



Stakeholders' Vision on the Socio-Ecological System (SES)
situation in Mexico. A Case Study



Community-Based Management of Environmental Challenges in Latin America

Deliverable D3.1

Stakeholders' Vision on the Socio-Ecological System (SES) situation in Mexico. A Case Study

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Mexico

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September 14th, 2012



Table of contents

1. Introduction	4
2.1 Resource System.....	7
2.1.1 <i>Location and system boundaries</i>	7
2.1.2. <i>Ecological features.....</i>	8
2.1.3 <i>The economy and the environment: quantification of resources and size of the resource system</i>	9
2.1.5 <i>Observed changes in resource use patterns</i>	16
2.2 Governance System.....	16
2.2.1 <i>Formal and informal rules regarding the organization of local stakeholders.....</i>	17
2.2.2 <i>Resource property rights.....</i>	19
2.2.3 <i>Management system of natural resources.....</i>	20
2.2.4 <i>Natural resource conservation schemes and formal and informal policies.....</i>	21
2.2.5 <i>Benefits distribution among population and local stakeholders.....</i>	21
2.3 Natural Resource Users	22
2.4 Interactions.....	24
2.4.1 <i>Stakeholders' time allocation and level of specialization</i>	24
2.4.2 <i>Information sharing among users</i>	25
2.4.3 <i>Conflicts among users.....</i>	25
2.4.4 <i>Lobbying activities.....</i>	26
2.5 Outcomes.....	26
2.5.1 <i>Social performance measures</i>	26
2.5.2 <i>Ecological performance measures</i>	27
2.5.3 <i>Economic performance measures</i>	27
2.5.4 <i>Externalities to other SESs</i>	28
5. Conclusions.....	42
6. References	44
Appendix A: Seminar Program (August 12th-15th 2012).....	47
Appendix B. Seminar's program about community challenges and climate change	51
Appendix C. COMET-LA Ethics Guidelines	54



Figures, Tables and Charts

Figure

Figure 1: Geographical location of Santiago Comaltepec, Oaxaca.....	8
Figure 2: Community organization diagram (governance system)	17
Figure 3: Comaltepec SWOT Matrix of field work.....	41

Table

Table 1: Land Use and Surface Devoted to Each Use According to Santiago Comaltepec's Land Use Plan revised in 2004	10
Table 2. Comaltepec's Secondary School Students' Environmental, Social and Political Proposals.....	30
Table 3. SWOT Analysis by Comaltepec Authorities.	35
Table 4. Comaltepec birth rate (1990-2010)	37

Chart

Chart 1: Daytime lower temperature pattern over the past 50 years	9
Chart 2: Production units with agricultural or forestry activity (total units average)	12
Chart 3: Yield and total production of Santiago Comaltepec's main crops.	13
Chart 4: People with a job in Santiago Comaltepec, Oaxaca (% of total population)	15

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1. Introduction

Forests play a critical role in balancing the global climate through carbon sequestration, serve as the repository for most of the planet's terrestrial biodiversity, mitigate carbon emissions, provide environmental services and hold important economic activities (FAO, 2006).

Mexico is a country with major forestry resources. At present, it has 128 million hectares covered with forests, jungles, and other kinds of wild vegetation (SEMARNAT, 2002). At the same time, it suffers from one of the highest rates of deforestation. According to FAO, the rate of deforestation reaches 600,000 hectares per year. More optimistic estimates point out that "only" 400,000 hectares are lost annually (CONAFOR, 2004).

Forestry represents an important source of living for many Mexican families. It is responsible for about 82,000 direct jobs and for more than 208,000 in the industrial sector. Industry, directly and indirectly related to forestry represents 7.4% of industrial GDP (INEGI, 2009). The property of forest resources in Mexico is basically social. About 95 million hectares of the 128 total are owned by *ejidos* and communities (Mota, 2006).

With a national estimated 12 million people depending on forest resources (Boege, 2010), conservation and sound good management of Mexico's forests are tools to create and maintain livelihoods and thus a source of human well-being. This implies that any production, conservation or development policy in forest areas of the country must begin to recognize the key role played by the owners and users of this land and incorporate provisions to develop collaborative agreements for resources sustainable use. In this sense, property regimes are highly relevant, as collective ownership and management of forest resources has been a major factor in the permanence of forest (LGDFS, 2012).

Having Mexico such an important forest land under collective management and being COMET-LA a research project which intends to create a participatory learning arena, the Mexican case in the community of Santiago Comaltepec in the southern state of Oaxaca, becomes an interesting opportunity to know the socio-environmental complexities that determine its behavior.

Santiago Comaltepec¹ is a community located in the northern highlands of the State of Oaxaca, (the so-called "Sierra Norte de Oaxaca") Mexico which practices community-based management of natural resources. This community is the study area on which the research project Community-Based Management of Environmental Challenges in Latin America (COMET-LA) focuses its attention in order to understand how this community has achieved a sustained conservation of their forest resources. On the basis of communal

¹ Santiago Comaltepec is the name of the municipality. However, it consists of three smaller administrative regions called "agencias (municipal agencies)": Comaltepec, La Esperanza and Zoloyapam.

property², it has a long tradition of use and defense of their forest. Social capital is perhaps the largest asset it has. This analysis also intends to answer the question of how natural resources have become the basis for local economic endeavors in Comaltepec. Despite external pressures, this type of rural economy has been resilient and has shaped an opportunity to go beyond the tragedy of the commons.

The Sierra Norte of Oaxaca³ is known not only as one of the regions with the highest conservation values, but also with a high cultural diversity. At least four indigenous groups had lived there before the Spaniards arrived. The importance of the whole area lies precisely in the capacity of the population to adapt to extreme, critical circumstances. Within the communities of the Sierra Norte, Santiago Comaltepec has become a paradigm for both the conservation of natural resources and social justice.

This report accounts for the first part of the research the Mexican group of COMET-LA has carried out until now in Santiago Comaltepec. The research team gathered data and information from different sources, including censuses, historical archives, theses, newspapers, books and specialized articles. It also benefited from information given by community members, and NGOs, as well as local and federal authorities. One of the most important sources of information was the field work carried out over the past few weeks, which has enriched the views and concepts the research group holds on the study area. The field work was carried out throughout five days (from August 12th to August 16th). Representatives of all groups of researchers (Colombia, Argentina, Spain, Norway) involved in COMET-LA participated in it. Workshops, interviews and surveys were carried out in the three different areas Santiago Comaltepec is divided into⁴.

Analyzing Comaltepec case offers an excellent and unique opportunity to discuss several issues regarding the natural resources and their collective use. As it was said, Comaltepec seems to refute the so-called tragedy of the commons. Its well-structured governance structure and the social awareness created around environmental issues have produced a very strong social capital which shields against the destruction of forests and resources attached to them. However, it entails also a portfolio of challenges that in the long term may affect the present sustainability everybody seems to be proud of. As this report will discuss at length, in the case of Comaltepec, sustainability has not necessarily meant great levels of social prosperity. Being a quite egalitarian society, it paradoxically suffers from levels of poverty that, vis-à-vis their wealth of natural resources, should not exist. Large parts of its population have been forced to abandon their hometown in search of new economic opportunities. Migration is the fashion in Comaltepec.

Another interesting issue is that despite the fact that by and large the governance system works efficiently, it is not necessarily fair. Moreover, it is increasingly facing resistance from the younger members of the society, who see in it a strong obstacle to their own development. Another source of unfairness is that not all community members have the same rights. Women, in particular are severely reduced to minor roles wasting their capacity to contribute. But on top of all, the system confronts a genuine and difficult dilemma: the preservation of tradition while accepting new ideas. Not being an easy

² Communal property establishes that each member of a community has the right to access and use the resources available as long as the rules of access and use established by the members of the group are followed. Each commoner (see Footnote 8) also has the right to exclude those who are not part of the group but does not have the right to exclude other members of the group.

³ 25 municipalities are part of the Sierra Norte of Oaxaca

⁴ See Footnote 2.

combination, tensions are steadily growing and will have to find a way out. All these issues are discussed in detail in what follows.

