	.04	1.04	.95
% Correctly Predicted	70.6		
-2 Log Likelihood	109.39		
Model Chi-Square	28.24 (df 8)		
Significance	.00		
Nagelkerke R ²	.33		

Table 6: Results of a three-ejido (n=100) binary logistic regression model to predict participation in women's agricultural CBOs

**Wald statistic significant at 0.05 level.

• *Whether or not the woman participates in agricultural field labor on a "household" parcel is a statistically significant predictor of whether or not she is a member of one of the women's agricultural CBOs (p=.04).*

The model suggests that women who contribute labor to agriculture on non-group land farmed by the household are more than twice as likely to participate in a woman's agricultural CBO (exp(B)=2.85), perhaps reflecting a greater affinity for or comfort with

agricultural labor. This variable may also possibly be acting as a marker for intra-household gender relations, with more equitable intra-household gender relations reflected in both women's agricultural field labor participation (and status as a farming partner) and in her CBO participation.

- *The ejido in which the woman resides is a statistically significant predictor of her CBO participation status—specifically whether or not she resides in Ricardo Payro ($p=.02$).*

Even after attempting to separate critical ejido differences in the predictive role played by ejidal status and household wealth, the ejido of residence plays an important predictive role in whether or not a woman is a member of one of the CBOs, with a woman living in Ricardo Payro almost five times more likely to be a group participant ($\exp(B)=4.97$). This variable may be capturing many remaining community differences that play a role in whether or not a woman participates in a women's agricultural CBO, including the positive roles of leadership and social networking in Ricardo Payro as opposed to elsewhere.

- *If a woman lives in Valentín, whether or not she is the wife of an ejidatario and the number of domestic appliances owned by her household both play predictive roles in whether or not she is a member of the UAIM.*

These two variables are not quite statistically significant in the model at the 0.10 level, but both are relatively close ($p=.11$, and $p=.10$ respectively). Being the wife of an ejidatario in Valentín increases a woman's odds of being a group participant by almost thirteen ($\exp(B)=12.71$), and each additional appliance owned by a Valentín household increases the odds of the woman being a participant by almost two ($\exp(B)=1.86$). These statistical findings dovetail with field observations indicating that the UAIM in this particular ejido is positioned strongly within the political center of the ejido and dominated by the economically better-off ejidatario households, with the most important men in the community playing important roles in the life of the group.

Ethnographic field research indicates that the varied histories of the different women's agricultural CBOs lead to quite different processes (and therefore, predictors) of group participation and nonparticipation (Radel 2005). Although the inclusion of interaction parameters to account for ejido differences alleviates some of the problems in constructing a cross-ejido model, the model remains problematic. The women's groups in the three case study ejidos are quite different one from another in terms of who participates. This is particularly evident in the case of Ricardo Payro, where three women's CBOs co-existed in 2002, with considerable differences in their memberships (Table 7).

The mean domestic appliance count for Ricardo Payro UAIM households is higher than that for nonparticipating households, same as is found for the Valentín UAIM households; however, the mean domestic appliance count for member households of the alternative CBOs in Ricardo Payro is lower. The women participating with these two CBOs (the SPR and the SSS) are also more likely to be pobladora women (from households without ejidal rights) or ejidataria women. This is in contrast to the high preponderance (92%) of UAIM members who are the wives of men with ejidal rights in the Ricardo Payro ejido. These data support the idea of the SPR and SSS in Ricardo Payro being made up of the poorer and/or excluded women and households of the ejido (those that are economically and politically marginal within Ricardo Payro), which include both the pobladora and ejidataria households. Thus, at least for some women's CBOs, ejidal status (inclusion in or exclusion from ejidal power) and household wealth (both as a class marker and perhaps as an enabling circumstance) assist in predicting whether or not a woman will participate in an agricultural women's group (and in which one she might participate).

