

Forest Conservation at the Crossroads? A case study of a timber producing Ejido in Quintana Roo, México.

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1. Introduction and Paper Summary

As part of the search for ways to combine conservation and development in the forested tropics, a number of projects to promote sustained yield forest management with a high degree of participation from local rural communities emerged during the 1980s (Richards 1991). One of the most internationally recognized initiatives has been that of the *Plan Piloto Forestal (PPF)* in Quintana Roo, México, in which communities (known as ejidos²) were supported during a transition from parastatal logging concessions to the implementation of their own management and harvesting plans. The PPF was based on the idea that the forest owners must be interested in the conservation of the forest for economic reasons, ie. that they receive an income from its sustained management. The principal aim of the PPF was therefore to demonstrate that an economically viable form of community forestry was possible (Galletti 1998).

18 years after the PPF began, over 50 ejidos participate in community forestry. Together these ejidos manage an area of 1,267,516ha, of which approximately 510,000 ha is officially registered as being under forest management. The majority of the

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² There are 3 types of land ownership in México (other than national lands): *private property*, and 2 forms of "social property": *communal* (whereby indigenous communities are recognized as having traditionally occupied the land before colonialism), and *ejidal* (which is a form of collective ownership whereby the government grants land to a group of people -known as *ejidatarios*-, who share usufruct rights)(Merino 2000), (SEMARNAP 1998). Both the area of land and the community of ejidatarios and their families are known as an ejido.

available literature³ refers only or mainly to the ten original ejidos under the PPF initiative who formed a producer group known as the Society of Forest Production Ejidos of Quintana Roo (SPFEQR), and/or concentrates on those ejidos which have permits to harvest relatively large volumes of the most commercially valuable specie; mahogany. In both cases the scheme is generally seen to be relatively successful in providing an income to the community and stimulating interest in long term forest management (Richards 1991), Vargas 1998, (Galletti 1998).

However recent research has emphasized the heterogeneity of ejidos participating in community forestry and have drawn attention to the relatively low proportion of family and ejido income generated through forestry in many of these. (Armijo Canto and Robertos Jiménez 1998), (Calderon Maldonado 1999). These commentators have raised the need to go beyond the original 10 ejidos of the PPF and analyze the situation in a range of ejidos to be able to make more realistic statements about the future of forest conservation and management in the region.

This paper analyses the diversity of conditions in which community forestry takes place and discusses a case study which presents conditions more representative of the majority of ejidos in the state. Qualitative data is used to describe the ejido's systems of land use, forest management and rule making. This includes attitudes toward the parceling of the ejido, as promoted by the recent federal government land titling program

Finally there is a discussion of the relevance of these findings for sustainable forest management in the state, particularly in the smaller ejidos, without considerable volumes of mahogany. Recommendations are made regarding the support needed by ejidos such to allow an integrated development of various economic activities which is not at the expense of forest conservation.

2. The Evolution of Community-controlled Timber Extraction in Quintana Roo

Over the past 15 years the state of Quintana Roo has become internationally recognized for the communal management of its tropical forests and was once described as "probably the largest, most important and successful forest management operation in Latin America" (Synott 1993 cited in (Lawrence 1994)). This community timber extraction was the direct result of an ambitious program known as the *Plan Piloto Forestal*⁴ (PPF) in which the state government, the Federal government and the German technical assistance program (GTZ) worked together to invite 6 ejidos in the south of the state to take over the management of their own forests, following the end of a 25 year timber harvesting concession to the parastatal logging company MIQROO⁵ ((Galletti 1999),(Argüelles and Galletti 1993.)). The basic principles of the PPF included the following (Lanz Herrera et al. 1995):

³ See for example (Lanz Herrera et al. 1995), (Galletti 1998), (Flachsenberg and Galletti 1998),(Vargas-Prieto 1998).

⁴ Pilot Forest Plan

⁵ MIQROO = Maderas Industrializadas de Quintana Roo.

- To halt the destruction of forest resources, making the forest an economic alternative for the ejidatarios, instead of it being cleared for other land uses.
- To achieve this via organized forest extraction, which will form a source of capitalization for the ejidatarios, as well as a complement to family income via salaries and profit sharing.
- To adequately integrate forestry with agriculture and livestock farming, making forestry the core activity.

From the original 6 ejidos, the project was extended to the central (Mayan) region, and was eventually adopted by the state as the *Plan Forestal Estatal*⁶ in 1989, during which time more ejidos were incorporated (Galletti 1998). In order to free the provision of technical services from their reliance on government, the ejidos were organized into groups, known today as the "Societies"⁷, who offer the member ejidos political representation and who contract a team of forestry professionals to carry out the necessary technical studies and supervise the extraction. 1986 saw the formation of the first Society; the *Sociedad de Productores Forestales Ejidales de Quintana Roo* (SPFEQR) which incorporated the original 6 ejidos and 4 others (Galletti 1998).

During a 13 year period from 1983 to 1996 over 40 communities were supported in the implementation of logging operations managed by the ejido authorities rather than by external companies. In all cases, in order for a timber license to be granted a Management Plan was drawn up, and a forest reserve; known as a Permanent Forest Area (PFA) demarcated and at least partially inventoried. During this period, Ejidos therefore undertook an important zoning of their territory; since anything between 3% and 78% of the total land (with an average of 41%) was effectively closed to agricultural development, as part of the Permanent Forest Area⁸. The decision to create PFAs was taken at the level of the assembly of ejidatarios (those who share usufruct rights to the ejido land) and required considerable extension work by the technical staff .

Forest permits are authorized by the federal environment agency SEMARNAP⁹ on the basis of inventory data generated by foresters working for the ejidos. Permits, expressed as a volume are broken down into 3 categories of timber: *preciosas* (mahogany and Spanish cedar)¹⁰, *duras* (tropical hardwoods) and *blandas* (softwoods). Since 1998 these permits have specified volumes per specie within these categories. Examples of the species are given in Annex 2. Permits are now also being issued for *palizada* (pole wood of various species) and limited controls have been put in place for the harvesting of *huano* (a palm leaf used for thatch).

⁶ State Forest Plan

⁷ They are all constituted as Civil Societies or "Sociedades Civiles" a form of non-governmental commercial organization under Mexican law.

⁸ Figures calculated from data in (Argüelles Suárez and Armijo Canto 1995)

⁹ Secretaria del Medio Ambiente, Recursos Naturales y Pesca. (Ministry for the Environment, Natural Resources and Fisheries.)

¹⁰ Mahogany is by far the more abundant specie. In this paper the term mahogany will be used interchangeably with *preciosas*.