The report is divided into four parts. The first one describes the study area and all its natural and socioeconomic features (land area, lakes, rivers, capital, economic activities, and many other related variables). The second section accounts for the description and analysis of the views the stakeholders of Santiago Comaltepec have on different types of issues (economic, social, institutional and environmental as well as on their interrelations). The third part includes a SWOT analysis of Santiago Comaltepec. In the last part of the report, we try to draw some conclusions considering all the information gathered so far.

2. Study area description

The Sierra Norte of Oaxaca also named Sierra Juárez is located in the southern State of Oaxaca, Mexico. It is a segment of the Sierra Madre Occidental and represents the major rainforest reserve of the country. It lodges a great diversity of flora and fauna. It is, in fact, the region with the largest flora in Mesoamerica, and operates as a water source for one of the most important rivers in Mexico: the Papaloapan. The Chinantla region is set in a privileged location in the Sierra Juárez. It functions as a protection against winds from the Gulf of Mexico, and it plays a major role to meet water demand in the area (Plan Municipal de Desarrollo, 2010).

Santiago Comaltepec is a Chinantec community where most residents cultivate their land mainly for self-consumption. In the past, the residents obtained cash income by selling crafts from a bromeliad (*Aechmea magdalenae*) that grows in the understories of their tropical rainforests and which was highly appreciated for the production of fine sailing ropes. At times, they collected and sold two varieties of wild yam from their rainforest (*Dioscorea mexicana* and *Dioscorea composita*), which were used as a key ingredient in the production of the first generation of contraceptives. More recently, they have been growing and selling coffee beans for export markets. Today, their main cash source is timber production. Remittances from community members working in urban areas in Mexico or in the United States have been emerging as another source of cash income for families in this community.

Comaltepec town was founded when other Chinantec villages, mainly from the community of Yolox, experienced the need to increase their farmland. By 1420, several families dispersedly settled in the area to cultivate land. In 1602-1603, people were congregated in settlements which today form Santiago Comaltepec. In 1659, the church and other basic infrastructure were built and Comaltepec asked the federal authorities to be entitled to the status of "town". In 1735, this recognition was granted by regional authorities. In 1819, the authorities issued property titles to Comaltepec⁵. So, the community is about to celebrate two centuries of uninterrupted land property, although their natural resources management systems and their governance structures have not stopped evolving for six centuries. Throughout this time, Comaltepec has faced deep changes, but the community has been successful in adapting to them.

⁵ Enciclopedia de los Municipios de México: Estado de Oaxaca, Santiago Comaltepec. <http://www.e-local.gob.mx/work/templates/enciclo/oaxaca/municipios/20458a.htm>

Studying this case helps to understand how communities can adapt to natural, social and political changes and how community institutional arrangements can help human societies to survive in a changing environment that puts them to the test of unedited situations.

2.1 Resource System

2.1.1 Location and system boundaries

The state of Oaxaca is located just south of Mexico at the confluence of Sierra Madre Oriental, the Sierra Madre Occidental and the Cinturón Volcánico. This geographical position explains the uneven topography, the varied landscape and the biological diversity that characterize it. In this sense, for about 10,000 years now, the inhabitants have developed systems of natural resource management that have allowed them to survive and to adapt to the changes caused by various variables, giving rise to the cultural diversity that defines the entity.

The Sierra Norte of Oaxaca is located north of the state capital (See Figure 1). In the 12th century, the Chinantecos colonized the steep slopes of this mountainous region, forming the culture known as "*Chinantla*". The geographical location of this area attracts much of the humid winds from the Gulf of Mexico making it one of the highest rainfall regions in the country (Plan Municipal de Desarrollo 2010).

The town of Santiago Comaltepec is located at 17° 33' 54" north latitude and 96° 32' 54" W, at an altitude of 2,052 meters above sea level (masl), with reference to the center of the region. It is about a three-hour drive north of the city of Oaxaca, the state capital.

The community of Santiago Comaltepec consists of three main towns: Comaltepec, La Esperanza, and Zoyolapam⁶. They are located across the slightly more than 19,000 ha of common property.

⁶ There is no consensus in writing Zoyolapan or Zoyolapam. In this paper we will use the name Zoyolapam.

Figure 1: Geographical location of Santiago Comaltepec, Oaxaca.



Source: Robson J. and Nayak P. (2010). Rural out-migration and resource-dependent communities in Mexico and India.

The extreme altitudinal variation observed in the area is one of the main features of Comaltepec. So while the county-seat is located at 2,005 masl of San Martin Zoyolapam barely reaches 160 masl.

2.1.2. Ecological features

Biodiversity is one of the main characteristics of Comaltepec's forests. This is due to the location of the communal land in the Sierra Norte of Oaxaca, which is recognized by large expanses of different forest types, such as deciduous forest, oak forest, pine-oak forest, pine forest, and evergreen forest. Countless types of animals, plants and insects thrive there. Comaltepec maintains the most important reserve of mountain cloud forests in Mexico and because of the existence of a road, it is one of the most important collecting zone in the state.

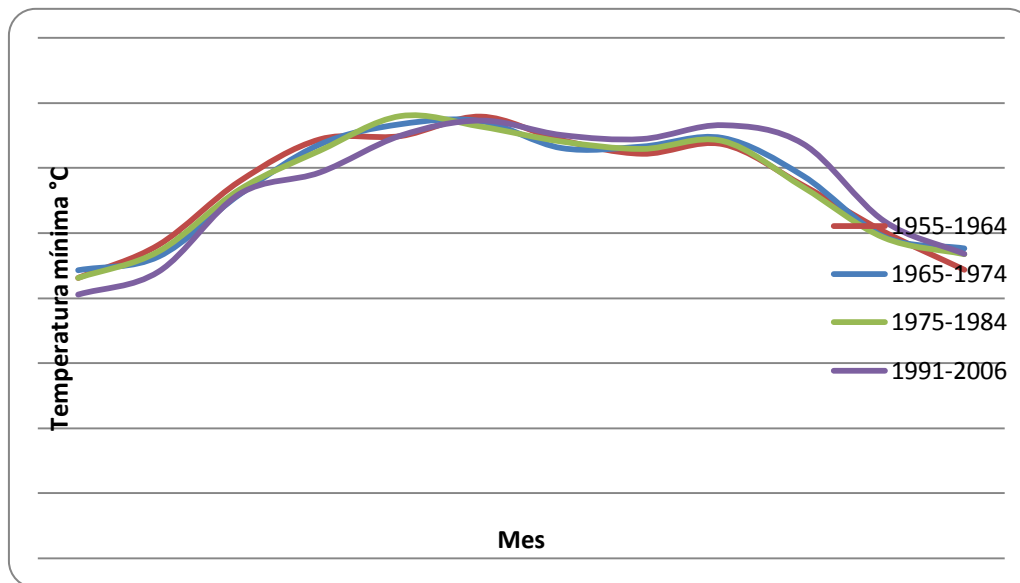
Forests have played a major role in the life of the community. Before the 1960s, they were a source of fertility to maintain the agricultural and pastoral systems. From then on, a set of changes has taken place. Tracts of forests were converted into agricultural areas while others were left as wild ones (Martin, 1993).

On a macro-scale, the communal territory is part of the upper basin of the Papaloapan River, the second longest river in Mexico. On a local level, the hydrographic landscape is characterized by the presence of numerous permanent and temporary streams that flow into the Rio Grande, Río Bobo and Río Zoyolapam, the main three permanent rivers in the region.

One key factor to understand the environment of the study area is the temperature patterns. It is important to know the extreme temperatures to determine the degree of change in this variable. Climatic data of the last fifty years given by the Mexican state water committee CONAGUA from San Juan Atepec, located 20 kilometers from Santiago

Comaltepec, were grouped in periods of ten years thus forming five decades. Chart 1 shows that in terms of the minimum temperature there has not been any variation over the five decades. The statistical analysis for comparison using the Tukey method allows to verify that there are no significant differences in the decades considered ($p= 0.8050$)⁷.

Chart 1: Daytime lower temperature pattern over the past 50 years



Source: Calculated using data from Conagua (2012).

