SELF-ORGANIZATION, LINKAGES AND DRIVERS OF CHANGE: STRATEGIES FOR DEVELOPMENT IN NUEVO SAN JUAN, MEXICO

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A Thesis
Submitted to the Faculty of Graduate Studies in Partial Fulfillment of the
Requirements for the Degree of

Master of Natural Resources Management

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Abstract

This thesis analyzes the characteristics of community-based management systems to promote both environmental conservation and rural development. in particular, community structures for self-organization and adaptation, and their evolution in relation to changing community perspectives and policy trends. The community-based forest management system of Nuevo San Juan, Michoacán, Mexico, which is more than two decades old, is the central case study. Through the exploration of structures of self-organization, and the identification and analysis of cross-scale linkages and drivers of change, I explore the case in some depth and provide details on the beginning, management trends and evolution of the communal appropriation of resources. During a period of close to three months, using methods inspired by Participatory Rural Appraisal (PRA), field data were gathered through approximately one hundred field interviews with community members and others linked to the case.

San Juan's intricate management system includes the exploitation of timber and non-timber forest products through a communal enterprise. Community members of San Juan came together to create a communal management system to solve their local socio-economic problems. The community, unlike many others in Michoacán and Mexico, has been able to maintain the forest resource base and contribute to the generation of employment and socio-economic development in the municipality. New leadership trends and exogenous factors, however, are modifying management processes and previously established trends. The findings indicate that enabling federal legislation, together with leadership and social capacity, can and do contribute to community self-organization. Moreover, linkages at various levels help to strengthen and consolidate community-based management systems and increase their capacity for adaptation to deal with pressure from external drivers. In addition, the findings suggest that a high level of system resilience, clear institutional and organizational structures, and proper government recognition and legal jurisdiction are not sufficient conditions for a successful communal management system. Other conditions, such as the application of core cultural and other values at the individual, community and institutional levels are also necessary to maintain community well-being and cohesion.

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To thank all the persons directly and indirectly involved in the development of the fieldwork and thesis is simply not possible. However, in the interest of giving at least some recognition to all of them I would like to say:

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" We cannot segregate the human heart from the environment outside us and say that once one of these is reformed everything will be improved. Man is organic with the world. His inner life moulds the environment and is itself also deeply affected by it. The one acts upon the other and every abiding change in the life of man is the result of these mutual reactions".

Shogui Effendi

(Quoted in: Conservation of the Earth's Resources. Universal House of Justice, 1989)

To my Dearest Elham and Lance

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List of Frequently Used Terms

AG:	Municipal Government Agencies
CEPAMISA:	Paper Company of Michoacán
CBRMSs:	Community-based resource management systems
CBSs:	Community-based systems
CDI:	National Commission for the Development of Indigenous Peoples
CFEM:	Forestry Commission of the State of Michoacán
COINBIO:	Biodiversity Conservation Project
CNC:	National Peasant Confederation
EI:	Equator Initiative
FONAES:	National Fund of Enterprises in Solidarity
FSC:	Forest Stewardship Council
GIS:	Geographic Information Systems
ICDPs:	Integrated conservation and development projects
INI:	National Indigenous Institute – replace by CDI.
LC:	Local Cooperatives from Nuevo San Juan
MP:	Municipal Presidency
MA:	Millennium Ecosystem Assessment
NRI:	Natural Resources Institute, University of Manitoba
PAN:	National Action Party
PROCEDE:	Program for the Certification and Registry of Ejidal and urban land tenure rights
PROCECOM:	Program for the Certification and Registry of Communal land tenure rights
PROCYMAF:	Forest Res. Conservation and Sustainable Man. Project
PRA:	Participatory Rural Appraisal
PRI:	Institutional Revolutionary Party
PRD:	Democratic Revolutionary Party
RM:	Rigoberta Menchu Foundation
SAGARPA:	Rural Development Subsecretariat
SEMARNAT:	Environment and Natural Resources Secretariat
SEDESOL:	Social and Human Development Subsecretariat
SEF:	Timber Extraction Company
SEDAGRO:	Agricultural and Livestock Dev. Secretariat
SRA:	Agrarian Reform Secretariat
SSIs:	Semi-structure interviews
UNDP:	United Nations Development Program
UNAM – CIECO:	Autonomous University of Mexico - Centro de Investigaciones en Ecosystemas
UECIFOMET:	Union of Ejidos and Indigenous Communities Luis Echeverria Alvarez
WB:	World Bank

Chapter 1: Introduction

1.1 Context of the Research

In a large number of countries development practitioners face the challenge of promoting the sustainable use of natural resources while providing solutions to the socio-economic problems of highly impoverished areas. Parallel to this situation, there exist locally designed indigenous/community enterprises that, using different perspectives and methodologies, have developed resource management systems able to satisfy local needs and protect key ecological processes. Some critics of these kinds of indigenous/local enterprises argue that conservation and development objectives cannot be linked and that it is too ambitious to believe that biodiversity can be used and at the same time conserved (Redford and Richter, 1999).

Thus, there is a need to analyze the characteristics and contributions of these conservation-development systems. There is also a need for learning whether such apparent incompatibility between conservation and development comes as a result of external drivers such as market forces (Millennium Ecosystem Assessment, 2003), and/or is due to the lack of the appropriate institutions to foster and channel the community efforts, to bring about and reinforce the required cross-scale linkages, and to help the enterprises to adapt to changes and reorganize (that is, be resilient) over time. The present document intends to contribute to the analysis of the effectiveness of these enterprises to foster long-term development while protecting the environment, by presenting the results of field research carried out in Mexico. The analysis describes the main characteristics of the communal enterprise of Nuevo San Juan, Michoacán. The community of Nuevo San Juan has created an enterprise that is trying to promote the sustainable management of a temperate forest. It represents a case of the integration of conservation and development objectives, backed by strategic partnerships contributing to dealing with internal and external drivers of change.

The research findings illustrate how through the process of community organization the leaders of San Juan brought to reality their vision of a community united to drive their own development. They show the approach used by San Juan in the development of the resource management system and the way these leaders identified

the use and management of resources and the strengthening of local institutions as the twin processes necessary to establish a long-lasting system. Other aspects such as the approach used to maintain economic relevance over time and to deal with drivers of change are expanded upon. The analysis emphasizes the way the case has evolved and the impacts that such evolutionary changes have in the resilience of the system. The finding and analysis are framed in complexity and resilience theory.

1.2 Purpose and Objectives of the Research

The purpose of the proposed research was to identify and analyze the characteristics of the Nuevo San Juan community-based resource management system (CBRMS) and how institutional and organizational arrangements and linkages contribute to the support of the system. The research attempts, moreover, to contribute to the development of a general description of the elements and arrangements present in successful CBRMSs. There were three objectives, regarding self-organization, cross-scale linkages and drivers of change.

1. Self-Organization

To describe key characteristics of the community-based system from Nuevo San Juan, including the processes and elements of self-organization, the integration of scientific and local knowledge, and local leadership.

Self-organization is seen as the process by which progressively organized cycles of negative and positive feedbacks developed as a result of the energy and information being received and given by the system, and that allow the system to build the required structures to adapt and survive over time (Waltner-Toews, 2004). It is considered as a primary characteristic of systems that are complex in nature and is applicable to biological, social and social-ecological systems (Berkes et al., 2003). As such, the study of the self-organization, integration of western and local knowledge, and local leadership of Nuevo San Juan could bring to light the ways in which the system deals with internal complexities such as multiple stakeholders and interests, and absorbs and adapts (is resilient) to environmental, social, political and economic influences, while maintaining its inner characteristics. In the analysis of complexity, the identification of the different

subsystems that make-up the social-ecological system is important to understand the whole (Berkes et al, 2003).

The self-organization of the Nuevo San Juan CBRMS, moreover, is the foundation of whatever contribution the community-based system has to offer in the path of researching more sustainable ways of promoting development and conservation. The objective, therefore, addresses the identification and understanding of the elements present in the institutional arrangements, and the overall local structure for management of natural resources that make the local system work and allow it to reorganize over time.

2. Cross-scale Linkages

To identify and analyze the institutional and organizational cross-scale linkages that Nuevo San Juan has developed with agencies and organizations and how these linkages affect the local management system.

Understanding the relationship of institutions at different levels of organization is central to the analysis of the strength of systems. Institutions present in Nuevo San Juan and their link to institutions and organizations at other scales, therefore, were analyzed to comprehend the dynamics and the way they affect the system. This deep understanding of the cross-scale linkages is important in the identification of institutions and approaches for conservation and development that minimize undesirable feedbacks across scales and help in the balance between local, national and international needs. The objective focused on the elements present in the institutional and organizational linkages and the way they enhance or inhibit local management strategies over time.

3. Drivers of Change

To identify drivers that help or hinder the development of the Nuevo San Juan system, including policies for poverty reduction and environmental protection.

As the Millennium Ecosystems Assessment states, "the understanding of the factors causing changes to ecosystems and ecosystem services is essential to the

design of interventions that enhance positive and minimize negative impacts" (MA, 2003. p.85). The study of the factors affecting the CBRMS becomes important for identifying outcomes of previously established development policies, strategies, and programs in and for developing regions and to offer a deeper analysis on the foundation of institutions that better fit social-ecological systems facing current conservation and development challenges. The study of these external drivers centered around the identification and understanding of the strategies/programs/actors affecting the performance of CBRMSs and their strategies to reduce poverty and protect the environment.

1.3 Significance of the Research

Numerous researchers concur in affirming the existence of relatively small groups/communities around the world managing resources successfully through the establishment of varied institutional arrangements and linkages (Grima and Berkes, 1989; Ostrom et al., 1999; Barret et al., 2001; Brown, 2002). These institutions typically deal with a multiplicity of stakeholders and interests, external drivers and internal environmental and social changes, and at the same time have demonstrated their capacity to balance livelihood needs with conservation of natural diversity. Extensive research has been directed to study what makes these systems succeed or fail in their goals of development and conservation, and to describe the systems in general. However, because most research on the areas of institutional linkages and self-organization of community-based systems is relatively new, more information is needed on the underlying characteristics of institutional arrangements, linkages and impacts of policy on the systems. Some of these underlying aspects include resilience of the systems, foundation of management strategies, etc., which are easier to discover in long-term documented cases.

The Nuevo San Juan community-based system (See Figure 1 for a map of the location of the communal land of San Juan) has received much attention from national and international agencies for its achievements in alleviating poverty at the community level while managing its ecosystems sustainably. The system was established more than two decades ago. It has been extensively documented in many areas such as:

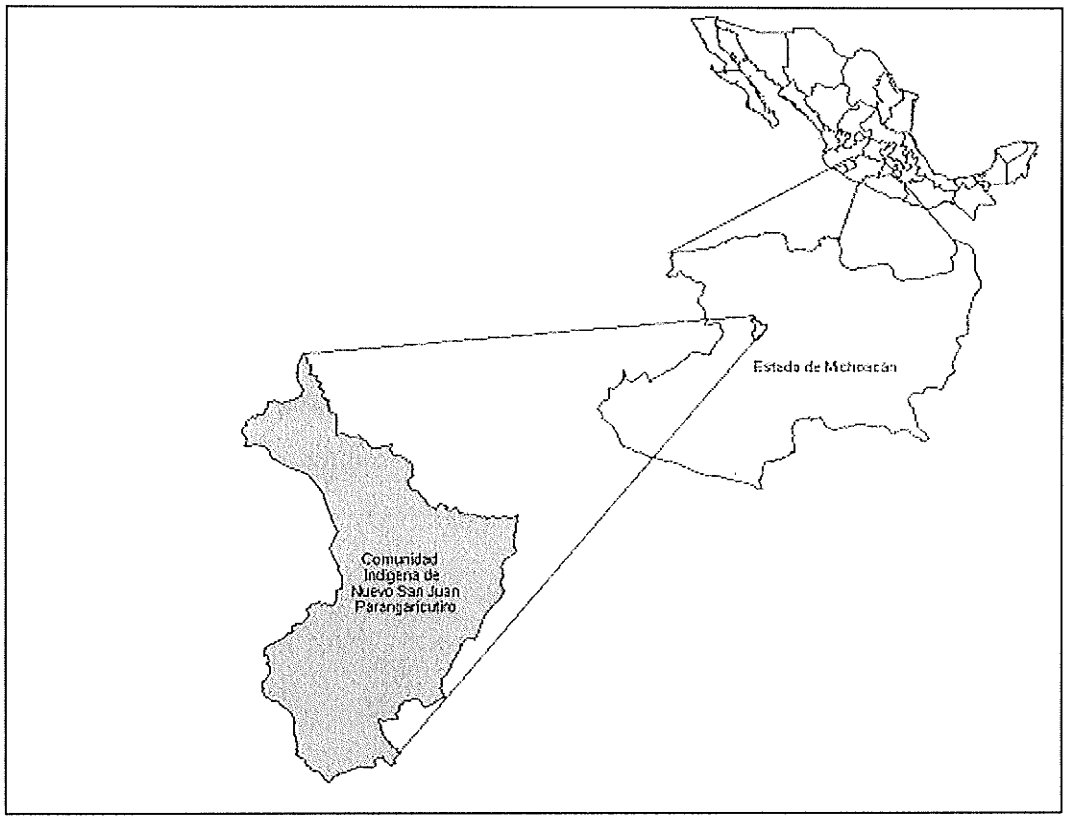

Figure 1. Communal land of Nuevo San Juan located on the Northwest of Michoacán in the central region of Mexico. Source: Velasquez et al., 2003.

- The catalysts and factors that inspired the creation/strengthening of the system (Pego, 1995; Bocco and Toledo, 1997; Torres et al., 2003).
- Community dynamics, including involvement of disadvantaged groups and agencies (Pego, 1995; Garibay and Bocco, 2003)
- Socio-economic impacts of development (Pego, 1995; González et al., 2003)
- Biodiversity protection (Chávez et al., 2003; Fregoso et al., 2003; González et al., 2003; Monroy et al., 2003; Sánchez et al., 2003; Sosa, 2003; Torres et al., 2003).
- Awareness, funds raised and other support from local, national and international organizations (Pego, 1995; Bocco and Toledo, 1997; Bocco et al., 1998; Castillo and Toledo, 2000; Rosete and Bocco, 2003; Rosete et al., 2003) and
- Factors of the system and partner organizations that led to the success of the system, including characteristics of the local institutions and monitoring and management systems, among others (Pego, 1995; Castillo and Toledo, 2000; Barraza and Ceda-Adame, 2003; Cortés et al., 2003; Garibay and Bocco, 2003; Olguín et al., 2003; Pulido and Bocco, 2003; Torres and Velásquez, 2003).

However, detailed research and analysis on underlying aspects of the community organization process, the resource management system strategies and cross-scale linkages and resilience of the system could be useful to deepen the understanding of the case.

Nuevo San Juan at the present time shows stability and progressive outcomes. Such a system, designed and started by local people and currently supported by national and international organizations, has been able to overcome constant changes in the Mexican economy including the rise of an open market system and varying degrees of support from successive governments. Such a system deserves closer investigation to identify underlying factors that contribute to its maintenance and adaptability over time and its resilience. In this perspective the analysis of self-organization and leadership, among other factors, would make significant contributions to understanding how peasant and aboriginal cultures can cope with change and survive in an era of globalization. Moreover, the study of the linkages between Nuevo San Juan and other organizations and institutions and the way they limit or support the system, could shed light on strategies to face the challenge of establishing more appropriate policies and institutions (North, 1990; Brown, 2003) to deal with current complex environmental and socio-economic problems (Ludwig et al., 1993; Meyer and Helfman, 1993; Holling and Meffe, 1996).

1.4 Limitations of the Study

Taking in consideration that there is a large body of research on the characteristics and successes of the Nuevo San Juan case in reducing poverty and maintaining the resource base (eg. Pego, 1995; Chávez et al., 2003; Fregoso et al., 2003; Garibay and Bocco, 2003; González et al., 2003; Monroy et al., 2003; Sánchez et al., 2003; Sosa, 2003; Torres et al., 2003), no large efforts were made to expand on these aspects of the case.

The study and analysis of the research findings is based primarily on contributions from community members, government agencies, organizations and consultants linked directly and indirectly to the Nuevo San Juan community-based system. However, the field research was not designed to provide a comprehensive

analysis of all the possibly relevant characteristics of the social-ecological system, but to give a synopsis of key components of the system and their relevance over time.

1.5 Definitions

In order to facilitate a clear presentation of ideas, the definitions of some key terms framing the analysis of the case are presented below.

The term ***conventional management approaches*** refers to management systems inspired by Western science or reductionist thinking. All the other systems are referred here as community-based or indigenous management systems.

The terms ***systems, complex systems*** **and** ***social-ecological systems*** are used interchangeably except when other meanings are indicated. Even though Integrated Conservation and Development Projects (ICDPs) and community-based systems combine conservation and development goals, they are divided in this review. The researcher's assumptions are that ICDPs are, most of the time, initially championed by organizations and agencies and then adopted by communities. On the other hand, ***community-based systems***, ***community-based resource management systems***, and/or ***communal management systems*** are assumed to be long-standing management strategies that are for more than satisfying human needs and conserving resources; they are ways of living and interacting with the environment. ***Self-organization*** and ***community organization process***, are considered the methods and adaptive strategies through which San Juan leads the construction of its own institutional and organizational structures.

The term ***institutions***, as used here, refers to a "complex of norms and behaviors that persists over time by serving some socially valued purpose, while an organization is a structure of recognized and accepted roles (Uphoff 1986: 8-9). "Institutions can be organizations, and vice versa. Marriage, for example, is an institution that is not an organization, while a particular family is an organization (with roles) but not an institution (with longevity and legitimacy). 'The family', on the other hand, is both an institution and an organization" (Uphoff 1992, p. 3). For example, some local level bodies in San Juan such as the General Assembly are considered here as institutions. Administrative bodies such as the enterprise's management area, is a local organization

but not an institution, but abides by ***institutional arrangements*** and/or institutions at the operational level.

The ***Comuneros*** and ***community of comuneros*** refer to the members of the indigenous group whose list was officially recognized as owners of the communal land under a Presidential resolution in 1991. Unless otherwise indicated, the phrase ***community members*** applies more broadly to indicate both comuneros and persons living within the Municipality. The term ***communal enterprise*** is used to mean both the resource management processes and the built infrastructure. ***Shareholders*** of the communal enterprise refers to the different interest groups – including cooperatives – and all other ***comuneros*** that are directly and indirectly owners of the communal enterprise. The term ***stakeholders***, on the other hand, makes reference to the various interest groups, organizations and agencies at the different levels, which are linked to the communal enterprise and contribute to or limit its internal resource management processes.

Drivers are defined as "any natural or human induced factor that directly or indirectly causes a change in an ecosystem" (MA, 2003, p. 86) or, for the purpose of this document, that causes changes in San Juan institutional and organizational structures.

By ***community leaders*** and ***administrators*** is meant the comuneros that have occupied positions in the institutions and organizations present in San Juan.

1.6 Organization of the Thesis

After introducing the main components of the research in Chapter 1, Chapter 2 examines some of the empirical and theoretical concepts and perceptions on development and management approaches and systems that integrate conservation and development. This examination is accompanied by the exploration of theory related to complex systems and finally linked to the objectives of the present study. Chapter 3, after presenting a brief overview of the research approach, expands on the details of the case and the field research plan and methodology applied to gather and verify data. Key information on community members and outsiders involved in the research and a description of challenges faced during the research are also included in the chapter. Chapter 4 provides a general perspective of the Mexican policy environment and its

legislative outcomes during the 1ast century and their impact on community-based management systems. Moreover, Chapter 4 introduces some of the findings on the case; in particular, it provides an overview of the community of San Juan, its institutions and its community-based management system. Chapter 5 presents key findings on the three objectives of the research, and brief analyses, based on the data gathered through interviews. Chapter 6 contains brief summaries and conclusions, mentions some contributions from other authors about the case and explores some of the theoretical implications of the research findings here presented.

Chapter 2: Theoretical and Empirical Perspectives Framing the Research

2.1 Introduction

Having as its main goal the introduction of the key elements of theory and empirical findings in the areas of conservation and development, this section briefly describes the evolution in thinking on conceptions and management of social and ecological systems. It starts by defining the characteristics of linear and of systems thinking, and the way each have inspired management approaches. The guiding principles of these management approaches, especially of more recent approaches inspired by systems thinking is analyzed in some detail. This detailed analysis attempts to make the connection between these new management strategies and the objectives of the proposed research. After identifying the research areas, successes and limitations of new approaches such as integrated conservation and development projects (ICDPs) and community-based systems are discussed. Certain attributes of systems such as self-organization, scale and unpredictability are analyzed in some detail and identified as key to understand the resilience of systems and their institutions. In addition to the study of the attributes of complex systems, the influence that external drivers have over these systems is also identified as a research topic that must accompany the study of the internal characteristics of social-ecological systems. From the discussions and review of literature presented throughout this section, it becomes easy to understand how important it is to be open minded and willing to learn more about long-standing local or indigenous systems that have achieved numerous conservation and development goals by designing appropriate management strategies for complex social-ecological systems.

2.2 Foundations of Management Approaches

2.2.1 Conventional Management Approaches

Reductionist thinking was developed three centuries ago and aims at the "analysis of the parts to understand the whole" (Capra, 1996, p 19). It eventually became the basis for conventional resource management approaches. This reductionist approach, led by scientists such as Descartes and Newton, started and grew into the so-called "scientific revolution". In reductionist thinking, systems were thought of as

controllable and predictable units that could be measured and analyzed by sciences such as mathematics (Capra 1996; Holling et al., 1998).

The changes brought about by the reductionist vision have helped in the solution of a large range of common problems and have contributed to the existence of modern technology, but at the same time inspired the traditional resource management approaches, based on the assumption that behavior of natural systems could be predicted. Under this paradigm the dominant motivation became to develop the correct tools, through scientific research, to control the dynamics of ecosystems (Holling and Meffe, 1996). The desire to regulate nature, assuming that the parts of its ecosystems could be individually managed, be easily understood, and possess predictable reactions, has shaped the design of management objectives (Holling and Meffe, 1996; Usher, 1987). Moreover, strong convictions among scientists about the inevitable depletion of common resources if left under community control, which they believed lacked institutional capacity, backed decisions to centralize management (Ostrom et al., 1999). Government agencies, international development agencies and multinational corporations with the support of scientists led these conventional management systems, which were established to promote development but also conservation. Their objectives, which were fixed on the maximization of production through large-scale resource exploitation and of biodiversity protection through exclusion of humans from ecosystems – "fortress conservation" – were adopted, causing alteration to and often replacing community-based/indigenous management systems and their land tenure rights (Ostrom 1990; Kellert et al. 2000).

Currently, the history of resource exploitation in most developed and developing areas around the globe and the periodic problems being faced to achieve the development goals of rural areas, together with the inability of conservation approaches, such as the creation of protected areas, to maintain the ecological integrity of natural systems have directed the attention of social and ecological scientists towards more holistic strategies to deal with the complexities of social and ecological systems.

2.2.2 Shift in Paradigms: Towards a Holistic View

The depletion of numerous resources and the accrual of benefits to a few powerful interest groups looking for short term profit, on the one hand, and the fallen angel of "exclusionary conservation" in highly impoverished areas, on the other, have shown the low utility of reductionist scientific approaches as single-focus methods, to contribute to the design of strategies to deal with ecological and social systems. In contrast to the reductionist and mechanistic worldview of conventional resource management science emerges the systems approach to resource management. Meyer and Helfman (1993), describing the challenges being faced by resource managers and the repetitive failures of reductionist thinking to foster sustainability, have argued for the need to take a broader perspective – a systems perspective – to design more sustainable resource management approaches. They also indicate that the human component must be considered when dealing with ecological issues.

Holling et al. (1998) explain how the systems approach integrates all the scientific knowledge available about the system and about the technology that has been developed to manage the system, in order to construct and evaluate hypotheses about the outcomes of planned and unplanned interventions. The objective in systems thinking is then primarily related to understanding the complex nature of systems. It assumes that complete knowledge does not exist and management practices need to change with the changes in the system over scales of time and space.

The systems approach is interdisciplinary. It uses historical, comparative and experimental data, at the appropriate scales, to identify groups of adaptive responses to the surprises and uncertainty inherent in complex systems (Holling et al., 1998). Actions that address the complexity of these systems consider the needs of the societies interacting with ecosystems, but also the needs of ecosystems to maintain their healthy conditions. Berkes et al. (2003) indicate that among the inherent attributes of complex systems are uncertainty, self-organization and scale. External drivers, the study of which also helps in the understanding of dynamics in complex systems, in turn influence these attributes.

2.2.3 Emergence of New Management Approaches

2.2.3.1 Management Approaches Integrating Conservation and Development Goals

There have been numerous strategies to achieve conservation and development goals. Some these strategies have established collaborative management and other arrangements in an effort to share responsibility for resources in some cases, and or to counteract top-down exclusionary conservation approaches – "fortress conservation". Bell (1987) and Brown (2002) explain that fortress conservation approaches have failed in their conservation goals essentially because by emphasizing long-term societal benefits at the expense of short-term community benefits they inadvertently promote inequity. On the other hand, even though co-management has encouraged shared responsibility for the management of natural resources by involving user groups in decision-making, implementation and regulation processes, among other activities, there is the need to integrate other institutional and organizational components to ensure sustainable management. To understand the successes and failures of these sort of new management strategies, two approaches will be analyzed in more depth: Integrated Conservation and Development Projects (ICDPs) and community-based management systems.

2.2.3.2 Integrated Conservation and Development Projects (ICDPs)

Wells and Brandon (1992) indicate that ICDPs emerge to promote sustainable development through the resolution of the conflict of interest between livelihood activities and conservation objectives. They explain that essentially these projects aim at protecting biodiversity by integrating management of protected areas with the socio-economic needs of the people inhabiting or surrounding the targeted ecosystems.

Salafsky and Wollenberg (2000) describe how ICDPs attempt to integrate the demands created by livelihoods with conservation objectives. Linking conservation and livelihoods has been pursued mainly through the application of two approaches characterized by indirect linkage – where communities are encouraged to find alternative livelihood activities outside and around park areas – and direct linkage – where communities are inhabiting and/or carrying out productive activities inside conservation areas (Salafsky and Wollenberg, 2000). The essential assumption in ICDPs is that

people will conserve natural resources if they receive benefits from them and/or for them.

The conclusions made by Wells and Brandon (1992) about challenges faced by ICDPs are summarized below:

Design and implementation: the need to ensure the consistency between conservation goals and development activities. Real challenges have been faced to promote livelihood activities that, going beyond the satisfaction of human needs, are also able to persuade communities to change behavior harmful towards the resources that protected areas are trying to conserve. Moreover, implementing agencies and organizations often lack the required capacity and legal jurisdiction to carry out the projects, as well as the institutional and organizational cross-scale linkages needed.

Empowerment of local people: Objectives related to local participation must pass from being just a catch-phrase in the design of ICDPs to being a seriously implemented process. This local involvement must be done through all stages of ICDPs.

Monitoring and Evaluation: ICDPs must be evaluated in relation to the achievements of their conservation goals. Scale also plays an important role. It is not enough to deal with communities surrounding the conservation area; consultation and agreement at higher levels is required.

Wells and Brandon (1992), identifying lessons that have been learned, recognize that there are actors and forces at other scales that often make it impossible for ICDPs to achieve conservation goals. Among these actors and forces are external drivers supporting overexploitation of resources, and policies and institutions that rural communities cannot influence.

Brown (2002) also mentions how ICDPs are often unsuccessful for a number of reasons: assumptions about communities, which are sometimes treated as homogeneous groups of persons with the same needs and interests; community involvement, which more often is a popular phrase in project documents than a reality at the field level; lack of empowerment of local people, which does not allow community members to have control/ownership over their sources of livelihoods and their lives;

institutions at various scales and decision-making structures that limit or disregard community participation and consider communities as homogeneous.

The thorough analyses presented by Wells and Brandon (1992) and Brown (2002) address with clarity the issues of scale, complexity, nested institutions and community involvement as fundamental characteristics of social-ecological systems in which ICDPs are applied.

2.2.3.3 Community-based Management and Conservation Approaches

Alcorn (1993, p.424) comments that even though conservation is a "social and political process", it needs to be based on real options. Working with local people to achieve conservation is a real option. Alcorn (1993) indicates that indigenous communities have a legitimate concern for conserving healthy ecosystems, possess deep knowledge about ecosystems and their species and have established institutions to enforce their conservation and management systems. She moreover states that there is a need for strengthening the institutional cross-scale linkages between governments and indigenous groups to achieve better management of ecosystems. This can be done by empowering communities and helping them to participate in the political processes and management decisions that relate to their lands.