Today there are 56 ejidos (and 6 private properties) with forest permits (SEMARNAP 1999) (see map, Annex 1). Much of the literature of the early 1990s heralded the PPF as highly successful, above all in conservation terms (Lanz Herrera et al. 1995), since between these 56 ejidos over 500,000 ha of forest land in the state is classified as Permanent Forest Area and therefore considered to be protected from land-use pressures (Argüelles Suárez and Cortés. 1993),(Merino 1995) (Lawrence 1994). This protection is assumed to exist, given that it was in the ejidatarios own economic interests to preserve their forest reserve. However, commentators have begun to question the viability of this model of community forestry in the majority of communities, but in particular those with smaller forest reserves, and little or no volumes of the most commercially valuable timbers.

3. Heterogeneity and the partial understanding of community forestry in Quintana Roo.

There is no doubt that the PPF was ground-breaking in its efforts to develop a system of sustainable tropical timber extraction managed by *campesinos*. Enormous advances toward its stated goals were made within the relatively short period of time afforded by political changes within the state. The changes observed in several ejidos helped to change attitudes toward community managed forestry locally, nationally and even internationally. Helmut Janka, one of initiators of the plan, wrote in 1998,

Above all there is one crucial point: Today people no longer doubt that forest harvesting should remain in the *campesinos* hands.

In several ejidos, forest management has become an important economic activity; permanent and seasonal employment has been generated, investments are being made in extraction and processing equipment and ejidatarios continue to seek training as forest technicians. Four of the largest ejidos have Forest Stewardship Council certification for good forest management which has brought secondary benefits in terms of international recognition and associated funding (Maynard and Robinson 1998).

In order to discuss the robustness of the system of community forest management Alberto Vargas (1998) carried out an analysis of the "ejidos of the PPF" (p128) using the framework of Ostrom's (1990) design principles for common pool resource (CPR) management institutions. He found that *for the larger ejidos* a) boundaries and membership were clear and respected; the Permanent Forest Areas are well defined areas, and the members are the ejidatarios with clear usufruct rights b) that there was participation in modifying operational rules, with monitoring, sanctions and enforcement, via the ejido assemblies and the *consejos de vigilancia* and c) there was recognition of rights to organize (at state and national level) and there are nested enterprises, in the form of the Sociedad Civil (Vargas-Prieto 1998). He finds them to be robust CPR management institutions.

Here, Vargas uses the term *ejidos of the PPF* but he clarifies that this analysis of the PPF model refers *only to the original 10 ejidos and the first Civil Society; the Sociedad de Productores Forestales de Quintana Roo*. It is important to recognize that most of the documents written in the 1980s and early 1990s by members of the AMA and many of the subsequent studies *are referring only or mainly to the larger ejidos of the*

*SPFEQR*¹¹. Much caution is needed in extrapolating their conclusions to the 56 ejidos with forest extraction permits in the state.

Indeed, Vargas emphasizes that the sense of robustness seen in the larger ejidos is replaced by fragility in some others, even within the same Society;

..the heterogeneity of ejidos was evidence that the scheme was working only for the larger and richer ejidos. The reduced volume of mahogany available in the poorer or smaller ejidos was not enough to maintain the interest of the ejidatarios. (p107)

These mechanisms were very different in Mayan and migrant ejidos, and were particularly complicated in the mixed ejidos. There is very limited information and no studies to explore how [other] ejidos in the PPF deal with these design principles (p124)

This heterogeneity among ejidos, touched on by Vargas, deserves greater attention. It is a heterogeneity with many facets. These include total ejido size, rainfall, soil type, communication infrastructure, ethnic origin of the population, cultural relationship with the forest, and history of timber extraction.

Here, two more of these interrelated factors will be discussed in greater detail, since they are particularly important in determining current resource management in a broader range of ejidos. These are a) the availability of volumes of mahogany and b) the degree and type of support offered to the ejidos from government or supra-ejidal organizations.

*a) Volumes of mahogany*¹²

Ejidos *without* a permit to cut mahogany and cedar often carry out little or no commercial forestry at all, despite having a Permanent Forest Area, a management plan, the support of supra-ejidal organizations and official permits to cut hard and softwoods. This is particularly the case since the demise of the market for railway ties in the region, which provided a market for several hardwood species. Ejidos with very low volumes of mahogany are most likely to sell their timber as a standing volume where the contractor carries out the entire extraction process. Thus little or no employment opportunities are generated within the community and nothing is done to foster a forestry culture¹³. Therefore in these ejidos the principles of the PPF are not being met: forestry is not providing an economic alternative for the ejidatarios and there is no source of capitalization.

¹¹ For example (Galletti and Argüelles 1987), (Argüelles et al. 1992),(Lanz Herrera et al. 1995),(Taylor and Zabin 1997),(Taylor and Zabin 1997).

¹² The volume authorized by SEMARNAP for each ejido is influenced by the size of the Forest Area, but is also determined by combination of natural and anthropogenic factors including soil type, disturbances such as hurricanes and milpa plots (which create the necessary conditions for regeneration), and past overexploitation.

¹³ Even in those ejidos where some hardwoods are sold, there is little or no participation in harvesting. The main buyer for tropical hardwoods in the Zona Maya region even brings his own chainsaw operators to the ejido.