2.1.3 The economy and the environment: quantification of resources and size of the resource system

In 1993, the community of Santiago Comaltepec, with the support of *Estudios Rurales y Asesoría A.C.*, carried out the first voluntary plan to organize their land management. In 1994, a communal statute was elaborated which included the land use plan. In 2004, both instruments were reviewed and written standards and rules were introduced in the Statute (Comisariado de Bienes Comunales de Santiago Comaltepec, 1999). Table 1 shows the different categories as they were reviewed in the Plan of 2004.

As can be seen, more than half of the communal territory serves protection purposes, while the rest may serve for productive purposes, either agricultural or forestry, or for home use. The changes that may arise in the future, especially the agro-forestry use, will depend on how to solve the claims for lands of the younger generation and how to achieve balance with activities such as cattle rising.

⁷ However, as it is mentioned in section 2, agricultural producers refer that from the 80s the weather has changed.

Table 1: Land Use and Surface Devoted to Each Use According to Santiago Comaltepec's Land Use Plan revised in 2004

Category	Surface (ha)
Forest production areas	1,726
Intensive forestry	453
Low intensity forestry	292
Domestic forestry use	982
Forest protection areas	10,300
Watershed protection	517
Protection of wildlife	4,421
Forest reserve	5,068
Seed area	5
Natural regeneration	289
Forest restoration area	127
Agricultural areas and urban agro-forestry	6,108
Agriculture	144
Agro-forestry	5,954
Urban use	108
TOTAL	18,366

Source: Community Plan of Land Use, Comaltepec, revised in 2004.

2.1.3.1 Natural resources availability

In the case of Comaltepec, all commoners⁸ have access to natural resources located within legally recognized limits. The legal possession was given to the community in the year 1953 based on the *Ley Agraria* (Agricultural Law) by means of a Presidential Order for Communal Property Restitution⁹.

All community members that fulfill their obligations are entitled to using land, forests, water and other resources. Community members and their families are also entitled to a place to build their home. They also can have an urban lot and an agricultural plot and/or grazing land. All these activities are carried out on a family basis and the community recognizes each family's land ownership as long as they keep working on it. In the case of forests, all community members have the right to collect firewood, secondary forest crops,

⁸ Commoner refers to a person who has a right in or over common land jointly with another or others. The commoner status is generally assigned by the community to adult males and it gives them the right to participate in the decision making of the community's general assembly. A commoner has not only rights over common property but also the obligation to participate in the year-long duties named *cargos*.

⁹ Restitution is the legal instrument which acknowledges the collective or communal ownership of the land to the inhabitants of the indigenous communities that have been in possession of them for centuries.

to hunt in certain seasons and to use water from springs and streams for irrigation. Each family is responsible for what is cultivated in their land and decides what to do with the production. In the case of agriculture, almost all of the crops harvested are devoted to self-consumption, except for Zoyolapam (one of the three “agencies” that constitute Comaltepec), where they have surpluses that are sold on local markets. Communal enterprises are collectively owned and are responsible for carrying out the exploitation of forest areas in its various forms: round-wood production, timber production and ecotourism.

The first ten-year management program (1993-2003) was elaborated and authorized in 1993 and operated by four different communities, all of them members of the Union of Zapotec-Chinanteca Forest Communities of Sierra Juárez (UZACHI by its Spanish acronym). Thus, Santiago Comaltepec got permission for the use of the first cutting cycle by the then Ministry of Agriculture and Water Resources (SARH by its Spanish initials). In 1998, a fire forced a modification of the forest management program for the next four years (1998-2003). Having completed the first cutting cycle, the community updated its management plan to continue with the second cutting cycle, which was authorized for another ten years (2003-2013) (Comisariado de Bienes Comunales 2003). These authorizations have been delegated to the Comisariado de Bienes Comunales (Communal Property Commissioner) who represents the community, and who is in charge of the ‘Unidad de Aprovechamiento Forestal Cerro Comal’¹⁰, which has the organizational structure to implement forest-related activities.

2.1.3.2. Access to inputs and investments

In 2010, according to the National Institute of Statistics and Geography (INEGI for its Spanish acronym), in Santiago Comaltepec there existed 23 production units with access to a tractor for agricultural activities; however, the type of access is exclusively by leasing because none of units owns one. Out of the 437 ha of farmland, only in 12.2% is some kind of technology applied, such technology consisting mainly of the use of herbicides. A very small proportion of the farmland (3.2%) is exploited with the slash and burn technique or other rudimentary procedures. No production unit has access to credit or insurance coverage.

The Municipality of Santiago Comaltepec currently has a program called remnant resource production options. With this economic resource, commoners can have access to small credits and are charged only a 1% annual interest rate.

Almost all families of the community have one or more relatives in the USA, Mexico City or Oaxaca City who send remittances. This income is owned individually and mainly used for consumption.

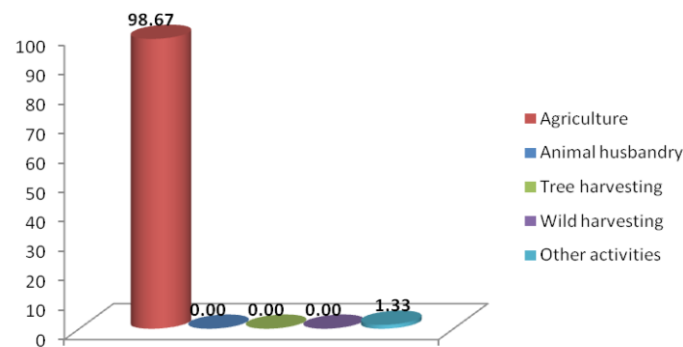
¹⁰ This is a firm which exploits the forest products (round wood and table products).

2.1.3.3 Economic activities

According to the Agriculture, Livestock and Forestry Census (INEGI, 2007), there are 226 production units in Comaltepec, out of which 99% are involved primarily in agriculture, indicating that almost all of the working population are active in this sector (see Chart 2).

Agriculture is the main family activity in the municipality and its main purpose is self-consumption. Only 46% of production units apply some form of technology, such as chemical fertilizers, natural fertilizers or slash and burn. There is one production unit with irrigation system and the rest are rain-fed. Even if the official statistics do not show an industrialized agriculture, some empirical observation shows that most of the farmers use quite sophisticated ecological techniques, and with some help, these farmers could even start labeling their products as organic products with an internationally recognized brand.

Chart 2: Production units with agricultural or forestry activity (total units average)

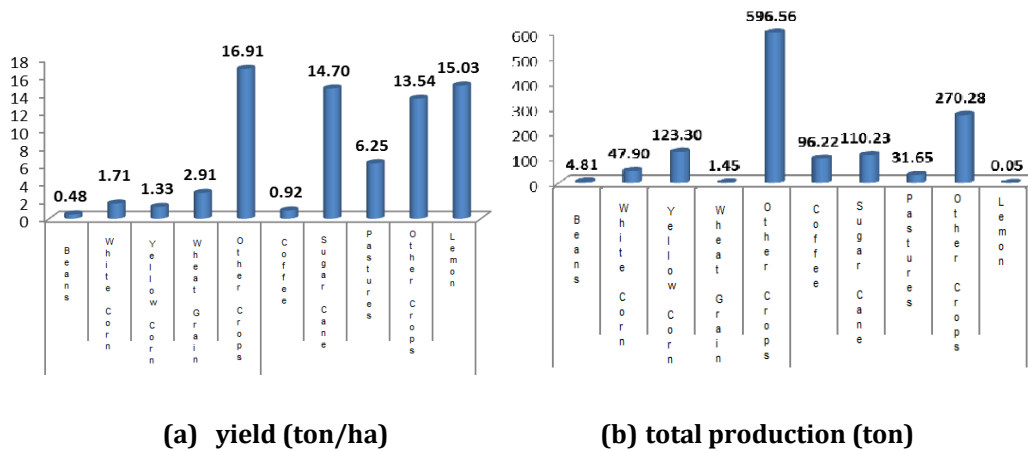


Source: INEGI; Agriculture, livestock and forestry census, 2007.