Usher (1987), talking about the link between wildlife and indigenous groups in the Canadian north, argues that economic activities such as hunting and trapping are not valued just for the volume of the harvest, but that they are a part of the people's culture and experience. These economic activities, he mentions, as well as being the basis of their economic system are also at the core of their social life. Usher, moreover, argues that long and well established aboriginal systems with their non-formal processes and mechanisms should not be taken to be cases of non-management or of lack of law enforcement and responsibility. Northern native cultures posses resource management structures linked to their cosmology and values, which conceive the environment and its components as a linked an integrated whole (Usher, 1987).

Grima and Berkes (1989), and Ostrom et al. (1999) explain the difference between common property regimes and situations of "free for all" (open access). In the former there are institutional structures in place to guide management, and normally

resources are under community control. In the latter, there are no enforcing institutions or the institutions that exist are ineffective.

Toledo et al. (2003) explain that indigenous approaches to the use and management of resources in tropical regions have been overlooked by scientists whose misconceptions labeled indigenous systems as wasteful systems. They explain that this misunderstanding of indigenous systems could be due to the focus scientists put on agricultural systems, excluding all other management activities of ecosystems processes that were and are implicitly and explicitly addressed by indigenous systems. Indigenous systems in Mexico concentrate on production both for subsistence and for sale to local markets (Toledo et al., 2003). As a consequence, indigenous groups often maintain heterogeneous landscapes, which are used for diversified production to meet the needs of the household and local market economies.

Describing the impacts of these indigenous systems, Toledo et al., (2003) mention that scientists have recognized that the mosaic landscapes created by indigenous systems can be considered as a good strategy for degraded or homogenized ecosystems to increase biodiversity. The outcomes for biodiversity protection can be measured by the richness of species being used by indigenous groups. Another of the aspects Toledo et al. (2003) identified was social- ecological resilience, which can be seen by the magnitude of disturbances being absorbed and the way the indigenous systems and their managed landscapes redefine their structures. Under these indigenous systems, human communities and institutions are an active part of the local ecosystems (Toledo et al., 2003).

An examination by Berkes and Adhikari (2006) of 42 cases of community-based natural resources management and biodiversity conservation, all of which were winners of or finalists for the UNDP Equator Initiative Prize indicates that many of the indigenous systems have partnerships at multiple levels. A high degree of emphasis on business networking was discovered. Networking was particularly important in the areas of fundraising in 21 of 42 cases, training and research in 18 of 42, and others such as institution building, technical support, innovations and knowledge transfer, and gender empowerment and equity (Berkes and Adhikari, 2006). Their findings indicate also that NGOs are playing a large role in the field of rural development, with 12 local NGOs and

10 national NGOs helping in the formation and consolidation of some of the 42 indigenous enterprises analyzed.

Castillo and Toledo (2000) describe some community-based systems from Mexico, where most land is under community control. They indicate how many of these systems have successfully integrated traditional ecological knowledge with Western science when designing more sustainable management practices. They also describe how local leadership played a role in the establishment of linkages with institutions and organizations at higher scales, among which were university researchers, government agencies and international development and conservation organizations. All the systems they studied maintained essentially heterogeneous landscapes and had institutional structures that allow them to unify the community's energies towards the common well-being. That is, poaching and other illegal activities are reduced and mostly done by outsiders, and diversified economic activities were benefiting in one way or another almost one hundred percent of the families.

Ostrom et al. (1999) indicate that nested institutional arrangements at different scales are an inherent characteristic of many community-based systems around the world. They indicate that challenges being faced by these community management systems relate in a large part not to the mismanagement of resources – because many of their managed ecosystems continue being important reservoirs of biodiversity – but to the organizational and institutional arrangements at larger scales over which these community systems do not have control and which are driving them to adopt unsustainable management practices in order to survive.

A study of 5 community natural resource management systems by Kellert et al. (2000) indicates that the systems were not always successful in achieving objectives of socio-economic development and biodiversity protection. The authors considered that the cross-scale linkages -institutional and organizational support, the self-organization and financial help- were among the main reasons for the success or failure of the systems.

A study by Toledo (2001) on indigenous cultures and remaining highly biodiverse spots in the world indicates that the most biologically rich areas were also the ones

possessing the highest cultural diversity. Toledo's findings together with the discoveries of the other authors mentioned above show indigenous management systems as having approaches that can offer contributions towards holistic, systemic understanding of the environment and its resources; as systems having institutional arrangements that embrace the complexities inherent in social-ecological systems, and as entities capable of self-organizing over time under varied resource and environmental constrains.

2.3 Exploration of the Research Objectives

2.3.1 Self-Organization

Social and Ecological systems are complex in nature. Holling (2001) explains how the complexity present in social-ecological systems does not emerge from random interconnections among the components and factors of these systems, but is the result of a few controlling processes. Holling (2001) indicates that there is an inherent process of self-organization in complex systems that are able to adapt depending on varied influencing factors. Similarly, Waltner-Toews (2004) defines self-organization as the process by which progressively organized cycles of negative and positive feedbacks develop as a result of the energy and information being received and given by the system, and which allows the system to build the required structures to adapt and survive over time. In Holling's (2001) perspective, the system's mechanisms for self-organization are the key to its sustainability. The reduction of natural variability and diversity (biological and human) in the system erodes these self-organization processes and therefore reduces the capability of the system to adapt to change caused by varying levels of disturbance. Large-scale exploitation of natural resources typically aims at controlling the system through the reduction of its natural variability and diversity and therefore tends to reduce the systems' capacity for self-organization and adaptation. On the other hand, most exclusionary conservation aims at protecting the systems from disturbances (especially human caused) in order to maintain the system's biodiversity, ignoring the fact that intermediate disturbance levels increase the biological diversity of ecosystems and therefore their adaptive capabilities.

Institutional arrangements are considered a fundamental component of social and social-ecological systems, contributing to their adaptive capacity, and therefore their self-organization. Furthermore, it is necessary to identify the subsystems nested in the

system to understand the whole (Berkes et al., 2003). Dietz et al. (2003) list the eight design principles represented in successful common property resource institutions, described originally by Ostrom (1990), and links these principles to their contributions to various aspects of adaptive governance. In Chapter 5, these principles are used as a way to describe and analyze part of the Nuevo San Juan resource management system structure for self-organization. Figure 2 represents these design principles and the areas of adaptive governance they influence most. It is acknowledged that there are authors (e.g., Young 2002) who have criticized these design principles, indicating, among other things, the possible misfit of such design principles at scales higher than the local and the inadequacy of emphasizing universal propositions before the existing universe of complex and hard-to-define institutional arrangements. However, the main point of using the principles in the present thesis is to analyze their applicability in the context of San Juan and how they could be contributing or not to establishing stronger self-organization structures.

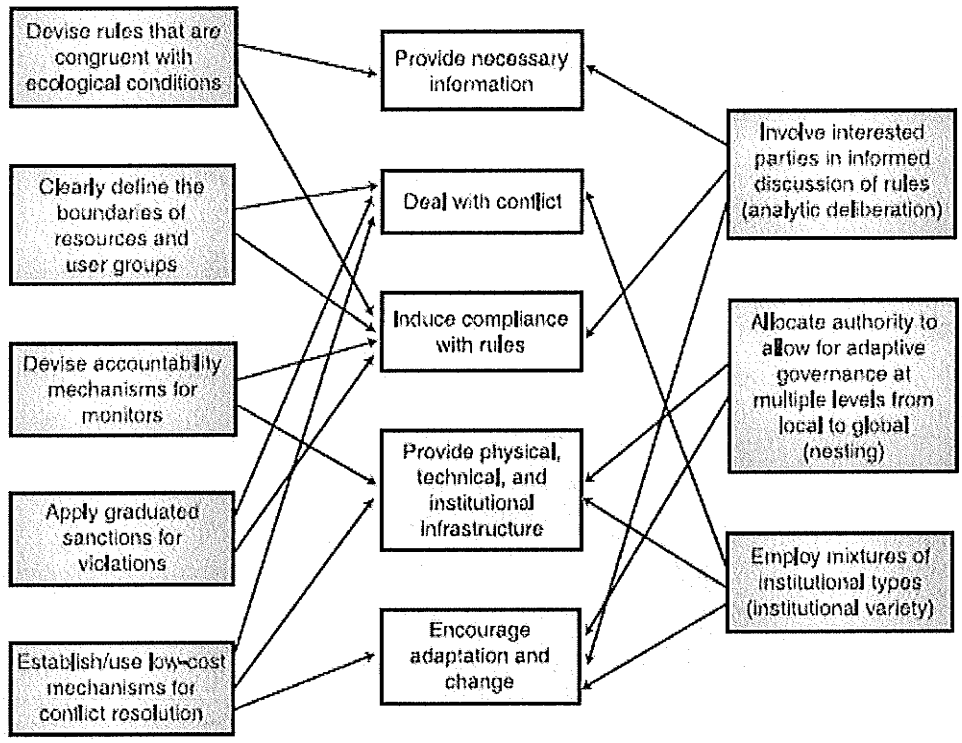

Figure 2. Design Principles and their contribution to adaptive governance. Source: Dietz et al. (2003).

Self-organization is also an attribute that contributes to the resilience of the system. Walker et al. (2004, p. 3) define resilience as "the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks". Berkes et al. (2003) expanding on the importance of considering the whole to be much more than just the sum of its parts, explain how resilience is a property of the system that cannot necessarily be understood by analyzing the systems' components. The study of self-organization then is extremely relevant to understanding how flexible and adaptable the social, ecological or social-ecological system is to deal with unpredictability and survive over time. Understanding institutional arrangements, as key elements in processes of self-organization, can contribute to an understanding of the resilience of a system. The description and analysis of nested institutions is dealt with in some sections of Chapter 5.

2.3.2 Cross-scale Linkages

The processes taking place in ecosystems and the scales at which they occur must be identified to properly analyze the system. In complex systems, interventions may vary strongly depending on the scale at which they are applied. Management approaches at the species scale differ radically from the ones applied to ecosystems or landscapes. The documented negative impacts of management decisions taken based on the needs of a single level appeal for the design of management institutions involving more than one scale. The design of institutions linking various levels, therefore, is vital to address factors influencing or being influenced by more than one scale of time and/or space (Berkes, 2002).

In conventional management, institutions supporting the management approaches tend to be as rigid as the management objectives they aspire to accomplish. As the goals of reductionist management approaches are to reduce variability and stabilize yields of the commodities provided by the environment (Folke et al., 2003), the supporting institutions are also fixed on suppressing variability and promoting stability and homogeneity. In the same way, conventional conservation approaches have been sustained by institutions immersed in the paradigm of protecting nature from both humans and non-human disturbances to maintain biodiversity.

Authors such as Ostrom (1990) and Berkes (2002) have recognized the importance of studying the institutional linkages between different levels and the dynamics of these linkages. Berkes (2002) has identified some of the processes by which higher-level institutions affect local institutions. These processes include centralization of decision making, shifts in systems of knowledge, nationalization of resources, increased participation in markets and development policies.

More direct interventions by higher-level institutions that can impact positively on local institutions include state legitimization of local institutions, enabling legislation, capacity building and institution building (Berkes, 2002). There is no doubt analysis of these interventions is important when studying common property regimes such as community-based management systems. Research on such interventions could help to account for the complexity of human systems, and therefore, could help in the design of interventions to strengthen holistic management of ecosystems and the societies depending on them.

Berkes (2002) also mentions promising types of institutions to link different scales. These institutional arrangements range from simple partnerships such as co-management, where a certain degree of power is shared, to more complex institutions such as multi-stakeholder bodies and policy communities, each of them having different degrees of influence on decision-making processes (Berkes, 2002). He goes further to bring-up some ideas about research and management procedures that could help in linking different scales. These approaches include ecosystem management, adaptive management, participatory rural appraisal (PRA) and participatory action research (PAR).

Robust common property regimes have often been characterized by networks of institutions and sub-systems that constitute part of the social-ecological system's structure for self-organization and, therefore, contribute to the resilience of that system. These local level systems or regimes can be positively or negatively impacted by the processes initiated at higher levels, depending on factors such as the speed of change produced by the processes and the characteristics of the social-ecological system, including key resources that are being managed (Berkes, et al., 2003).

Numerous community-based institutions have applied approaches such as adaptive management[1] when embracing diversity and validating human presence in ecosystems. Their institutions have been interacting with and adapting to interventions from other institutions, with many of them unable to survive to these interventions. It is time to give attention to the regimes of this sort that are still alive to comprehend their systemic vision of the environment and to learn from them key characteristics in the art of managing complexity. The second section of Chapter 5 deals with the kind of institutional and organizational linkages the Nuevo San Juan enterprise has developed.

2.3.3 Drivers of change

Other important forces influencing social and ecological systems are the drivers of change. Under management practices guided by the systems view, the identification of these forces is extremely important, but not always easy to achieve. The Millennium Ecosystem Assessment (2003) explains how the modification of ecosystems services and attributes (see Figure 3 for a list) and the consequent impact on human well-being come from both deliberate and non-deliberate human actions.

The understanding of the forces causing these changes is crucial to design interventions that enhance positive and minimize negative impacts (MA, 2003). These drivers can be endogenous or exogenous depending on scales of time and space. However, by their nature, many drivers are difficult to define and to classify. The MA also distinguishes between direct and indirect drivers, the former being those that clearly affect ecosystems and their services and the latter the ones that affect direct drivers.

The major categories of global driving forces accepted by the MA are demographic, economic, socio-political, scientific and technological, physical and biological drivers. See Figure 4 for a graphic representation.

[1] Adaptive Management considers management strategies, policies and structures as experiments, from which better understanding and learning takes place (Holling and Meffe, 1996).

The MA explains that these drivers seem to be exogenous because their current condition cannot be influenced directly, the changes taking place in them mostly come from cumulative effects of decisions taken at various scales. However, when these drivers are seen within a longer perspective, it is easier to observe how they can be or are influenced by human decisions.

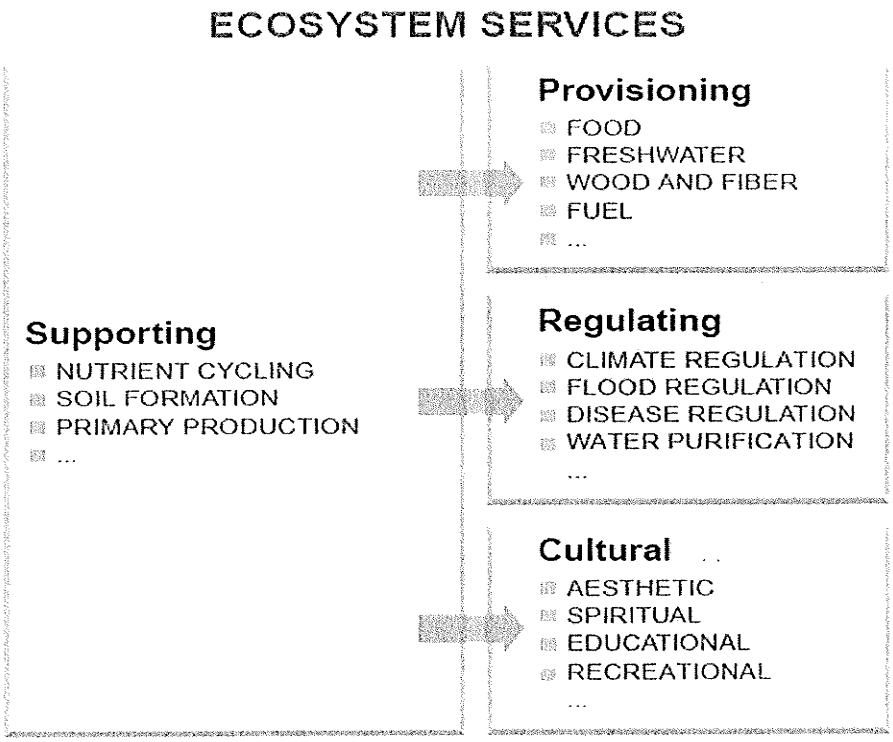

Figure 3. Ecosystem Services. The benefits people obtain from ecosystems. Source: Adapted from MA (2003).

The identification and understanding of these drivers of change is an extremely important research area for the promotion of sustainable development. This topic is particularly relevant when studying community-based systems. Assessments of the successes or failures of many of these systems are frequently based on the effectiveness of their institutions to maintain healthy relationships between humans and ecosystems; however, it is not always evident that even well founded common property regimes have been seriously undermined or have disappeared due to exogenous drivers. Such drivers, together with cross-scale linkages and self-organization of community-based systems, deserve to be researched further.

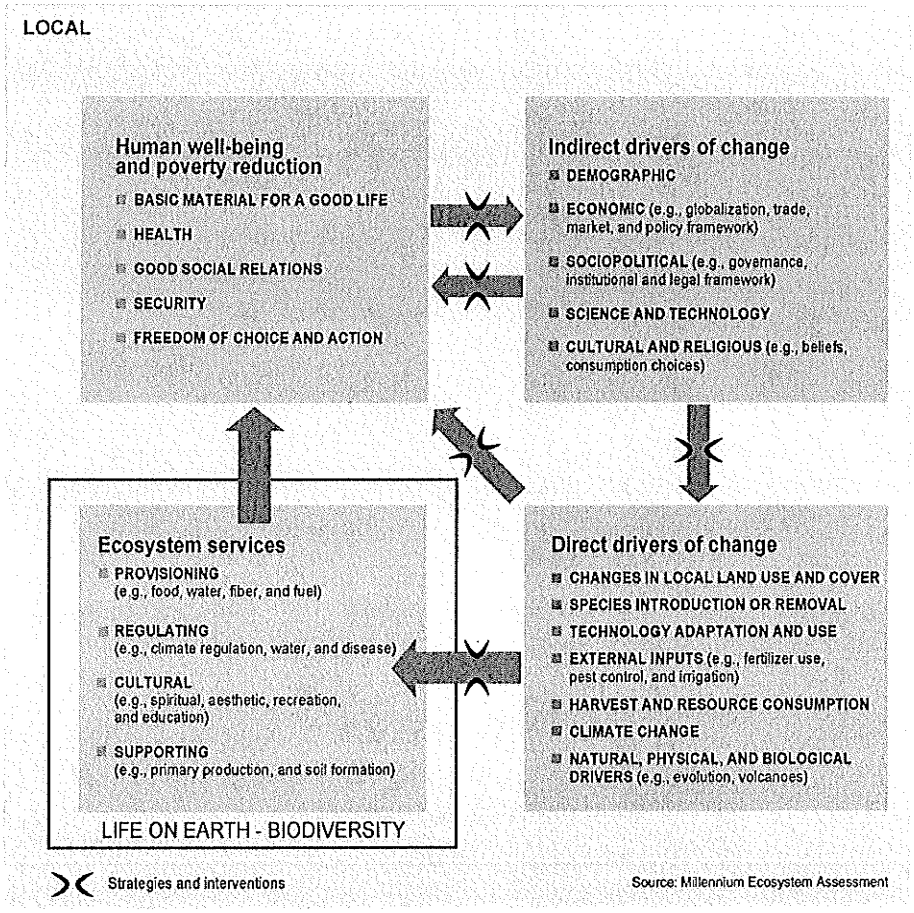

Figure 4. Ecosystems services and drivers of change. Source: Adapted from MA (2003).

In Chapter 5, the MA (2003) framework guides the analysis of the main impacts of drivers on the ecological and social components, and on the services of the CBRMS of San Juan. Drivers of change in the CBRMS, moreover, are mentioned – without necessarily being identified as such – and analyzed through all the chapters in this document.

2.4 Research Approach

The resilience approach has been designed to understand complex systems. Three key aspects are crucial to resilience (Berkes et al., 2003; Walker et al., 2004):

- The degree of disturbance that a system can absorb and still maintain its structures, identity and ability to recover.
- The degree to which the system is capable of self-organization
- The capability of the system to develop and intensify its adaptive capacity

Adding to the traditional view of ecosystems as governed primarily by the two processes of exploitation and conservation, Holling and Gunderson (2002) indicate there are two other processes: release and reorganization that should be considered part of social and ecological systems. During the exploitation processes organisms take accessible resources of disturbed ecosystems, while during the conservation stages, resources accumulate building complex connections. Liberation or destruction of the accumulated resources and reassembling of remaining ecosystems resources, respectively, characterizes the processes of release and reorganization. Whereas, the stages of exploitation and conservation are slow, the release and reorganization stages proceed rapidly. As Costanza and Folke (1996, p.14) explain "the stability and productivity of the system are determined by the slow exploitation and conservation sequence" and the resilience is determined by "the effectiveness of the last two system functions". Every cycle builds the necessary linkages and structures for the next cycle to take place. These processes comprise the adaptive cycle that characterizes most complex systems (Holling and Gunderson, 2002). See Figure 5 for a graphic representation of the adaptive cycle.

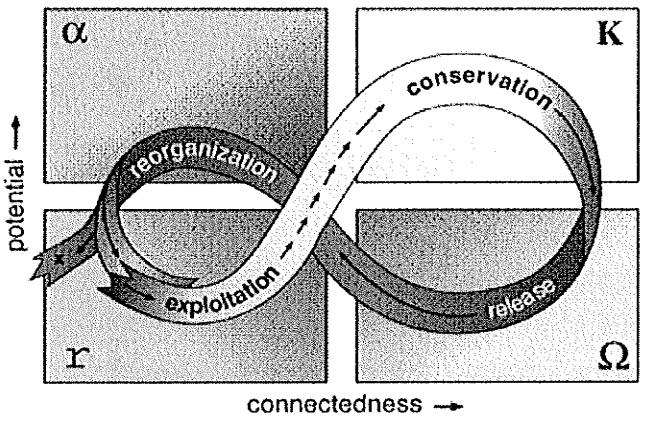

Figure 5. The adaptive cycle, a representation of the systems' exploitation, conservation, release and reorganization functions. The short arrows indicate slow changing condition and the long ones fast changing conditions. Source: Weeks et al. (2004).

The resilience approach, thus, can contribute to understanding social-ecological systems and their community-based resource management systems. The amount of interventions systems can absorb, and the adaptive responses of peoples and ecosystems to these interventions while maintaining their functional characteristics is of primary importance in the study of their complexity. Similarly, studying how institutions in social-ecological systems deal with and adapt to the changes forced by external environmental, social, economic and political drivers, is required to understand the foundation and characteristics needed at the institutional level.

As Berkes et al. (2003, p. 15) point out, "the concept of resilience is a promising tool for analyzing adaptive change towards sustainability because it provides a way for analyzing how to maintain stability in the face of change or disturbance".

Outcomes of research based on the resilience approach, moreover, are appropriate and well suited to contribute to the design of management strategies promoting sustainable development. The research findings could help to maintain or promote the diversity of social and or ecological systems enhancing their adaptive capacity, and they can also contribute in the establishment of institutions that embrace uncertainty and are able to deal with change.

2.5 Motivations to Choose the Research Objectives and Approach

Extensive theoretical and empirical research has been conducted in the field of development and conservation. Many outcomes of these research projects have highlighted issues such as the need for holistic analysis when trying to understand social and natural environments and the importance of using all sources of knowledge to design and maintain management approaches. Currently, there is awareness of the socio-economic and environmental crises taking place in many areas around the world. There is also awareness of the impacts across scales, with actions and decisions at the international level impacting on the local level and vice versa. It appears that our duty at this point in time is to address the problems of resource management approaches found by previous investigations, by consciously studying new strategies that can help to solve these problems. The researcher considers that community-based systems with their long-standing experience and numerous successes in conservation and development represent one of the areas in which deeper and more systematic research must be carried out. Let us embrace all the fruit that human beings have produced through the passage of the centuries.

As argued by many of the authors referred to in this section, nested institutions at all scales should be studied to understand the way systems work, the way they deal with communities' dynamics and the way they ensure the application of adaptive management over time (Berkes et al., 2003; Brown, 2003). The agents operating at large scales, the external drivers that they control and the impacts they produce at local scales should also be studied in more detail in order to contribute to the construction of

global institutions that address national and international needs without compromising local needs (Ostrom et al., 1999). In the same line, the community-based management systems themselves ought to be studied thoroughly to identify the structures and self-organization mechanisms that have been able to maintain these systems for long periods of time often under difficult conditions. Moreover, the strategies used and successes achieved in the integration of Western science and traditional ecological knowledge, in which these systems are leaders, also need to be analyzed and documented.

2.6 Previous Findings from Nuevo San Juan

Nuevo San Juan is a long standing case, and there have been many publications on it, including a recent edited book (Veslasquez et al., 2003). Here I refer to, not the whole literature on Nuevo San Juan, but to a few references related to my objectives. These include four theses, two Masters and two PhD, all of them in anthropology.

Challenges and other Perspectives

In their analysis of the resilience of community-based management systems, Alcorn and Toledo (1998) highlight, as the present document also does, the strength of San Juan's institutional arrangements and its contributions to maintaining the community's forests. Their conclusion presents San Juan as a well-structured community whose traditional land tenure and management practices have been successfully combined with modern resource exploitation strategies. Alcorn and Toledo (1998) also expand on challenges been faced by community-based resource management systems, such as the Trade Agreement (TLC) and related policies, which are here considered as drivers of change. Their analysis of these challenges call for the development of legal instruments directed to protect CBRMSs from external pressure from politically and economically more powerful players.

Similar findings on the importance of cross-scale linkages and some local drivers of change are discussed by Guerrero-Murillo's (2000) anthropological study of the origins and characteristics of the communal enterprise of San Juan. Guerrero-Murillo (2000) indicates that even though San Juan's leaders seems to have lessened community members' political and other choices, still, the level of community self-

governance and organization of its management system represents a model that can be followed by other indigenous communities. Guerrero-Murillo also expands on the way the enterprise has used strategies such as the diversification of productive processes to ensure rational use of forest resources and increase community benefits and socio-economic development. Supporting some of the findings here referred to as self-organization structures, Bofill (2002) indicates, in her exhaustive ethnographic study of San Juan, that San Juan's "communal management" discourse and practice have ultimately become an instrument to ensure individual benefit over communal interest. In her detailed analysis of the conditions that gave life to the enterprise and the strengthening of its institutions, she describes, as the present thesis also highlights, the shift from the values guiding the creation of the management system and the values guiding leaders and institutions in more recent times. Her conclusions illustrate the way empowered *comuneros*, whose individual benefits and interests rose with the economic success of the enterprise, manipulated the community energies and built cohesion, to maintain power.

Moreover, Acosta's (2001) study on self-organization structures also supports some of the current thesis research outcomes presented in Chapter 5. Acosta (2001) presents accounts of her field interviews which describe in detail the way discourse and leadership helped in the cohesion of the community and the formation of San Juan's CBRMS. Her findings on the economic and political struggles emerging in the community during and after the first years of creation of the enterprise and her analysis of key aspects of the decline in community unity and numerous conflicts a the local level, represent San Juan as a community where freedom of choice is considered a threat to the long-term endurance of communally driven community development.

Last but not least, Garibay's (2005) comparative study of two Mexican communities, reflecting some of the key findings of this thesis on self-organization and drivers of change, masterfully elucidates the instruments by and the conditions through which the San Juan *comuneros* envisioned themselves as a community and the mechanisms they adopted and adapted to build their enterprise. In his analysis, Garibay acknowledges the contributions of the enterprise in improving economic conditions at the local level, clarifying, however, the way generated wealth accumulates in already powerful players while poor community members are far from having large economic

benefits from the enterprise. The conclusions of his study represent the *comuneros* of San Juan as a group of community entrepreneurs gathered to drive their own socio-economic development using the label and discourse of "indigenous community" to gain the allegiance of the disempowered and relevant support from agencies and others. Garibay's conclusions imply that the community cohesion, contrary to being an expression of their cosmology and perception of themselves, is the outcome of common economic interests and the systematic repression of the masses to exercise ideological and political freedom.

Contrary to the present research, which is framed in terms of theory on resilience and community-based development, the above mentioned findings have an anthropological frame, most of them directly focused on dealing – to varied degrees – with the analysis of the cosmology and indigenous identity of the *comuneros* of San Juan. However, key conclusions of the current research that coincide with the other studies briefly described above, are numerous. As will be described in Chapters 5 and 6, the present research and all these other authors concur in identifying San Juan's economic success, the core values shared its by primary founders, and the challenges being faced from internal and external drivers, including the sharing of power and resources. Finally, most of their analyses coincide in describing the existence of an increasing gap between poor and wealthy *comuneros* and contradictions between discourse and practice on common well-being.