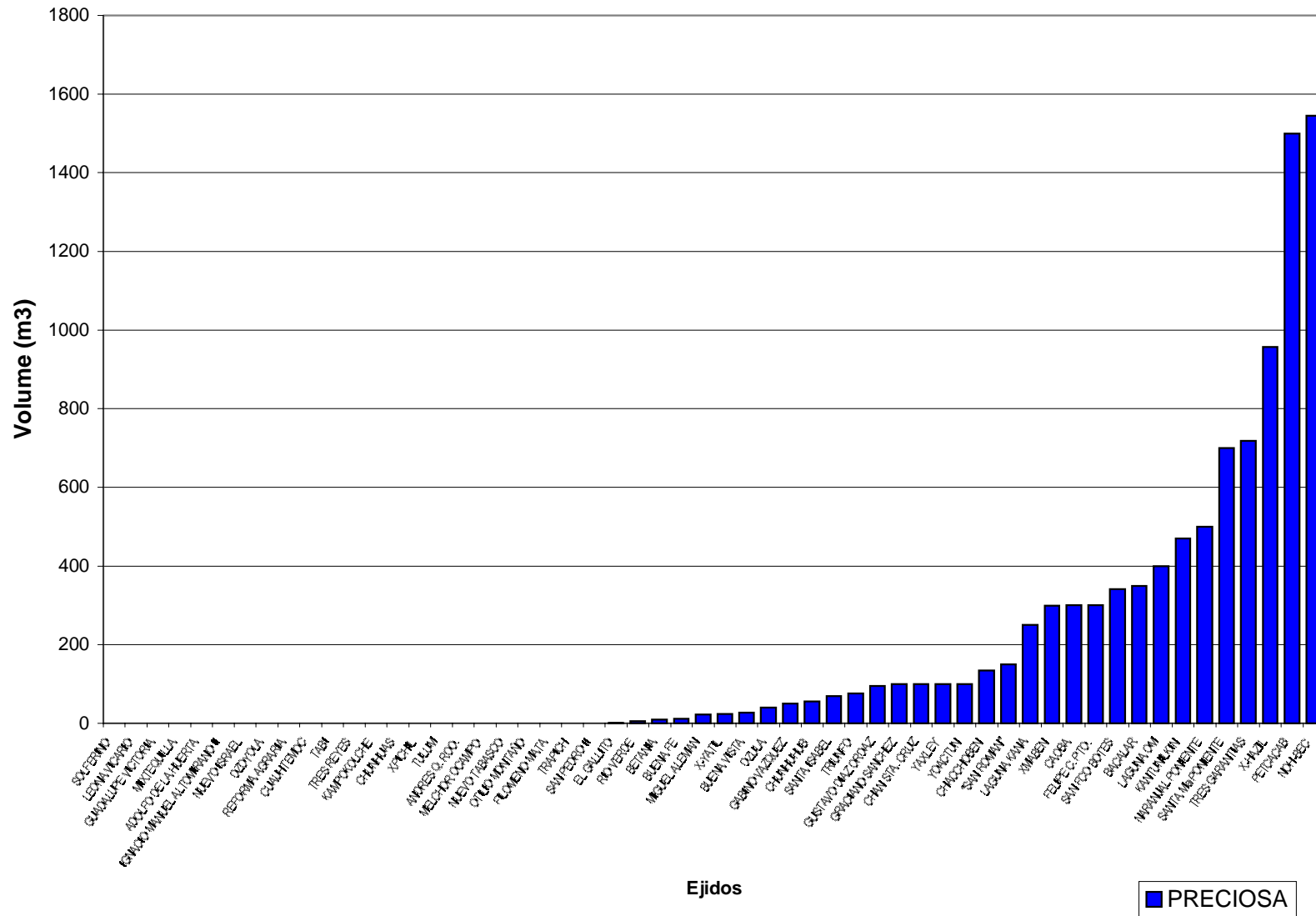
Recent work by Calderon (1999) observed attitudes toward forestry in a small ejido with no mahogany permit. He found that 100% of ejidatarios interviewed did not perceive that the creation of a Permanent Forest Area had affected their income in any way, and 77% said that they made no use of products from the PFA, nor benefited from it in any way. Armijo and Robertos (1998) found that income from forestry in this ejido - Guadalupe Victoria -represented 1% of the total ejido income, as compared the ejido of Petcacab where 50% of global income was generated by forestry activities. Guadalupe Victoria has no permit to harvest mahogany; Petcacab has 1499m³ per year. The ability of such ejidos to generate employment, capitalize the forest business, distribute large profits to their members and invest in infrastructure is greatly enhanced by the guaranteed income from mahogany sales¹⁴.

SEMARNAP figures demonstrate graphically the variation in the availability of mahogany among the different ejidos (Figure 1). 23 ejidos (41%) have no annual permit to harvest *preciosas*. Only 13 ejidos have annual permits for *preciosas* of 300m³ or greater. The two ejidos with the greatest volumes of mahogany are Noh Bec and Petcacab (figure 1) which are also among the most well-known, most visited ejidos. They have volumes of over 1400m³; over 50% more than any other ejido. They continue to be targeted for support and proposed as 'models' for the smaller ejidos of the region, despite showing this extreme difference in natural capital. Ejidos with smaller volumes (generally also being much smaller ejidos) tend to receive far few visits from government officials, researchers and independent funders interested in forestry and resource management, and yet they surely require distinct policy interventions from their larger neighbors.

It is undoubtedly true that these larger ejidos (with annual mahogany permits of at least 300m³) manage extensive forest areas and together represent 51% of the total of Permanent Forest Areas. However, this still leaves a significant area of forested land; 247,881 ha or 49% of the Permanent Forest Area in Quintana Roo under the management of ejidos that often generate minimal economic benefit from timber extraction. Far less is known about resource management in these ejidos.

¹⁴ It is accepted that there are many other factors which determine their ability to convert this natural capital into a sustainable forest business. However, they have a considerable advantage over any other ejido under current circumstances.

Figure 1. Authorized Harvesting Volumes. "Preciosas" (Mahogany and Spanish Cedar). Ejidos Only. Quintana Roo. 1999



b) Support to Forestry and Ejido Land Management¹⁵.

The importance of on-the-ground support to ejidos with regard to subsequent land management and forestry precedes the PPF. For example the intervention of the federal government program FONAFE¹⁶ in the 1970s allowed many ejidos to increase their participation in forestry long before PPF began, and the legacy of this support has been important in determining the future of forest management in some ejidos. This program financed the acquisition of extraction and processing equipment which in some ejidos today forms the principal capital of their own forest business. They also gave technical back up and provided training for ejidatarios. In those ejidos where the incipient forest business failed to take off, and the equipment was left to rust or sold off, *the most frequently expressed cause was said to be the lack of technical assistance or its premature interruption* along with the funding which accompanied it. (Lanz Herrera et al. 1995). In other words, where technical assistance was discontinued, ejidos were more likely to experience difficulty in remaining active participants in timber processing.

The ejidos were also subject to a great deal of control and supervision from the government via extensionists from the *Reforma Agraria* (RA) until the late 1980s. Forest income was placed in communal funds on behalf of the ejidos, and access to these by the ejidos was controlled. This system has been criticized for the low income it generated, and the mismanagement of funds which was said to occur. It is beyond the scope of this paper to analyze the impact of the RA actions, however, it is possible that this presence at least offered a form of coordination for programs at ejido level, which is absent today¹⁷.

With the PPF came an innovative approach to the relationship between forestry advisors and ejidatarios (Lanz Herrera et al. 1995). In this more collegiate relationship the advances and setbacks of the early years were jointly appraised and the process of learning was often inverted; that is, the forest technicians took on board the knowledge of the *campesinos* (Lanz Herrera et al. 1995). This interaction between advisors and *campesinos* was once described as "*el acompañamiento de la gente*" (the accompaniment of the *campesinos*) to emphasize its distinction from top-down extension-style work (Deocundo Acopa, pers. com. 1999). Forest technicians worked with a flexibility rarely seen in government assistance programs¹⁸. Those first PPF communities, benefiting from a period of heavy financial support from GTZ and the state and federal governments received intense technical and promotional support (Janka 1997) during which time important land zoning was carried out, and systems of administration and operation put in place. This has *not* been the case for the majority of

¹⁵ Here I refer mainly to the presence of trainers, facilitators and extension workers in the ejidos. Obviously this is partly dictated by the level of supportiveness by state and national governments. See Vargas 1998 for an analysis the interaction between government reformists and local communities in the Quintana Roo forestry sector.