Even if the agricultural yield seems very high in the system, in many cases this is so because the cropped area is minimal. White Corn is the main crop, with a total of 137.57 ha, planted in two cycles (see Chart 3).

Regarding animal husbandry, the technical function is reduced to cattle feedlots and working animals. The technology used for farming is, as is the case in agriculture, limited. This situation reduces land productivity and the farmer's income.

Chart 3: Yield and total production of Santiago Comaltepec's main crops.



Source: INEGI; Agriculture, livestock and forestry census 2007.

Recently, two community companies have been formed: Industria Forestal Maderera de Santiago Comaltepec S.P.R. de R.I. (Santiago Comaltepec Forest and Timber Industry Company) and Ecoturismo Comunitario Cascada de Niebla S.P.R. De R.I. (Cloud Forest Waterfall Community Ecotourism)¹¹.

Communal enterprise profits are used for social benefit within the community. In recent years, 10% of the timber production has been paid to the 'Comisariado de Bienes Comunales'. This resource is used by the Committee for administrative expenses with the approval of the plenary of commoners. The rest is distributed amongst the locals in the form of public goods.

2.1.3.4 Accessibility, age and conservation conditions of local infrastructure and its connection with the region's main centers.

The main access to the towns of Santiago Comaltepec is Federal Highway 175. Off this highway come secondary roads which connect major population centers. La Esperanza is located next to the federal highway. To get to San Martin Zoyolapam, an eight-kilometer unpaved road must be taken. The town of Comaltepec has a bus service that performs community transport service to and from the City of Oaxaca twice a week.

For logging activities and monitoring there is a forest road network which can be accessed using the same Highway 175, which serves as the main road along 55 km within the territory of Comaltepec.

¹¹ Since January 2012, the forest and timber company has been making contributions for some social benefit works. The ecotourism firm, in contrast, has not made contributions yet because it just started up operations. It is developing more customer services. It aims to provide ecotourism services to the public, has a dining area and has opened some trails in the woods. Companies are managed as community cooperatives. Their benefits are distributed amongst the three different towns (Comaltepec, La Esperanza and Zoyolapam) and allocated to the infrastructure.

The access to different services differs from service to service and from town to town. The three towns have access to electricity from the state company. The price the commoners pay is subsidized, but still too high when compared with the local people's income. Water is also a service that is provided by the state water company in all mayor towns; however, the houses located farther away meet their water needs turning to nearby small rivers. While in Comaltepec the houses have drainage, those in San Martín Zoyolapam use septic tanks.

2.1.4.1 Production and employment opportunities

An important part of the year is dedicated to yearly crops such as corn, beans, zucchini and some garden vegetables. Besides, local dwellers perform family activities such as ranching or extra chores inside the community in order to have more income options. During the periods of time 'Secretaría de Comunicaciones y Transportes' (the Ministry of Communications and Transport) gives maintenance to the federal road, several commoners are hired.

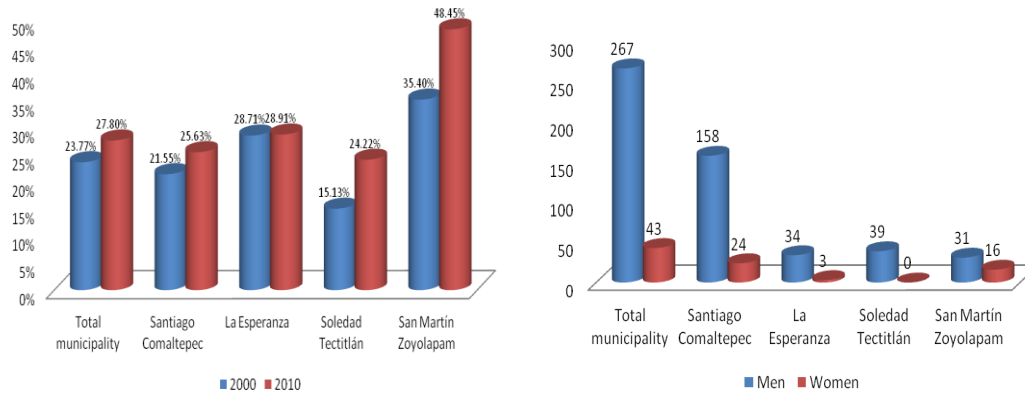
In La Esperanza and San Martín Zoyolapam, several other seasonal crops such as chile, green bean as well as perennial crops such as coffee, papaya, mamey, watermelon, citrus fruits, bananas and nanche (*Birsonima crassifolia*) are grown. In all towns belonging to Santiago Comaltepec Municipality, most families rely on animals to plow their land. These animals might include horses, mules or bovine cattle. In addition, families usually have backyard animals (pigs, sheep and hens). (Development Plan of Santiago Comaltepec's Municipality 2004).

As for employment levels, Comaltepec has experienced a relatively important increase. Chart 4 shows that in the period 2000-2010, all localities of the municipality had an increase in the total employed population in relative terms. However, data from the Population and Household Census 2000 and 2010 indicate that the number of employed persons, in absolute terms, decreased in all communities in the municipality of Santiago Comaltepec. That can be explained by a decrease in the total population which has been higher than the employment decrease in absolute terms.

The same sources show that in Santiago Comaltepec the occupation rate is one of the lowest in the country (21.6% and 25.6%, in 2000 and 2010, respectively). In 2000, 198 people had a job while in 2010, this number fell to 182. In absolute terms, the drop in the employment rate is due to the decline in the productive activities (see Chart 4).

In addition to the generalized decline in employment, the labor market is characterized by a high male labor component. Women only represent 14 % of total employees. This does not mean that women do not get involved in the community activities; it only means that they do not perceive a salary.

Chart 4: People with a job in Santiago Comaltepec, Oaxaca (% of total population)



Source: Based on data from INEGI, Population and Household censuses, various years.

2.1.4.2 Forms of production organization

Land rights in Comaltepec are communal, and they are mainly determined by the land use potential. As it happens in several parts of Mexico, in Comaltepec the use of land is ruled by what is known as "usos y costumbres" (*i.e.*, traditions and customary practices). In most cases, this means that the management of resources is made in accordance to a communal organization.

The community has planned the resource management establishing cultural restrictions for their use and a few safety measures. This type of planning has proven successful in preserving resources for long periods of time. Besides, communal ownership avoids the concentration of agricultural and forestry activities in few hands. In Comaltepec, 59.5% of the production units consist of more than one plot (Chapela y Lara, 1996).

The main part of the communal production¹² is generated through the communal forest management which is worth USD 203,115 per year^{13,14}. As for other economic sectors, the main part of the income generated relies on retail sales of groceries and food. Their highest value reached by such sales amounts to USD 24,098 (Rainforest Alliance, 2012).

2.1.4.3 Comaltepec stakeholders' income sources

Income comes mainly from the forest and agricultural activities. Virtually all the families (99%) make their living this way. Out of the 226 units, 99% is dedicated to the agriculture. 52% have another economic activity to increase their income. 32% obtain part of their income through a government program. 16% of the production units obtain their income

¹² It is different to familiar production. Agriculture is the main familiar form of production.

¹³ Source: Rainforest Alliance, 2012: Diagnóstico socio-económico de la comunidad de Santiago Comaltepec, Oaxaca.

¹⁴ The exchange rate used to estimate the values is: 1 dollar equals 13.03 Mexican pesos.

in part from the remittances family members that migrated, mainly to the U.S.A. send regularly (Censo Agrícola Ganadero y Forestal 2007).(Agricultural Census, 2007).

2.1.4.4 Trade, marketing and use of production

Santiago Comaltepec and La Esperanza do not have any type of external market. Only the residents of San Martín Zoyolapam sell their second corn harvest, *i.e.*, between 2 and 3 tons a year per commoner. In the town of Comaltepec and La Esperanza, peasants individually offer their produce door to door.

2.1.5 Observed changes in resource use patterns

Since 1956, as a result of two critical events, the pattern of land use has changed substantially. These events were the construction of the Oaxaca-Tuxtepec highway and the publication of the concession decree of the forests to the Tuxtepec Paper Mill (*Papelera Tuxtepec*). When there were no roads, ranches located in the mountain provided several agricultural produce to surrounding communities. In those days, Comaltepec produced its own food and even supplied the neighboring communities with basic grains (corn, beans), fruits (orange, banana, mamey, and avocado), coffee, sugar cane and its derivatives (brown sugar cakes or *piloncillo*, fermented pineapple liquor or *tepache* and rum-like liquor).