Chapter 3: Research Plan, Approach and Methods

3.1 Introduction

As has been mentioned in the previous sections, the objectives of this research are to describe the self-organization of a system and other of its inner characteristics such as leadership and management structures; to identify the drivers that support or limit the development of Nuevo San Juan and to identify and analyze the cross-scale institutional and organizational linkages that Nuevo San Juan has with other organizations. The Nuevo San Juan resource management system, which will be described in detail in the next section, is characterized by a large number of activities including the use and protection of timber an non-timber forest products, national and international marketing, environmental education, ecotourism, monitoring and evaluation, among others. Because of the characteristics of the system and the purpose of this research, where the interest is to build knowledge about the system by interacting through meaningful dialog and activities with community members, the qualitative approach has been selected as an appropriate one. The qualitative approach, for its focus on process more than products and in discovering the different meanings of reality rather than its components, provides the required frame to achieve the research objectives that were adopted.

The objectives of the research are grounded in theoretical and empirical findings related to community-based resource management systems. The need for analyzing self-organization emerges from the theory about complex adaptive systems (Berkes and Seixas, 2004). The importance of cross-scale linkages was identified through research findings on other Equator Initiative cases (Jonas, 2003); and the study of external drivers has been identified as key to improve conservation and development interventions (MA, 2003).

3.2 Philosophical Approach of the Research

The researcher's interest has been to analyze the complexities of views about the environment and livelihoods in community-based management systems rather than narrowing possible outcomes to a set of a few ideas or categories. Therefore, a social

construction of the reality at the community level and the way this reality interacts with other realities at different scales, led by different actors, was the best way, the researcher assumed, of constructing knowledge on the Nuevo San Juan case study. In this regard, the views, socio-economic evolution and documented achievements in development and conservation of the *comuneros* of San Juan were considered among the most important aspects to emphasize in this research. The strategy of enquiry, therefore, was qualitative in character. Broad questions to help participants to describe the different aspects and meanings of their resource management system, and to help the researcher to make an in-depth exploration of the case (Creswell, 2003; Leedy and Ormrod, 2005) were employed to learn about Nuevo San Juan.

The social-ecological system under study involved a group of community members from the Nuevo San Juan Municipality in Michoacán (Mexico) and the communal forestry enterprise they have established. The case study was defined according to social and administrative characteristics. The social characteristics included the locally recognized group of people culturally and economically linked to a defined piece of land and communal enterprise. The administrative characteristics included the official identification and recognition of the *comuneros* and their land provided by government agencies. The analysis initially focused on the community level. However, because of the socio-political context under which the communal enterprise was created, the complexity of cross-scale linkages developed by the *comuneros* and other more general characteristics of the community-based system, the researcher broadened the scale of analysis to include other players' perspectives at the state and federal levels. Secondary sources of data have also contributed to the analysis of the case.

Even though the research design process did not involve people from the community to give inputs on the research objectives, the research plan included the promotion of consultation, once in the community, to develop research outcomes useful to the community. The identification and selection of the research approach and techniques were also based on trying to achieve a certain degree a respectful involvement of the target groups of the research.

3.3 The Nuevo San Juan Case Study

The Nuevo San Juan community-based management system has combined traditional and scientific knowledge to promote a more sustainable use of timber and non-timber forest products. Their association with universities, government, and national and international organizations, has helped them to increase their knowledge about ecological systems and to develop strategies to promote a long-term development by maintaining their natural resource base.

The communal enterprise has established systematic activities for soil and forest management that include use assessment, recovery cycles, re-use of wastes from farms for cattle and/or agricultural fields, selective grazing, watershed protection, cutting for regeneration, reforesting clear cut areas and where poor soil conditions predominate, among others (Pego, 1995; Pulido and Bocco, 2003; Rosete et al., 2003). The activities are supported by researchers from various Mexican universities including the Universidad Autónoma de Mexico (UNAM), national agencies (SEMARNAT) and international non-governmental and multilateral agencies such as the UNDP, which has made Nuevo San Juan a winner of its Equator Initiative prize.

The Equator Initiative (EI) has been designed to reduce poverty through the sustainable use and conservation of biodiversity by supporting community-based initiatives (Jonas, 2003). Through the cases it promotes, the EI is building the capacity and improving the conditions of peasant and indigenous systems working to provide sustainable livelihoods through more sustainable strategies to manage natural resources. Nuevo San Juan received an Equator Initiative Prize in 2002.

Nuevo San Juan has made systematic efforts to work as a community and in partnership with other organizations in the sustainable management of the forest, and successfully integrate conservation and development objectives. The community's long-standing management system has focused on improving strategies for livelihoods and conservation. Nuevo San Juan, therefore, has demonstrated that it has much knowledge to share in development and conservation and deserves to be analyzed in more detail at least in some of its strong areas such as re-organization over time (self-organization), strong linkages across different levels (cross-scale linkages) and its strength when dealing with drivers influencing its different processes.

3.4 Research Plan

To start, contacts were developed with researchers knowledgeable about Nuevo San Juan residing in Mexico, to receive comments and contributions about the case and their suggestions about research procedures. The researcher also expected to consult with UNDP personnel and receive contributions/inputs on researching this EI prizewinner community-based system. More importantly, the researcher planned to hold, before beginning any research, consultation meetings with the management board of the Enterprise and other local stakeholders to receive their inputs about the focus and approach of the proposed research and the best way of sharing the research outcomes. By carrying out such consultations, the researcher aimed at making the outcomes useful to the Nuevo San Juan enterprise and the community.

3.5 The Participatory Rural Appraisal Approach

Participatory Rural Appraisal is one of the families of methodological approaches and techniques most used in rural development. It has been defined as "a family of approaches and methods to enable rural people to share, enhance and analyze their knowledge of life and conditions, to plan and to act" (Chambers, 1994). Robinson (2002) explains how the PRA approach is more than the provision of a number of techniques to apply when promoting rural development; its ultimate goal is the promotion of real participation and empowerment of the people. Taking as a guide the emphasis PRA puts on ongoing learning and adaptation, techniques associated with or adaptable to PRA are also applicable in the context of varied conditions, time limitations, and differences in community members' availability and interest.

Based on the above description, the PRA methodology is a mechanism by which the research is controlled by participants. In PRA, participants identify how research is going to serve them and decide about the techniques they want to be applied, in this way attempting to promote participation and empowerment. Thus in PRA, community members rather than academics drive the research process. Participatory Rural Appraisal (PRA) was, for its focus on helping people to drive the research, considered an adequate approach to try to involve research participants more fully and respectfully in the field research process. The methods for data collection have been suggested

based on their adaptability to the PRA approach and the complexity of the Nuevo San Juan case.

3.6 Research Methods and Tools

Some of the techniques that are commonly used in PRA are semi-structured interviews, diagramming and visualizations, ranking and scoring exercises, oral histories, ethno biographies and seasonal calendars. Other techniques that PRA has borrowed include focus group discussions, participant observation, structured interviews, etc. Many of these earlier developed techniques can be adapted to the PRA approach and already have been used to achieve its objectives of promoting participation and empowerment.

Information available about Nuevo San Juan indicated that the community has had a long-standing process of participation and empowerment taking place, and a high level of organization and systematic knowledge building. It also indicated that there were well-established social and economic development programs in the community and that the indigenous people of Nuevo San Juan have been exposed to different research approaches and methods for a long period of time. This may indicate a high level of literacy and communication skills in the managers of the enterprise and the community as a whole, and may imply the existence of researcher fatigue. The researcher, therefore, considered that semi-structured interviews or dialogs, participant observations, group discussions and use of secondary sources, as techniques that are not very intrusive, would be among the most appropriate techniques. Below, an explanation of the research techniques and tools is provided together with brief commentaries on their appropriateness to the Nuevo San Juan case study. The adoption of more than one technique aims at making it possible to verify information through triangulation, to reach as much and as diverse participants as possible and to be flexible to the conditions present in the field.

3.6.1 Semi-structured Interviews (SSIs)

It has been stated that without sensitive interviewing discussions yield poor results and understanding (Pretty et al., 1995). Semi-structured interviewing has been defined as "guided conversation in which only the topics are predetermined and new

questions or insights arise as a result of the discussion and visualized analysis" (Pretty et al., 1995, p. 73). SSI is a well-defined and systematic activity, but at the same time appears informal, a dialog. In SSIs the context, the participants, the way the interview is conducted and when it takes place are as important as the questions themselves (Pretty et al., 1995).

To conduct SSIs, researchers need to be self-critical and aware of biases, open, good listeners and observers (Pretty et al., 1995). The development of these skills requires time, but also renders good fruits. Among the parts of SSIs, Pretty et al. (1995) mention adequate previous preparation, the use an interview guide or checklist, use different resources such as visual help to encourage participation and dialog, being an attentive listener and humble, considering the helpers (who?, what?, why?, etc) when formulating questions, look into and judge responses, verify through triangulation and record responses and observations.

This technique applied wisely could help community members to be open to dialog in a very respectful environment and to find meaning in their contributions to the research. It moreover, seemed appropriate to Nuevo San Juan for its mature stage of intellectual and managerial development.

3.6.2 Participant observation

It was the hoped of the researcher to be allowed to participate in most of the daily activities taking place in the enterprise. Leedy and Ormrod (2005) mention that observation in a qualitative research are deliberately unstructured and with a free flow. In this way the researcher shifts focus from one thing to another depending on the processes and events before his/her eyes. Participant observation can help the researcher to understand the community dynamics and organization. The observation of people's management activities and interactions with the environment and other people can contribute to insights into community values, internal relationships, management structures and differences in decision-making and hierarchies.

Participant observation techniques also make the researcher more aware of his/her own biases and generally increases the receptiveness to foreign people when local people see the legitimate interest of researchers in learning by doing. This

technique was also considered an appropriate one to be applied in Nuevo San Juan. The large number of activities taking place in the community in addition to the complex nest of systems, needed to be observed, in addition to hearing about them, to get a more comprehensive understanding of the self-organization of the system. Moreover, it was expected to find participants with limited time to engage in dialogue, which would make observations important in the collection of data and even in the corroboration of results obtained by the use of other techniques.

3.6.3 Focus group discussions

Discussion among local people and discussions with particular groups of stakeholders, with the researcher as a facilitator, are considered important methods to employ during the collecting data process. These focus group discussions were different from the consultation and other discussion meetings that the researcher planned and facilitated at the beginning and towards the end of the research. In the former the participants primarily shared their experiences and information with the researcher. In the latter, the researcher got inputs from the research beneficiaries, among them the management board, on the focus, procedures and activities to share outcomes.

Grenier (1998) mentions that gathering information from groups increases the likelihood of having truthful findings and collecting data in a shorter period of time. Group discussions can also help to identify key knowledgeable persons and allows the others to learn from them. Some of the risks involved in this technique are the limitations provided by the power relationships among participants. Because of these positions of authority taken by some participants, information from other participants may be withheld (Grenier, 1998). The organization of groups based on age, gender, etc. may help to avoid some of these potential limitations.

Focus group discussions were considered an adequate technique to use in Nuevo San Juan. The administrative structure of the enterprise and the subdivision of management activities by sectors make it particularly relevant to hold discussions with different groups of stakeholders involved with the enterprise.

3.6.4 Equator Initiative Checklist for Field Research

The main tool used to guide the interviews, and discussions was the Equator Initiative checklist of questions. The University of Manitoba, through the Natural Resources Institute (NRI) has developed a list of questions to address when doing research on Equator Initiative case studies. The list was created by a team of researchers of NRI led by Dr. Cristiana Seixas and Dr. Fikret Berkes. Berkes and Seixas (2004) explain that one of the seven activities of the Equator Initiative is research and learning, and that these activities are promoted by locating networks of professionals and practitioners willing to use communities' best practices – as discovered by the EI – to inform policy and development priorities. Equator Initiative winners and nominees are a rich source of information on strategies to combine development and conservation objectives, and many of these cases – the short listed – can be seen as particularly successful in the above mentioned objectives.

Bearing in mind the need of narrowing the research to a manageable number of questions, the NRI researchers created the EI checklist. The two major objectives of the checklist – community self-organization and cross-scale institutional linkages – are based on theoretical and empirical considerations. Early studies indicated that scale and linkages of community-based organizations with other organizations and institutions were important for the success of the management system (Jonas, 2003). Consultations with researchers from the International Institute for Sustainable Development, the International Development Research Centre, Environment Canada and other institutions, moreover, showed the importance of studying self-organization in management systems and in social-ecological systems generally (Berkes and Seixas, 2004). The complete EI checklist can be found in Appendix 1.

3.7 Once in the Field

3.7.1 Interacting with Key Persons

Facing the situation of limited communication with the *comuneros* from San Juan Nuevo during the design of the research proposal, and having the need of focusing, at least partially, on particular themes during the field research, which needed to be approved before any fieldwork could be carried out, once in the field contacts were made

with researchers from the Autonomous University of Mexico (UNAM) and the UNDP Mexico office, to receive information about the best way to proceed once in the community and the required entry point support needed to be allowed by the community to do the research. Both researchers from UNAM and an officer of UNDP Mexico backed the researcher's entry to the community. Such support compelled San Juan to welcome my efforts to document their experience.

On July 1st the first personal contact with some of the community representatives was made followed by a visit to the headquarters of the enterprise. That same day residential and meals arrangements were made with the help of community representatives who became the regular contact persons and the organizers of the interviews to take place with workers of the enterprise. It was also possible to consult with some representatives of communal institutions and the administration about the research and the presentation of expected research outcomes. During these interactions, the content of the Research Ethics Consent Letter was explained and community members requested to hear the researcher's ideas about new productive activities that could be carried out. They also requested to receive copies of official reports on the research outcomes.

In coordination with the contact persons at the management level, the heads or deputies of the enterprise's productive areas were interviewed. The initial findings of this first set of interviews, together with the findings from formal interviews and informal discussions with other players at the local and regional level, contributed to an understanding of the community's social dynamics and its communal enterprise, the local and regional socio-economic context, and to the identification of key informants and important secondary sources of data. Further interviews helped to build understanding of the different processes that give life to the enterprise, the role of leadership, the importance of external help in the development and consolidation of the enterprise, and internally and externally driven changes in the enterprise over time.

3.7.2 Interviewees

At the beginning of the research, following the suggestions and arrangements made by the contact persons, the researcher interviewed the head, and in some cases

the deputies, of the various productive areas of the enterprise. This first set of interviews was combined with field observations on resource use and management strategies in the enterprise and on the communal land. Through these interactions other key informants inside and outside the enterprise were identified and later interviewed; secondary sources of data were also discovered through desk research at libraries and in documents provided by the UNAM, the enterprise and government agencies.

A total of 100 interviews were conducted over a period of two months and 20 days. Being presented as a student from a Canadian university with support from a UNDP officer, and a Hispanic background, created certain conditions in the field that made it possible to interact with many *comuneros* linked to the enterprise, other community members and knowledgeable outsiders. In addition to the *comuneros*, workers and representatives of communal institutions interviewed, representatives of local and state government agencies, consultants previously and presently linked to the enterprise, *comuneros* working with governmental and non-governmental agencies, NGO representatives, business partners and researchers were also formally and informally interviewed. The diversity of interviewees provided a better understanding of some of the complexities of the CBRMS and a broader perspective of the community's challenges and achievements. In Table 1 the total number and categories of interviewees are presented.

The interview sessions lasted between 45 minutes and 4 hours depending on the knowledge and interest of participants. The information generated through the interviews contributed to further the researcher's understanding of the community and therefore helped to identify other ideas and questions to supplement the EI checklist. Except for 5 informal interviews during which notes were taken, all the interviews were digitally recorded and many of the productive processes also visually captured.

Table 1. Categories and Number of Interviewees.

	Category Interviewees	Name of Agencies/Institutions/organizations/groups[2]	Interviewees and Interviews
Community Level	*Comuneros* playing important roles in creation of enterprise	Presidents of the Commissariat (previously known as the communal representative) one of them a key founder of enterprise; the 1st manager of the enterprise (previously called Forest Exploitation Commissioner), also a founder of the enterprise; elders playing important roles in community organization process	6 interviewees/ 11 interviews
	Current Manager of the enterprise and coordinators of productive areas.	Departments: Training and ecotourism; resin plant; fertilizers; agricultural livestock projects; management; technical forest department; Fundraising and follow-up projects office; furniture factory; accounts office; human resources office; marketing office; supplying area; maintenance department; cable TV; water purification plant; fruit packaging area; integral development office; sawmill and chipper areas	27 interviewees/ 49 interviews
	Current members of community institutional bodies	Secretary of the Commissariat; Deputy of the Commissariat; Communal Council members;	5 interviewees/ 5 interviews
	Local self-help groups	1 Women's group	4 interviewees/ 3 interviews
	Representatives of government agencies	SAGARPA-San Juan; Natural Resource Management office-San Juan; San Juan office of other agencies-; Adult Education Project	5 interviewees/ 5 interviews
	Other community members	Radio presenter; family members of *comuneros* working in the enterprise; community members opposing the communal organization; foreign settlers	7 interviewees/ 7 interviews
State Level	**Category Interviewees**	**Name of Agencies/Institutions/organizations/groups**	**Interviewees and interviews**
	Government agencies	Urbanism and Environment Secretariat; COINBIO; PROCYMAF; Agrarian office of advocate general; SEMARNAT	9 interviewees/ 12 interviews
	Academic institutions	UNAM; Michoacán College University;	4 interviewees/ 4 interviews
	Non governmental entities	Certified Accountants Office;	1 interviewees/ 1 interviews
Federal Level	**Category Interviewees**	**Name of Agencies/Institutions/organizations/groups**	**Interviewees and interviews**
	Academic institutions	UNAM	1 interviewee/ 1 interview
	Non governmental agencies	Rigoberta Menchu Foundation (RM);	2 interviewees/ 2 interviews

3.7.3 Verification of Data Collected

Verification of the data being collected was made throughout the research process. The means of corroboration of the information received included: checking repetition in responses – triangulation, interviewing the same respondent more than one

[2] The roles indicated in the table are the ones interviewees represented. There were, at times, interviewees representing more than one institution, organization and or agency. The number of interviews includes both primary and follow-up interviews.

time, confronting responses with observations in the field and cross-checking data and perceptions with key informants inside and outside the community. After arriving in Canada additional inputs and verification were received through email communications with *comuneros* and outsiders.

3.8 Research Challenges

3.8.1 Legitimizing a Researcher Driven Research

The researcher's aim was to apply in the research approach the new paradigm of more participatory methods, where inputs from the bottom-up are as important as the ones from the top-down and where nothing is taken for granted or assumed, but knowledge is built through interactions with the environment and its peoples over time (Chambers, 1994). To this end, the writer appealed to procedures that allow participants to decide the ideas to focus on, express their thinking and understanding of reality without externally imposed frames and even to evaluate their own contributions. However, because the research proposal had pre-established objectives and suggested some methods to achieve them, it is not accurate to claim that it was participatory research.

Moreover, because it was assumed that there was willingness in the part of the community to be research subjects, which was far from being the reality at the local level, the researcher engaged in detailed discussions about the justification of the research. The main consequence of the lack of communication and proper involvement of the community was that a research project was conducted in which there was no commitment on the part of some communal institutions to contribute to the research and to discover, in partnership with the researcher, meaningful insights for the community's benefit. In this respect, the assumptions made by the researcher about the community's interest in the research, and reality of the lack of full involvement of the subjects in the research design are among the key aspects that contributed to the objective of respectful involvement and participation of the research subjects not being achieved. To this was added the fatigue of many community members with researchers.

3.8.2 Realities at the Community Level Constraining the Research

San Juan Nuevo has been successful in its efforts to present itself as a highly organized, strongly united and economically successful community to foreigners. Proofs of this are the numerous recognitions and prizes awarded to the communal enterprise including the Smartwood certification for its forest management strategy and the Equator Initiative Prize. This image of success generated some tension during the fieldwork. The tension was caused by a number of factors including that I was representing a Canadian University receiving support from the UNDP office in Mexico and that there have not been intensive research or documentation of the case in English. This tension was manifested through the way official community representatives tried to control the people from the enterprise whom the researcher was going to interview; the way they tried to have a general sense of the people outside the enterprise the researcher was interacting with; and by the way many workers presented the same – almost memorized – discourse about the "successful communal enterprise". Subsequent interactions with some of these workers and other that were not among the ones selected by the community representatives helped in the identification of other key informants, the deeper understanding of the reality at the local level and some of the challenges the community has faced and is facing.

In a similar way, researcher fatigue represented another challenge. Interactions of researchers with the community have been driven, mostly, by community leaders and/or administrators depending on their own training or information needs, on linkages with educational institutions, and on the community's interest in developing new skills/generating information or in taking advantage of the availability of resources from government or other organizations. This background of numerous interactions has generated some skepticism on the part of some current leaders about potential contributions from researchers. To this was added the fact that the researcher did not come as a consequence of the community's initiative or with financial resources to invest. As a result, some people holding key positions in the community saw the research activities as irrelevant.

Gender represented a third challenge. Women have a passive role in the enterprise and only in a few exceptional individuals hold key positions. Because of this it was only possible to gain insights from three women workers. In an attempt to document

local women's perspectives in the research findings, interviews were carried out with other women less directly linked to the enterprise. Being a female researcher also represented a challenge for community members; however, this difficulty was almost completely overcome once there was a bigger understanding of the researcher's role.

3.8.3 Sample Size and Validity

The research findings are a representation of the researcher's understanding of the views and perceptions of the participants. Furthermore, it is assumed that the few persons interviewed in each category represent more or less the general perspectives of their represented group/agency/organization unless otherwise indicated. Time and resource constraints made it unfeasible to interact with many other potential participants. To address these constraints, the researcher tried to involve participants that have played key roles and were part of key processes, to attempt to ensure that the information being collected was accurate and represented the local reality. The reiterations of accounts from different participants, important similarities in responses from antagonistic actors in combination with the observations in the field, were used as indicators of a fair range of validity of the participants' contributions.

Chapter 4: General Context and Achievements of Nuevo San Juan

4.1 Mexican Socio-Political Context

Mexico is a country rich in forest resources, with forests accounting for 17% of the country's land area[3]. Mexico's forests have been important to the national economy since the mid-nineteenth century and have increasingly become the target resource to boost that economy. Since the creation of the first legislative norms to regulate silvicultural activities in 1884, Mexico's forest laws have focused on timber production, but have been modified recently to include the use and exploitation of non-timber forest products and services (SEMARNAT, 2004). The forest, being not just a source of timber but of many other resources, including resin and other products, has become of central interest to government administrations. This interest has given rise to numerous laws and policies regulating the use of natural resources and particularly forest resources in Mexico and has given life to the different processes of use, appropriation and management of resources and lands, in some cases with detrimental consequences for rural communities.

Particular socio-political conditions, moreover, have contributed to making of Mexico a country with very unusual land tenure and forest resource exploitation conditions, where a large portion of the forestry production is made in land under communal tenure and under communal management (Bray et al., 2002).

4.1.1 Forest use and appropriation: from communal to private hands

Garibay (2005), Campos (2004) and Merino (2004) describe how government administrations throughout the second half of the nineteenth century established laws directed to extinguishing the pattern of communal ownership and management of land and its resources. The 1857 Mexican constitution embraced parameters such as the ones promoted by the Lerdo Act[4], whose aim was to abolish communal tenure and administration of land. This constitution, which gave impetus to the establishment and

[3] Total area of Mexico is 1,972,550 km² of which 328,507 km² are forested areas (SEMARNAT 2004).
[4] Ley de Desamortización de Fincas Rusticas y Urbanas (Law abolishing the communal holding and administration of land), created in 1856 during the administration of Lerdo de Tejada. The law prohibited ecclesiastical and civil organizations from owning real estate and commanded the adjudications of such lands to the persons renting or leasing them (Garibay 2005; Campos 2004).

unconditional use of forests on private land in an attempt to promote large scale investment (Merino, 2004), inspired the drafting of legislation such as the Colonization Act[5], a law directed to promote foreign immigration and produce internal displacement (Campos, 2004). To pursue such ends, were created the "Colonization and Appropriation Companies Decree[6]" and the "Law on Occupation and Expropriation of Unoccupied Lands[7]" (Garibay, 2005; Campos, 2004). These groups of laws, together with the constitution itself, favored the appropriation and unsustainable exploitation of forest resources, where the interests of the private sector and national and international companies trumped the interest of communities fully dependent on these resources.

4.1.2 Policy and Legislation Trends During and After the Revolution

The Mexican Revolution (1910-1917), in its attempt to re-establish communal ownership of land and resources, set the foundation for agrarian reform. Government administrations subsequent to the revolution would face the dilemma of restitution of land through communal or private legal instruments by centering power and decisions in the state (Garibay, 2005). Since that period to the present time two trends have been envisioned and pursued: legislating restitution and provision of land, and mandating government control of the forestry sector.

4.1.2.1 To legislate the restitution and provision of land

In response to the privatization of land and addressing the abolition of legislation on eradication of communal land tenure regimes, new legislation emerged. The Agrarian Act of 1915 led the way to restore land to communities and provide it to dispossessed groups (Garibay 2005). The Mexican constitution of 1917, making a total shift in the conceptions and prescriptions on communal land tenure rights, eliminates the supremacy of private ownership of land and resources, and positions the State as the primary owner of land and resources and the only figure in charge of assigning ownership rights to others (Merino, 2004; Constitution, 1917, Art. 27). In addition, the 1917 constitution would further formalize the two types of communal land tenure in

[5] Ley de Colonización (Colonization Act) created in 1875 with the aim to promote foreign investment through the reallocation of unoccupied lands (Campos, 2004).
[6] "Decreto sobre Colonización y Companias Deslindadoras" (1883).
[7] "Ley sobre Ocupación y Enajenación de Terrenos Baldios" (1894).

Mexico, the "Agrarian Communities" and the "Ejidos", where the former implied restitution or devolution of land and resources to a preexistent groups and the later the provision of land and resources to groups of people gathered for such aim and that are unable to demonstrate ownership (Garibay 2005; Vazquez Leon, 1992).

4.1.2.2 Ensuring government mastering and control of the Forestry sector

The parameters established in Article 27 of the Constitution of 1917 would provide the frame for state jurisdiction on land and resources. It became the starting point for subsequent governmental actions and legislation to restore or provide land to peasants and communities and for regulations, which continue to this day, limiting access to and exploitation of natural resources, including land. Merino (2004) mentions how the regulation of resource property rights, since the creation of the Article 27 of the 1917 constitution, has given way to a large numbers of laws and regulations to both ensure the appropriate exploitation of resources and to restrict or penalize its mismanagement. In the forestry sector, Articles 25, 26 and 27 of the Constitution, which address the responsibilities of the state in the promotion of national sustainable development, the creation of institutions to promote such development and the ownership of the state on land and resources have provided the structure to develop subsequent laws and regulations (Weaver, 2000). Garibay (2005) describes the way the cataloging of forest lands as of "public interest" set the foundation for the creation and growth of a complex set of institutional structures to administer, monitor and provide training on forestry matters. This emergent sector was backed in its growth by regulations establishing the compulsory use of "forest science and scientists" in the elaboration of forest use and management plans all around the country (Caro, R. personal communication, September, 2005; Garibay, 2005). In brief, as Garibay (2005) masterfully explains, "An expansion of the State to create the institutional apparatus, the political agents, the technical operators and the intermediaries to master the control of the Mexican peasant and non-peasant forests, took place[8]" (Garibay, 2005. p.63).

[8] En suma, se presenta una expansion del estado que crea los aparatos institucionales, los agentes politicos, los operadores tecnicos, los intermediarios sociales para instrumentar su control sobre los bosques campesinos – y no campesinos – del pais. (Garibay, 2005, p. 63).

Merino (2004) describes in detail the legislation affecting directly and indirectly forest communities and resources. Table 2 summarizes Merino's and other authors' contributions, indicating key legal instruments and their main outcomes.