		<i>Participants in Three Women's CBOs in Ricardo Payro</i>			<i>Non-participants</i> (n=20)
		UAIM (n=12)	SSS (n=8)	SPR (n=10)	
Domestic appliance count	mean	4.6	1.4	1.8	2.9
	SD	1.9	1.2	1.6	1.5
Woman participates in household agricultural field labor	yes	.92	.63	.60	.45
	no	.08	.38	.40	.55
Woman's ejidal status	ejidataria wife	.92	0	.20	.40
	ejidataria	0	0	.30	0
	pobladora	.08	1.00	.50	.60

Table 7: Differences among household characteristics in Ricardo Payro

Land access, control, and decision making through women's CBOs

Many ejidal assemblies conformed to the 1971 legal requirement of setting aside a UAIM parcel, but then did little or nothing to encourage women's independent access to that land or the development of cooperative productive enterprises. Under 1992 revisions, ejidos are no longer even required to set aside a parcel for the UAIM (Mingo 1996). Instead, the law¹⁴ now states that assemblies *should* designate land for women's groups upon request and subject to land availability. This has considerably weakened women's claim to land through the UAIMs. At the same time, the possibility of receiving conservation project funds has bolstered and reinforced women's access to the UAIM parcel. Husbands and the male-dominated ejidal assembly now tend to encourage UAIM group formation and project activity. Success in procuring projects, in turn, tends to legitimize women's access to land through the UAIM.

The alternative women's CBOs that wish to cultivate land must find a means to procure it. In Ricardo Payro, the SPR women collectively purchased their land, and the SSS women "borrow" land under a project-sharecropping agreement. Each of these two groups has twenty women collectively working ten hectares of land. Although each individual participant has a share of only one-half hectare, as a group the women control enough land to leverage conservation projects. For the SSS, land access (and a degree of control) and the receipt of conservation funds have reinforced each other. For the SPR, which finds itself in a precarious relationship with the ejido (in part due to its nature as a "successful" oppositional women's agricultural group), land access and control is externally legitimized through their repeated participation in conservation projects.

For the vast majority of UAIMs around the Calakmul Biosphere Reserve, UAIM organization represents a strategy for ejidal *families* to gain access to additional resources, rather than a strategy for women to independently access these resources. This aspect

became clear through discussions with the UAIM members in the case study ejidos. These women identify the UAIM parcel as land belonging either to the ejido or to their households, not to them as women. To some degree, the UAIM parcel, which is almost always subdivided among the women into individual plots, becomes an extension of the household land primarily controlled by the men. As illustrated in Table 8, more women participate in land-use decisions for UAIM land (57%) than for non-group "household" parcels (17%), but this decision making generally is shared with men or remains solely in the hands of men: Only 30% of the women interviewed stated that they alone decided what would be planted on the UAIM plot.

Women's CBO Land (n=53)*					
<i>Woman's CBO Membership</i>	<i>Who Decides What Crop to Plant and How Much?</i>				
	Man	Woman	Both	CBO leader or members	Totals
UAIM	14 (42%)	9 (27%)	9 (27%)	1 (3%)	33
SPR or SSS	0 (0%)	0 (0%)	0 (0%)	20 (100%)	20
Individual "Household" Land (n=88)*					
<i>Woman's CBO Membership</i>	<i>Who Decides What Crop to Plant and How Much?</i>				
	Man	Woman	Both	Totals	
UAIM	27 (84%)	1 (3%)	4 (13%)	32	
SPR or SSS	17 (85%)	3 (15%)	0 (0%)	20	
No CBO Membership	30 (79%)	0 (0%)	8 (21%)	38	

Table 8: Land-use decision making in three case study ejidos

* Sample sizes are less than 100 as not all households in the full sample have each type of land

Even beyond the questions of intra-household land-use decision making, control over the UAIM parcel is limited. The ejido retains control over the ultimate disposition of the land. In practical terms, the women's use and access is subject to ejidal approval, and the women cannot "sell" the UAIM parcel the way that an ejidatario can "sell" his parcel.¹⁵ With the 1994 Article 27 reforms to the ejidal system, rights to the UAIM parcel now may be "certified," but that certification is in the name of the ejido, not in the names of the

women.¹⁶ In addition, under the law, the ejidal assembly can take the parcel away from the women for several different reasons, including the failure of the group to achieve their objectives for the use of the parcel.¹⁷