¹⁶ Fondo Nacional de Fomento Ejidal (FONAFE)

¹⁷ Personal communication Peter Wilshusen

¹⁸ For example, the suggestion to create a *Consejo Consultativo* (advisory council), while accepted in many ejidos was rejected in Noh Bec, where an alternative system of decision making was designed. (Pers com Deocundo Acopa, 1999)

other ejidos who took up forest management under a less supportive political climate¹⁹. The forestry Societies have found themselves struggling to pay the salaries of the forest technicians and priority is necessarily given to fundraising, and even contract work for independent ejidos over such tasks as consensus building, conflict resolution, and priority definition within the communities.

Since the communities which received most support (technical and for organization and decision-making) were also those about which most PPF reports and conference papers were written, this constitutes another bias regarding the situation across the ejidos of the State. Far less is known about those ejidos who did not receive intense technical and organizational support at the time they drew up forest management plans.

The following section analyzes the case of one ejido which is more representative of those ejidos that did not form a part of the first phase of the PPF. San Ramon²⁰ is one of the 43 of ejidos in Quintana Roo with a annual permit for less than 300m³ of mahogany. It has not been subject to intense organizational support for forest management. Using information from interviews with ejidatarios and committee members, the community's system of access to land, forest management, and rule-making is analyzed. Certain emphasis is placed on the historical context, considered vital to an understanding of the social and institutional situation within the community and to the development of forestry activities, since it can explain many of the present organizational structures, current land use patterns and attitudes regarding forest management. The study is also able to illustrate the early impacts of the recent changes in agrarian legislation and how this is influencing attitudes toward land use in the community.

4. A Case study of a Forest Ejido in Quintana Roo²¹

4.1 The Community:

The ejido of San Roman covers a total area of 21,756ha, and has an estimated population of 2,800 (Beck 1999), of whom 236 are ejidatarios. The non-*ejidatario* population is estimated to be at least 200 families and is growing due to in-migration and natural population growth.

The ejido was founded in 1942 on the extraction of *chicle* resin from the chicozapote tree (*Manilkara chicozapote*), for the production of chewing gum. The felling of mahogany and other timbers by international timber merchants also took place. The principal economic activities today are *milpa* agriculture, backyard animal rearing, 'mechanized' agriculture (using tractors to prepare the land), cattle farming, beekeeping and fruit and vegetable production (citrus fruits, watermelon, chili).

San Roman is located on the main state highway and is one of the closest ejidos to the southern stretch of the Quintana Roo coastline, currently earmarked for major tourism

¹⁹ There has even been hostility toward some forestry societies from recent state governments (Bray 1999)

²⁰ The name San Ramon is a pseudonym.

²¹ For details of field work see Annex 3

development as the 'Costa Maya'. This has already attracted a few workers to the area through the early road building projects, and can be expected to further encourage immigration.

4.2 Community cohesion, access to land, and rule making.

a. Community cohesion

The population (ejidatarios and non-ejdiatarios) is highly heterogeneous with regard to ethnic origin (Yucatec maya and mestizo) , state of origin (in the case of the non-Maya) and length of time in the community. The Yucatec Mayan language is rarely heard within the community; being mainly used by older people. The principal language, and that used in assemblies is Spanish. The origin of the individuals is significant, and to a certain extent determines social status within the community. The town itself has also developed a series of informal divisions among settlers; house construction and the names of the *colonias* betraying the ethnic division of living space: the mayan-style oval, thatched homes of the Yucatécans are grouped together and one area is known as the *Colonia Veracruzana* (Veracruz estate). The ejido is therefore not only heterogeneous, but segregated. Further heterogeneity exists in religious practices, with 8 different religious groups represented in the ejido²².

The residents of San Roman make a distinction between at least 4 different groups within the ejido with relation to their status and access to land.

<i>Ejidatarios</i>	236 (of whom 14 are women). With rights to land and a profit share of forestry activities. Obligations to carry out communal tasks (<i>faenas</i>), pay quotas and attend monthly assemblies. Since PROCEDE ²³ they consider that each has a right to approximately 40 ha of land for farming.
<i>Repobladores</i>	Community members who are on a type of "waiting list" for acceptance as ejidatarios. There were 68 people on this list. This may include sons and daughters of ejidatarios. They are expected to attend assemblies (but may not vote), take part in <i>faenas</i> and pay quotas. Considered to be entitled to 20 ha of land. Some people complain of having been on this list for years and never having been accepted as an ejidatario.
<i>Hijos de Ejidatarios</i> (sons and daughters of ejidatarios)	No official list exists, but this status carries considerable weight, and preference may be given to <i>hijos</i> in decisions determining access to land, to forest resources and to inclusion as an ejidatario.
<i>Avencindados</i>	Those residents with no formal land rights; they may be new arrivals who have not yet applied to become repobladores or residents who do not require access to agricultural land (such as teachers or merchants), only a housing plot (<i>terreno urbano</i>). This also includes landless laborers who have not been granted access to land, or who have lost their rights.

²² personal communication Carmen Cruz, 1999.

²³ The government land certification and titling program.

b. Written Internal Norms

The ejido has no up-to-date *reglamento interno*; the internal written norms drawn up in the community which determine the rules and sanctions governing access to natural resources, conflict resolution, the buying and selling of land, and the privileges and obligations of ejido membership. The *Procuraduría Agraria* (PA) provided support to draw up new norms, and a committee of 20 was named for this purpose. However, little progress has been made over the last year due to internal conflicts. The PA will not participate while unresolved internal disputes exist; the ejido therefore still requires a considerable internal capacity to determine rules and sanctions, which at present it is unable to demonstrate.

Ejido assemblies are held monthly and are well attended, but are not perceived by members to be an agile mechanism for discussion nor decision making. Several powerful families dominate, and in private, ejidatarios expressed the futility of speaking out which may invite backlash or criticism.

There are groups who don't agree, but they are afraid.....[those who dominate] simply ask for opinions..."what do you say *compañeros*?"..And everyone shouts "yes", but there's a group at the back who are not in agreement (ejidatario)

If you speak up they get angry with you. Outside of the meeting, afterwards, they get angry with you (ejidataria)

The ejido authorities have not kept up to date the register of members held by the Registro Agraria Nacional in which all ejidatarios should be listed. There are no clear rules about the incorporation of new members. For example, in late 1999 the ejidatarios voted to accept the entry of 96 new ejidatarios. Subsequently there were disputes over this and heated arguments in the assemblies amid suggestions of favoritism by the authorities and inconsistency in the selection of new members. In January 2000, the entire ejido committee was expelled after just 6 months of their 3 year term due to a failure to convince the assembly of good financial management, and the case of the new ejidatarios was also shelved.

In general there is suspicion of community leaders, who have tended to belong to one or two families; referred to by some as "*caciques*".

The ejido can't prosper because the *comisariados* are very sly and they take the lions share. The only thing left for the rest is to work very hard. All the wealthy men in the ejido are those who've been members of the ejido authorities. (ejidatario)

c. Summary

There is uncertainty regarding the system for accepting new ejido members. There is no real participation in modifying operational rules, which themselves are unclear to many members. Conflict resolution mechanisms, in the form of ejido assemblies are

inadequate and there is little confidence in the community leaders. Thus the ejido has been unable to develop much capacity for internal administration and organization.