Table 2. Forestry Sector: Legislation, policy trends and their main outcomes

Policies/Legislation	Dispositions	Main Outcomes
1880s Concessions to large companies, backed by legislation on expropriation, Lerdo Act, 1857 Mexican Constitution. (Weaver, 2000)	Favored privatization of lands, reduced requirements for foreign investment and exploitation of natural resources and to expropriate unoccupied lands	Establishment of foreign companies (mainly USA based) to exploit forest resources at large scales; considerable forest resources degradation; displacement of communities; disempowerment of peasants and indigenous peoples.
Agrarian Law of 1915 (Merino, 2004; Garibay, 2005)	Restore and provide land to peasants and indigenous groups.	Large numbers of communities with land tenure rights recognized by the Agrarian Reform Secretariat
Legislation on Conservation of natural resources after the Mexican revolution (Merino, 2004)	Establishment of National parks	Peasants and indigenous are excluded from some ecologically important natural areas.
First Forest Law in 1926 (Garibay, 2005; Merino, 2004)	Forest exploitation must be done by community-based cooperatives or by leases with outsiders of no longer than one year; creation of numerous requirements to exploit forests resources.	Large-scale forest degradation by small enterprises leasing forested areas; forestry elites led by gov. agencies emerge and are strengthened by the restrictive forest exploitation and management stipulations.
Forest Law of 1940 (Merino, 2004)	Abolished the short term leasing of forest resources, but established the long-term concessions to large companies[9] in an attempt to promote a sustainable use of resources. The law also maintained the numerous and – for communities – burdensome stipulations for the exploitation of forest resources, emphasizing in the scientific management of the forest production.	The communities' subsistence resource use rights were restricted and often forbidden. Unfair deals imposed on disempowered communities whose benefits were as reduced as the ones they previously had through the short-term leases. Government structures in support of unfavorable conditions for communities in the name of industrial development. Road and other physical infrastructure is developed together with the local capacity of community members involved in the exploitation processes. Extensive and intensive degradation of forest resources in areas under concessions.
Forbidding the exploitation of forest resources in the 1950s (Merino, 2004; Caro,R. personal communication, 2005)	Blockage to forest extraction in specific areas established in parallel to the forest concessions.	Disempowerment of communities. Land tenure rights were recognized, but forest resource use rights were undermined. Contradicting legislation promoted soil use change driven by peasant and indigenous in an attempt to exercise full land ownership rights[10]. Illegal logging is strengthened and illegal groups promoting it become highly organized.

[9] These large enterprises were then called Industrial Units for Forest Exploitation (Unidades Industriales de Explotación Forestal- UIEF). Average concession time was of 25 years, with some of up to 60 years; in total 30 concession were given (Merino, 2004; p. 180).

[10] "By marginalizing the land owners from the benefits of forest exploitation, the prohibitions favored the development of strong illegal groups dedicated to the extraction of timber, which were supported by corrupt forestry officers and communal authorities (Merino, 2004; p. 183).

Policies/Legislation	Dispositions	Main Outcomes
Forest Act of 1960 (Weaver, 2000; Merino, 2004)	Promoted the creation of government owned enterprises for the exploitation of forest resources with emphasis on the regionalization of forestry services	By mid 1970s the state corporations contributed 43% of the national forestry production, while 23% of the production came from community controlled enterprises, but still there was little re-investment in communities and forest resource renovation. The impacts of state corporations similar to the ones made bylarge companies.. Communities maintained the clearing of forested areas[11].
Lifting of the prohibition on forest extraction (Merino, 2004)	To gradually lift the prohibition of the exploitation of forest resources	Significant for communities deprived of using resources. However, communities were still facing difficulties in complying with regulations to extract resources and the problems of dealing with highly organized groups carrying out clandestine logging.
Reactivation of the Agrarian Reform in the 1970s (Merino, 2004)	To distribute land to ejidos and communities attempting to reduce their discontent with the various policies. Financially supporting human settlements and the growth of the agriculture and livestock sectors	Jungles and other ecosystems[12] were colonized and disappeared. Lack of coordination between the government sectors and policies contributed to environmental degradation. Many areas were deforested and sometimes not utilized for other productive processes.
Policy on support to community-based forestry enterprises (Merino, 2004)	The Agrarian Reform Secretariat (SRA) promoted the participation of community-based enterprises in forestry production by providing access to capital, training and other support.	Because concessions were still the axis of the forestry production, most decision-making power was not with communities, and because of the corruption of officers and communal authorities, there was little impact on the empowerment of community-based enterprises
Environmental Act of 1971 (Merino, 2004)	Law to prevent and control the contamination of the water, soil and air	Provided a legal frame for monitoring environmental degradation, but because of the lack of integration between different agencies and policies the positive impacts of the law were delayed and often diminished
Impulse to communal forestry by the Agriculture and Hydraulic Resources Secretariat (SARH) in the 1980s (Merino, 2004)	The Forestry Development Directorate was created to support social forestry enterprises	Limited government resources and other obstacles including previously established illegal groups, access to technology, etc., slowed the consolidation of communal enterprises. The development and strengthening of such enterprises varied depending on the regions. Still the legislation emphasized the total interference of the state in most of the communal matters, making communities highly dependent on agencies and seriously limiting their autonomy, but at the same time with more support to deal with complexities associated to the forestry production. The infrastructure already developed served to support communal exploitation.
Forest Act of 1986 (Merino, 2004)	Elimination of concessions and leasing of land for exploitation of resources. Prescribed the development of integrated forest management plans. Communities were given the primary role of resources exploitation	The social management of resources expanded and in some cases was strengthened[13]
Development of conservation policies, reforms to the constitution and new environmental	More inclusive conservation areas were established; reforms to Article 27 of the constitution conferred more autonomy on communities in decision-making	Establishment of biosphere reserves with varied degrees of land use rights for peasant and indigenous peoples; the environmental laws address the study of impacts before implementation of processes and the competence of

[11] In the mid 1970s, 40% of the forestry production was made by small enterprises with leases from the communities (Merino, 2004).
[12] By the mid 1970s, a 65% of the Mexican forest was under communal tenure (Gonzalo Pacheco quoted in Merino, 2004).
[13] In 1992, 40% of forest production was being made through community-based organizations (Merino, 2004).

Policies/Legislation	Dispositions	Main Outcomes
laws (Merino, 2004)	processes and less intrusive interactions	different agencies in the protection of the environment

As in the nineteenth century, in the twentieth century successive government administrations appealed to the exploitation of forest resources as a way to boost the economy and ensure material progress. As the policy trends described in Table 2 suggest, during part of the nineteenth and twentieth centuries the role of communities in resource management processes has been threatened by policies promoting the appropriation of resources by technologically and financially powerful national and international corporations. These policy challenges are even more significant for Mexican rural areas, where as much as 80% of Mexico's forests are in the hands of agrarian communities and ejidos (Bray et al., 2002), which is very different from most other countries, such as India, where much of the forest management undertaken by communities takes place in what is identified as government land (Sarin et al., 2003).

Even though since the first Forest Act in 1926 there were emphatic stipulations on the key role communities were to play in the exploitation of communal resources, but in reality, the lack of developed capacity and support strongly limited the outcomes of communities' resource appropriation efforts. Another significant obstacle to communal resource management was the contradictory legislation that on one side recognized communal land tenure and ownership rights while on the other prohibited or seriously limited communities' exploitation or appropriation of forest resources. Merino (2004, p.183) mentions that "at different points in time the lack of coordination between the forest, agrarian and conservation policies brought as a consequence the failure of the policies and the degradation of forests". More recent legislation has addressed the importance of supporting communities in their resource management efforts; however, new challenges such as the large number of requirements for beginning exploitation processes and the unequal competition in an open market economy make it difficult for forest communities to strengthen their productive capacity. Moreover, policies contributing to the detriment of community-based management structures have contributed and are contributing to the deterioration of local institutions for resource management and with it to the effective deterioration of forest ecosystems through highly organized and uncontrolled illegal logging. Illegal logging continues to represent one of the main factors of forest degradation in Mexico, with estimates of a deforestation rate of

up to 670,000 ha. per year, of which about 60% takes place in tropical forests (Masera, 2003. cited in Chodkiewicz, 2003).

Caro, R. (personal communication, September, 2005[14]), commenting on the factors influencing deforestation and soil use change in Mexico, describes the differences between land use rights for agricultural and forest communities. He mentions that for forest resource users there exists a large number of stipulations on the use, management and transfer rights of soil and forest resources. On the other hand, farming and livestock communities do not require permits for soil use and management. Caro concludes that forest communities, unlike other communities, do not exert all their property rights. To this condition is added the fact that past and present Mexican policy trends have typically offered large support to farming communities and to forms of land tenure other than the communal.

Legislation developed during and after the 1990s has been directed, in varied degrees to the diminution of the role of the state in monitoring exploitation processes and reduction of the support to local forestry management initiatives; to increasing support to forest plantation and agriculture in general; to the establishment of conservation areas with different level of resource use exclusion and subsidies to affected communities; and to the full adoption of an open market economy (Merino, 2004). Chapters 5 of the present document expands briefly on some of the policies and regulations that have more directly affected the Nuevo San Juan community-based resource management system.

4.2 Regional and Local Contexts

4.2.1 The Region of the Meseta Purhepecha[15]

The Meseta Purhepecha, identified as one of the two main natural regions of the State of Michoacán, is a geographic area characterized by pine-oak forests and large populations of indigenous peoples. Many of these indigenous groups, while being recognized or denied land ownership rights at different points in time, have developed internal land tenure systems largely guided by the use of non-timber forest products. Particularly in the Purhepecha plateau, traditional farming and resin tapping have been

[14] From an interview taken during the field research.
[15] Except when referenced all the information in this section has been provided by interviewees.

used as means of establishing land tenure arrangements (Merino, 2004). It was not until the nineteenth century that timber forest products acquired – for indigenous groups – a particular value that exceeded the traditional use for local markets, household construction, firewood and handicrafts. The changing government administrations and changes in land use rights caused significant changes in this region, similar to the ones taking place in other regions of Mexico. The shift from the appropriation of communal land and resources by the government during the administration of Porfirio Diaz in the second half of the nineteenth century, to the provision of land for large numbers of communities and ejidos in the twentieth century strongly impacted the region.

At the level of the State of Michoacán, Cuauhtemoc Cardenas, first as Forest and Fauna Sub-secretary and later as the state governor, from the mid 1970s to the mid 1980s, spurred the communal exploitation of forest resources by authorizing ejidos and communities, many of them without official documentation of their property rights, to use and manage their resources. This support given to communities and ejidos by the state inspired many communities to organize themselves to exploit their resources in a systematic way, among them the community of Nuevo San Juan. The support from Cardenas was of significant relevance to numerous if not most of Michoacán forestry communities that took advantage of the friendly policies. Such important support coming from a government agency equipped communities with some of the required instruments to develop institutional structures for the promotion of communal resource management, and to control the illegal logging that was strengthened during the establishment of policies in the 1950s prohibiting the exploitation of large extensions of forested areas in Mexico. Clandestine logging in Michoacán, estimated to comprise 75% of all wood employed in regional woodworking shops in the state (Alvarez-Icasa and Garibay, 1992, cited in Chodkiewicz, 2003), has affected and is affecting forestry communities, among them San Juan, whose forest conservation strategies involve the constant patrolling of communal lands by armed guards.

Unlike Ejidos, in communities of *comuneros* ideally there is no private property but rather individual/family landholders who carry out their subsistence activities on the land that belongs to the community as a whole. The legislation described in the previous section had repercussions on the Purhepechas' land tenure systems. The accentuated trend of supporting the transformation of communal land into private property,

predominant before the revolution, prompted many members of communities to privatize their occupied land. In some instances, the legislation gave rights to *comuneros*[16] to register pieces of communal land as private property after inhabiting it peacefully for no less than ten years. These laws, taking place before the establishment of the agrarian reform, allowed individuals to privatize the land. A large number of people, among them *comuneros* from Nuevo San Juan, registered pieces of the communal land as private property. In many instances the transformation of communal land to private property took place because of the need to demonstrate ownership to authorities in order to keep the land, and to be entitled to use and manage the forest resources in such lands. At the time of enactment of the Presidential Resolution for the *comuneros* of San Juan in 1991 in recognition of their land ownership rights, in San Juan there were 133 pieces of land registered as private property, comprising something more than 4,000 ha. of the 18,138,323 ha. identified as communal land. (See Figure 7 for a map depicting the private property inside the communal land).

4.2.2 The Nuevo Parangaricutiro Municipality

The Municipality is located in the western part of the State of Michoacán at an elevation of 1880m. The municipality covers 234.31 km², of which the San Juan communal land comprises almost two thirds. In 1995 there was an estimated population of 14,637 inhabitants (Instituto Nacional para el Federalismo y el Desarrollo Municipal, 1999) in the municipality. Current estimations indicate a population of about 17,000 persons, with about half of this being composed of *comuneros* and their family members. The rest of the residents in the municipality are members of surrounding ejidos, private property owners and outsiders. Many *comuneros* and their families live in the communal land, but most of them reside in the capital of the municipality.

Among the economic activities taking place in the municipality, forest exploitation represents the largest activity and is almost entirely carried out by the communal enterprise; this is followed by avocado farming, cattle raising and commerce respectively. Other agricultural activities take place such as maize farming but do not have a significant economic impact in the municipality. Timber extraction by the

[16] Community members holding heritage rights on pieces of communal land or whose family members are recognized members of the community. Please refer to the Definitions section for a complete definition.

communal enterprise accounts for 75% of local economic growth and is a primary source of employment in the municipality.

4.2.3 The *Comuneros* of Nuevo San Juan

Nuevo San Juan is one of the Mexican rural communities that kept secured documents from 1715 where the Spanish kingship recognized their property rights. They were originally settled inside their communal land, but an eruption of the Paricutin volcano in 1943, which destroyed the community together with approximately 1500 ha. of forest, forced the community to move outside the perimeter of the communal land. The *comuneros* settled in Los Conejos, a property located beside the communal land. Interested in exploiting their forest, the community led an organizational process, together with other communities and ejidos, that gave birth to the Union of Ejidos and Indigenous Communities Luis Echeverria Alvarez (UECIFOMET) at the end of the 1970s – during the emergence of government support to community-based management initiatives. After three years of operation, the members of the Union had differences of opinion and leadership problems that resulted in the Union's dissolution at the beginning of the 1980s. At this time San Juan, one of the communities advocating for radical changes in the management of the Union, was ready to organize itself independently in order to lead the exploitation of its forests. In this way, in 1982 the *comuneros* from San Juan through key leaders started to envision the communal enterprise[17] and make it a reality. During the 1980s the community did not have official recognition of their property rights; however, the leadership that united the dispersed *comuneros*, that gave life to the communal enterprise, and that contributed to its consolidation, was key to achieving official recognition through a Presidential Resolution in 1991 (See Figure 1 for a map of the location of the communal land).

At the community level the *comuneros* of Nuevo San Juan are organized based on the requirements established in the Agrarian Act, which is based on Article 27 of the Mexican constitution. That is to say, the Act regulates matters such as land use and ownership, local institutions, and rural development in general. See Figure 6 for a diagram of institutional and organizational structures in Nuevo San Juan. The

[17] Communal enterprise is understood as the process and the organization by which the *comuneros* started to lead the use and manage the forest resources from their communal land. The communal enterprise comprises many productive areas to take advantage of timber and non-timber forest products.

institutions[18] heading the consultation and decision-making processes of the *comuneros* from San Juan are:

The General Assembly. Formed by the community members enlisted during the communal census carried out as part of the process of acquisition of government recognition of the land tenure rights. The official list of members of the General Assembly is included in the Presidential Resolution from 1991. The General Assembly acts as the prime consultative body. Among its main functions are the following: it elects the members of all the other communal institutions; makes the major decisions on internal rules, land distribution, legal agreements and contracts; and evaluates the accountability reports of the areas of the communal enterprise.

The Commissariat, which is formed by a president, a secretary and a treasurer with their respective deputies. It is in charge of the execution of the decisions taken in the General Assembly and of the representation before authorities and other entities of the group of *comuneros*. The Commissariat also enforces the local rules among *comuneros* and coordinates administrative procedures related to the General Assembly. Moreover, administrative and financial reports of the communal enterprise are presented to the General Assembly thorough the Commissariat.

The Monitoring Council is constituted by a president and two secretaries with their respective deputies. It is in charge of monitoring the actions of the Commissariat and reporting them to the General Assembly; it also assumes the administrative responsibility of the Commissariat whenever it is unable to do it. In the case of San Juan the Monitoring Council has as one of its primary functions the field monitoring of the communal forest.

A Communal Council, which is formed by representatives of the different neighborhoods of San Juan that are elected or reelected by the Commissariat. It is the institution added by the *comuneros* to make the consultation and decision-making processes more time-efficient. The Communal Council filters all the information coming from the enterprise, the Commissariat, and the Monitoring Council to the General Assembly.

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[18] The term *institutions* is being used to define the local bodies in charge of the administration and representation of the *comuneros* of San Juan and the communal enterprise. The description of the institutions' functions is based on the parameters established in the Mexican Agrarian Act. See details on the meaning of institution in the Definitions section in Chapter One.

The organizational structure created to the lead resource exploitation activities includes **Management**, which is comprised of a manager and his deputy. The manager is in charge of the enterprise and of the **area coordinators** of the enterprise's various productive activities.

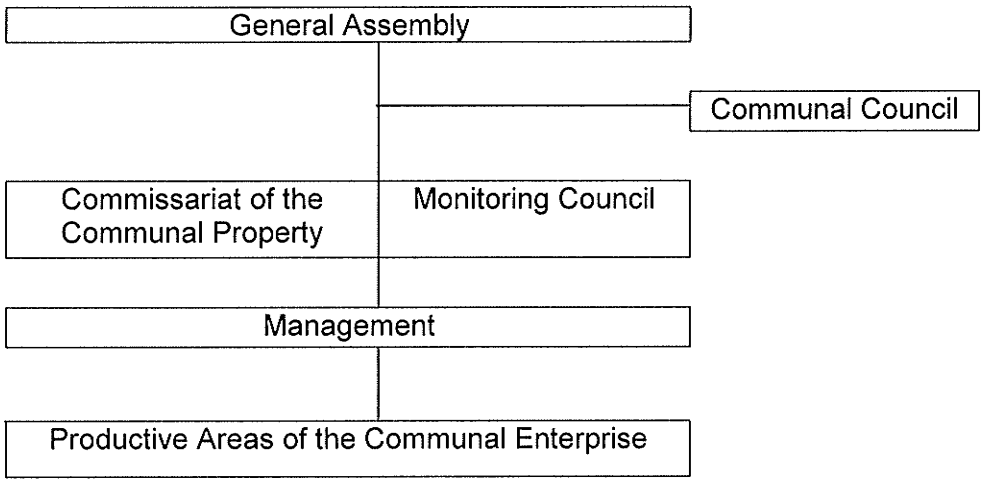


Figure 6. Diagram of San Juan's Institutional and Organizational Structures.

4.2.3.1 Main Stakeholders of the Communal Enterprise

Municipal Level

The main stakeholders at the municipal level are *comuneros* and family members of the *comuneros*. To give a particular distinction to this group, which are directly and indirectly the owners of the enterprise, from now on they will be identified as "shareholders". These shareholders are grouped based on economic activities. Most of these groups, also identified as the community interest groups, are highly organized and most of them existed even before the creation of the enterprise. As can be expected, some interest groups hold more power than others, for a given period, in decision-making processes, depending on the elected members of the communal institutions and the administrator of the enterprise. Among these groups we find:

Family-owned small-scale sawmills cooperative: Many member of this group of family-enterprises existed before the creation of the enterprise. This is one of the cooperatives with increasing membership. This increase in membership is due to the compensation system from San Juan for ex-members of communal institutions. The

compensation system consists of conceding preferential provision of wood in small sizes to the ex-members who wish to have their own sawmills. This group holds the strongest political power and also strong economic power.

Trucks owners cooperative: Some members of this group also existed before the creation of the enterprise. This group also holds some political power

Light truck owners cooperative: As with the above-mentioned cooperative, some were there before the enterprise was formed. They also hold some political and economic power.

Ranchers Cooperative: Even though the practice of having some cattle in combination with a farm have been there for a long time, this interest group is relatively new among the Nuevo San Juan enterprise stakeholders.

Avocado farmers cooperative: This is the group holding the strongest economic power due to the large national and international avocado markets.

Peach farmers cooperative: A relatively new interest group increasing its economic power.

Among other local stakeholders we find the Municipal Presidency and other government agencies. These government stakeholders have intermittent linkages with the communal enterprise depending on the elected political party, because the communal institutions of Nuevo San Juan serve as the branch of the Institutional Revolutionary Party (PRI) at the local level. Currently the Democratic Revolutionary Party (PRD) is in power, which makes the links between the enterprise and the administration very weak to nonexistent. Another important group of local stakeholders is comprised of landholders belonging to the private property sector. Some of the families in this category have been engaged in legal battles with the lawyers of the communal enterprise to gain the right to keep their property as private and exploit it for themselves. Most of the legal processes have been resolved in favor to the *comuneros*. However, since the occurrence of radical political changes that have taken place at the federal, state, and community levels, the *comuneros* have lost a few large extensions of communal land. These most radical changes relate to the passing of power from the 70 year old hegemony of the PRI to diverse administrations that have included the National Action Party (PAN) at the federal level and the Democratic Revolutionary Party PRD at the state and local levels.

4.2.3.2 Local Land Tenure Rights

The Presidential Resolution of 1991 for Nuevo San Juan recognized an area of 18,138 ha. of communal land belonging to 1,229 *comuneros*. Of this land, 4,354 ha. were identified, in the same document, as private property (See Figure 7 for a map depicting the private property in the communal land). Under these circumstances, the Presidential Resolution bestowed communal land rights, but also left to the *comuneros* the responsibility to solve differences with the families opposed to communal ownership of their land. Most of the families belonging to the private property sector are avocado farmers who at times developed strong political ties at the state level. The *comuneros*, in the interest of recovering the entitled communal land, have engaged themselves in a search for agreements with the families owning private land appealing, whenever necessary, to judiciary processes to recover parcels of land.

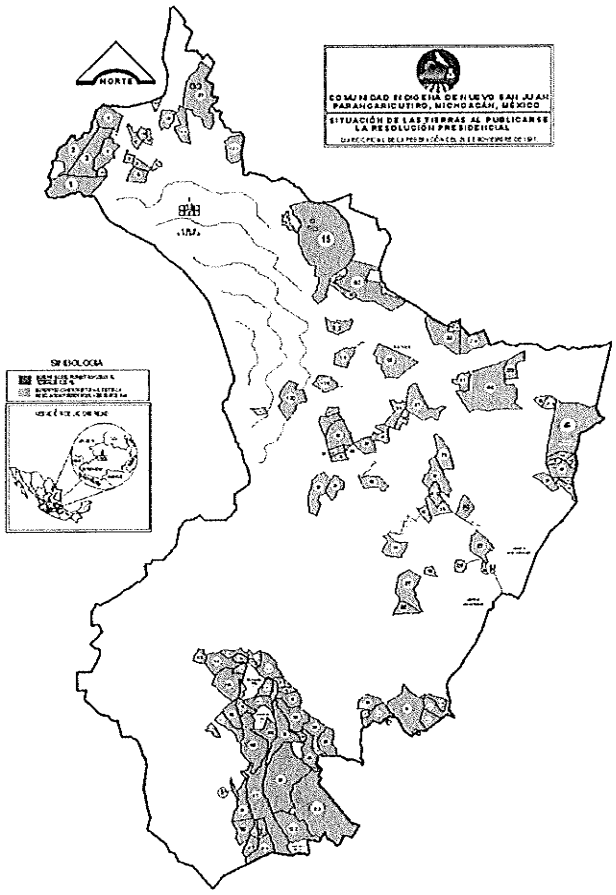


Figure 7. Private property parcels in the communal land at the time of publication of the Presidential Resolution in 1991. Source: Communal enterprise of San Juan (2005).

Currently the *comuneros* of San Juan have been able to recover 1031 ha. of land through legal and direct agreements; through judiciary sentences they have reacquired 834 ha. and also through judiciary sentences they have lost 561 ha. The remaining land is in the process of restitution. In recovering the communal property, the *comuneros* have searched for expert advice from local and foreign lawyers.

4.2.4 The Nuevo San Juan enterprise

The enterprise of the *comuneros* of Nuevo San Juan, Michoacán is a community-based organization established in the early 1980s with the aim of promoting development through the use and management of forest and non-forest resources. When the enterprise began it gave employment to approximately 100 *comuneros.* Presently it has approximately 600 direct employees who are receiving the social benefits established in the Mexican legislation. There are also approximately 89 persons in the non-timber related adjunct areas of the enterprise, and approximately 700 part-time and seasonal employees and thousands of beneficiaries. According to key informants, the current annual sales are over US$10 million for an exploitation of 70,000 m^3 of wood per year. The forest exploitation of the enterprise, coordinated by the Technical Forest Department (DTF), is carried out in a systematic way. Exploitation activities, including the selection of tree stands, types of silvicultural method to apply for each stand, and transportation are guided by data from GIS and field monitoring activities. The communal forest management system in Nuevo San Juan has received national and international recognition for its vertical integration of forest production (use of product and byproducts), scale of operations, innovative management system and use of profits, among other achievements.

The Forest Stewardship Council[19] (FSC) ratified in 2006 the SmartWood certification given to San Juan in 2000. The SmartWood Program provides certification of forest management plans as a way of recognition to more sustainable forest use and management practices. The evaluation was carried out to ratify the certification involved the study of conservation activities, research on forest management, timber and non-timber products processing, and the restoration and production of forest resources. The evaluation's results highlight the efforts made by the enterprise in the field of social development and the need it has of strengthening the environmental component and the management of the forest. An important concluding point of the evaluation emphasizes the need of institutionalizing organizational and management strategies to be able to do continuation to improved management actions and programs under newly elected administrations; and of the need of using outcomes of monitoring activities to improved silvicultural program and environmental protection strategies.

[19] Linked to the Rainforest alliance.

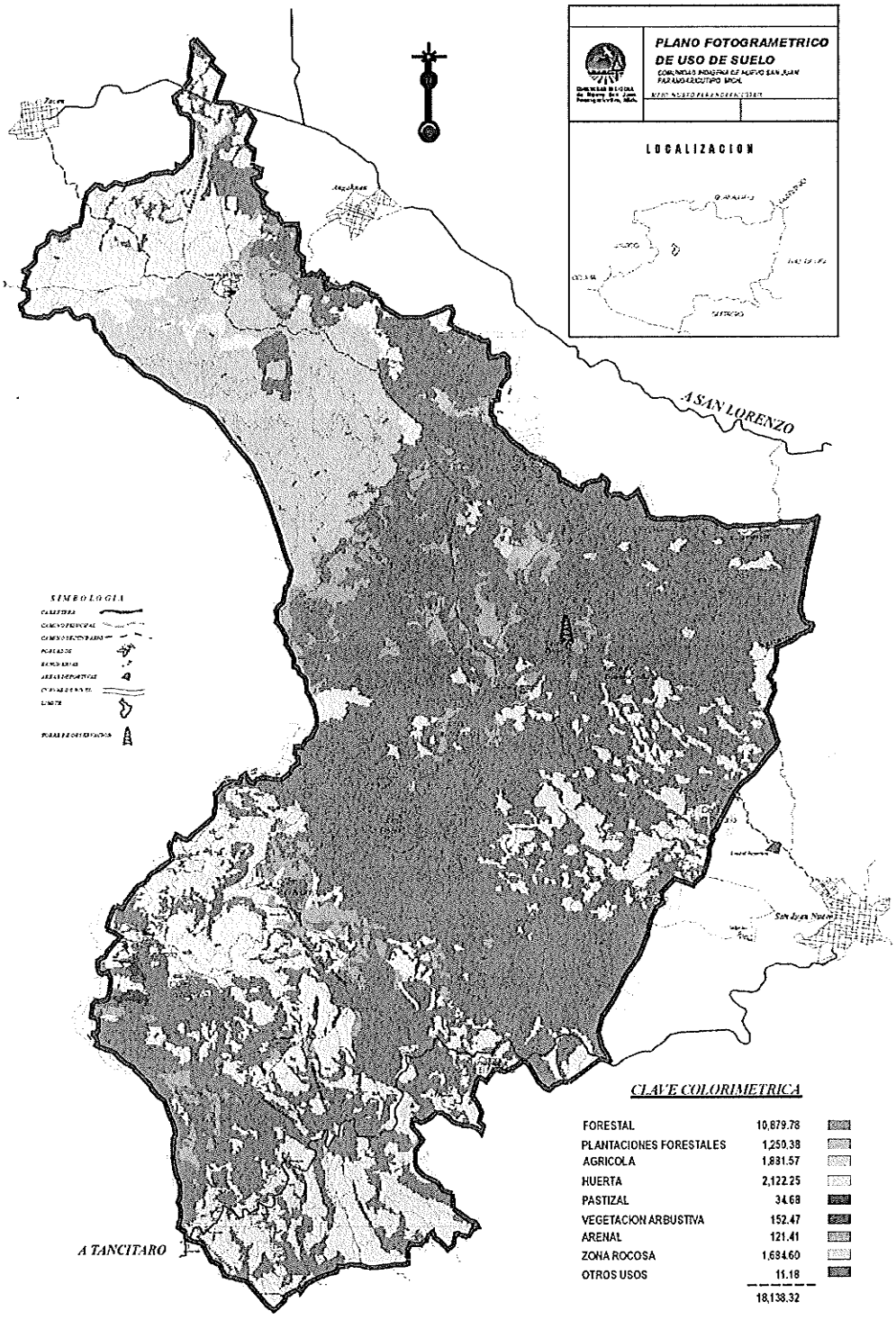


Figure 8. Land use strategy in the communal land of Nuevo San Juan. Source: Communal Enterprise (2005).