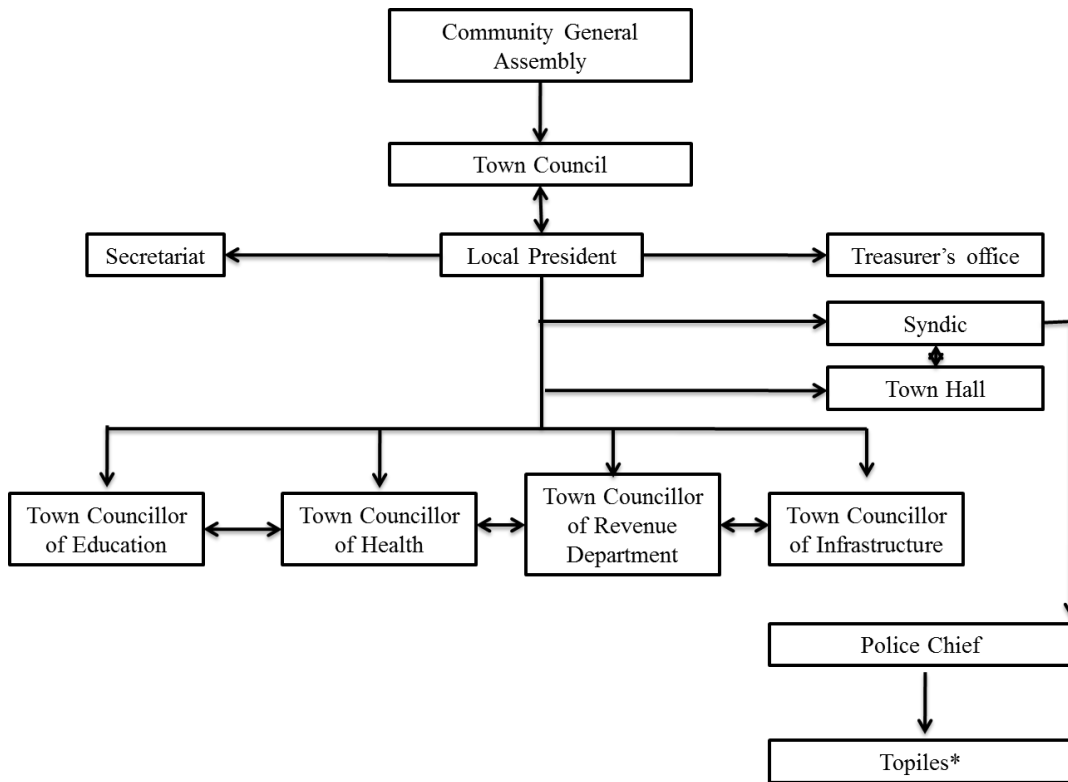
The construction of the Oaxaca-Tuxtepec highway demanded a considerable amount of work-force for several years, causing relocation of the settlements to areas close to the road under construction. One of the major changes in the local economy was also the fall of coffee price, in the early 1980's. This event marked the beginning of the relative abandonment of agricultural activities and the start of massive migration, mostly to the United States but also to Mexico City and the City of Oaxaca.

2.2 Governance System

In the case of Comaltepec, the community has developed a sophisticated system of governance based on the provision of services and work that each one of the community should pay over their working life (*see Figure 2*). Community life is governed by the system of "Usos y Costumbres" (tradition and customary practices)¹⁵, which consists of two key social institutions, *tequio* (unpaid days of community work) and "*cargos*" (unpaid positions of responsibility).

¹⁵ Customary practices are a set of standards and rules of behavior and social interaction that contribute to the integration of a society, maintaining the internal order and conflict resolution and that have not been created by the State (Stavenhagen, 1988).

Figure 2: Community organization diagram (governance system)



Source: Plan Municipal de Desarrollo, 2010. (Municipal Development Plan, 2010)

*Note: 'Topiles' is similar to Policemen

This system provides a significant degree of autonomy to rule communal and municipal affairs. It also encompasses the use and conservation of community resources, including community forests. The community is the ultimate authority within the system and precludes the involvement of external parties.

During the first half of the nineties the community made a great effort to train its members, with the goal of increasing the level of social capital, mainly in the management of the community's natural resources. As a result, the forest was recovered and even a small forest industry developed (Lara, *et al.*, 1996).

2.2.1 Formal and informal rules regarding the organization of local stakeholders

Comaltepec is governed by a system of "*Usos y Costumbres*"¹⁶ where commoners represented by a family member make decisions in the form of direct democracy in

¹⁶ See Footnote 12.

assemblies. However, the implementation process takes long due to the slow negotiation mechanism. In addition to these stakeholders, there exist other outsider groups such as NGOs, government programs, and the UZACHI with which the community interacts and eventually has conflicts.

In 2007, at the municipality level the positive law is enforced by the police. Nevertheless, at the communal level, a system based on a status enacted in 1994 is active. This status sets the rules regarding the use of commons.

Despite the existence of positive laws such as Mexico's and the State of Oaxaca's constitutions, since the community's foundation, it was governed by the unwritten or consuetudinary laws. The decisions were taken by the General Assembly. Any agreement that emanated from it became law for all. Until now this way of governing themselves is still operating.

2.2.1.1 Structure of formal and informal governance systems

Regarding the governance structure, there exist a well-defined organizational structure in terms of hierarchical levels and functions involving a gradual ascent of duties from low to high responsibilities.

All householders must perform a compulsory service in the governance structure (both civil and religious). Most of the "*puestos*" or posts, as the community calls them, are occupied by men and, in their absence, their responsibilities can be taken by their wives, children or parents. The posts are voted at the assembly and the elected members need to work in the appointed roles for a year or even a year and a half without receiving any monetary compensation. A total of six roles must be completed during an active lifetime, between 18 and 60 years of age. The people from La Esperanza and Zoyolapam must perform one of the 6 Comaltepec roles for 18 months. This obligation derives from the status that they have as commoners and from their duties within the 'Comisariado de Bienes Comunales'.

The number of public officials (people in charge of positions and commissions) reaches 84 commoners or citizens. This indicates that there is a good organization because somehow throughout their lives, all community members have to play a role in administrative affairs. At present, posts are occupied exclusively by men while women carry out commissions.

In 1985 the "Union of Zapotec-Chinanteca Communities" (UZACHI), was founded to provide technical support for forest management and other forest-production related aspects. The community is part of this organization, which gathers four communities (three Zapotec ones and a Chinantec one). With the support of this stakeholder (UZACHI), the community has integrated communal enterprises as those mentioned under 2.1.3.1.

There are government institutions such as the Ministry of the Environment, which is the body responsible for granting regulatory permits for logging and for publishing rules and regulations related to the forest and other productive activities. Another relevant institution is the National Forestry Commission which has the function of both promoting forest production and regulating forest management. In order to spread the use of good

forestry practices, the National Forestry Commission and the community have agreed to have a dialogue mechanism called the “Sierra Juarez”.

Finally, there are civil society stakeholders. One of them is the association called ‘Estudios Rurales y Asesoría, A.C’. In 1992-93, the Association started a voluntary land planning process in the community. This has helped to promote the creation of a protected area by the community itself. Two other stakeholders are present in the area: the Forest Stewardship Council and the Rain Forest Alliance. In 1997, Comaltepec was awarded the certificate for good forest management by the Forest Stewardship Council, after a certification process that was carried out by one of the entities accredited to do so, the Rain Forest Alliance¹⁷. Although they are not part of the governance system, their advice is usually taken into account when the time to make decisions comes.