4.3 Natural Resource Management

a. Farming systems and access to land

Agriculture is the principal economic activity in the ejido. There is considerable diversity among the population with regard to the type of agriculture practiced, and the area of land being worked by each farmer.

During interviews carried out in the ejido half of the ejidatarios reported that they had less than 4 hectares under cultivation in any one year. The majority of this agricultural land is referred to as *espeque*, a reference to the planting tool used to make a hole in the rocky soil; i.e. it is farmed by hand. Several of these ejidatarios reported that they were managing up to 20 ha in total; the remainder being in fallow, or under mature tree cover. In some cases their plots form part of the so-called "Permanent Forest Area" and have been included in the forest inventories. Many of them consider that they have been actively conserving this forested land and are resentful of encroachment, be it in the form of firewood, palm or post extraction, or timber harvesting by the ejido.

Some ejidatarios also have land in a number of tractor-friendly areas known as "*el mecanizado*", where mechanical preparation of the soil permits two crops of maize a year. These areas of land are the result of a forest clearance program (*Programa Nacional de Desmontes*) of the 1970s. The cultivation projects they promoted were not successful and some of the 120 ha cleared have now reverted to secondary forest.

One third of ejidatarios interviewed had between 4 and 20 ha in production, and around 10-15% had over 30 ha. There are a handful of ejidatarios who are known to have over 60ha in a combination of pasture, *espeque* and mechanized land. (They include the owners of the only 2 tractors in the ejido). They have invariably purchased land from other ejidatarios, and this tends to be relatively close to the town. Ejidatarios such as these, with mechanized land or pasture, have plots which are more easily demarcated and identified than those who practice a rotation with fallow. It is important to note is that these *campesinos* have also tended to occupy positions in the ejido authority, despite being the minority.

Those residents who do not have usufruct rights (*repobladores, avecindados*) may be allocated ejido land, or be lent or rented land by an ejidatario or the authorities. There is no official parceling, nor has the ejido undertaken an exercise of "*parcelamiento económico*", or internal parceling. However, in practice there is a well-entrenched land-use system, in which individual areas (*ranchos*) are known and respected, and buying and selling of land among ejidatarios has taken place and is sanctioned by the ejido.

There are 30 livestock farmers in the community, with approximately 3.7% (774 ha) of the total land area dedicated to pasture. The activity is growing; there was an increase of 700% (from 119 to 830) in the number of cattle over a 9 year period. 27 of the 30 livestock farmers are ejidatarios. In a workshop to discuss cattle ranching, participants

expressed their frustration that current policies prohibit the clearing of medium or high forest which limits the expansion their livestock production. One also expressed anger that international organizations have promoted the conservation of tropical forests, being the "lungs of the world", which has led to a restriction of their economic growth. At least one livestock farmer, who is an extremely influential figure in the community, is known to have illegally converted medium forest to pasture in the past 5 years.

b. Management of Timber extraction.

Table 1 gives a brief outline of the history of natural resource management in the community since its establishment in the 1930s. Despite the donation of a sawmill and extraction equipment the ejido never managed to capitalize its forest management activity nor develop it sufficiently for it to be a principal income or employment generator.

The ejido has a Permanent Forest Area of 12,500ha; or 57% of the total area. However this is not clearly delimited. The harvestable volume of mahogany has authorized as 150m³ for the past 7 years with around 1,300m³ of hardwoods and 200m³ of softwoods (Figure 2). Data for 1999 show that while all mahogany was extracted, no softwood and less than 1% (2m³) of hardwood was sold (Figure 3). 18% (26m³) of pole wood (*palizada*) was harvested. The ejido sells its standing volume to a contractor who brings the extraction equipment necessary. Processing takes place off site. The only ejido labor required is in tree-spotting, and occasionally in felling. Ejidatarios reported radically different estimates for the 1998 profit sharing from timber sales, ranging from between NM\$300-400 to NM\$1000²⁴. The ejido is not actively engaged in the search for markets for timber, but relies on approaches from regular buyers in Chetumal.

c. Forest Protection; Fires and Illegal Felling

The ejido has achieved notoriety as one with a history of serious fire problems. Major forest fires were reported in 1994 and 1996 and evidence from satellite images suggests that they affected several hundred hectares. In 1998 fires also destroyed part of a silvicultural experiment being carried out by the Forestry Society and Iowa State University²⁵. The ejidatarios suggest that several of the fires began in the Biosphere reserve and show resentment towards their carrying the burden of extinguishing them. They stated that all the ejidatarios collaborate to extinguish fires. However they have no equipment, no specific brigades and visual evidence suggests that some fires were only stopped from spreading by roads forming incidental firebreaks. The problem of extensive fires may be a symptom of a lack of cooperation within the community, or the low perceived value of the collective forest resource.

At least 8 people interviewed considered that clandestine felling was carried out by the ejido leaders themselves. One informant; himself an ex-member of the ejido committee commented that it was justifiable, given that they receive no salary, and need to cover

²⁴ Approximately US\$100 at the time. Payments are usually made before Christmas and once the timber is sold (between February and May).

²⁵ Communication Personal Patricia Negreros Castillo.

their administration costs somehow²⁶. Others cited the enormous increase in visible wealth of the present authorities as a sign of their corruption. The ejido has an outstanding case of a charge of over-harvesting registered with the natural resource protection agency PROFEPA²⁷.

²⁶ Ejido authorities need to make frequent trips to the capital to deal with government officials, carry out legal transactions, or knock on doors for potential funding.