4.2.4.1 *Forest Management Plan*[20]

As part of the land use strategy, the *comuneros*, with support from researchers from different institutions and some government agencies, have classified the communal land based on landscape and vegetation features (See Figure 8 for a map representing land use). The 18,138.32 ha of communal territory have 6,443 ha. of forested land. The planned timber extraction cycles are based on periods of 10 years. The communal land has been divided in 10 annuities based on the distribution of the forest. The exploitation is based on the silvicultural development method, which involves cutting trees in a way that promotes natural regeneration of desired species. The silvicultural treatments include:

- Clearcutting for regeneration: Method where most trees are harvested leaving just some few mature individuals of desired species for natural regeneration.
- Thinning: Method where an intermediate cutting of the tree takes place. This method is used to increase growth and improve general conditions of the trees.
- Final Harvest: Method where mature trees, previously left as seed providers, are cut to leave space and light for new trees.

Since 1978, when the first forest management plan was developed, the silvicultural method applied has changed little. The full cycle of tree harvesting is of 50 years, in agreement with the attainment of the commercially important size of about 50 cm in diameter. Therefore, it is hard at this point in time to determine the benefits of the silvicultural method in the search of sustainable management practices aimed at allowing future generations of *comuneros* to enjoy the communal forest.

Field research on soil use and forest cover in San Juan based on interpretation of aerial pictures from 1974 and 1996, indicated that forest cover – including the portion of the Pico Tancitaro national park in the communal land – increased by 2800 ha. (Sanchez et al., 2003). The increase in forest cover was attributed to a centrally managed system of forest exploitation, the federally imposed restrictions and the limitations of accessibility (Sanchez et al., 2003). Other outcomes from the same research also indicated the changes in soil use, where traditional crops maintained the

[20] Information based on the Forest Management Plan of the San Juan Forestry Enterprise, unless otherwise indicated.

same expanse while perennials crops, especially avocado, increased from 192 ha. to 1,974 ha., reflecting the new market conditions and some of the tendencies inside the community itself (Sanchez et al., 2003).

The forest management plan also mentions, in addition to the harvesting measures and timber allocations, the management and approximate harvesting measures for resin, and the general protection and mitigation measures to reduce environmental damage. The evaluation report of the SmartWood Program (2006) indicates that the primary objective of the San Juan enterprise of obtaining the maximum benefit of the forest is limiting management actions on other areas. It also calls for more effective and systematic monitoring strategies. Addressing the analysis of other management implications, it mentions that the benefits being accounted for by the enterprise do not include costs generated by activities other than the timber extractions, processing and management (SmartWood Program, 2006). In general, the evaluation's outcomes show that there isn't a regular ongoing process to evaluate and improve the silvicultural methods being applied. It implies that wherever information is being collected it is not being used to improve management strategies. Moreover, it highlights that there are no clear environmental protection and mitigation measures, with the exception of the exclusion of riverbanks from forest extraction activities.

4.2.4.2 Vertical Integration of Forest Production

San Juan's community-based management system has been recognized by numerous government agencies and organizations for its management approach which emphasizes the vertical integration in the forest production. Such vertical integration means that byproducts of the timber management and processing areas are used in other areas, reducing waste considerably. Byproducts from the sawmill, the furniture factory and the secondary timber processing areas are sold and used as fuel, employed in the pine tree nurseries for composting, and transformed into small pieces for the chipper machine and then sold for paper production. Lumber and timber are grouped into three to four classes based on quality. First and second class lumber are employed in the furniture factory, and are sold to outsider clients and to the community's woodworking shops and family owned small scale sawmills and used to construct platforms. Third class lumber is used in the broom and mop factory and the construction

of platforms and packing boxes, is sold to the local wood working shops, and is sent to the chipper machine. Byproducts from the timber areas such as sawdust, bark, etc. are partly sold and partly employed in the drying stoves and other areas such as the tree nurseries. See Section 4.5 for plates of the enterprise's areas.

The resin plant has not yet reached the level of vertical integration achieved in the timber management area, but apparently steps are being taken to improve current conditions of waste generation and add value to primary products. In other productive areas there is also an ingenious integration of processes. The visionary *comuneros*, in their interest of diversifying economic activities, work in the identification and implementation of other projects in a way that addresses the strengthening of current activities, and at the same time attempts to cover as much of the chains of industrial production and management as possible. For example, in relation to farming, it starts from visualizing the recovery of land deforested by the volcano eruption with fruit tree plantations to establishing a fruit packing company and transportation services. In other words, San Juan's enterprise managers and leaders have, at different periods in time, identified the necessary steps to own most of the stages of production up to the sale of the raw or value-added product to individual consumers or other enterprises. However, it is important to mention that, with the exception of the transformation of some of the timber forest products, the communal enterprise's capacity to add value to raw materials is still weak.

4.2.4.3 Productive Areas

Diversification of productive projects is one of the primary objectives of the communal enterprise. Table 3 shows the development of key productive areas of the enterprise through time and the progressive network of administrative activities to deal with increasing complexity in production and management. However, the enterprise's main managerial structure continues to be the same since the creation of the enterprise, increasing therefore, the reliance of many on the decision-making power of one or some few.

Table 3. Productive and administrative areas of the communal enterprise through time.

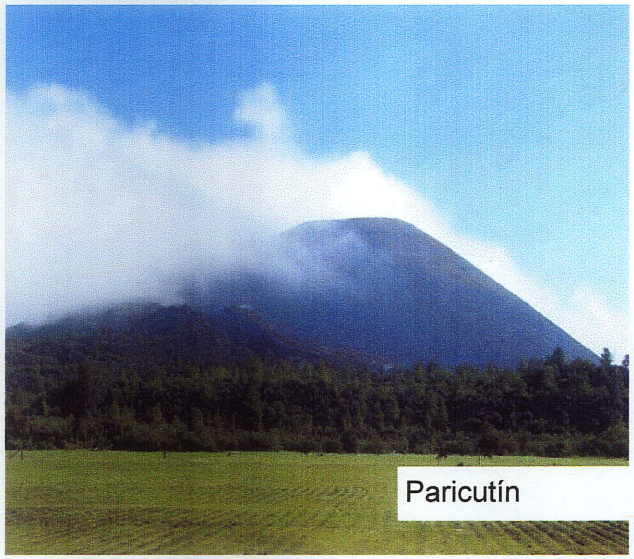
Productive Areas of the Communal Enterprise / Period of Creation		1980s	1990s	2000s
Productive/management Areas	**Related sub-areas**			
Sawmill				
Chipper				
Molding and Furniture factory	Finger joint dept			
Maintenance	Automotive dept.			
	Industrial dept			
	Weld workshop			
Drying stoves	Drying patios			
	Stoves			
Supplying Area				
Spare parts depot				
Secondary timber products				
Charcoal (from Oak)				
Monitoring	Industrial			
	Communal forest			
Resin plant	Laboratory			
	Distillation plant			
	Storage facilities			
Brooms and mops factory				
Tree nurseries				
Administration and management	Board of directors			
	Management office			
	Legal representatives office			
	Integral development office			
	Projects and Fundraising			
	Marketing office			
	Accounts office			
	Accounts receivable			
	Human resources office			
	Documentation			
	Inventory			
	Cash			
	Computers office			
Tech. Forest Services Dept. (DTF)	Forest protection team			
	Forest harvesting coordination			
	Forest regeneration promotion area			
Storage and distribution of Fertilizers				
Communal store				
Agricultural-livestock project	Farming program			
	Orchards program			
Water purification plant				
Fruit packaging				
Ecotourism				
Training				
Cable TV				

4.3 Summary

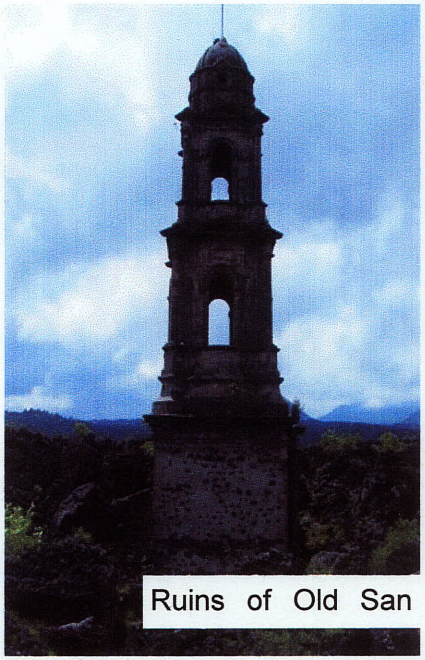
Among the various countries of the world, Mexico is unusual that much of the forest area, perhaps as much as 80%, is owned and controlled by communities (Bray et al. 2002). This makes community-based forestry enterprises such as San Juan extremely important experiments for learning about what makes sustainable community forestry possible. Mexico's forest resources are rich but vulnerable to illegal logging that occurs in many parts of the country (Chodkiewicz, 2003). In the case of San Juan, the community enterprise seems to have been successful in controlling illegal logging on their lands. The fact that the total forest cover in San Juan has not declined over the years but actually increased is an indication of the community's success in combining development with conservation (Castillo and Toledo 2000). This success in maintaining the resource base and achieving key development goals is also attributed to government imposed restrictions, such as protected areas, and to the inaccessibility of some forest patches (Sanchez et al., 2003). The next chapter turns to the findings of this research regarding three other important factors that have made this possible: self-organization processes in the community, the institutional linkages that it has developed in order to maintain sustainable use, and the forces driving change in San Juan's CBRMS.

4.4 A Photo Essay on Nuevo San Juan

Photographs of the communal land and some of the productive areas of the communal enterprise of San Juan. (Source for all photos: Alejandra Orozco, taken during field research, June to September 2005).

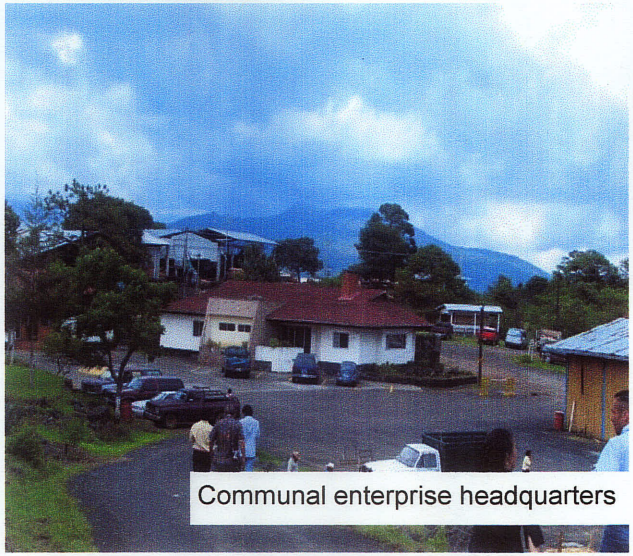


Paricutín



Ruins of Old San

Nuevo Parangaricutiro



Communal enterprise headquarters

Technical Forest

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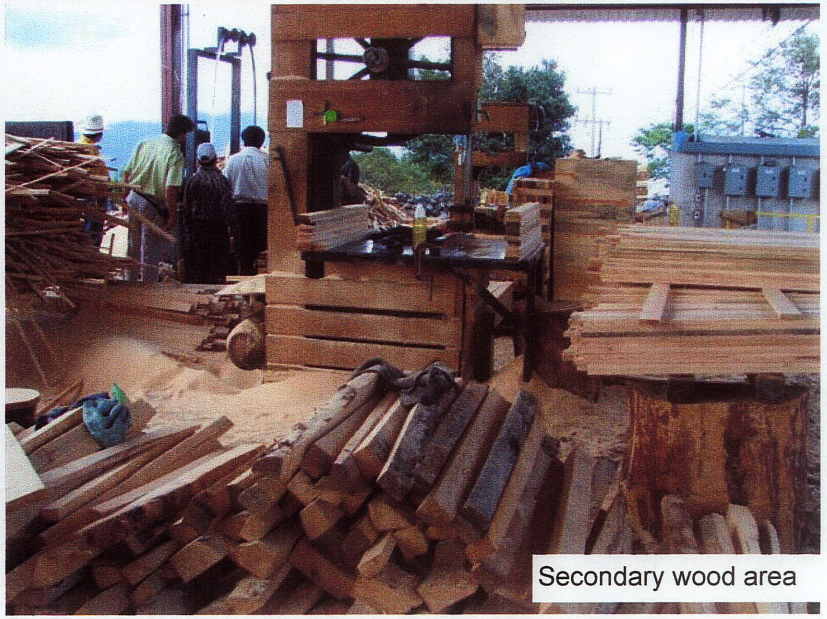
Logging

Decorticating machine

Industrial sawmill



Secondary wood area

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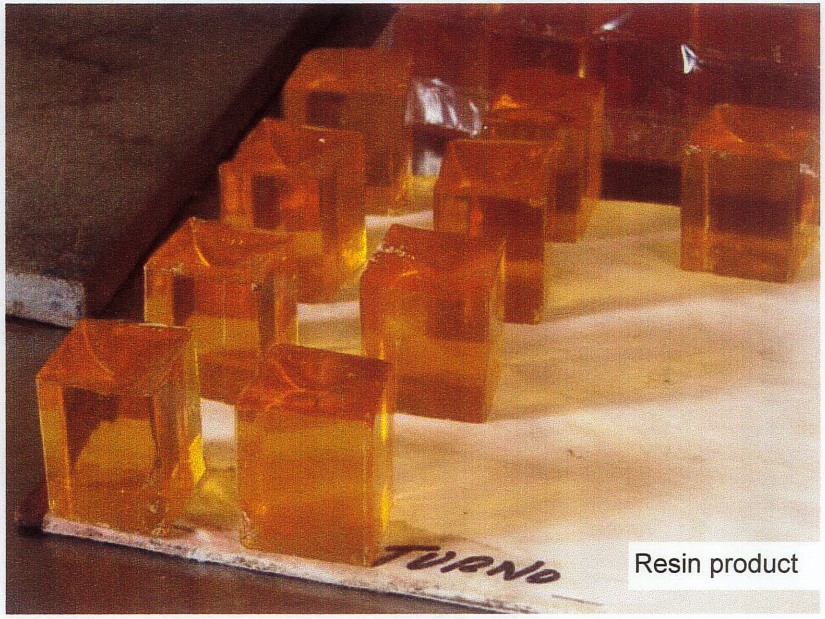
Furniture Factory

Finished furniture

Resin plant



Resin product

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Fruit packaging area

Water purification plant

Fertilizers Section

Tree nursery

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Chipper machine

Sawdust collection

Communal store

Training of other communities

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Chapter 5: Research Findings and Analysis

The information provided in this chapter is based on the data gathered during the interviews. The chapter contains both basic field data provided during the interviews and some analysis of the information provided. The first part of the chapter has a description of the community organization process, institutional linkages to access funding and information, and an analysis of changes in San Juan. The second part discusses institutional linkages and strategies, including horizontal and vertical linkages, key persons and leadership. The third part discusses drivers of change at various scales and their impacts on San Juan. The figures and tables here presented have been developed by the researcher after returning from the field, based on the contributions from interviewees[21].

5.1 Community Organization Process

5.1.1 Origins and Evolution of the Project

The intensive timber extraction during the 1800s and the first half of the 1900s undertaken by private companies without tangible benefits for most communities, as well as the consciousness of the need to be drivers of their own development, impelled many rural communities in Mexico to start an organizational processes that eventually gave birth to numerous resource management systems. In a similar manner, the unequal distribution of wealth and uneven socio-economic development taking place in rural communities in Mexico were some of the key triggers of the awakening of the *comuneros* and the strengthening of their communal institutions for resource management.

In San Juan, based on accounts given by current elders and ex-organizers of the community, after the eruption of the Paricutin volcano in 1943 the elders maintained the link with their land. This link and closeness to the land, together with the emerging leadership among some of the literate *comuneros*, who became tired of adopting a passive attitude towards the individually owned enterprises that were unsustainably exploiting their forest resources, triggered the creation of the management system.

[21] Attempts to develop a more participatory analysis of the data in the end were limited to identifying key aspects of the case with interviewees. Engaging interviewees in analysis was limited by the their own time constraints, the environment of secrecy at the community level which hampered interactions with key informants and the lack of a completely visualized structure and shape for the thesis document at that time.

These leaders decided to organize the *comuneros* to oppose the "mining" of resources that was taking place. In this manner, in 1982 after not very successful attempts to team up with other ejidos and communities to exploit the forest resources, the community took action, extracting and selling wood on its own at a small scale. The initiative thrived so much and the commitment was so strong, that soon after their productive activities as an independent community started, with the help of key partners, the *comuneros* acquired an industrial sawmill and started developing a large-scale operation for forest exploitation.

The community of San Juan, whose leaders developed linkages with some key individuals in the private sector and other important individuals in the state government, acquired some capital through the selling of dead wood (wood left by illegal cutting and from infected trees, mainly), with permission granted by the federal government. In the middle of 1983, the enterprise acquired what would become the heart of its operations – the industrial sawmill – and at the same time received permission from the government, after systematic lobbying, to extract timber. Currently, the enterprise comprises more than 20 areas of operations including both production and administration. Some of the productive areas are focused on exploiting the potential of non-timber forest products, and it is the only communally owned enterprise in the State of Michoacán that has its own Department of Technical Forest Services, which ensures that the enterprise is able to develop forest use and management plans in agreement with the Mexican Forest Act. (See Table 3 for details on the productive areas of the communal enterprise).

> "In first place the leader must be born not made and if he makes mistakes he must ask for forgiveness and keep working on improving. He should not combine community matters with management issues, etc., then the communal representative has nothing to do asking money from the manager, these two aspects shouldn't be combined and that is what happened here. The manager knew his job and the people came to me to solve community issues.
>
> "That is why I keep telling people, always talk with the truth, keep your word, be honest and the people will respond in mass."
>
> **Founder and former member of institution**

5.1.2 Leadership and key people

At the local level, as described by most *comuneros* that were interviewed, leadership has played a unique role in the formation and consolidation of the enterprise.

Particularly, the vision of some individuals gave life and shape to the enterprise. Among the most important leaders have been the Communal Representative elected at the end of the 1970s, the lawyer Francisco Ruiz Anguiano, and the community Commissioner for Forest Exploitation elected at the beginning of the 1980s, the engineer Salvador Mendez, who together were able to create the vision, organize dispersed *comuneros* and engage other local stakeholders – organized by cooperatives[22] of family-enterprises such as family-owned small-scale sawmills, cooperative of truck owners, cooperative of light track owners, etc. – to work together to form the communal enterprise. These leaders also took the most important steps in the process that brought the official recognition of the *comuneros* and their communal land in 1991.

Subsequent administrators of the enterprise and communal representatives during the first decade, in a similar fashion, contributed also in the cohesion of the *comuneros* and to the diversification of economic activities in the enterprise and in the community. The administrations and representatives during the second and third decades of the enterprise, however, have played varied roles that have ranged from being passive in terms of innovation, expenditure and reinvestment of profits to being very bold, from being passive in finding partners at different scales to being quite proactive, and from managing profits well to managing profits in a questionable way.

> "...Soon the harvesting time came, by then there were lots of battles won and accumulated resources [financial, official recognition, etc]. This was the time when ____ came and bought peoples' favors and loyalty and sold the image of the community to agencies who used it as they pleased, to increase their popularity and receive recognition for what they didn't do. Even worse, the subsequent administration did nothing to change what was going wrong".
>
> **Former important member of local institution** speaking of developments in the 1990s.

The younger generations among the *comuneros* and some of their family members have taken over the administration and management of most areas of the enterprise since its second decade. However, membership in communal institutions continues to be, very often, in the hands of the senior *comuneros*.

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[22] *Cooperatives* are defined as the associations of local businesses, who are shareholders. They are organized based on type of family businesses. These groups have a high level of organization directed to obtaining increasing benefits from the communal enterprise.

5.1.3 Key Linkages at the Regional Level

Results from field interviews indicate that at the state level, one of the key persons was an entrepreneur who gave support to the *comuneros* by paying them for their timber before it was delivered and by vouching for them to a sawmill manufacturer to get the sawmill constructed in the community.

In addition, Cuauhtemoc Cardenas, first as Forest Subsecretary and later, as Governor of the state of Michoacán, gave open support to the communal exploitation of forest resources by providing the required legal permits to do so. Also, some other persons in the forest secretariat facilitated the process of getting permission by giving basic information, being flexible and facilitating the process of providing permits. During this period, bureaucratic obstacles for communities to get permission to exploit resources were moderately reduced.

> "...But then 'the friends of the community' helped us to keep going by facilitating bureaucratic processes; therefore, the agency was key on that, but in the first stage it was the federal government through the Forest Sub-secretariat...this office was our refuge, the hand from above that appeared for our help...then their contributions were crucial for our success."
>
> **Founder and former member of local institutions**

5.1.4 Key organizations

Interviewees fully involved in the initial and subsequent stages of the community organization processes indicate that among the organizations that made key contributions to the communal enterprise in its initial stage were the following:

A. Servicio de Extracciones Forestales SEF (Timber Extraction Company), a private company founded by the engineer Salvador Mendez together with a colleague. This company, based on the *comuneros*' request, was part of a partnership with the General Assembly (principal institution of the *comuneros* established by the Agrarian Act) to start extracting timber and dead wood in 1981 when the community's forest was being exploited through the UECIFOMET. This partnership helped the *comuneros* to acquire basic road infrastructure and equipment to do the extractions; SEF also vouched for SJN to other organizations and enterprises whose support – in the provision of services without payments in advance – contributed in part to the

construction of the sawmill and helped in the capitalization of the enterprise to carry out the necessary activities to deliver forest products.

B. Celulosa y Papel de Michoacán – CEPAMISA (Fiber and Paper Company of Michoacán): Based on the recommendation given by SEF and on its own needs, it financed the activities of extraction of cellulose materials of the enterprise through payments in advance. This financial support helped the enterprise to invest in infrastructure and equipment.

C. Santander Serfin Bank: The bank provided the first credit to SJN, which was used to invest in road equipment, infrastructure and to operate the enterprise.

5.1.5 Other Linkages

As indicated by some external consultants and some comuneros, researchers and other regional and national agencies and organizations played important roles mostly during the second and third decades of the enterprise. In some important cases, such as the link the community has with the Autonomous University of Mexico (UNAM), the Government agency PROCYMAF, the private company El Palacio del Hierro, and others, such partnerships have been decisive in the self-organization and adaptive management of the enterprise to deal with drivers of change (market economy, rationalization of management processes, competitiveness, etc.).

The affiliation of the *comuneros* to the Institutional Revolutionary Party also contributed to the establishment of other strategic partnerships, including the initially strong involvement of San Juan with the Union of ejidos and communities (UECIFOMET), to the formation of alliances to overcome pressure from private land owners, and to facilitate some flow of government funding to the enterprise, the *comuneros* and the community.

5.1.6 Initial funding and other resources

With very detailed accounts, the founders of the enterprise described to me the process of community organization that led to the creation of the communal enterprise. Such organizational process was carried out without the use of external funding. Between 1976 and 1979 some of the *comuneros* together with leaders from other communities and ejidos took the first steps to organize themselves, taking advantage of the friendly policy environment, and formed the Union of Ejidos and Communities Luis Echeverria Alvarez (UECIFOMET). More friendly policies included the opportunity of being allowed to have communal exploitation of resources if made through associations of ejidos and communities – a policy championed by persons such as Cuauhtemoc Cardenas. The UECIFOMET received government funding to start its operations. At the end of the 1970s, during the process of deterioration of the Union, due to mismanagement, the *comuneros* of San Juan who had participated in the process of its formation, all of them represented in the General Assembly, elected a new Communal Representative and soon after decided to leave the Union. In the process of deterioration of relations with the Union, the San Juan *comuneros* made attempts to exploit patches of their forest through the permit the community received through the Union, but the outcomes were economically disappointing. The Communal Representative then made contacts with the Timber Extraction Company SEF knowing that its director was a native of NSJ, to invite him to work with the community. The communal representative started working with the director of SEF making use of some of the resources and windows of opportunity left by the affiliation to the Union, among them the possibility of requesting an individual exploitation permit if leaving the Union and the dasonomic study of the land that had been developed. The Communal Representative and the director of the company consequently led the community organization process that gave life to the communal enterprise.

> "...then they (agencies and others) supported not by bringing financial resources. I think if they would have done that they (the community) would have put me aside and started fighting to get as much as they could (completely normal when you see a community that has come from total deprivation to almost total deprivation, in such circumstances all you see is avarice). Then, we were orphans of money but not of people, they were not the most important people in their agencies/organizations but had positions from which they were able to facilitate processes."
>
> **Founder and former member of local institution**

The resources the *comuneros* generated between June 1981 and July 1982 through the sale of dead wood brought 1,006,000 pesos. These funds, in combination with the resources generated from the first timber extraction made with the support of SEF between 1982 and 1983, made possible the acquisition of the industrial sawmill. In addition, a small amount of money provided by the corn farmers from the community, together with the active participation of key local interest groups in communal labor, contributed to the development of facilities and the starting of operations. Similarly, with part of the resources mentioned above and advances of funds provided by CEPAMISA, other costs such as electrification for the enterprise and the chipper machine were covered.

Capacity Development

SEF provided basic training in the management of timber to start the enterprise's operations as part of the partnership with the *comuneros*. However, because of the long-term experience in timber management of a large number of families among the *comuneros*, many of them were already knowledgeable about timber exploitation and prepared to perform their tasks.

The manufacturers of the sawmill also provided basic training to the *comuneros*. In addition, some of the allies in government offices such as the Forest Subsecretariat and the Rural Development Department provided technical support and information on application procedures for forest exploitation permits and required general documentation.

Investors

Key informants stated that the San Juan enterprise was built without the use of external financial donations but with some local financial support and lots of local in-kind support, together with some key indirect financial support from a couple external of business partners. Among the initial supporters were SEF and CEPAMISA. SEF provided lots of in-kind support and CEPAMISA provided monetary advances for the enterprise to start operations. Later on, some banks and eventually the government became important investors in the enterprise. SEF provided key personnel together with the *comuneros*. The road construction machinery and other heavy equipment were acquired with the help of SEF. The land for the construction of the headquarters of the

enterprise was given for free by an ejido, after the *comuneros* manifested their interest of using it for their plans. Some of the equipment, such as chainsaws, was provided by local families owning small-scale sawmills. Similarly, trucks to transport the timber were provided by both SEF and some families belonging to the trucks cooperative of the community. Some months after the enterprise started operations, flows of money became available to buy trucks and other equipment for the enterprise.

Most of the key interest groups among the *comuneros*, organized by cooperatives, participated actively in the establishment of the enterprise. These cooperatives, especially the sawmill owners and truck owners gave a lot of in-kind support to capitalize their businesses through the acquisition of wood from legal logging. Outcomes of the communal enterprise development and strengthening also, consequently, influenced and help in the consolidation of other local business cooperatives. SEF also provided personnel to start operations.

A large number of the outsiders that provided some help to the community – on required documentation, etc. – developed contacts with Nuevo San Juan through the active role it played when affiliated to the UECIFOMET. Other contacts, such as the one with SEF, happened because of the link of community leaders with one of the founders of SEF. Subsequent support came as a consequence of the numerous successes of the community in acquiring legal status and in managing the communal forest.

5.1.7 Knowledge Applied

Past and current enterprise personnel indicated that the main body of knowledge in use and used to put the enterprise in place and make it function was based on Western science. Timber handling processes, in agreement with the legislation and the market, required specialized technical knowledge. However, as mentioned above, by the time the enterprise was being formed, numerous *comuneros* already had numerous skills in the use of timber and non-timber forest products from their ancient interactions with the forest. Moreover, local knowledge had a role to play in aspects such as the direct management of tree stands, in dealing with communal issues and the *comuneros*, with law enforcement agencies and with outsiders in general.