2.2.1.2 Functioning of different decision authorities and formal and informal rules governing their behavior

The relationship amongst the locals is managed basically by the mayor's office. Every decision regarding a petition by a stakeholder is subject to the approval of the assembly. The committees are proposed by the different stakeholders, and elected by the assembly. There is no evidence of presence of potential leaders that could impose their point of view, because the assembly is integrated by all commoners from Comaltepec, and they usually have high level of participation. For example, in the case of Zoyolapam out of 40 commoners, 20 to 25 are sent to each assembly, using a rotation system.

The municipal organization for law enforcement and maintaining order is in charge of the police, whose members are appointed in an assembly under the “cargo” system and whose number varies according to the community. They are controlled by the mayor who is responsible for preserving the order and executing arrests.

2.2.2 Resource property rights

Although the land is communal, the *ejido*¹⁸ regime also exists. The communal land covers an area of 18, 366 hectares. In the town of La Chuparrosa the land property right system that prevails is the *ejido*, with 361 ha.

As mentioned, the land in the area of study is communally owned, but simultaneously there are agreements that respect the ownership of agricultural and urban land of each family. In return, citizens are obliged to provide public services and contribute collective work (*tequio*). Although the lands are not subject to sale, in the case of plots, sometimes

¹⁷ Certification is a process that allows the evaluation and monitoring of the forest management system and generates a series of recommendations that should be incorporated gradually to forest management in order to increase the marketability of the timber and improve the forest maintenance.

¹⁸ Ejido is a type of property right defined in the Mexican Agrarian Law. It is government land given to farmers, usually peasants. Before 1993, it could not be sold, rented or borrowed. After 1993, it can be transformed into private property and sold, rented and others.

transactions are done which involve the transference of land rights from or to close relatives or neighbors.

In such cases, the communal authority closely supervises the transactions as the General Assembly does not allow the transfer of communal land rights to people outside the community unless they are community residents and have been serving in the “cargos” system. This mechanism has allowed for the maintenance of a functional organizational structure in relation to the land which preserves internal cohesion. Forests, grasslands and water remain as common property and are administered by the Comisariado de Bienes Comunales under the mandate of the Assembly of Commoners.

The community makes communal authority, specifically the Supervisory Board, responsible for the supervision and monitoring of production activities the community develops regarding use of forest resources. All timber is common property, including timber from plots and agricultural land. Private wood harvesting is only allowed for domestic purposes. Only the community forestry units are allowed to cut wood for marketing ends. Those who violate this rule are required to pay a fine that is set by the General Assembly of Commoners. Before granting any wood harvesting permit to any community member, the communal authority must ensure that the commoner has met his duties towards the community.

2.2.3 Management system of natural resources

Comaltepec's forestry history shows over 40 years of experience of communal use of forests although it is only over the last 20 that the community has been in full control of them. The Forest Management Plan considers various activities: agriculture (self-supply), timber (income generation) and environmental services (biological resources and carbon sequestration). Concerning the ecosystem services in particular, the so-called biological resources have focused on some fungi, orchids and other ornamental plants' potential, whereas carbon sequestration seeks to consolidate the community forestry systems.

Between 1992 and 1993, forest management programs were developed for the four communities: La Trinidad Ixtlán, Santiago Xiacuí y San Mateo Capulalpam de Méndez and Santiago Comaltepec. Such programs established a technical forest direction. In December 1993, the communities obtained forest exploitation permits. Forest operations with new management programs started in the year 1994. In 1997, the UZACHI Forest Management of Forest Producers was certified by Smart Wood, with SW-FM/COC-011 code. Currently, the UZACHI manages 26,110 hectares, where activities of commercial forestry and agroforestry are developed; in addition, almost half of its territory forest areas are applied for biodiversity protection and soil and water conservation.

The total surface of the municipality is 18,366 ha, out of which 15,852 (86%) can be considered forest production areas while 2,514 are used for agriculture, livestock and urban purposes. The 15,852 ha of forest production are subdivided into several uses as follows: the protected area (or reserve), 74%; the production area, around 25%, and 1% for other uses.

According to the study by Bonnart (2009) where he analyzed projects implemented by the Technical Department of the UZACHI from 1999 until 2009, the trend of Santiago

Comaltepec forest management is slow compared to the other three communities, because the project was not implemented in Comaltepec. Another reason is that the processes of consultation and decision-making in the community are slower than those in other communities.

2.2.4 Natural resource conservation schemes and formal and informal policies

As for the formal rules, the community has a forest management plan approved by SEMARNAT (the Ministry of the Environment). This plan is implemented by the 'Comisariado de Bienes Comunales' with technical support from UZACHI. The plan determines the cutting cycle and annual timber volumes allowed. In the past three years, the community has taken a total of 4,500 cubic meters but without following a clear growing trend: 1,800 m³ in 2005, 1,200 m³ in 2006, and 1,500 m³ in 2007 (Plan de Manejo de la Biodiversidad, 2008).(Biodiversity Management Plan).

Informal agreement allow that each time a commoner requires a considerable amount of firewood which involves the use of a transportation means approved by the municipal authorities, he pays a fee. If the wood is extracted for business (*e.g.*, restaurants), the vehicle pays a higher amount. As for the use of timber for home purposes, the Supervisory Board is responsible for supervising the cutting zones. Regarding fungi harvesting and other forest agro-produce, there is no cost or regulation because the quantities extracted are minimal.

The largest part of the cloud forest lies between La Esperanza and the waterfall area. That site has been declared a conservation area. Thus, all community members know that they are not allowed to perform extraction or production activities within its boundaries. Until now this regulation has been well respected. As for the case of other forests, the community, via communal authority, specifically the Supervisory Board, is responsible for the supervision, monitoring and surveillance of its use. The agricultural lands are allocated to individual community members whose rights are clearly recognized in deeds or wills.

2.2.5 Benefits distribution among population and local stakeholders

For a five-year period, the community has been benefited by the Hydrological Environmental Services Program of the National Forestry Commission, as a result of their conservation effort of an area of 2, 062 hectares of cloud forest. With this modality, the commoners seek to expand the area to a total of 4,162 hectares.

In La Esperanza, as part of the projects managed by the UZACHI, there operates a laboratory mainly for the cultivation of fungi, although it also works on other vegetable species. The same town has an orchid greenhouse where different species of wild orchids are grown. La Esperanza's project has been implemented as part of the conservation actions and local use of orchids in the Sierra Norte of Oaxaca.

Biodiversity is also incorporated as an environmental service. A basic research contract with the Swiss pharmaceutical company Sandoz (now Novartis) is currently being implemented. Finally, the carbon sequestration was integrated. In the pursuit of

sustainable development schemes, the generation of environmental services is also considered. In this respect, the UZACHI, ERA, CCMSS (Mexican Civil Council for Sustainable Forestry) and IXETO (Union of Communities Ixtlan-Etla, Oaxaca) have formulated a proposal that could guarantee the capture of 836,000 tons of carbon over 30 years. It would require the application of forestry and agro-forestry systems to increase forest extension up to 49,027 has (Informe sobre la Propuesta de Pago por Servicios Ambientales en México, 2002).

This project is directed towards the protection, management and restoration of forest areas and the increased efficiency of wood utilization. The project plans to reinvest 60% of the net carbon captured. Over half that sum will be allocated to increasing biomass while training and technical assistance will get the other half. The remainder would be allocated to monitoring and evaluation, environmental investment (infrastructure and equipment), operation, promotion and sales. It is estimated that the total investment in carbon capture for 30 years will be U.S. just under 5 million US dollars. (Informe sobre la Propuesta de Pago por Servicios Ambientales en México, 2002).

Even if Comaltepec is still physically far from the cities of Oaxaca or Tuxtepec, in the near future there is a plan to promote ecotourism. This plan would need to exploit Comaltepec status as an indigenous community that is characterized by a unique landscape in the Sierra Norte. Among the opportunities to explore is the restaurant to generate economic resources. The rent of cabins, hiking in the different forest types, including long trips (eventually, with camping options) are alternatives now being considered by community members in order to generate extra income. As it will be discussed later on in the report, these initiatives require financing as well as training of local guides who can give talks about the distinctive elements of forests in terms of biodiversity, cultural uses of the territory, local history and landscape characterization.

The common goal in all these projects is to generate alternative of non-extractive use of forest areas that raise both household income and the value of the protected areas of communal land.