²⁷ Procuraduría Federal de Protección al Ambiente

Table 1. A Brief History of Natural Resource Management in San Roman

Approximate date or period	
1930s	The first settlers lived in <i>Chicle</i> -tappers camps and arrived from Yucatán, Veracruz, Guatemala and Belize.
1946	The ejido was legally constituted. Around 45 ejidatarios and their families lived in a <i>chicle</i> camp called Sabanitas.
1957	Following a huge and devastating hurricane in 1955, the settlers moved to higher ground to the site of the current town. As a result of the trees lost in the hurricane a ban on <i>chicle</i> harvesting was imposed which lasted 10 years. A permit of 1000m ³ for timber was authorized. Contractors moved in to harvest the timber downed in the storms.
1950s and 60s	Colonization programs increased the ejido population to 80 ejidatarios and caused some resentment within the ejido. The colonists came principally from Michoacan and Guerrero and were offered 50 ha of land each, plus financial support. Eventually after about 5 years they were given ejidatario status.
1970s	Federal government mechanization schemes cleared over 120 ha of forest to promote commercial agriculture and livestock rearing. The principal activities remained <i>Chicle</i> , <i>milpa</i> , hunting and some cattle farming.
1972	A government program of ejido support (FONAFE) installed a sawmill designed to process hardwoods for railway ties or sawn wood. They also donated a tree-harvester and vehicles. The ejido generated jobs in the production of railroad ties and producers paid a quota to the ejido authorities. Mahogany continued to be harvested by contractors.
1983	The sawmill fell into disuse. Railroad ties continued to be made, but by axe. Around 4-500 ties were made in the ejido every year. This was the only outlet for tropical hardwoods.
1987	The ejido joined an organization of forest producers who carried out forest inventories and applied for harvest permits for the ejido. The timber industry was now fully in the hands of the ejido and profits were distributed among the ejidatarios. However there were now around 180 ejidatarios and the licensed volume dropped to 150m ³ due to new inventory data so profit sharing was minimal. In the next 12 years the ejido never advanced beyond selling the standing timber, and therefore gained very little value added. A few seasonal jobs were generated in tree spotting (<i>monteo</i>), and felling but the extraction and transport machinery was never maintained was sold off in the period 1993-96. Reforestation was usually carried out as an obligatory community activity (<i>faena</i>).
1999	Since 1997 there is no longer a market for <i>chicle</i> , nor for railroad ties. The ejido has a license to harvest 150m ³ of mahogany and 1700m ³ of hard and softwoods, but normally only manages to sell the mahogany and a smaller volume of hardwoods. The ejido contracts a timber company to harvest the wood, and therefore benefits little from employment. Permits are now issued for Poles (<i>palizada</i>) and some sales have been made. However, no steps toward their organized extraction have been taken.

Figure 1. Authorized Timber Volumes for "San Roman" 1993-1999

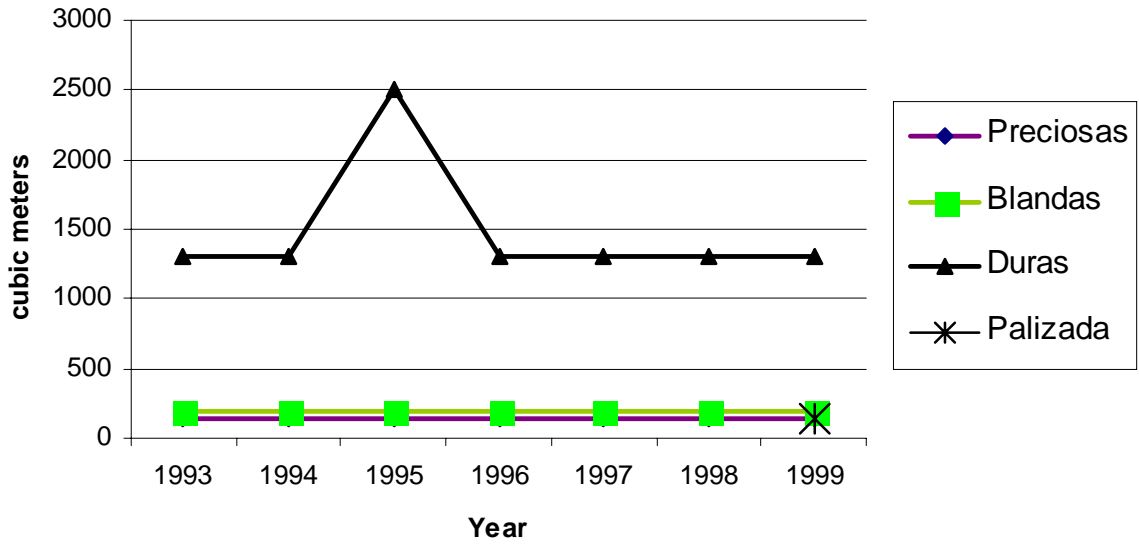
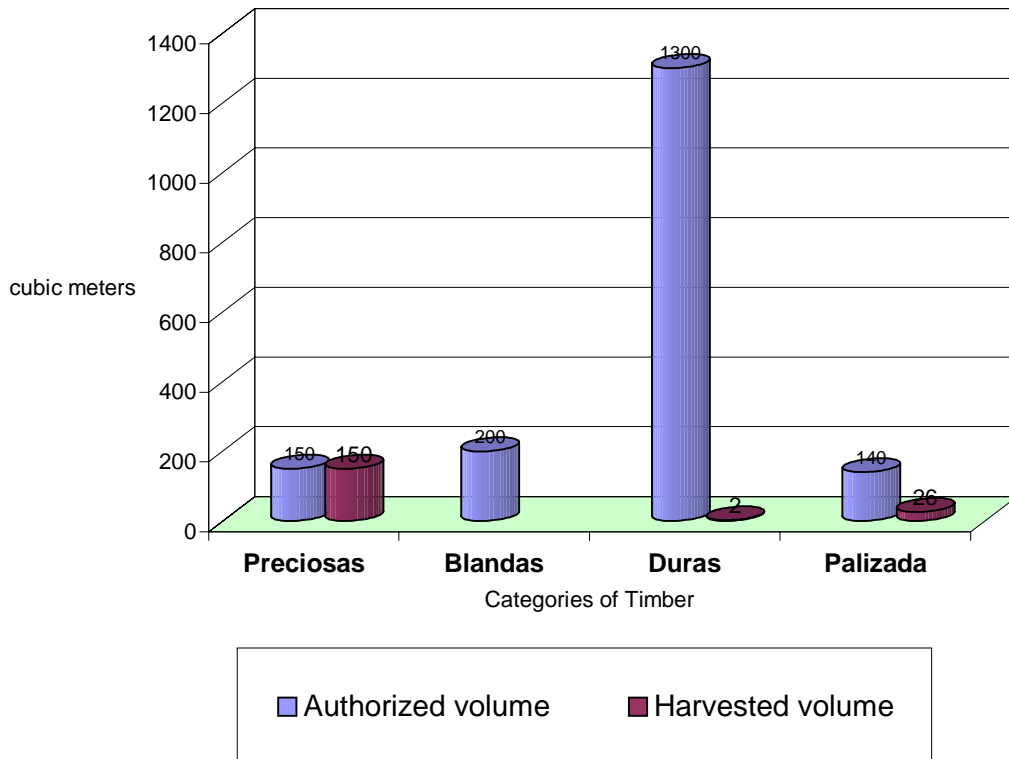


Figure 2. Authorized vs Harvested Volumes of Timber Ejido "San Roman" 1999
data source. SEMARNAP



d. Access Rules and Attitudes Toward Forest Management

Most residents stated that ejido norms include the use of firebreaks when clearing an agricultural plot. There was no consensus over rules of access to mahogany for domestic use. Some said that this was prohibited, others that ejidatarios could fell one or two trees per year. Most ejidatarios said there was unlimited access to non timber products for the whole community, but some non-ejidatarios claim to have been charged for access to palm and poles for domestic use. There was a recent incident in which an ejidatario who had previously sought permission for cutting two mahoganies was found to have cut six. There was much debate over this case, in which members of the ejido authorities were also implicated. The wood was eventually confiscated by these authorities without penalty. These same leaders were replaced a few months later.