Contributions from TEK

Since the *comuneros* from Nuevo San Juan have been interacting with the forest and its resources for many generations, there is local knowledge on natural processes of the forest, its management and environmental conditions in general. Moreover, the *comuneros* have had in place for many generations particular farming systems and resin tapping activities; therefore, there is also a body of knowledge on this area. In addition, there is local knowledge on institution building processes, particularly, in the form of communal multi-stakeholder bodies, which seems to be closely linked with traditional religious practices/festivals and customs. The knowledge on institution building, farming systems and forest management is held by both males and females; however, it seems that such knowledge is being applied mostly by males. In the communal enterprise, all of these areas of the local knowledge have been applied in varied levels through time. In particular, the area of institution building made strong contributions to the successful formation and first years of strengthening of the communal enterprise.

5.1.7.1 Other Knowledge

Key interviewees indicate that because of the need for satisfying the requirements of the market, of the scale and type of forest extraction, and of being highly productive in a competitive environment, the *comuneros* appealed to scientific knowledge. The professional knowledge held by some of the local leaders was also key in contributing to proceed methodically in the process of community organization, in the design and implementation of forest management plans, in the acquisition of the Technical Forest Department and in the search for official recognition of the communal property.

5.1.8 Overview of the Social-ecological system

Drawing from the description of the socio-political environment presented in the previous chapter and some additional information also provided through interviews, the researcher attempts in the present sub-section to analyze and represent in a very general way a description of the San Juan community and stages of development of the enterprise.

The figure below presents a brief scheme of the self-organization processes taking place in San Juan, the way land passed from being perceived as communal to be conceived as private property and eventually again as communal, and the players and drivers leading these processes. In Figure 9, Holling's adaptive cycle is used to present these different land and resource management and ownership changes in San Juan. The figure illustrates a) the way traditional management of the forests helped in the accumulation of resources that later were released by small to medium scale exploitation of timber, and b) how the unequal distribution of economic benefits, a natural disaster, and enabling policies generated awareness and prepared the way for re-organization manifested as a communally driven development process. New social conditions in the same social-ecological system then emerged and evolved giving life and strength to San Juan's community-based resource management system. Subsequent changes in leadership and generational perspectives produced the release of accumulated capacity and resources, generating, afterwards, new conditions for re-organization.

The stages that the San Juan social-ecological system has passed through, as summarized in Figure 9, indicate the influencing drivers, the periods of influence and the prevalent conditions at the different stages. The room for experimentation and novelty created during the stages of re-organization that brought, as a consequence, different social-conditions, is a product of and is fed by the higher level of knowledge and developed human and social capacities, the enabling legislative environment, and the linkages at various levels (especially local and regional). These factors generated a flow of resources and helped in the creation of key partnerships and subsequently the communal enterprise.

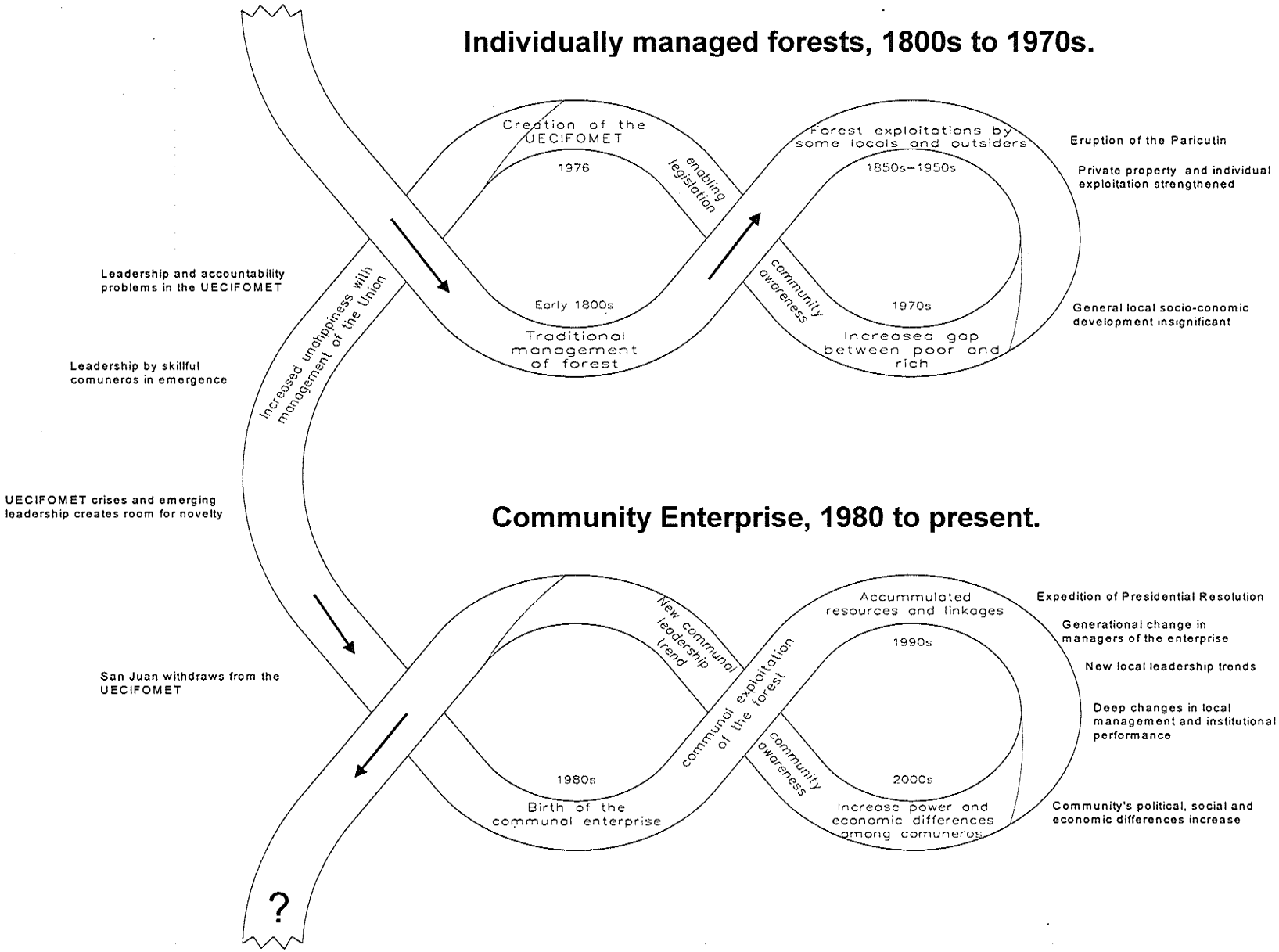

Figure 9. Adaptive cycle representation of forest resource management strategies at Nuevo San Juan.

5.1.9 San Juan's Changing Trends

After the formation and consolidation of the enterprise (whose defining milestone is assumed to be the publication of the Presidential Resolution in 1991), the changes in resource and administrative management implemented by new leaders – especially during the second decade – brought far-reaching changes in the built, social, human and financial capital of the community and the enterprise. Generally, what comes out from interview after interview with key players previously and currently involved in administrative and institutional processes in the enterprise, is that at some specific periods some of the primary values of promoting communal economic development have been partially or totally replaced by the fight by individuals and/or groups (community elites) to capture and/or increase financial and political power. These periods of irregular application of institutional arrangements or of irregular representation of the community interests as a whole have, consequently, strengthened the political and economic power of some local elites or local business associations, increasing the challenges for carrying out inclusive decision-making and other processes. A summary of the leadership changes in San Juan and of the principles guiding the formation and evolution of the institutions for resource management is represented in Table 4. The temporal analysis, made by the researcher based on the data from interviews, is structured around Ostrom's (1990) design principles of long-enduring common property institutions and some other important management strategies. The processes mentioned have mostly been locally driven, unless otherwise indicated. Key changes coming as a consequence of outside agencies, organizations and institutions are more thoroughly explained in the sections on cross-scale linkages and drivers.

The manifested outcomes described in Table 4 reflect the contributions – most of them backed by specific examples – of numerous[23] interviewees holding important positions at the institutional and administrative levels. These outcomes show some important aspects of the leadership trends taking place in San Juan. Like the ecological system, the social system has proven to be very resilient. The scale of exploitation, the maintained resource base, as well as the general community structures for resource

[23] "Numerous" indicates that at least 10 interviewees highlighted the issue(s) as current or past challenges. The current institutional and management challenges to which this document refers to are basically based on the contributions of people holding key positions, not on the comments or contributions of outsiders or *comuneros* not very much involved in communal processes.

management, are still so large and strong that even though their permanence may have been threatened at some points by mismanagement and weak leadership, management strategies have been maintained and institutional arrangements have, to a certain point, adapted. The social capacity and strategic partnerships that have been developed appear as some of the key contributors to the adaptability of the social-ecological system.

In relation to the management system, adaptability to new social and economic conditions seems to be losing strength. The managerial structure of the enterprise is almost identical to the one with which the enterprise started, even though the level of activities have increased. The manager has under his charge all productive areas without an intermediate body to advise on performance and required actions. Monitoring of performance of productive areas and coordinators, of institutional bodies and exhaustive monitoring of financial and other resources, by neutral outsiders or comuneros, does not take place regularly, making it harder to ensure compliance with local institutional arrangements and distribution of management power. Similarly, meaningful, regular and healthy interaction between community institutions and management can be hard to achieve depending on the elected members of each and the community's interest groups they represent. Under such conditions elected members of communal institutions may also drive, polarize and/or politicize management processes, adding to the difficulty of achieving a good performance of the enterprise.

Table 4. Changing trends of San Juan management and institutional arrangements.

Institutional and Organizational Processes			
Principles	**First decade of the enterprise**	**Manifested Outcomes**	**2nd and 3rd decades**
Devised rules congruent with ecological conditions	Dasonomic study of the communal land at the end of the 1970s, and professional and other knowledge held by founders provides required data and instruments for design and implement of forest management plan able to maintain the resource base	Adequate management and conservation of timber resources contributes to increase credibility among agencies and organizations and to establishment of the enterprise's Technical Forest Department	Resource management rules continue to maintain resource base and diverse linkages increasingly influence management procedures.
Clearly defined boundaries	Land boundaries defined and well known by leaders and locals but not officially recognized until 10 years after the creation of the forest management system. Internal boundaries for resource users and identification of users were based mainly on traditional land tenure arrangements. Official recognition of land ownership included private and communal landowners	Conflicts between private property owners/users and common property owners/users appeared less often after official recognition. Common property forest resources are centrally managed and boundaries among users accepted	There are still legal struggles over transforming private into common property or keeping private property as such
Proportional equivalence between benefits and costs	Traditionally users exploited resources in their land on an individual basis. Communal institutions established the central management of forest resources, where users must sell their timber to the communal enterprise. Benefits included: preferential treatment and hiring of local businesses, generation of employment, payments matching market conditions and participation in decision-making and other institutional processes	Resource users and managers agreed on restrictions and benefits from resource exploitation. General improved socio-economic conditions. The communal enterprise becomes motor of local development. Larger production costs because of the need to generate employment	Some forest resource users in discomfort with benefits from centrally managed resource. There are struggles between landholders with forested land and communal management/institutional bodies, whose appeal for changes in the original resource management arrangements are numerous. Many current landholders don't see direct benefits from enterprise and often don't have strong voices in decision-making processes. New leaders have also, at certain times, contributed to the deterioration of transparent and participative management processes
Collective-choice arrangements	Common property users were involved progressively and systematically in decision-making and other designing processes. Regular consultation became the norm. Communal structures were clearly defined and administratively separated from management institutions. Clear boundaries between rights and duties of communal and management institutions were established	Even though traditionally men have dominated decision-making processes, women got interested and involved in them. Generation of trust and strong communal support to institutional and management initiatives. Large numbers of locals participating in decision-making processes	Members at lowest socio-economic level or isolated from strong interest groups don't have much power to influence decisions or processes. At certain periods changing leadership has brought as a consequence the mix of communal and management issues, where institutional decision-making processes are just a way of legitimizing previously taken decisions. Networks of elected members of institutions and powerful interest groups seem to be driving most management processes and communal issues. Newer generations are struggling to have their decision-making and other rights recognized
Monitoring	Communally supported. The large extensions of forested land are primarily monitored by the users or community landholders and supported by a monitoring and evaluation body coordinated by the	Conflicts with outsiders were inevitable but sense of communal ownership and stewardship protected the land as a whole. Community	Monitoring body still strong. From outside, the community represents an example of unity and proper management of resources. Some *comuneros* feel, however, that

Institutional and Organizational Processes			
Principles	**First decade of the enterprise**	**Manifested Outcomes**	**2nd and 3rd decades**
	enterprise	resource in better conditions than all other forests in surrounding communities	changing leadership and passive attitudes towards mismanagement may be threatening the long-term survival of the system and deteriorating further the sense of a united community
Graduated sanctions	Verbal sanctions and if the misconduct persists stronger sanctions were applied. These applied for locals not adhering to the community rules and for outsiders stealing timber	Created a clear image of ownership and stewardship before locals and outsiders	There is a generalized sense among interviewees-of the lack of clear sanctions to mismanagement and of the passivity of enforcing bodies in applying existent rules, during second decade of the enterprise. Some feel rules are still being irregularly applied
Conflict resolution mechanism	Use of regular channels to avoid conflict whenever possible. Different kinds of arrangements took place to try to solve differences with local contending groups. Whenever considered necessary, users gathered and claimed their rights before authorities	Community unity and stewardship was demonstrated before outsiders. Government agencies backed community efforts for their effectiveness. Increased credibility before potential partners	Peaceful ways of solving problems with private property and outsiders are still maintained. However, deterioration of inclusive decision-making and arbitrary management give less credibility before local users and generate still unresolved conflicts
Minimal recognition of rights to organize	After unsustainable forest exploitation by outsiders with the approval of locals belonging to the private property sector, enabling legislation motivated San Juan and other communities to come together to exploit their communal resources. This union had varied results and ended in dissolution. Lessons learned and not too constrictive laws, allowed San Juan to organize most of its community of resource users and establish the enterprise	Increasing government recognition to organizational efforts allowed San Juan to achieve full recognition of land use and ownership rights, Thereby consolidating its communal management system. Legislation driving organizational processes were adopted by the community and adapted to the local needs	Subsequent legislation has redefined communal management systems as "private and for profit", increasing management challenges. Other policy trends, taking place since the last decade, discourage communal but support private land ownership; and have reduce channels of resources to support communal initiatives
Community-Based Resource Management Processes			
Management of profits and accessed financial and other resources	Profits were distributed in the first year. During subsequent years of first decade profits were re-invested to create more productive areas	Increase in generation of employment by about a 500% in the first 6 years of operations of the enterprise. Generation of trust because of tangible benefits	Partly re-invested and more productive areas created. During much of second and third decades financial monitoring has seriously weakened. Profits and other financial resources were used to provide loans to locals to gain communal support, and to develop partnership and other initiatives with outsider organizations and agencies
Rationalization of processes	Most infrastructure and industrial machinery was acquired during the first ten years of the enterprise	Exponential increase of profits. The enterprise becomes the motor of local development. Elimination of extreme poverty at the community level	Some important productive areas were created, large numbers of linkages and partnerships have been established. National and international recognition was strengthened
Diversification of productive activities	Key objective and achievement since creation of the enterprise	Employment generation, local socio-economic situation seriously improved	Still a very important and highly emphasized objective of leaders and the enterprise
Development of partnerships	Very important and strategic objective since creation of enterprise. Key partnerships were established	Diversification of productive activities and generation of employment	Very important objective whose achievement has allowed the enterprise to have international recognition for "improved" and successful management ofthe forest

5.2 Linkages and Strategies for Resource Management

5.2.1 Cross-scale linkages

As part of the local strategy used by the community to manage resources, the partnerships and varied linkages established with a large group of entities, agencies and organizations are of primary relevance. The community's strategic steps include: the business association with family owned enterprises at the community level that support and are supported by the economic activities carried out in the communal enterprise; the development and strengthening of linkages with many other agencies, organizations and institutions through direct association and through the channels provided by key linking persons; and the regular relation with consultants whose counseling provide the necessary tools to maintain a regular condition of competitiveness and growth. This competitiveness has come as a consequence of the ongoing training of workers and the improvement in the rationalization of productive processes. The growth in the enterprise has been a consequence of the competitiveness, linkages and other management strategies. Table 5 presents some of the important stakeholders at the local and other levels.

5.2.2 Institutional and Organizational linkages related to the project

5.2.2.1 Horizontal Linkages

Political Linkages

The communal institutions of Nuevo San Juan act as the branch of Institutional Revolutionary Party – PRI – at the local level. This political identification has allowed the *comuneros* to have strong linkages with the local government administration from the time of its foundation until recently. The affiliations of the Nuevo San Juan *comuneros* with the PRI predate the creation of the enterprise, but they became strategic linkages to get support once the enterprise became a serious project. Most if not all of the PRI candidates to the Municipal Presidency are nominated by the communal leaders and have been people in important positions in the enterprise. Once they are elected, government economic support to some of the enterprise's or *comuneros* productive processes has taken place more frequently. Currently, however, the PRD is in power at the national level, which makes the links between the enterprise and the local government administration very weak to nonexistent.

Linkages with other communities

Linkages developed with other national and international rural communities are facilitated by federal agencies, organizations such as the Rigoberta Menchu Foundation and the World Bank. The function of these linkages is mainly capacity building for visiting communities, who use the Nuevo San Juan enterprise as a model to imitate (See Figure 11 and Tables 5 and 6 for details on linkages).

5.2.2.2 Vertical Linkages

Vertical linkages of the enterprise became stronger after the *comuneros'* land ownership rights were recognized by the Presidential Resolution in 1991. Key linkages that existed when the enterprise started were primarily with individuals at the state level rather than with organizations and agencies per se (See Figure 11 and Table 6 for details on cross-scale linkages of the communal enterprise). Currently, Nuevo San Juan has many linkages which have contributed to flows of resources, and even though this has contributed to the diversification of productive activities, capacity building and rationalization of processes in the enterprise, it does not indicate dependency of the enterprise on external funding. The annual sales increasing to up to over 10 million dollars at the present time and the numerous business linkages the enterprise has developed allow it to employ other resources that have been raised to improve or create new productive activities, rather than using these inflows of new funds as the way covering general on-going expenses of areas previously established. Several interviewees commented that changing leadership in the 1990s affected the performance of productive processes in the enterprise and caused misuse of considerable funds received from government agencies and general profits; however, they also mentioned that such challenges have affected performance and profitability of the enterprise *at some points or periods in time*, but do not signify a lack of economic sustainability of the enterprise. Only some of the most important linkages are indicated in Figure 11. Most of the linkages shown are with government agencies and are mainly related to raising funds for improving current management and other processes or to develop new productive activities[24].

[24] Fundraising is used to indicate direct funds raised for specific projects and/or to invest at the comuneros discretion, and in-kind support such as technology for research, for rationalization of production, institutional performance and others.

Table 5. Stakeholders and periods of formation of partnerships. (Source: field interviews).

Agencies/Organizations/Institutions	Level at which agency operates			1970s	1980s	1990s	2000s
	S/L	F	I				
WB (World Bank)							
RM (Rigoberta Menchu Foundation)							Ω
FSC (Forest Stewardship Council)							
CNC (National Peasant Confederation)				Ω			
SRA (Agrarian Reform Secretariat)							
CDI (National Commission for the Dev. of Indigenous Peoples) before know as INI (National Indigenous Institute)							
FONAES (National Fund of Enterprises in Solidarity)						Ω	
SEMARNAT (Environment and Natural Resources Secretariat)							
CONAFOR (National Forest Commission)							
PROCYMAF (Forest Res. Conservation and Sustainable Man. Project)							Ω
COINBIO (Biodiversity Conservation Project)							Ω
SEDESOL (Social Development Secretariat)							
SEF (Timber Extraction Company)					Ω		
CEPAMISA (Paper Company of Michoacán)							
SEDAGRO (Agricultural and Livestock Dev. Secretariat)							
SAGARPA (Rural Development Subsecretariat)							
CFEM (Forestry Commission of the State of Michoacán)							
UNAM – CIECO (Centro de Investigaciones en Ecosystemas)							
AG Municipal Government Agencies				Ω			
PM (Municipal Presidency)				Ω			
CL Local Cooperatives							

S/L	Active at the state and/or at the local levels
F	Active mostly at the federal level
I	Active at the International level
	Period of formation or strengthening of the linkage
Ω	Key person (creating or strengthening the link)

Key linking persons

Unlike many other rural areas, in San Juan many *comuneros* have reached high literacy levels, making it easier for them to work outside the community. The human knowledge and capacity thus developed, together with the fact that the enterprise is used as a model, has allowed to some the opportunity to work with government agencies and NGOs. These opportunities have been used by elected leaders of community institutions and the enterprise's management to create and establish linkages with the organizations where these *comuneros* work. Having key linking persons is one of the strategies of the enterprise to keep strong vertical linkages.

In a similar way, San Juan has also used the help of consultants from some of the agencies or organization it has interacted with. This business association allows the enterprise to develop proposals to raise funds, receive training and adopt new management systems and technology while at the same time encourages the hired consultants to find sources of funding from government and others for the enterprise's and the community's benefit.

Table 6. Key organizations and functions of their linkages with the Nuevo San Juan communal enterprise.(Source: field interviews unless otherwise indicated)

Organizations/programs/agencies	Aim of the Organization[25]	Details of linkage	Functions of linkages
WB (Banco Mundial) World Bank	To provide financial and technical assistance to poverty reduction and development projects in developing countries mostly through government agencies	Started in the mid 1990s. Provides support through gov't agencies and consulting services	▪ Innovation and knowledge transfer. ▪ Training and research ▪ Access to markets
FSC (Consejo de Manejo Forestal) Forest Stewardship Council	Provides certification of forest management plans through all the world	Started in the late 1990s. Regular, important linkage	▪ Certification ▪ Access to markets
SRA (Secretaria de la Reforma Agraria) Agrarian Reform Secretariat	To provide land tenure security by facilitating territorial planning and by regulating rural property. To design public policies to foment integral agrarian development	Very old and strong linkage.	▪ Regulating ▪ Fundraising ▪ Legal Support
CDI (Comision Nacional para el Desarrollo de los Pueblos Indigenas) National Commission for the Development of Indigenous Peoples before known as INI	To coordinate, promote, support and evaluate programs, projects and strategies oriented to achieve the integrated development of indigenous peoples and the protection of their rights	Old and important linkage	▪ Fundraising.
CNC (Confederación Nacional Campesina) National Peasant Confederation	One of the main representatives at the national level of the Institutional Revolution Party, who is in charge of promoting political ideologies and ensuring voters' support	Very old and strong linkage	▪ Political Networking. ▪ Business Networking: access to capital
RM (Fundación Rigoberta Menchu) Rigoberta Menchu Foundation	To promote indigenous rights. The organization works as a link between indigenous communities and resources (financial, technical, etc.)	Linkage started after 2000. Currently strong.	▪ Innovation and knowledge transfer ▪ Institution building ▪ Training and research
SEMARNAT (Secretaria del Medio Ambiente y Recursos Naturales) Environment and Natural Resources Secretariat[26].	To facilitate the protection, restoration and conservation of ecosystems, and environmental goods and services to support their sustainable use and development	Very old and strong linkage.	▪ Resource monitoring. ▪ Forest exploitation permits provider ▪ Fundraising ▪ Technical Support
*CONAFOR (Comision Nacional Forestal) National Forest Commission	To develop and promote initiatives to conserve and restore forest resources. It is also the agency in charge of the application of the policy on sustainable forest development	5 year old, important linkage	▪ Technical Support. ▪ Fundraising. ▪ Access to markets
*COINBIO (Proyecto de Conservación de la Biodiversidad por Comunidades Indigenas. Mexico). Indigenous and Community Biodiversity Conservation Project in Mexico	To conserve areas of high biodiversity by strengthening and promoting community conservation initiatives on communally owned lands	Relatively new program and linkage. Key linking person facilitates interactions	▪ Fundraising
*PROCYMAF (Proyecto para la Conservación y Manejo Sustentable del Recurso Forestal en Mexico) Forest Resource Conservation and Sustainable Management Project	To assist ejidos and communities in priority regions to generate local development by improving the management of forest resources	Relatively new linkage. Key linking person	▪ Fundraising ▪ Training ▪ Innovation and knowledge transfer ▪ Technical Support

[25] Source: Published documents on the Organizations.
[26] All other organizations/programs/agencies market with " * " are linked to SEMARNAT, but act as decentralized entities.

Organizations/programs/agencies	Aim of the Organization[25]	Details of linkage	Functions of linkages
SEDESOL (Subsecretaria de Desarrollo Social y humano) Social and Human Development Subsecretariat	To design and coordinate Mexican social and human development policies and programs.	Intermittent, old linkage	▪ Fundraising
FONAES (Fondo Nacional de Empresas en Solidaridad) National Fund of Enterprises in Solidarity	To support indigenous, community and urban producer efforts on productive projects and employment-generating social enterprises	Intermittent linkage	▪ Fundraising
SEF (Servicio de Extracciones Forestales) Forest Extraction Company	Private company created to provide forest exploitation services to ejidos and communities with approved forest resource use plans	Key linkage in the formation of the enterprise. Currently SEF doesn't exist	▪ Technical Support ▪ Business Networking: Access to markets
CEPAMISA (Celulosa y Papel de Michoacán) Paper Company of Michoacán	State owned enterprise dedicated to the production of paper	Very old and key linkage	▪ Business Networking: Access to markets; access to capital.
El Palacio de Hierro (The Iron Palace company)	Department store dedicated to the sale of varied goods ranging from perfumes to furniture and home facilities	Old and very strong linkage	▪ Business Networking: Access to markets.
SEDAGRO (Secretaria de Desarrollo Agropecuario) Agricultural and Livestock Development Secretariat	To promote the integrated and sustainable development of the forest and agro-livestock sectors	Old, intermittent linkage.	▪ Fundraising.
SAGARPA (Subsecretaria de Desarrollo Rural) Rural Development Subsecretariat	To promote the capitalization and economic strengthening of primary production units through the investment in capital goods and the use of professional services for rural development	Old, intermittent linkage	▪ Fundraising.
CFEM (Comision Forestal del Estado de Michoacán) Forestry Commission of the State of Michoacán	To promote the sustainable use and conservation of forest resources by providing technical and financial support, monitoring of management programs, etc.	Old and regular linkage	▪ Technical Support. ▪ Resource Monitoring
Red estatal de Ecoturismo comunitario (State Network of Community Ecotourism)	A community-based organization aiming at building channels of financial help between the government and communities and ejidos to promote environmentally sustainable ecotourism activities	New organization where the enterprise is a founding member	▪ Fundraising. ▪ Business Networking: access to capital
UNAM-CIECO (Centro de Investigaciones en Ecosystemas) Center for the Study of Ecosystems	To develop human resources, promote scientific research and disseminate knowledge	Intermittent linkage	▪ Training and Research ▪ Technical Support
Universidad Michoacána de San Nicolas de Hidalgo (San Nicolas de Hidalgo University of Michoacán	Academic institution aiming at the development of human resources and the dissemination of knowledge	Relatively new and Intermittent linkage	▪ Research.
AG (Agencias del Gobierno) Municipal Government Agencies	Varied objectives on biodiversity protection, forest management, water body management, etc.	Very old and intermittent linkage	▪ Fundraising. ▪ Political Networking.
PM (Presidencia Municipal) Municipal Presidency	Ensure well being of Municipality, including the promotion of economic growth, education, health, etc.	Very old and intermittent linkage	▪ Fundraising. ▪ Political Networking.
CL (Cooperativas Locales) Local Cooperatives	Generation of profits for owners and their families	Very old, and regular linkages depending on cooperative's type	▪ Business Networking: Access to market for enterprise and to capital for the cooperatives

5.2.3 Institutional Linkages

The umbrella of legal procedures and rules that influence communities and their management systems have been largely driven by legal and regulatory instruments canalized through the Agrarian Reform Secretariat SRA and the Natural Resource and Environment Secretariat, SEMARNAT. These two agencies, as it is described in Chapter 4 on the Mexican socio-political environment, have provided guidelines for the formation of communal institutional structures (SRA) and have regulated the way communities and others should access to forest and other resources (SEMARNAT).