Due to their position outside of ejidal structures, the alternative women's CBOs can achieve more complete control over their land. Although the land may be ejidal land, the women exercise control over it equal to that exercised by an ejidatario over his ejidal parcel. In addition, pooling resources and purchasing or borrowing land collectively, many of the women in the SPR and the SSS have achieved control over more hectares than they could independently. In the case of both women's alternative CBOs, land-use decision making is exercised as a group. This may obscure the role played by the women's husbands within the group decision making process, but nevertheless, all the women identify themselves (and are identified by others) as the decision-makers. As a result, women's participation in land-use decision making for the SPR and SSS land is significantly higher than for UAIM land. It is worth noting that for both UAIM and SPR/SSS members, participation in land-use decision making is higher on the women's group land than on non-group household land (Table 8). With regards to control over land sale, for most UAIM land, control remains with the ejidal assembly, but the SPR and SSS members, if they succeed in purchasing land, can also sell it.

Land-based income

Although most women's CBO crop cultivation is for domestic consumption purposes, some productive income-generation by these groups does occur. In addition, the receipt of project funds and state supports represents concrete income gains for CBO members. Over half (58%) of the CBO-participating women reported receiving a PROCAMPO payment during the previous year, and 45% reported receiving another type of income from group land, including project funds. Local residents recognize the potential of participation in a women's CBO for increases in household income through receipt of project funds, and even for increases in household wealth. In Valentín, for example, UAIM membership is associated with higher levels of household wealth, based upon two indicators (Radel 2005). Although this is in part a reflection of the increased initial access of the wealthier, elite ejidal households to the UAIM, the extensive conservation project-based activities of this UAIM and the successful cultivation of their UAIM parcel have reinforced these existing social divisions and income accumulation patterns.

Women's access to land can result in their receipt of, and control over, financial resources, but this depends not only on the income-producing and project-generating potential of land but also on the ability of women to retain income control, as opposed to losing it to men. Project funds received by women as a result of their group participation tend to be pooled with other household income held by women. The interviews indicate that women do participate a great deal in deciding how this money is spent. In the case study ejidos, all the women in the SPR and SSS and 90% of those in the UAIMs reported that they participated in deciding how to spend this money—either by themselves, with their husbands, or as a group of women (Table 9).

CBO Income (n=47)*					
Woman's CBO Membership	Who Decides Spending?				
	Man	Woman	Both	CBO Leader or Members	Totals
UAIM	3 (10%)	18 (58%)	10 (32%)	0 (0%)	31
SPR or SSS	0 (0%)	0 (0%)	6 (50%)	6 (50%)	12

Table 9: Control of CBO-generated income in three case study ejidos

* Sample size is less than 100 as not all households in the full sample receive income.

Despite sharing some control of group-land-generated income with men, UAIM women members tend to have greater control over this income than over other land-based income: In 23% of the UAIM households, men exercised sole control over income generated from non-group household land; while in only 10% of cases did they do so over income from the UAIM land. Both the UAIMs and the alternative women's CBOs, if generating income, contribute to income control by women, as defined as independent or shared decision making over the spending of that income. Thus, in turn, women's participation in conservation projects (through the women's CBOs) contributes to their control of land-based benefits, an important aspect of land control.

Nonetheless, the gender empowerment value of women's receipt of, and at least partial control of, project funds remains unclear. For most of the UAIMs, women's participation in the group is a household strategy and does not redefine or challenge current gender relations through, for example, changes in the intra-household bargaining position of the women. In a sense, the UAIMs are an opportunity for men to further appropriate women's labor and mobilize it to access increased financial benefits from the Mexican state and from the conservation NGOs. In the one UAIM case (Valentín) where productive income-generation has resulted from group activities, women's control of project-generated income is, in fact, lower than it is in the cases of UAIMs in other ejidos. Only 30.8% of the Valentín UAIM women reported deciding alone how to spend project income (compared to 58% for all UAIMs combined), and 23.1% reported that their husbands decided alone (compared to 10% for all UAIMs combined). This compares to recent research by Kantor (2003) in India, in which she found that women's control of income flowed from the low levels of that income, and that as levels of income generated by the women increased, their control of that income in fact decreased. In Valentín, productive activities on UAIM lands have proven to be relatively successful, as opposed to activities on UAIM lands in other ejidos. Perhaps it should be no surprise that men participate more in the control of income with the move of these activities out of an economically marginalized position into one of relative economic importance to the household. As Zapata (1996: 123) finds elsewhere in Mexico: "...in demanding UAIM plots they [women] are acting not as social subjects with equal rights but as good wives and mothers whose work can supplement low male incomes." This economic move, however, has consolidated select *households'* control over the subdivided UAIM parcel, transforming it from ejidal resource under ejidal control, into a household resource

available for sale on the informal land market, and some women do participate successfully in this new control of UAIM land in Valentín.