In interviews ejidatarios demonstrated a very partial understanding of the forest management process, and almost no recognition of a Permanent Forest Area, which was frequently identified as the small fire-damaged area where reforestation is taking place, rather than the 12,500ha zone which is officially registered as an PFA. Only a couple of people take part in tree-spotting and chainsawing and there are no other regular paid activities in the forest. However most ejidatarios were aware that the ejido has a 150m³ permit for mahogany and had taken part in reforestation activities. Many ejidatarios felt that timber in "their own plots" was at risk from community felling and this limited their interest in tree planting.

"If I plant trees they are going to cut them down, and take them from me, because its communal".

e. Summary

In summary there is confusion over the regulation of access to forest products and the boundary of the common pool resource (the Permanent Forest Area) is not defined. Those rules which exist are not monitored for compliance, and sanctions are perceived to be unevenly applied. Ejidatario reports suggest that there has been a decline in the quality of the forest resource due to a number of serious fires and some over-cutting of timber. A relatively low volume of mahogany and unreliable markets for other species mean that economic benefit, proposed by the PPF model to be the main motive for interest in conservation, is minimal. In general the forest resource is not valued by the community members as a source of current *nor* future income. In some cases, rather than be seen as a potential benefit, ejido-level forest extraction is perceived as 'poaching' by some ejidatarios. Furthermore forest cover has now been identified by some as a hindrance to agricultural development in which the ejidos pay for benefits received elsewhere.

4.3 Land titling and Certification. Attitudes and impacts in the ejido.

a. The impact of PROCEDE

The ejido took part in the land certification and titling program PROCEDE²⁸ during 1998/99. The entry of PROCEDE into the community was favorably viewed, since it was widely considered to have been a response to a dispute with a *campesino* from a neighboring ejido, which was resolved in favor of the ejido. PROCEDE measured and marked all the outer boundaries, *área urbana* and the *área de uso común* and produced a plan which shows their location. No distinction between agricultural and forested land is made and the PFA is not indicated. Ejidatarios were then given their "*certificados de derecho de uso común*". The proposal by PROCEDE to offer titles to the plot holders in the town (*solares*) was rejected; said to be "due to fear of taxation that might follow".

In general there was evidence of a very partial understanding of the options open to the ejidatarios and almost no understanding of forest law nor the land titling process, except among one or two key actors who are *ex-ejido* presidents. Many of the ejidatarios, having received a *certificado de derecho de uso común* were aware that they were entitled to 0.32% of the communal lands, and had been told that this was roughly equivalent to 40 ha each. Some had also heard that the *re pobladores* would be entitled to 20 ha each.

The ejidatarios of San Roman had divided opinions over land parceling; still a much discussed topic even since PROCEDE finished their work. Those **in favor of parceling** cited the following reasons:

- There would be access to bank credits, with the land as collateral
- The ejido authorities would stop stealing the trees from their land.
- They would feel like it was their own, and therefore manage it better.
 - ..that way one would work with love. It would be different because it would be one's own
- They would be able to better regulate access:
 - The problem with being an ejidatario is that despite having a piece of land anybody can go in and exploit [the resources] such as palm and poles. People go in, even though there are clear boundaries.
- They could plant trees, and know they were for their children.

²⁸ Article 27 of the Mexican Constitution (established 1917) was modified in 1992 to end land redistribution and permit the sale, rent or mortgage of their land by ejidatarios. The amendments allow an ejido, by act of general assembly, to allocate individual agricultural land parcels to its members, although it does not permit *common lands* to be parceled or sold (Key et al. 1998). Article 59 of the 1992 Agrarian Law specifically prohibits the parceling of forests. PROCEDE (Programa de Certificación de Parcelas Ejidales y Titularización de Solares Urbanos) is one of the main vehicles for change in the agrarian law. This federal program was begun in 1993 with the aim of providing "legal security regarding ejidal and communal land tenure" ((Preciado Jiménez 2000), Those ejidos which decide to participate in the program may do so in several ways; receiving certificates for their individual agricultural plots (*parcelas*), and/or for their urban area land (*solares*) and/or certificates of rights to joint usage (*certificados de derechos de uso común*). Once the land is certified ejidatarios may seek authorization for the full ownership of their land (Rivera Herrejón 2000).

Those **against land parceling** cite:

- The variation in quality of land, which might lead to unfair distribution.
- Fear that the government would then charge taxes on the land.
- That it would be difficult to do fairly given that some people already have several small plots in different parts of the ejido.
- That there is so little value (in forestry terms) in the remaining forest area that it is not worth while.
- That communal management is the best way; everyone benefits.

b. The future of forested areas

Since awareness of a forest management area was so low and there is no consensus over the extension and boundaries of the PFA there was predictably little reference to the future management of this area in conversation with the ejidatarios about parceling. One member of the ejido authority suggested that even if they decided to parcel the ejido up to 15% of the ejido would remain as communal land, which would consist of a reforestation area in a fire-damaged part of the ejido. This would be a major reduction of the 57% currently registered as Permanent Forest Area.

Representatives from SEMARNAP and the *Produraduría Agraria* (PA) took part in an ejido assembly during which they explained that despite the interest in parceling, the ejido is effectively subject to a "double ban"; firstly for their location in a region of "tropical forest" and secondly for having a forestry reserve (PFA)²⁹. They explained that a piece of land was considered to have forest cover when there are more than 25 trees per ha, with a diameter of more than 20cm, or where the basal area exceeds 20m². They added that this generally included *acahuales* (fallows) more than 20-30 years old. Some ejidatarios responded angrily:

The government is using us for forest guards.

There are areas where we - the cattle ranchers - are destroying it. But I can't afford the luxury of enjoying the forests.

The representatives from SEMARNAP and the PA modified their statements saying that "if there are areas where there is no longer forest, this can be shown in a sketch map...SEMARNAP then issues a feasibility report which is presented for consideration to the PROCEDE State Working Group". Furthermore, they explained that it is feasible for the assembly to authorize the certification of certain individual's plots; such as those which are cultivated by tractor (*los mecanizados*), without necessarily certifying plots for all ejidatarios. In other words, it was suggested that plots which have been cleared may be parceled and given titles. This generated interest among some of the ejidatarios with large areas under pasture and with tractor-prepared land.

At one point an ejidatarios asked "can't the PA advise us?", to which the representative replied "we *are* advising you"; referring to his presence in the assembly. But the

²⁹ Personal Communication RS, SEMARNAP. Ejido Assembly June 1999.

assembly ended with many unanswered questions and the majority continued to be confused over what was possible in their specific case.

c. Summary

While the intervention of PROCEDE has not yet led to any parceling - even in the urban plots, it has generated considerable discussion about land tenure and promoted ejido-level debates about the clearance of forested land. There is considerable interest among ejidatarios in obtaining certificates for agricultural land, and thus dividing up some of what is currently communal land. Current legislation will make this difficult, although it is still possible that those with clearly demarcated, non-forested plots will be able to do so. Those with considerable forest cover in their plots will be prevented from obtaining certificates; which may act as an incentive to deforest. Indeed, those who have broken the law by deforesting to create pasture, may even be "rewarded" under this system.