Because to be officially recognized communities need to meet organizational and institutional parameters established in the Agrarian Reform laws, the linkages San Juan developed with the SRA through time contributed directly to the establishment of its communal institutions and its communal management structure. The *comuneros*' strict adhesion to statutes and regulations and the way they have incorporated such parameters into local institutional arrangements account for a large part of their success. This harmonization and adaptation of institutional arrangements at larger scales into the local scale has allowed San Juan to receive support from the agency to enforce rules at the local level. Figure 10 represents some of the institutional linkages between San Juan and agencies and organizations at higher levels.

As mentioned in previous chapters, San Juan did not always abide by the legislation and at some points in time pressed for a better treatment and recognition of its rights, especially during the process of communal organization, receiving, eventually, official recognition for its organizational efforts.

Other institutional arrangements at the state level and scales larger than the local have influenced San Juan's institutions, but in a way that has strengthened its set of local enforcement, use, membership and management rules. Communities surrounding San Juan do not seem to have established long-term institutional arrangements strong enough to help them to maintain their forest resources, as is the case for San Juan. The critical socio-economic situation in the surrounding areas has not seriously undermined San Juan's efforts to maintain its management system, but it takes a considerable portion of the *comuneros'* energies and resources to enforce boundaries and other rules on outsider violators.

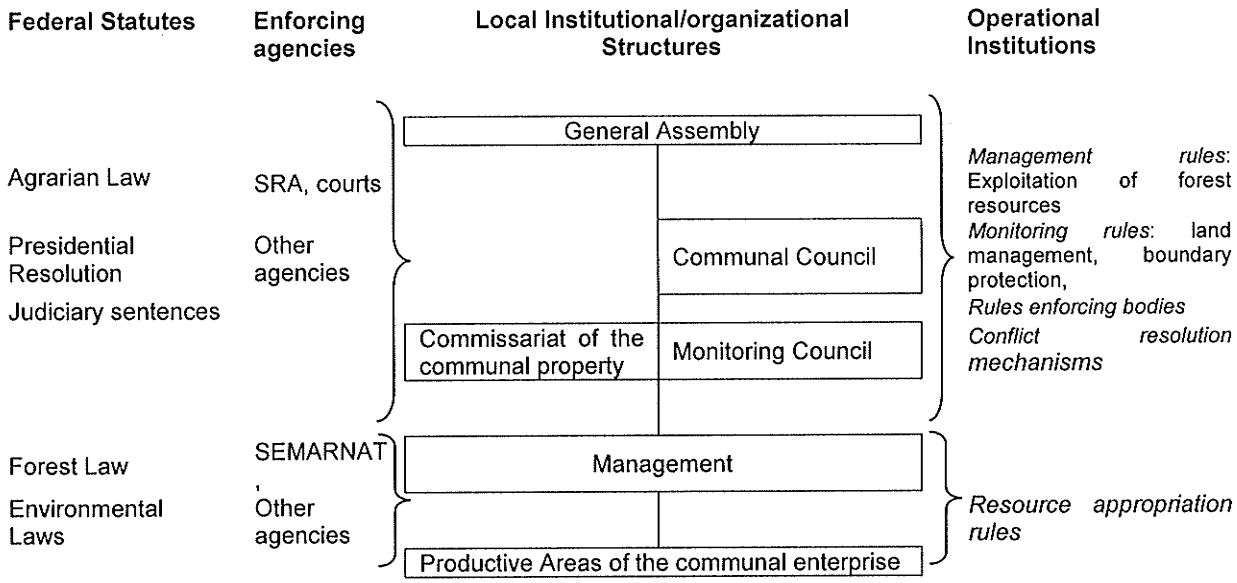

Figure10. Institutional linkages affecting local institutions. The figure represents some of the linkages between local and higher scale agencies and institutions, and some of the resulting institutional arrangements.

Other institutional linkages resulting from the interactions between San Juan and other organization such as the Forest Stewardship Council (FSC) have been of great benefit to the *comuneros*. In particular this linkage has allowed the communal resource management system to improve operational rules[27], increasing, therefore, the number of confident business partners and helping the enterprise to gain the support of environmental agencies and organizations.

Similar linkages influencing local arrangements for resource appropriation and management are mentioned in brief in the section on drivers of change.

5.2.4 Socio-economic Impacts

There has been a large and evident impact on the social, economic and physical development of the *comuneros*, their families and the Municipality in general. The Municipality has passed from being a place without proper physical infrastructure, schools, primary health care or other services, to being a municipality with around

[27] Operational rules are defined as the rules applied to exploit and monitor resource management appropriation at the local level (Ostrom, 1990)

17,000 inhabitants (Instituto Nacional para el Federalismo y el Desarrollo Municipal, 1999), almost a third of them immigrant settlers, with primary and high schools, basic road infrastructure, water and sanitation systems, proper housing, active commercial and other economic activities, among other things. A large portion of these positive changes have been influenced by the partnerships between the local administrations and the enterprise, and by the income generated through the enterprise, whose rate of direct and indirect employment has increased from approximately one hundred persons in 1982 to more than 1000 persons at the present time. However, other activities such as religious pilgrimages also account for some of the local revenues and improvements in the Municipality. The enterprise, furthermore, has occasionally subsidized some of the *comuneros* to get higher education at the state level and also occasionally works as a guarantor for women's groups, avocado and peach farmers, etc. applying for government subsidies, economic and financial help.

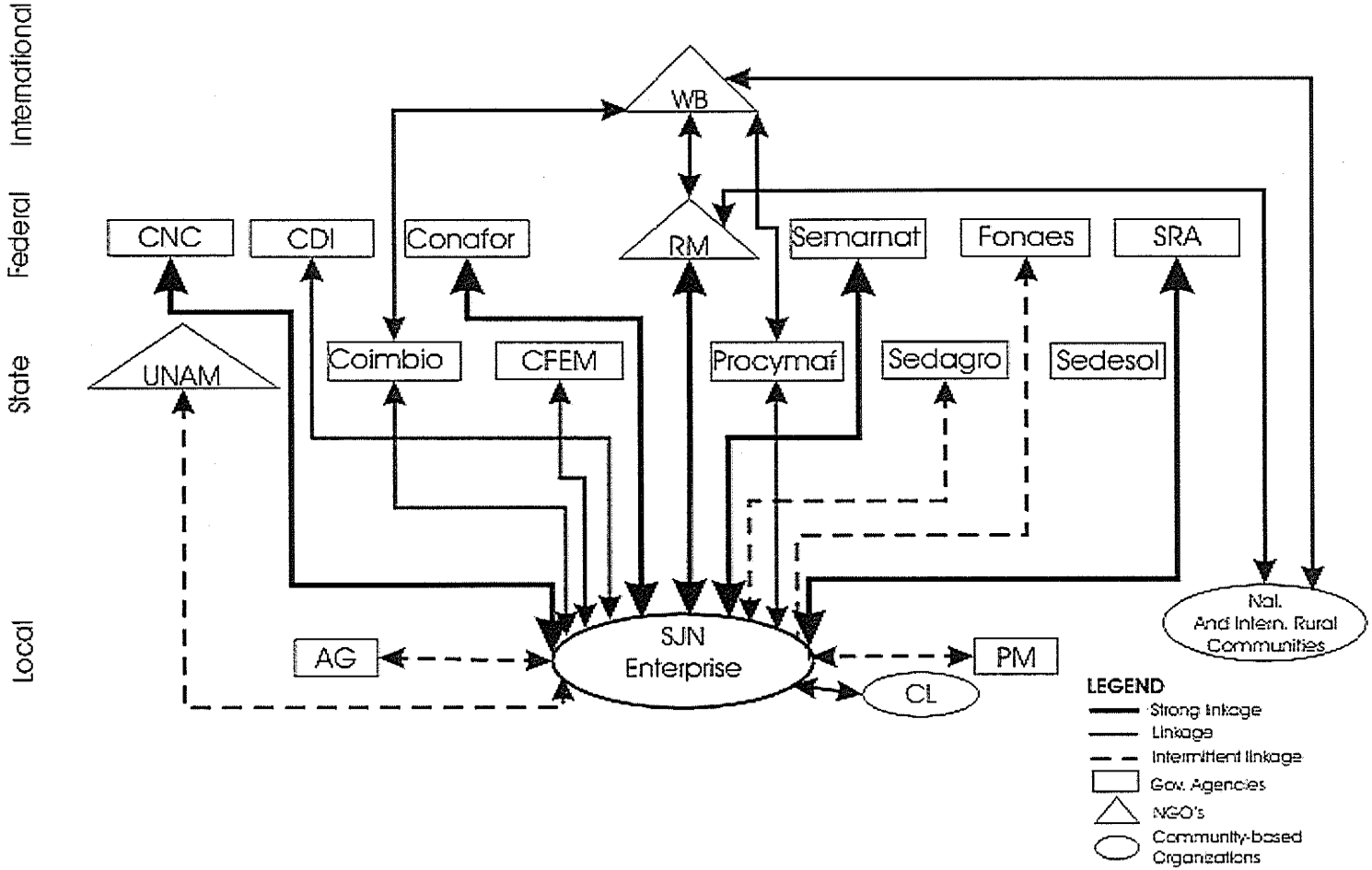

Figure 11. Representation of some important cross-scale linkages in the community-based resource management system of Nuevo San Juan. For acronyms see Table 5 and 6.

5.3 Drivers of Change and San Juan's Responses

5.3.1 Drivers influencing the Performance of San Juan's CBRMS

The Nuevo San Juan communal enterprise, based on information provided by interviews, built strong foundations during its first decade. However, the changes that have been taking place since the 1990s in the Mexican socio-economic environment and other drivers and factors, both internal and external, have forced the enterprise and the community to change the enterprise's management strategies and institutional arrangements in order to survive and maintain the enterprise's resource base.

5.3.2 Drivers at the Regional and Larger Scales

5.3.2.1 Open Economy (Free Market System)

Federal economic policies, here identified as a driver exogenous to the community, has been characterized since the mid 1990s by the emergence of an open economy crystallized with the Free Trade Agreement (TLC) of 1994. This externally driven process has, according to the views of enterprise workers and key outsiders linked to the enterprise, resulted in a series of changes in the resource management strategies of San Juan. The abrupt invasion of cheaper wood products brought on by the free trade agreement, together with the competition with highly mechanized private enterprises and timber coming from forest plantations, caused a 20% reduction in the enterprise's profits in the subsequent years. The response of the enterprise to this challenge was the search for partnerships for training to rationalize, mechanize and diversify. In this respect UNAM through CIECO has made large contributions helping the enterprise to train human resources in GIS and to identify and map, using satellite data, the geography and resources on the communal land. CIECO also supported the *comuneros*' efforts to create new productive activities such as ecotourism.

Technology has been used to achieve more systematic forest extractions and other management processes, increasing, therefore, the pressure on previously excluded forest patches and other natural areas. At the same time, technology and scientific inputs have contributed to improvements on ecosystem management (through the mapping and exclusion of water resources from forest exploitation activities,

monitoring of biodiversity sport species management and forest patches management, etc.), resource base regeneration (through the establishment of programs to monitor natural and artificial regeneration and other forest protection related activities) and diversification directed to reduce pressure on forest resources.

5.3.2.2 Land Ownership Rights

Key informants from inside and outside the community identified other drivers of a socio-economic nature brought about in the early 1990s through federal legislation, such as the programs designed to facilitate the transformation of communal land into private land. Of particular importance were the Program for the Certification and Registry of Ejidal and urban land tenure rights (PROCEDE) and the Program for the Certification and Registry of Communal land tenure rights (PROCECOM), both of which were publicized as the means of strengthening and getting official recognition of communal land ownership rights, but which have become the mean of privatizing land for resource exploitation by individuals or companies, and of applying land use patterns contrary to the forest soil aptitude. PROCEDE and PROCECOM then came to support the subsequent Free Trade Agreement. San Juan identified the long-term negative impacts that the adoption of these programs could have on the communal management of resources and therefore the enterprise, because of the risk if having *comuneros* registering and exploiting land individually, and took the necessary steps to prevent their implementation in the community. Instead, the community has used some of the procedures implemented by PROCECOM to register the land on the perimeter of the communal territory as a way of re-ensuring official recognition of the communal boundaries.

5.3.2.3 Tax on Profits

A socio-political driver, also mentioned by interviewees, more recently put in place, was the one related to the changes in the status enjoyed by rural resource management systems. Between 2001 and 2002 Mexico had a fiscal reformation through which changes to the Tax on Profits were made. The new legislation has located communal and indigenous enterprises under the same taxation conditions as private enterprises, a trend that started with the changes brought by the Free Trade Agreement,

and has been strengthened with the fiscal reforms. This redefinition of communal enterprises, which, unlike the maximization of profit of the private sector, aim at the common well being, has created a large debt for the enterprise that increases each year. The consequent pressure from the new normative and legislative trend affects San Juan's management performance and the level up to which the enterprise can continue contributing to the local socio-economic development and to the protection of its resource base. As a response to this new challenge, the enterprise has reorganized its productive activities in such a way that the areas related to primary processes are divided from the areas where industrial transformation of resources takes place. This reorganization caused the reclassification of activities related to primary processes as "integrated development" (which is tax exempt) and those related to secondary or industrial processes as "forest exploitation", for which the enterprise needs to pay taxes. The reorganization has not saved Nuevo San Juan from paying taxes, but has notably reduced its debt. This response to the fiscal reformations have been influenced and supported by professional consultants from the community and from outside.

5.3.2.4 Other Development and Social Programs

Legislative trends, along with the economic and fiscal reforms, include some rural development and conflict resolution programs. Among the development strategies are the programs to subsidize farming products for the growth of specific internationally important crops such as avocado. This increased support to agriculture has had important implications for changes to land use patterns and the continuity of traditional farming and other resource use activities that respect soil aptitude and ecosystems services. Conflict resolution programs include the Programa de Atención a Focos Rojos (Attention to Conflict Zones Program), that began in 2003 and, which has been coordinated by the Agrarian Reform Secretariat (SRA) in partnership with other secretariats. This program oversees areas of the country where land tenure conflicts have exploded or have the potential to explode. Due to the long-term legal battles that the *comuneros* from San Juan have had, since the official recognition of their communal land in 1991, with small landowners interested in keeping the land as private property, the *comuneros* appealed to SRA to recover some of the communal land that is still in private hands. With the help of this program, the *comuneros* have been able to recover

some of the land that was recognized and conferred to them through judiciary decisions, but that could not be exploited due to the animosity of the private property owners.

5.3.3 Local drivers influencing the communal enterprise of San Juan

5.3.3.1 Private Property Sector

The political stand of the *comuneros* as the branch of the PRI at the local level has made other groups such as those who own land privately to identify themselves with the opposition party PRD as a way of gathering support to prevent the *comuneros* from achieving their objectives. The PRD is currently in power in the Municipality, thereby causing a rupture between the local administration and the enterprise. Because of this separation between the local government and the *comuneros*, the current administrators and representatives of the *comuneros* appeal directly to the state and federal government whenever they identify programs of interest or potential support. This particular situation of not having political power at the local level, which has happened just a couple of times since the creation of the enterprise, brings about a tense environment between the *comuneros* and non-*comuneros* in the Municipality and between the local government agencies and the enterprise, with each side trying to find legal ways of defeating or stopping the other.

> "Yes, political affiliations have played an important role, but once our community became strong there was no more need to sell our ideals to favor any party. This is my biggest problem with current leaders. Our Presidential Resolution should be enough for us to become autonomous and let our *comuneros* to vote their conscience, we should base our decisions on people and ideas not on parties."
>
> **Founder and former member of local institution**

The *comuneros* and the enterprise have been able to attract support because of the large and successful productive process taking place in the enterprise. However, changes in which political parties have been dominant at the federal, state and municipal level have hindered some of the potential support that Nuevo San Juan could appeal to. The *comuneros*' success, as the local key informants mentioned, has been maintained in the face of political stagnation at the community level, because elected leaders continue identifying themselves and the community with the Institutional Revolutionary Party (PRI). In many instances, *comuneros* who oppose to the long-term commitment

that leaders have created with the PRI are unable to make a difference because of lack of political power to promote change through consultation processes or are in a delicate situation, fearing to lose their jobs, as employees of the communal enterprise.

5.3.3.2 New Leadership and Management Trends

The communal leaders, as part of the process to obtain the Presidential Resolution, carried out a census to enlist the inhabitants of the Municipality who were settled on the communal land before the eruption of Paricutin. For the family units the names of the father, mother, sons and daughters older than 15 were included; and in the case of husbands from outside the community, the names of their wives were included. As a general trend, names of men from outside the community were not included, except for some exceptions mentioned by some interviewees that the researcher did not have the opportunity to crosscheck. However, as some of the founders of the enterprise recognized, there were community members who for more than one reason were not included in the final census. These reasons include the skepticism of some to the importance of the process taking place; the desire of some families to belong to the private property sector and abide by their own and not communal rules; and other reasons such as inherent difficulties to reach all *comuneros*. There was also an interest among some to exclude others. The group of persons finally incorporated as members of the community of San Juan Nuevo included very young community members, but also missed the names of a significant number of comuneros and their families. Some of the families excluded then became founders of groups opposing the communal enterprise. The tension generated from this community division has been, to some extent, a source of conflict at the local level that manifests itself through political and judicial battles mainly. Inevitably, the conflict has become an influential driver at the local level that is producing important changes in the way the communal management of resources is perceived at all levels.

To this conflictive situation is added the evolution of the community into entrepreneurship associations. Information provided by numerous interviewees involved in regular institutional processes suggest that these associations are often and mainly engaged in imposing their group/elite interests over the general communal interests. There were groups of family businesses that at one point in time participated in

communal labor to support the creation of the enterprise and others that were created as a consequence of the expansion of the enterprise. Some business associations or what we have called here cooperatives, have become so politically and economically strong, that it appears that most community consultation and institutional processes are strongly driven by them and are directed to supporting the interests of these community elites. The consensus of many interviews conducted suggests that some individuals from younger generations of *comuneros*, and other politically powerful *comuneros* who have taken over the administration of many productive processes and part of the membership of communal institutions seem to have been representing the interests of the elites to which their families or relatives often belong to or, in the most critical cases, their own individual interests. This change in generational values, perspectives, local leadership and consequently in the underlying, unwritten institutional arrangements is considered to be one of the main factors driving a very drastic change in the management system, whose outcomes are causing deep divisions between powerless and powerful *comuneros* and may be driving the former to forcefully separate themselves from the communal systems and to adopt a private management and ownership, which many of them consider would render greater real benefits. Figure 12 shows leadership trends mostly from periods in the second and third decades of the enterprise.

Younger generations named in the Presidential Resolution as registered members of the community and some of the ones not named have, furthermore, pushed elders to make changes to some institutional arrangements and operational rules, and allow family members to be registered as *comuneros.* One of the most important outcomes of their efforts was the acceptance of the General Assembly to allow younger *comuneros* not registered in the Presidential Resolution and working in the enterprise to participate in the election of the manager of the enterprise in 2004. Other important achievement of such efforts is the start of a new consultation process through which the milestones of a new census can be established.

Figure 12 presents, based on the researcher's analysis, some of the drivers affecting the *comuneros* of Nuevo San Juan, their communal institutions and resource management system. The links between drivers and their chain of effects on San Juan illustrate some of the different stages that the community and its system have passed through or are currently in. Other drivers such as the ones influencing the maturity of

communal institutions for resource management and the ones giving life to the communal enterprise, are not the focus of the present section. Nor do the different chains in the figure necessarily represent what has happened since the creation of the communal enterprise to the present time; they are more a representation of periods in the second and third decades. The impacts or consequences of the influence of drivers presented in the figure do not always represent radical changes but the emergence of new challenges for San Juan. The scale of ongoing community and management processes taking place in San Juan makes it difficult to identify what the main impacts of the drivers will be.

San Juan's institutional structure and community-based resource management system have, as the researcher perceives, absorbed various shocks from various drivers, demonstrating, beyond doubt, the strength of its foundations and the resilient character of the system. The outcomes presented in Figure 12 should not be overstated, but they do represent some of the challenges faced at the local level. These challenges are common to many other communities, but Nuevo San Juan probably has more at stake because of the institutions and the community-based systems it has been able to establish. Even though local management and institutional conditions may have changed negatively for humble *comuneros* and their families, the general benefits generated through the enterprise, especially in the Municipality's infrastructure, family income, employment, housing and education, are undeniable. The enterprise represents a good example of the way common well-being, and more sustainable environmental management of natural resources can be achieved through proper leadership, a united vision and systematically coordinated efforts.

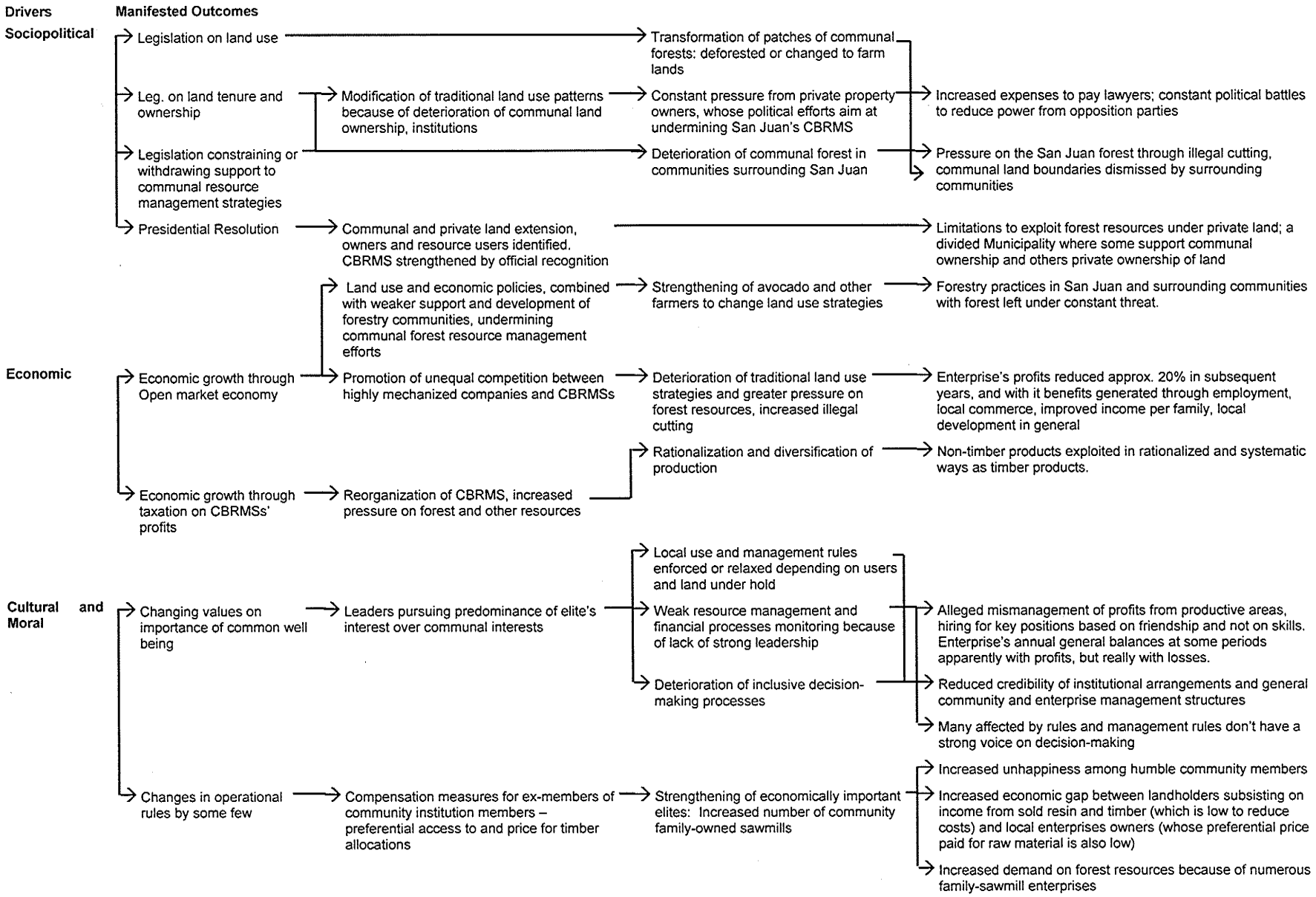

Figure 12. Drivers of Change affecting San Juan's communal institutions and management strategies.

Chapter 6: Conclusions

This thesis has examined the self-organization structures giving life to the community-based resource management system of Nuevo San Juan, Mexico, and some other of its characteristics; the linkages developed for socio-economic sustainability; and the drivers influencing the communal resource management system. Analysis of the data gathered through field interviews indicate that the achievements of the San Juan *comuneros* in creating a strong communal management system for the use and protection of forest resources has been strongly influenced by key enabling conditions both at the local and federal levels.

At the local level, the general disappointment of community members with the uneven socio-economic development promoted by capitalist/individual-based structures, and the innovative leadership emerging among promoters of community-based management of resources, helped to launch and consolidate the communal enterprise of San Juan. Federal policies allowed the energies released at the local level to be channeled towards strengthening communal processes. Community management strategies developed at San Juan have contributed to making the system more resilient, by helping it to grow and to adapt to new socio-political conditions and other drivers of change. Challenges emerging at different points in time have threatened the permanence and adaptation of built, human and social capital. However, the scale of operations, general socio-economic achievements, numerous institutional linkages and emerging new local conditions may, at last, help the system to either sustain itself or to change its course of being community-driven toward being driven by individuals and/or groups within the community.

The next three sections recap the findings of the three objectives of this project, concerning self-organization, cross-scale linkages, and drivers of change. After that, I discuss these findings in the light of theory and findings by other researchers.

6.1 Self-organization

6.1.1 Building San Juan's Institutions and Management System

As indicated in the Chapter 2, some key controlling processes generating important interconnections (Holling, 2001) have largely contributed to the self-organization structure giving life to and strengthening San Juan's communal enterprise. The strong leadership of some few empowered *comuneros*, whose level of education helped them to identify the relevant tasks to promote community development and whose collective initiative gave life to management institutions able to foster development and promote common well-being were key to achieving community organization and empowerment. Discussions with founders of the enterprise revealed the vision of such local leaders and the way they inspired the formation of institutions by building on core cultural values and by sharing time and information. In doing so, and in allowing the assembled *comuneros* to guide and lead key decision-making processes, they generated trust. The accomplishment of this initial community organization process appears even more significant when one considers the challenge of a policy environment not very supportive of communal resource management initiatives. Furthermore, the identification of key partners contributed greatly to the success of the communal enterprise and the establishment of its strong foundations. Last but not least important was the mindset of the *comuneros* in establishing a communal enterprise with a growing rate of employment and profits. That is to say, they were searching for the common well-being but with the mentality of being as efficient and successful as a private company.

The *comuneros'* outlook and careful planning allowed them to develop a forest management plan able to protect the forest resource base and to have their own Technical Forest Services Department in the fifth year after starting timber extractions. This very important step, together with the partnerships they developed to pay in-kind for the construction of the first productive areas of the communal enterprise, helped in its capitalization. Prior to the establishment of the Technical Services Department, the *comuneros* had to hire consultants to design their management plans, as all other indigenous forest communities in the state still do. The subsequent most important achievement of the *comuneros* was to convince the Federal government to publish the

Presidential Resolution in 1991 granting land ownership rights. The official recognition of land use and ownership rights took the *comuneros* to a higher level of confidence in the future of the enterprise and the community as a whole.

Therefore, the community organization process in Nuevo San Juan probably would not have been successful without the leadership demonstrated by some key individuals. Among the most important contributions community leaders made – in keeping with conclusions about the features of successful institutional regimes for natural resource management as described by authors such as Dietz et al. (2003), Brown (2002), and Ostrom (1990) – was the building of institutions able to foster successful decision-making processes. Increasingly united *comuneros*, with the help of the leaders, took the important decisions that gave birth to the enterprise and subsequently consolidated its foundations. Even though there were challenges in gathering and creating the vision of a communal enterprise, the leaders' systematic efforts finally yielded fruits. Subsequently, from the early 1980s to the early 1990s, the institutions driving the decision-making processes were the General Assembly with the support of the Communal Council, which by then were more developed.

However, some interviewees who participate actively in institutional processes, indicate that since the mid 1990s, at certain times, the decision-making processes seem to be have been strongly driven by some of the individuals elected to lead some key areas of the organizational and institutional structures, who use the interaction with the highest institution – the General Assembly – as a way of legitimizing decisions already taken. In general, the current feeling expressed by key informants and other numerous *comuneros* at all social levels is that their role during the General Assemblies has not always been one of contributing directly in consultation and taking decisions, but rather very often is merely to approve what has already been decided.