Forests are the basis for major economic activities in the community. Their importance is due to both the total area occupied and the revenue they generate. However, because of the collective ownership of the forest and how it has been regulated, revenues are not distributed among the families of the community but reinvested in the firms or in infrastructure for social benefit, not individually. Thus, the main source of family income is not forestry, but agriculture and livestock rising.

2.3 Natural Resource Users

"As common resources, forests are characterized by the difficulty of exclusion and generate a finite number of units. In this way, people, who use them, do that subtracting part of the units available to others"(Wertime, and Ginson Ostrom, 2003).

This rule applies not only to forests but to any other resource collectively owned, so it can be said that the community of Santiago Comaltepec is the main user of forests and other resources that belong to them both legally and customarily. However, the term

"commoners" is much too unwieldy or broad for research purposes. In order to have a real characterization which allows us to understand the interaction and social dynamics going on between the natural resources on the one hand and Comaltepec dwellers on the other, it was necessary to consult the International Forestry Research (IFRI) manual.

According to IFRI, user groups can be defined as a group of people, either formally organized or not, who harvest, use and/or maintain one or more forests and share the same rights and duties on the products extracted from there.

In addition to the direct users, other actors may also be affecting the way a forest is governed, such as non-for-profit organizations. Their influence can be seen in the processes of making up rules, policies and guidelines on the use of forest.

Comaltepec forest users

According to the report of the community planning workshop for the management of the territory of Santiago Comaltepec, we can identify the following user groups:

Commoners

- a) Loggers
- b) Shepherds
- c) Wild plant, wood and animal collectors
- e) Livestock owners
- f) Farmers

Foreign Inhabitants

- a) Loggers
- b) Shepherds
- c) Wild plant, wood and animal collectors

Forest Associations:

- a) Forest production unit "Cerro Comal"
- b) The sawmill
- c) Social Solidarity Society "Cascada de Niebla"

Characterization

Each group of 150 families is headed by a person who holds the status of commoner. The remaining families are generally those of commoners' children who have not received such recognition. However, these people who are still not recognized as commoners serve as citizens and maintain the status of 'foreign inhabitants' who try to obtain the status of commoners. This primary classification produced user groups that receive direct benefits from the forest, such as shepherds, woodcutters and collectors and farmers (we decided to include farmers in this users group because most of them use the forest for renewing soil fertility). The main characteristics of these groups are:

Shepherds. It is a group that includes both community members and the so-called 'foreign inhabitants' who are devoted to raising cattle using forest clearings for free grazing.

Loggers: Most families in the study area use wood for cooking. The logger group is therefore mainly integrated by women who are responsible for bringing firewood from the forest for cooking purposes. It is interesting to mention that there is a little percentage of families who cook with gas. The women in these families do not take part in wood harvesting.

Acahual Farmers. This is a set of community members who practice agriculture using rotation cycles of sowing and rest. In the off cycle, the forest or land, after some years of rest is again used to produce corn. During the resting time, young trees are planted improving the ecosystem.

Collectors. There is a wide variety of non-timber products that are collected for consumption or sale. One of them is the 'tepejilote', the fruit of a parlor palm species that is prized locally.

Livestock owners. This is a group of people who practice extensive livestock raising for fattening steers. In recent years, this group has contributed to the loss of tree cover in the warm-humid zone of the community's forest.

Forest production unit. It is a community-run company which is dedicated to cutting and removing trees in the pine-oak forest. It is the oldest company in the community.

The sawmill. This is the community's second company. It focuses on communal production of sawn timber. Its main source of raw material is the production unit, but it also buys rounded wood from neighboring communities to maintain operations throughout the year.

Social Solidarity Society "Cascada de Niebla". It is the community's third largest enterprise. It aims to provide ecotourism services to the public. It currently has a dining area and has developed some hiking trails.

2.4 Interactions

2.4.1 Stakeholders' time allocation and level of specialization

It is uncommon for a household in Comaltepec to specialize in just one or few production activities. The community bus driver, the 15 sawmill workers or the 5 persons permanently hired by the community ecotourism business are the exception. Instead, most families try to diversify their income options so they can maximize their productive opportunities and reduce the risks associated with an eventual failure in any single activity. Therefore, each family unit tries to have agriculture plots in different environments, combine perennial and yearly crops and perform other activities such as small commerce, provision of transportation services, carpentry, butchery, bakery and so on. An average commoner may well distribute his time as follows:

- 25% Agricultural activities
- 25% Family businesses
- 15% Forest management and extraction activities

- 25% Masonry, carpentry and other jobs within the community
- 10% Miscellaneous jobs out of the community

This of course varies considerably from household to household. It is worth noticing that commoners do not have a personal economy, but a family one. Active women participation in family production activities makes the diversification strategy possible. Otherwise, it may be impossible for the husband or other male members of the family to perform for example masonry and agricultural work while at the same time running a family business.

2.4.2 Information sharing among users

Collective production activities are planned by the group in charge of coordinating them and are discussed and decided at the general commoners' assembly. Seemingly, periodic information about production, costs, sales and other relevant information is prepared by the group in charge and presented to the Assembly. This is the case of "*Cascada de Niebla*" ecotourism community business, the "*Cerro Comal*" forest management unit and the community sawmill. From 1990, all the activities covered by these three businesses were dealt with as collective endeavours. This posed difficulties to timely reach practical agreements and made Comaltepec lose several important business opportunities. In the last 2 years, under the leadership of the last commissariat of the commons, the Assembly decentralized forest management activities, splitting them up into these three businesses that are still considered owned by the community, but are no longer collectively managed. This means that the young people in charge at each business can make operational decisions by themselves, but need to keep the assembly informed.

In the case of family-level production activities, the information flow is less formal and systematic. The main and more effective way of information sharing is visiting a peer planting plot. There commoners explain their cultivation issues to one another and share ideas on how to face them. In addition to this, when issues of general interest arise, they can be discussed at the General Assembly. Agriculture extension activities are normally addressed at focus groups. Big projects, as an irrigation project or the opening of a new road, are discussed at the Assembly.

2.4.3 Conflicts among users

A main source of conflict arises from the real or perceived asymmetry between the three different towns which are part of the municipality. Small towns like La Esperanza and Zoyolapam complain that Comaltepec concentrates not only most of the resources resulting from forestry and conservation activities but also others such as the profits from ecotourism.

This asymmetry sets the ground for conflicts where La Esperanza and Zoyolapam residents ask for a wider share of forest management and public programs benefits. Moreover, residents in Comaltepec town sometimes charge La Esperanza and Zoyolapam

residents for damaging the environment because they open lands for agriculture and pastures.

2.4.4 Lobbying activities

Lobbying activities are a common practice amongst Comaltepec commoners and dwellers. Although under a relatively simple form, lobbying does occur. The most used method to discuss problems and to reach agreements consists of information exchanges and open discussions of difficult issues such as benefits sharing. In addition to this, a policy of sharing power has been developed for the last 15 years. Under this unwritten rule, a balance on representative charges is sought between the main town and the subsidiary ones. This is why today most of municipal and communal decision positions are held by Comaltepec residents in La Esperanza or Zoyolapam. In addition to this, when proactive municipal agents from La Esperanza or Zoyolapam take office, they have proposed development projects for their hometown. For example, this has been very important to keep coffee production in La Esperanza, and more recently for the improvement of Zoyolapam road.

Lobbying is not only exercised within but also outside the community. When a community group gets support, goods or cash, from external actors, is granted to them to carry out their project. However, these resources are normally limited and require federal or state extra support. External lobbying is then needed, but it usually proves to be difficult and slow. Federal and State agencies have complicated procedures to authorize and allocate resources. Other lobbying actors help in these activities. Outside stakeholders like UZACHI and ERA play an important role in those lobbying endeavors.

2.5 Outcomes

2.5.1 Social performance measures

The communal use of natural resources is efficient at delivering social services. The combination of family-level and community-level productive activities, as well as the combination of federal or state government expenditure with community work (*tequio*), ensures that today almost any household has access to transportation and basic health services. Any child has guaranteed access to elementary and secondary education. Security services are efficiently provided by the commoners themselves and by community formal order instances (*Town Council, Syndic, and topiles*).