Women's gender empowerment

Women's engagement with conservation projects through women's agricultural CBOs, both the UAIMs and the alternative CBOs, has facilitated access to land, but there has been varied translation of this access into effective control over land. Income generation rests primarily on any direct financial and material project resources received. For a few groups, such as the Valentín Gomez Farias UAIM and the Ricardo Payro SPR, these project resources have been significant, but for most they have not. Thus, for most, the women members' gender empowerment relies upon increased participation in control of decision making around land use and land disposition. For many of the women in the UAIMs, this participation has not materialized. In contrast, the women in the SPR and SSS uniformly exercise control over land use, and for the SPR, which has successfully purchased its land, control over land disposition as well.

When project funds have represented income gains, there is some evidence that this income is treated differently than is general household income, in terms of who decides how it will be spent. In this, there is little difference between the two types of women's groups, UAIMs versus alternative CBOs. Engagement with conservation projects, by enabling the groups' activities and the receipt of project income, *has* thus contributed to women's gender empowerment through this land-based income. Yet as the case of the Valentín UAIM illustrates, as the income flows become more significant, women's control of those flows may decrease, particularly if there is not first a strong sense of the group as having been established by women for women. A small subset of women are empowered through interacting directly with the staff of the conservation organizations and participating in ongoing municipal-level sustainable development planning processes and forums for "local participation." The process of leaving the community, traveling to the municipal seat, and interacting with NGO and state authorities empowers the leaders of the women's groups. Participant observation and conversations with the women indicate that all the participants are empowered to some degree by the simple act of leaving their homes to meet together as women, make decisions, and organize activities.

This research undertaken in the southern Yucatán peninsular region and reported here indicates that the primary mechanism at work for women's gender empowerment is not women's formal land rights, as these rights frequently do not translate into actual land-use decision making and control over any subsequent benefits. In taking this position I agree with Jackson (2003) and her doubts about the potential of land rights *per se* to transform gender relations. In Calakmul, women's land rights tend to be contingent on (versus independent from) men's rights or men's organizations. Rather, it is women's *own* decisions to access and control land, in order to gain access to financial resources, that empower them. Furthermore, in the communities surrounding the Calakmul Biosphere Reserve, this outcome may be most easily achieved through women's organization of alternative CBOs, independent of the state-sanctioned UAIM structures.

Conclusions

Controlling land as an ejidataria or private smallholder, if combined with actual participation in decision making and benefits arising from the land, can empower women. This participation, however, does not automatically arise from women's formal rights to land. In Calakmul, men control much of the land in women's names, in as much as they act as the primary land-use decision makers. Even more to the point, formal land rights remain out of the reach of most women, as in most cases these rights must be purchased.

Participation in a UAIM is within reach of many more women, and appears to enable independent land access. However, women that participate in the UAIMs face structural realities that significantly constrain the possibility of actual land control and the gender empowerment of women. First, for at least some UAIMs (and perhaps many), members are often women whose husbands are positioned within the core of the ejido's power structure, in terms of ejidal status and relative wealth. Thus, as a mechanism for land access and control it would seem to be unavailable to many women. Second, the nature of the UAIM parcel as an ejidal resource contributes to its *de facto* treatment as household land—not women's land. The UAIM parcel does represent access to land by women, and the growing availability of project funds, especially conservation project funds, has facilitated and enabled the formation of women's groups around these parcels by holding out the promise of household financial benefit. However, husbands frequently exercise control through their control over land-use decisions and through the ejidal assemblies. Finally, even when women make land-use decisions and/or participate in the control of the resulting income, the ultimate disposition of the UAIM parcel remains in the hands of the ejidal assembly, a male-dominated institution. UAIM land is women's land in name only. As such, for many women, access to it lends little to their gender empowerment.