4.4 Support for ejido-level land use planning.

a. Experiences of land use planning and organization.

Most ejidatarios are unaware that their ejido belongs to a supra-ejidal producer organization which provides forestry technical services. The foresters and extension workers have no regular presence in the community and their work is currently limited to authorizing harvesting and the supply of plants for agroforestry and small plantations. They offer no support to community organization, land-use decision making, administration and conflict resolution. For a period of at least six years, until 1999, this Society was in conflict with the state government. They suffered harassment and financial limitations, which certainly had repercussions for their presence in the ejidos. Some ejidatarios and commentators have even suggested that the case of over-harvesting outstanding against San Roman was part of a politically motivated campaign against the Society.

Over a period of five months a team of researchers, that included the author, worked in the ejido to promote a process of reflection and planning around the central theme of land use³⁰. During this process it became clear that there was a great deal of interest in the discussions, but little experience of taking a holistic view of the ejido. Most of the participants, several of whom were ex-authority members, had a very partial view of the ejido, based only on their own economic activities. Participants were also unfamiliar with maps of their community, and large parts of the ejido was unknown territory for them: for several, the transect walks the researchers organized were the first time they had visited the forest harvesting areas, the limits of the ejido, the *cenotes* and the silvicultural experiments.

It was observed that extension workers who visited the ejido during the study period attended only small groups or individuals and in no way discussed general land use, communal area management, nor the impact of individual projects on other land uses.

³⁰ See Annex 3 for details.

b. Summary

It is clear that the ejido has received little support with regard to capacity building for administration, internal communication, decision making and production organization. The supra-ejidal organization to which San Roman belongs has been unable to provide the sort of close technician-*campesino* relationship promoted by the PPF model. The majority of the ejidatarios have not participated in the forest management nor land use decision-making which has been dominated by a few individuals. Most government-supported action in the community is directed at individuals or smaller producer groups. Nevertheless the ejido remains a critical organ of decision making regarding land use; given its role in approving or rejecting proposals such as those to parcel individual plots, to alter the size of the forest area or to develop further ejido-level activities such as pole and palm cutting.

5. Conclusions

The above case study illustrates the precarious situation of community-based timber extraction in one ejido in Quintana Roo. This can be attributed to a number of factors. One is the low income obtained from forest management, due to the combination of a small volume of mahogany, the absence of a market for railroad ties, the collapse of the chicle market, and the difficulties of finding buyers for the lesser-known hard and soft woods. Furthermore, historically this ejido only ever had a forest tradition of extraction, as opposed to silvicultural management. The lack of technical and organizational support in the 1970s and 1980s allowed the forestry infrastructure to fall into disrepair. Despite its membership of a supra-ejidal organization in the later 1980s the ejido could not reverse its fortunes, since such a small volume of mahogany was not enough to generate a forestry management culture, capitalize the business and create jobs and income. The political crisis of the supra-ejidal organization and a history of *caciquismo* exacerbated the situation; most ejido members never took ownership of a forest management plan, nor reconciled forest extraction with their own agricultural systems.

It seems likely that this situation is representative of many other ejidos in the state. As previously mentioned, 43 ejidos (76% of ejidos with permits) have low volumes of mahogany (less than 300m³ per year) and SEMARNAP figures show that the pattern of sales in San Ramon is in keeping with those for the state as a whole (Annex 4). 93% of the authorized volume for *preciosas* is harvested annually, but only 40% of softwoods and 12% of hardwoods find a market. Essentially those ejidos with authorized volumes of *preciosas* are the only ones guaranteed an income from timber extraction. In many of these ejidos awareness of forest management and attitudes toward land parceling could be expected to be similar to opinions expressed in San Roman. The need to support alternatives to timber for adding economic value to the forests, recognized for some time, has now become critical given the collapse of the market for railway ties and *chicle* and the continuing shortage of markets for lesser known species.

This paper also highlights the complexity of the relationship at the forest - agriculture interface. It tends to be assumed that all ejidos carrying out forest management have 2 clear land use zones: a Permanent Forest Area and a remaining agricultural zone in which land is divided into agricultural plots. However this case study, and observation in

other communities, suggests that in many cases the PFA is not a contiguous block, but the combined area of most of the remaining stands of mature forest, *whether or not they are considered to be part of the land worked by an individual or family*. There remains a knowledge gap over the *real* relationship between forestry and agriculture and many questions regarding the impact of recent agricultural sedenterization packages on the milpa-forest interface. Useful answers however, will only be found if researchers can peel away the myth of a clearly delimited PFA and find a more realistic starting point.

There is a clear need to strengthen the internal capacity of ejidos to carry out land use decision making: to analyze the various options and resolve conflicts as they arise. 18 years on from the PPF the foresters who work in the ejidos are no longer supported by government salaries and international aid funds. They are no longer able to "accompany" the *campesinos*. They are overworked and understaffed and rely on quotas from timber extraction. This situation is therefore most acute in those Societies whose member ejidos sell little or no timber. In most ejidos, but particularly in those, there is now little or no presence of foresters or NGO workers to offer guidance or training related to the discussion of land management.

The lack of capacity for land use decision making at ejido level has become critical due to the recent change in Agrarian Law and the Mexican constitution. The findings of this study reinforce the viewpoint of Key et al (1998) who conclude that with these reforms and the greater autonomy in management given to ejidos, "endogenous ability to cooperate becomes the determinant of quality management of ejido affairs, particularly of common pool resources" (p42). Similarly it concurs with the conclusion that assistance is needed to help ejidos to cooperate over land use and management, and crucially to permit the accumulated social capital to develop new institutions and organizations capable of supporting the ejidatarios in their new forms of working (Key et al. 1998).

Not only is support required, but it is evident that priority should be given to those ejidos that are carrying out little or no forestry management (as identifiable by no or low permits for mahogany) and where the stability of the AFP is under greatest threat. There, an internal process of defining priorities and being proactive in the search for alternatives should be encouraged. In that respect, much of the model used by the PPF in the early 1980s needs to be resurrected; in particular there should be a return to the more collegiate form of *campesino*-technician relationship promoted by the PPF. However, it is essential that this be accompanied by political support to ejido self-determination, which translates into a coordinated, consistent presence in the communities. This analysis of the current situation, where no such presence is felt, suggests that forest management in many ejidos of Quintana Roo - the vanguard of tropical community forestry - is at an important crossroads.

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Annex 1 Map of Ejidos which are members of Supra-ejidal Forest Management or Conservation Organizations.