Moreover, the politically and economically strong community elites seem to be pushing elected leaders to capture larger portions of the benefits and resources generated by the enterprise. Other important arrangements related to the roles that should be played by local institutional bodies and the enterprise's administrative

structure is yet another of the characteristics which some *comuneros* feel have been deteriorating since the 1990s.

6.1.2 Effectiveness of Institutional Arrangements: Operational Rules

6.1.2.1 Relation between the Enterprise and Community landholders

Broad strategies to solve conflict and balance benefits and costs (Ostrom, 1990) have shaped some of the *comuneros'* interactions with key stakeholders at the local level. One and perhaps the most important mechanism the *comuneros* of Nuevo San Juan have used to try to reduce conflict was the establishment of a verbal agreement between the communal enterprise and the landholders. The group of landholders included the *comuneros* taking care of pieces of the communal land and some of the private property owners who decided to abide by the communal institutions. This agreement includes the recognition of the landholding rights that families possess and the landholding inheritance rights of the descendants of the families, under the condition that the families will abide by the local rules, respect the decisions of the local institutions, and allow the enterprise and only the enterprise to exploit the forest present on the land, with the families receiving in return a payment per cubic meter of timber, and other broader benefits such as employment for family members. This agreement was generally accepted by all *comunero* landholders, and by some families previously identified as supporters of holding land as private, but was rejected by some other families owning private property, whose members have since opted for legal battles, which in most cases have been resolved in favor of the communal enterprise and the *comuneros*[28].

6.1.2.2 Enforcing Rules on Outsiders

Effective monitoring of the communal land, the establishment of clear boundaries and the application, whenever possible, of sanctions to outsiders (Ostrom, 1990) have greatly contributed to San Juan's success. A very conflictive situation that Nuevo San Juan and many other communities which still have forests have faced is clandestine timber extraction. This is a particularly important issue in San Juan since their resource

[28] See the definitions section in Chapter One for a detailed description of the group here identified as *comuneros* of San Juan.

management system has been successful in maintaining the resource base while the surrounding communities have depleted most or all of their forest resources. In the past, the *comuneros* dealt with this threat by apprehending the violators and presenting them to the authorities, committing them to stop or be arrested; they have also patrolled and used guns to scare violators. Current ongoing monitoring of the communal land involves the use of radio-communication, armed guards and constant patrolling of land boundaries. The institution of the Monitoring Council centers most if not all of its efforts in monitoring the communal land and stopping/apprehending violators from surrounding communities.

6.1.2.3 Monitoring, Compliance and Sanctions at the Community Level

The key contribution provided by the system's institutional characteristics were described in terms of commons "design principles" (Ostrom 1990) in Table 4 in the Chapter on self-organization. The principles guiding the design of San Juan's CBRMS were applied in a way that allowed the system to be communally supported and very much consolidated a few years after its creation. During the 1990s, however, changing leadership perspectives and values weakened the monitoring of managerial and institutional performance, as well as compliance with established institutional arrangements and the application of sanctions. Steps taken by the General Assembly and the Communal Council after 2002 to appoint a temporary monitoring body helped the community to learn, up to some extent, the financial impacts of mismanagement, invalidating annual balances from some of the previous years which had inaccurately stated profits. However, it is not clear if systematic steps have been taken to put in place effective monitoring of management activities in the enterprise's productive areas. Moreover, the politicization of hiring for high-level positions in the enterprise is another of the areas in which *comuneros* advocating for change may have serious limitations for improving the situation. According to many interviewees working in the enterprise and at the institutional level, the strength of local elites makes it hard to ensure the best performance of the enterprise's areas, because, according to these interviewees, hiring for key management positions often depends on family ties and affiliations between leaders in power and supporting elites more than the capacities and talents of candidates.

6.2 San Juan's Cross-scale Linkages

6.2.1 Linkages and Outcomes of Interactions

Cross scale linkages are import in the creation and evolution of CBRMS (Berkes and Adhikari, 2006; Berkes et al., 2003; Berkes, 2002; Ostrom, 1990). In this regard, one of the most important lessons from the Nuevo San Juan case relates to the strong and key linkages developed with individuals and organizations. Among the most important linkages contributing to the creation of the enterprise was with an individual entrepreneur who vouched for San Juan to a key sawmill facilities provider and to persons from federal agencies. Among these federal level contacts was Cuauhtemoc Cardenas who gave permits to San Juan to exploit its forest through the UECIFOMET and later as an independent community, even though San Juan lacked official recognition of its land tenure and ownership rights. Therefore, these linkages were the ones that allowed the first building blocks of the communal enterprise to be put in place and that facilitated government approval for the launching of an ambitious forest exploitation venture. Linkages developed during the second and third decades of the communal enterprise have also contributed to the increase in the number and scale of resource management operations and have been helping the *comuneros* to establish regular channels for inflows of governmental and non-governmental support for the community and the enterprise. Making the experience more astonishing is the fact that it was not external financial help that contributed to the formation and consolidation of the enterprise, but in-kind local self-support and mostly in-kind external support.

Another aspect of particular interest is the strategy the communal enterprise and its institutions have used of keeping in constant contact with *comuneros* working for agencies and organizations, and with previously known external consultants, to develop strong relations with the organizations and institutions they belong to and to access available resources (in-kind and financial) for rural development, forestry, environmental protection and poverty reduction.

The mindset of the *comuneros* regarding the need for diversifying productive activities and for developing its technical and financial capacities are other relevant

aspects of the success and strength of the communal enterprise. Strategic partnerships contributed directly to achieving such objectives. Before the creation of the enterprise, resin collection, agriculture and intermittent timber extractions were among the main economic activities at the local level. While the enterprise still has timber extraction as the heart of its productive activities, it continues to focus on diversifying economic activities and maintaining ongoing human resources training. It has gone from relying almost exclusively on timber and its sub-products, to managing a diverse range of activities: transforming raw materials, exploiting the potential of water resources, facilitating access of local farm products to national and international markets, exploiting the potential of landscape features and some flora and fauna species, providing technical and other services, and giving training to individuals and communities. The communal enterprise has become one of the experiences in Mexico – and maybe in the world – where a large-scale timber extraction takes place with more than 99% of labor being from the community. The enterprise also acts as a link for community business associations and self-help groups. It vouches for their activities, strengthens their ability to deal with larger national markets, and serves as a channel through which these businesses receive funding from government and NGOs. Such diversification and capacity development is yet another fundamental factor that has allowed the Nuevo San Juan communal enterprise to broaden the possibilities of getting support and of surviving over time.

In general the *comuneros* have received national and international recognition for their forest use and management strategies, including the Smartwood Certification for innovative forest management from the Forest Stewardship Council; the Equator Initiative Prize from the United Nations for the reduction of poverty by properly using and managing natural resources; the Alcan Prize from the Alcan Group, for their sustainable natural resource management; the Ecological Merit Prize from the Mexican government, for their sustainable resource use and management; and the Prize for Successful Natural Resource Management Experiences from the Mexican government, for their innovative and diversified use and management of natural resources. The *comuneros* have also received state recognition for their forest use and management.

6.2.2 Some Institutional Linkages

Even though the communal enterprise has been an engine of socio-economic growth at the municipal level, it has undergone serious challenges from sporadically supportive, often indifferent and sometimes restrictive policy environments for communal forest exploitation and rural development in general. Institutional linkages have contributed considerably to framing communal institutional arrangements, improving resource management strategies and establishing channels of interactions with government agencies and institutional structures at higher levels. Of particular relevance are the linkages established with governmental and non-governmental institutions, among them the Agrarian Reform Secretariat, Environment and Natural Resources Secretariat and the Forest Stewardship Council. However, depending on varying circumstances at the time, these interactions have also affected, negatively or positively, the enterprise's ability to continue being economically sustainable and partially independent of external support.

Other institutional linkages such as the long-standing relationship of San Juan with the Institutional Revolutionary Party (PRI), whose hegemony lasted for about 70 years, opened some doors for the community to advance in their efforts to get approval from the government to exploit their forest. This linkage also, whenever proper local political conditions were given, ensured a particular link between the local government administration and the enterprise, where flows of money in both directions allowed improvements on the community's physical infrastructure and the enterprise's strengthening of some productive activities.

6.3 Drivers of Change

The research objectives related to community self-organization and cross-scale linkages deal, to some extent, with some of the drivers contributing to the formation and consolidation of the communal organization and the enterprise. However, the detailed analysis of drivers in this thesis centered on the ones that, emerging after the formation and relative consolidation of the communal enterprise, have more strongly influenced the performance of San Juan's communal institutions and resource management system. Understanding drivers of change is important for the promotion of more environmentally, socially and economically sustainable development (MA, 2003) – the findings of this

research on the forces generating change in San Juan indicate that key drivers are mostly federally or community-based. On one side, federal legislation, and on the other, changing local leadership roles and perspectives together with community socio-economic empowerment (accompanied by formation of groups of local elites, increased economic distance between more or less empowered social classes among *comuneros*, etc.), account for important far-reaching changes in community development, sustainable resource management and ultimately communal unity of thought and action.

Mexico's open market strategy, policies on land tenure rights recognition, taxation policies and policies on special subsidies to different economic activities, account for some of the important externally driven forces influencing change at the local level. Other drivers that were discussed in Chapter 4 include the numerous legal instruments constraining the management of forest resources by community-based organizations, and the sometimes indirect but emphatic support that different federal policies have given to economic activities other than communal forestry. San Juan's strategy for dealing with drivers ranges from the involvement of external consultants to the diversification of productive areas to widen the possibilities of receiving the required approval and/or support from federal agencies. Moreover, their instrumental adaptation to new conditions makes the community and the enterprise particularly unique in being able to take advantage and ultimately benefiting from initially/apparently detrimental conditions.

Local drivers of significant relevance for most interviewees are the changing political conditions in the community, which strengthens or diminishes opposition groups' power and therefore the deepening of conflict and/or ideological differences between local groups including *comuneros* and non-*comuneros;* and new generational and leadership perspectives that have threatened and sometimes changed key institutional arrangements. The latter driver is of particular relevance, since the disparities between elites and humble comuneros that it has influenced and the disappointments and changes it has caused coincide with the unfavorable political environment, threatening the community's unity.

From all the *comuneros* interviewed there was not a single one perceiving the privatization of land as a sustainable way of living for a community. However, there were some few – not less than 10 interviewees currently involved in decision-making processes – who considered that the power accumulated and the way it was being exercised by some elites through some of the elected leaders has widened the distance between humble and empowered *comuneros* at some specific periods in time. They believe that decisions on the distribution of some key benefits generated through the enterprise and the extra support provided by the enterprise to some local cooperatives of local family enterprises, do not simply empower some, but diminish others' portions of communally generated benefits. Interviewees also indicated their perception that communal living does not and should not necessarily mean "same for all" economic benefits, but that at least there are no extreme economic disparities in the community.

So, the interviewees' contributions and general field observations indicate, based on the researcher's understanding, that actions or omissions at the institutional and managerial levels have become drivers: a) changing the willingness of some or many humble/powerless *comuneros* to be part of a management systems that they perceive to be more group than communally driven; and b) creating the perception among numerous *comuneros*, non-*comuneros* and outsiders that the communal enterprise still fosters, as many other capitalist-based companies do, a distribution of resources and benefits based on power that is unfair to some of the officially recognized shareholders.

The findings presented for the three research objectives identify San Juan as a community that is far from being powerless before externally driven changes, and that is comprised of a resourceful group of community members that have increasingly and systematically been able to empower themselves to lead their own development and directly influence some of the processes that affect their communal conception of living. The social and human capital that they have developed demonstrates that even though there exist exogenous drivers that the community cannot directly influence, still, their locally mastered approaches to control the impacts of these drivers have helped them to become resilient and maintain local trends that many *comuneros* find desirable.

The evolutionary stages of the San Juan communal enterprise have decidedly marked the course of a large group of *comuneros* whose economic aspirations and

development mechanisms have contributed to maintain their forest resources while also satisfying their socio-economic needs (as some of the authors mentioned in Chapter 4 also describe). Nevertheless, San Juan has not escaped, for the fact of being communally managed, from the challenges faced by other resource management systems. However, the San Juan *comuneros* have contributed to the general empowerment of a community that otherwise would have been subject to a discriminatory capitalist system where structures based on the communal management of resources have little if any opportunity to survive.

From the researcher's perspective, after the consolidation of the enterprise (assumed to have been achieved once the Presidential Resolution was published) community or elites' choices about leaders and institutional arrangements and distribution of benefits have functioned as local drivers, generating new local trends that may be weakening the management system's capacity to gradually absorb impacts and take advantage of exogenous drivers in an effective or positive way. In other words, some local drivers, aside from producing conditions that the community must adapt to, have also affected and/or are affecting *the capacity of the community to adapt.* However, taking in consideration the high level of resilience of San Juan, it can also be said that on the whole local drivers of change have largely contributed to building a stronger system, a system able to more successfully recover from crises. On the other hand, it may also be the case that the capability of the system to recover from locally driven change, which has been affected by deterioration of community unity of thought and action, may at last, while projecting an image of strength, make the system's foundation gradually collapse.

6.4 Confronting theory and findings

1. **Factors contributing to the success of CBRMSs.** Numerous case studies and general theory on community-based systems, referred to in the Chapter 2 describe some of the characteristics inherent in indigenous and rural systems for resource management. These include the way local institutional arrangements recognize and embrace complexity (Toledo, 2001; Ostrom et al., 1999), their often reduced capability to deal with constraints from policy and other drivers at larger scales, and

their challenges to develop the necessary linkages and obtain the required support to lead resource exploitation processes, among others (Brown, 2002; Castillo and Toledo, 2000; Kellert et al., 2000; Ostrom et al., 1999; Well and Brandon, 1992). Findings from the study of San Juan's management system underline the way the institutional environment at scales larger than the local can shape and seriously support or constrain community resource management initiatives. The nurturing of inclusive locally minded institutions, moreover, is crucial to achieve success and gain local support. The skillful integration of satisfying livelihood needs with the conservation of the resource base, moreover, may account for a large part of the success of institutional structures. Last but not least important for the achievement of community cohesion and unity of action is the presence of local individuals personifying key core cultural and moral values. Rather than assuming that in San Juan there existed god-like local heroes, what is meant is that the existence of key individuals able to personify important core moral and cultural values was of critical importance. Such moral leadership is, far from being an illusion, a needed requirement to effectively foster any kind of long-term enterprise.

2. **Biodiversity and resource base protection in CBRMSs**. It has been argued that holistic management of ecosystems is an important aspect of indigenous enterprises (Toledo, 2001) and that predominant forces promoting unsustainable exploitation of natural resources in areas where there are CBRMSs are often, if not always, external to the system (Ostrom et al., 1999). Some authors also highlight the way numerous CBRMSs have applied adaptive management to maintain diversity and healthy interaction between humans and ecosystems (Berkes et al., 2003). San Juan's resource management system has not always been classified as an indigenous community-based system: the technology, technical expertise and other characteristics of the system makes it appear as a highly productive communal company where there is no real application of TEK on the management of the communal forests. If it may, sometimes, have been stated that there is very little or no local traditional ecological knowledge being applied to most of the communal enterprise's productive activities, it is also generally accepted that their successes in maintaining the forest resource base and in fostering clear institutional arrangements may have – at least to some extent – come from locally born ideas, land tenure

strategies and other operational rules. Moreover, the different uses given to the communal land, of which managing for timber is the most important but also one of many; the resin processing plant, whose design combines local and science based knowledge; and the way traditional agricultural methods are still being applied by some *comuneros* (Garibay and Bocco, 2003) indicate that this is not a case of typical industrial forest exploitation. Adaptive management of the San Juan's resources is an important area of research that has not been covered in the present effort. Field observations on the adaptability of management strategies being applied suggest the lack of a systematic incorporation of monitoring outcomes in current resource management strategies, as has also been indicated by the SmartWood Program Evaluation (2006). This having been said, an important achievement of San Juan relates to the way they have been able to maintain the timber resource base (Garibay and Bocco, 2003) during the more than two decades of communal exploitation. The researcher's perceptions from the contributions from key staff dealing with the management of tree stands and ecosystem management is that the protection of some of the area's biodiversity has come as a result of the compliance with the normative frame on general protection of ecosystems and as a consequence of the management and monitoring of other economically important resources such as water, rather than as a planned effort on conservation.

3. **Strength and performance of CBRMSs**. As has been mentioned by Wells and Brandon (1992), one of the aspects affecting the performance of Integrated Conservation and Development Projects (ICDPs) is the lack of developed capacity and official recognition to carry out development activities. This is also applicable to CBRMSs, where unclear land and resource jurisdiction and tenure arrangements can undermine local organizational and resource management efforts. San Juan's first steps to inventory its forest resources through a dasonomic study and to form, together with other communities, the UECIFOMET allowed the community to get its first forest exploitation permit. Even though the association with the Union did not provide any direct long-term benefit, it gave a strong impulse to the formation of the communal enterprise. Such official approval to exploit timber awakened and allowed the comuneros to start their business venture, it made them realize the world of opportunities they could take advantage of if they were well-organized, and it

facilitated processes of interaction with government agencies and acquisition of legal jurisdiction on land and resources management. Clearly, actors and forces at other scales played a big role in the consolidation and performance of the San Juan enterprise. The initial opening provided by a legislative context friendlier to communal management of resources (whether in the form of ejidos or agrarian communities) allowed the *comuneros* to acquire official permission to manage and exploit their forest and it was especially this together with skillful leadership that facilitated the way for the *comuneros* to systematically thereafter build the communal enterprise, to have the enterprise become a recognized Technical Forest Services provider, and to be granted official recognition of land ownership through a Presidential Resolution.

The system's performance and governance have been visibly affected by the drastic changes through time in the leadership processes and institutional arrangements (see description in Figure 12). These changes include the approaches to community conflict management, enforcement of operational rules, irregular involvement of affected parties, weak accountability and monitoring mechanisms, and consequently, reduced credibility in the eyes of authoritative bodies and institutional structures. The parallel processes of an enabling legislative environment and of local empowerment and governance have been marked by both progressive and regressive stages. The management system's starting point was distinguished by a harmonization between energies and opportunities created by federal legislation, and vision and leadership emerging at the local level; the second stage of evolution of the management system seems to have been characterized by a less supportive more constrictive legal environment and a decline in some community processes and key features of the local leadership; the present stage is characterized by some degree of uncooperativeness between the local and larger socio-political environments, where San Juan is more independent of varying support and is facing re-emergence of both innovative and poor leadership and trying to adapt and put in place evolved institutional and managerial structures to address current community and enterprise needs.

San Juan's community and enterprise self-organization structures are, beyond any doubt, very complex and are among the main contributors to its numerous

achievements and resilient nature. At some points in time its degree of adaptiveness to varying socio-economic and political conditions has been reduced or increased depending on the way local leaders have used or preserved the system's built, human and social capitals. Increasing interconnections, irregular application and/or stagnation of institutional arrangements and subsequently of local governance, together with external drivers, have been among the key forces generating change. As the communal management system has demonstrated, its survival capacity is strong. The well-built foundations of the system make it very adaptive and probably able to recover from current challenges in a successful way. However, even though its resilience is evident to many, and the system is strategically managing for resilience, this does not necessarily mean, in the view of the researcher, that the system currently manifests very healthy or ideal conditions. Authors referred to in Chapter 2 indicate that:

- Resilience is typically a desirable characteristic of systems and that management approaches should direct efforts to increase the resilience of social-ecological systems (Walker et al., 2003; Berkes et al., 2003; Holling and Gunderson, 2002; Holling et al., 1998; Costanza and Folke, 1996);
- Clear design principles exist for the fostering of successful institutional arrangements for resource management and are an indicator of the existence of appropriate management systems (Dietz et al., 2003; Ostrom et a., 1999; Ostrom, 1990).
- Enabling legislation and appropriate linkages (Berkes et al., 2003; Brown, 2002; Berkes, 2002; Barret et al., 2001; Castillo and Toledo, 2000; Ostrom, 1990 Grima and Berkes, 1989), a close relationship with nature, and a cosmogony founded on a holistic view of the environment (Toledo et al., 2003) can ensure protection and proper management of ecosystems and harmonious relations with nature.

San Juan manifests all of these characteristics and its social-ecological system can be described as resilient. Yet whether the existing situation is desirable for a communally driven socio-economic process is questionable. San Juan shows strong adaptive capacity, cross-scale linkages, sustained protection of the resource base, and strategies to deal with drivers of change. These do not account for the apparent conflict

between individual/group interests and the community interest. Nor do they account for the varied struggles and conflicts at the local level – as indicated in interviews with peoples at all community levels (rank and file members, workers and ex-leaders). San Juan's achievements indicate a certain degree of material success for the community, but it does not necessarily mean equitable distribution, balanced well-being and healthy involvement, cohesion and full participation of community members.

In San Juan, the main motto seems to be not necessarily equality but a degree of equity in terms of improved socio-economic conditions for all. San Juan's social ecological system appears to be resilient, with working institutional arrangements and appropriate linkages. However, community-based resource management systems should also be judged for their consistency and effectiveness to maintain inclusion, in a way that (while providing recognition of the most skillful and committed) do not diminish or dismiss the contributions, rights and needs of the less skilled and/or politically empowered among members. This dimension, involving more than just the design of proper institutional arrangements, implies the development or strengthening of the human resources required to make such arrangements effective.

The San Juan case indicates that community-based resource management systems can have more to offer than top-down development approaches or private resource management. San Juan's social enterprise has demonstrated at key periods the benefits of community unity in thought and action. This has contributed to redefine the way communities can lead the social-economic processes affecting their own cultural and communal identity. San Juan has been exceptionally successful in connecting resource conservation with livelihood benefits, and in the process even increasing the area under forest cover. People of San Juan identify themselves as forest people; their identity is land-based. This has made it possible for them to make and enforce among themselves rules that help conserve forest resources.

Moreover, despite many challenges, communally managed forest resources have provided beyond any doubt far better, real, larger and broader benefits to *comuneros* than the previous private forest management regime. However, it is important to keep in consideration an important dimension of community development:

even well-structured, long-lasting, perfectly designed, resilient systems may be incapable of delivering long-lasting benefits if they are not based on equity and trust. There is a generational shift in leadership and organizational challenges in San Juan. These changes can create "windows of opportunity" in renewing the enterprise. To do so, transparent and accountable management practices will be needed. The investment in building measures to establish efficient and inclusive institutional structures and transparent, fair and adaptable institutional arrangements, may be the way to ensure and maintain real participation, strong commitment and unity in facing the challenges ahead.

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Appendix 1: Equator Initiative Checklist of Questions

University of Manitoba
Center for Community Based Resource Management

Dr. Fikret Berkes and Dr. Cristiana Seixas

November 2004

1. **Community organization**
    a. Origins of the project
        i. Date of community initiation
        ii. Date of formally established (EI date)
        iii. What inspired or precipitated the project? What were the sources of inspiration for the project?
            1. Whose idea was it? Locals, outsiders, gov't, NGOs, etc
            2. Trigger event, if any.
            3. Catalytic element, if any
            4. Other?

    b. Leadership and key people (note gender)
        i. Individuals: locals and/or outsiders (e.g., local leaders, researchers, entrepreneurs). What role did they play? How did their role change during the course of the project?
        ii. Key organizations: locals and/or outsiders (e.g., traditional authority, gov't, NGOs). What role did they play? How did their role change during the course of the project?

    c. Funding and other resources
        i. If there was funding for initial community organization, who provided the funding?
        ii. If there was capacity building, including training workshops, who funded it?
        iii. If there was initial investments, who funded it?
        iv. If there was funding for office, office personnel, vehicles, etc., who funded them?
        v. Human resources for initial organization (in-kind work as opposed to money)
            1. Volunteer support from pre-existing groups
            2. NGO and Gov't personnel providing their time or services for free
            3. Enlisting free help from outside groups, e.g., proposal writing, information, contacts, communication, etc.
            4. Were there pre-existing relationships between these groups and the community?
        vi. Use of free facilities (e.g., community radio, office space, community television)

d. Knowledge (note gender)
    i. Sources of knowledge: local/TEK and/or outside knowledge
    ii. If there is local knowledge and if relevant, who holds this knowledge?
    iii. If there is outside knowledge used in the project, was there capacity building (education, training, knowledge exchange)? Who was involved in providing capacity (e.g., other communities, NGOs, Gov't, universities, researchers)?
    iv. Were there other ways of integrating knowledge systems?
    v. Were there *learning networks* (self-organized groups consisting of people from different organizations, who are engaged in problem-solving, subsequently recycling their experience to tackle new problems)?

2. Cross-scale linkages

a. Identification of main stakeholders (community groups, business groups, gov't, NGOs, development agencies) by levels of organization. Produce a table (see example attached) as way of checking off all the combinations, and enter the names of organizations/agencies into the matrix of the table.
    i. local/community/village level
    ii. regional administrative level: municipality, district, etc. as appropriate
    iii. state/provincial level
    iv. national, including national NGOs
    v. international, including international development agencies

b. Institutional linkages related to the project
    i. Produce a diagram (see example attached) indicating key linkages
    ii. Key horizontal institutional linkages (i.e., linkages across space and sectors, such as networking with other community groups, NGOs, development agencies, etc)
        1. facilitating/enabling the project
        2. as barriers/hindrance to the project
        3. Whose initiative established these linkages?
    iii. Key vertical institutional linkages (i.e., linkages across levels of organization, such as linking with key gov't agencies)
        1. facilitating/enabling the project
        2. as barriers/hindrance to the project
        3. Whose initiative established these linkages?
    iv. How does the policy environment impact the project? (e.g., policies, legislation, political space for experimentation)
    v. What change (if any) did the project trigger in government legislation or policy?

c. Are there any unusual interactions among gov't agencies, NGOs, development agencies, etc, that impact the project positively or negatively (e.g., competition over gov't department jurisdiction, or NGOs competing

over funding)? What motivates these linkages? What are the drivers of positive or negative interactions?

3. **Biodiversity conservation and environmental improvements**
    a. Conservation/improvement of what target resources (species and environmental resources)
    b. Changes in resource state
    c. Indicators of biodiversity conservation or improvement (e.g., birds or butterflies started to come back; water became clearer, etc)
    d. Was there any reduction on threats to biodiversity?

4. **Poverty reduction**
    a. Indicators of poverty reduction (e.g., number of jobs, increased income etc)
    b. Improvements in community well-being (e.g., access to clean water, new village school, waste management etc.)
    c. Was there any reduction on threats to human well-being?

5. **Detailed analysis of community-based conservation (CBC)**

    a. Mechanisms, dynamics, drivers
        i. Analysis of catalytic element that made the initiative work
        ii. Decision-making process (e.g., participatory, transparent, responsible)
        iii. Conflict-management mechanisms
        iv. Conflict resolution and enforcement

    b. Learning and Adaptive Management
        i. How did previous observations lead to project formation and development?
        ii. How was experience incorporated into subsequent steps of the project? What learning processes did the different parts of the project go through? (project – including all stakeholders)
        iii. What was the role of experimentation, if any?
        iv. Role of memory, novelty, innovation
        v. How monitoring (e.g., rare species) informs the project
        vi. Barriers to CBC, and how the barriers were overcome
        vii. Combining knowledge systems to solve problems
        viii. Was there adaptive management (learning-by-doing) with the organization structure and/or with ecosystem management?

    c. Community benefits from biodiversity conservation and environment improvements
        i. What direct benefits were observed (e.g., improvement in resource base to be further exploited; alternative income sources (e.g., tourism))
        ii. What indirect benefits were observed (e.g., awards and recognition; publicity; increased funding opportunities for conservation)

d. Livelihood strategies, coping and adapting
    i. How did involvement in the project affect other livelihood pursuits, negatively (e.g., time, resources) or positively (e.g., synergies, increased capital)?
    ii. How did the project affect the ability of households and the community to adapt to changes (e.g., markets)?

e. Resilience of communities, livelihoods and management systems
    i. Did the project add options (e.g., livelihoods, alternative management possibilities, new coping and adapting strategies)?
    ii. Did the project create learning opportunities (see under learning)?
    iii. Did the project create self-organization opportunities (see under community organization)?

f. Transferability of the lessons from this EI case
    i. Which lessons were likely transferable? Why?
    ii. Which lessons were not transferable? Why?

g. Recommendations (to improve your EI case), if any