Forming an alternative CBO outside of the UAIM, pooling limited resources, and buying or borrowing land collectively, allow women as a group to control enough land to leverage conservation project funds. In the case of the SSSs and SPRs, this land is controlled independent of ejidal structures such as the male-dominated assembly, and unlike the state-sanctioned UAIMs, tends to be accompanied by significantly increased rates of women's participation in land-related decision making. This places within reach of almost all women, actions that the women themselves can take to challenge and transform gender relations that are built upon notions of male land control and decision making. Not many of these alternative groups have formed; nonetheless, the activities of women in these groups represent a nascent challenge to gender relations in Calakmul.

Thus the organization of women's agricultural CBOs in Mexico's southern Yucatán does not automatically result in women's effective land control. It does tend to facilitate women's access to land, through the engagement of these groups in conservation projects, but effective control depends in great part upon the nature of the women's CBO in question, with the UAIMs considerably limited by their position within the ejidos. In the communities surrounding the Calakmul Biosphere Reserve, land access and control and conservation project support for women's agricultural CBOs are linked, and mutually reinforcing. Importantly, it is *effective land control*, in all its aspects, and not land access that potentially empowers women within their households and communities.

Notes

¹ A person's fallback position in a negotiation is their outcome if they walk away from the negotiation. A stronger fallback position, especially if known to the husband, strengthens the negotiating position of the woman.

² The SYPR Project is a joint project of Clark University, El Colegio de la Frontera Sur, Harvard University, University of Virginia and Carnegie Mellon University.

³ Ejidos are land grants given to collectives of individuals and administered in a communal manner. For excellent discussions of Mexico's ejidal sector and the changes to it under

the 1994 Article 27 reforms, see A. de Janvry et al. (1997) and W. Cornelius and D. Myhre, eds. (1998).

⁴ Ejidatarios (male) and ejidatarias (female) are individuals holding ejidal rights, including rights to ejidal land.

⁵ Agroforestry, as practiced in the communities surrounding the Calakmul Biosphere Reserve, is a crop complex of annuals, such as maize, combined with fruit and hardwood trees (Roy Chowdhury 2003). As the trees mature and shade cover increases, the annuals are no longer cultivated.

⁶ *Programa de Apoyo Directo al Campo* (PROCAMPO) is a federal program of direct payments to farmers, introduced in 1994 to assist farmers during the NAFTA transition away from agricultural subsidies (Klepeis and Vance, 2003). It requires the achievement of certain benchmarks (e.g. clearing of the land in preparation for cultivation, planting, etc.) that may be spot-checked prior to payment.

⁷ The percent ranges by ejido from 0% to as much as 34%, and it compares to a higher national rate estimated at 17.5% (Katz 1999).

⁸ Data for parcels held in men's names is from the weighted sample of 100 households (120 parcels total); whereas ejidatarias' parcel data is from interviews with all resident ejidatarias in the three case study ejidos.

⁹ Percentage is based on count of women over age 18 in 2000 national census population data (INEGI 2002).

¹⁰ Interview with head of Calakmul's municipal ecology office, May 2002.

¹¹ Credit for the insight represented by this term belongs to Dianne Rocheleau.

¹² The following domestic appliances were counted: stove, refrigerator, radio or stereo, television, blender, clothes washing machine, and sewing machine. It is important to note that these appliances are not equal in cost, and that this introduces error into this index.

¹³ The domestic appliance count is employed rather than the housing materials index, which although also important and useful in distinguishing households, is partly a function of access to state welfare projects that provide cement floors and lamina roofing to poor rural families.

¹⁴ Reglamento de la Ley Agraria para Fomentar la Organización y Desarrollo de la Mujer Campesina, Article 7, 2002.

¹⁵ Although ejidal parcels are technically not sold, the ejidal rights to land are regularly transferred among individuals in exchange for cash payment—even prior to the 1994 Article 27 revisions providing for the optional certification of (and also transfer of) ejidal rights.

¹⁶ Interview with staff agrarian lawyer, Procuraduría Agraria, Campeche Delegation, 29 November 2002.

¹⁷ Reglamento de la Ley Agraria para Fomentar la Organización y Desarrollo de la Mujer Campesina, Article 11.

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