Both social infrastructure and population show some degree of concentration. With two thirds of the total population living in the main town and the rest mainly in La Esperanza and Zoyolapam, health, communications and education services are concentrated in Comaltepec town. People in the minor towns recognize the great strides the community has made—onchocerciasis eradication was an outstanding one—but has a sense of inequity regarding the importance communal authorities give to them. Anyway, households in La Esperanza and Zoyolapam have access to tap water, basic health services and elementary education. Zoyolapam, which used to be the least communicated town, will have a paved access road, which is already under construction.

Both communal and municipal authorities are accountable to the community. They are required to give explanations to the commoners or citizen assemblies that regularly meet at least every two months. Under the traditional system, where a commoner is reputed for his/her track of service, there is a strong incentive to perform well. Under this “social prestige” system, not being accountable or performing poorly has serious consequences¹⁹.

2.5.2 Ecological performance measures

The communal natural resources management system of Comaltepec exhibits a good ecological performance. The community's mesophyll forest is considered by specialists as one of the best conserved areas of this unique world's ecosystem (Martin et al, 2011). Its diversity of ferns and butterflies is also considered the highest in the world. One example of this is the presence of the endemic *Papilioesperanza* butterfly, considered one of the rarest butterflies because its distribution is restricted to La Esperanza (Collins and Morris, 1985). This butterfly might not survive if the perturbation pattern, *i.e.* Comaltepec's natural resources control and use system, were unable to preserve its rare habitat and prevent overharvesting.

Since 1993, Comaltepec forest management system in particular has been considered as an example of sustainable forest management according to international standards (Markopoulos, 1999; SmartWood Program, 2006).

In spite of this good environmental performance, the expansion of pasture areas seen in Zoyolapam may raise some concerns. This issue is related to the need for income in this remote place. Zoyolapam does not have timber or coffee production, which are sustainable cash income sources in Comaltepec town and La Esperanza. Therefore, a cattle rising has become a good option to obtain cash. This situation may change in the near future, when the new paved road is built. With a better road, precious wood production may be feasible, so conversion of pasture lands into enriched forest areas may become economically viable. Another possible scenario may contemplate developing intensive agriculture systems to produce most of food supplies to meet Comaltepec's need and at the same time to grow high-value vegetables for cash income. In this last situation, the community may be doing an internal trade-off, where some forest would be still cleared in Zoyolapam while other lands in the main town and La Esperanza could be transformed into enriched forests.

2.5.3 Economic performance measures

With considerable land resources, almost any household can make a livelihood from agricultural activities. Although formal employment options are not enough, 99% of

¹⁹Once, several years ago, a community representative was caught reporting false figures to the assembly. He had been doing so, until in one assembly session, it was evident that the representative was not informing the truth. The assembly deposed him immediately, asking him to hand over the keys and community stamp, the material symbols of community power, and leave the assembly. The shame associated to this event, prompted him to leave the community forever.

workers in Comaltepec are occupied in agricultural activities and 76%, in small commerce business. But this is certainly not enough to meet employment and income needs.

At national level, the national census registered that 48.4 out of 114.9 million inhabitants have a job (INEGI, 2010). In Comaltepec, the national census registers that 310 out of 1,110 inhabitants have a job (INEGI, 2012), meaning a 3.5 dependency rate. The 3.5 to 2.4 occupational gap is a strong incentive to migrate out of Comaltepec, in particular for young people.

As many of the neighbouring communities, Comaltepec is struggling to overcome its marginalized situation. According to national standards, over the past 20 years, the community has moved from a “very high marginalized” to a “high marginalized” status. This transition is not trivial, since many communities and towns in Oaxaca seem to be endemically poor and marginalized.

Comaltepec has been investing economic resources to build human and social capital, raising its people's living conditions. This investment faces Comaltepec with a development dilemma. In one sense, building human capital could mean an enhanced capacity to get relatively good jobs outside. From this perspective, Comaltepec is investing in the creation of sustainable livelihood for most of the families, but it is also preparing its youth to become competitive in urban areas of the country and even on abroad labor markets. The question is which path will prevail.

2.5.4 Externalities to other SESs

Comaltepec's natural resources management system may have negative externalities over other SESs. The main environmental risks might include the erosion associated to logging and the pressure over the neighboring forests where Comaltepec's sawmill buys round wood. So far, these risks seem to be under control since Comaltepec's logging operations are certified as ecologically sound and therefore observe international standards and make sure timber bought outside the community also come from controlled sources according to national norms.

On the other hand, Comaltepec is a community where other productive systems externalize their impacts and costs. For instance, the timber industry sets regional prices that do not reflect the full costs of sustainable forest management. But, for Comaltepec to meet the international environmental, economic and social standards set by the Forest Stewardship Council, it needs to absorb the costs sustainable management of the forest entails.

3. Stakeholders' views on the problems existing in the study area

The stakeholders considered include a series of actors whose views on different issues were studied. Several local stakeholders such as the community authorities, farmers' representatives, cattle raisers and traders were interviewed. All of them expressed their opinions on the subjects discussed above. Representatives of external Stakeholders like

UZACHI, the National Forest Commissioner²⁰ and the Committee for Indigenous People²¹ provided the research groups with insights about themes influencing the development of Comaltepec. NGOs like the Forest Stewardship Council-Rain Forest Alliance²² and Estudios Rurales y Asesoría, A.C.²³, also shared their views on the matters discussed here. Finally, we also conducted some interviews with local students to get their point of view on these matters.

3.1 Main perceived problems

One of the most important perceptions stakeholders share is the contradiction which arises between their preoccupation to maintain their traditions and the need for being able to find new economic avenues to economic and social growth. There is a tension between tradition and modernity. For example, the community wants investors to come by, but at the same time they impose strong restrictions on how to use the forest. From the community's perspective, the forest must not be destroyed. Recently, there was a case in which investors proposed to set up a company to install eolic farms. However, the proposal was refused on the basis that they would destroy biodiversity.

Santiago Comaltepec makes decisions slowly because of their assembly system and because of risk aversion. The risk aversion adopts several modalities, which sometimes are in contradiction with one another. For example, in the case of the eolic farms, the Ministry of the Environment stressed the benefits the project could bring along to the community and explained how the existing norms can prevent possible environmental damage. The community representatives had divided opinions on the issue: some were against for fear of dubious economic benefits; others opposed on the grounds of environmental damage. Furthermore, ERA (an outside stakeholder) argued that more studies were required to make a sound final decision. In the end, as said before, the project was turned down.

A prospective exercise was carried out with local secondary-school students to capture their views on how they foresee Comaltepec in the future. The results which are presented below illustrate the contradiction between the interviewees' interests and what is happening in the community (see Table 2). At least two major conclusions emerge from the answers. Firstly, students have a strong environmental awareness and secondly more modern perspectives are wished. A similar exercise was carried out with adult

²⁰ **National Forestry Commission and Natural Resources Committee.** This entity has the function of promoting forest production and forest management regulation. In order to better spread its programs, it constituted an instance of dialogue with the Regional Natural Resources Committee named 'Sierra Juárez'.

²¹ **The Committee for Indigenous People** is a government agency to promote the indigenous rights and culture.

²² **Forest Stewardship Council and Rain Forest Alliance.** In 1997, Comaltepec was awarded the certificate of good forest management by the Forest Stewardship Council. The certification process is carried out by one of the entities accredited to it, which is Rain Forest Alliance.

²³ **Estudios Rurales y Asesoría, A.C. (ERA).** In 1992-93, the Association started working in the community planning process of land use. This has the intention of stopping successfully conservation groups to promote the creation of a protected area for the community. ERA has maintained a constant presence in the community since then and currently manages the field phase of this project.

stakeholders. The answers coincide by and large with those of the secondary school students'.

Table 2. Comaltepec's Secondary School Students' Environmental, Social and Political Proposals

Environmental	Social	Economic
To Preserve forestry and biodiversity: 28 Water conservation: 6 No animal hunting: 5 To avoid tree cutting: 6	To preserve traditions and well established practices: 1	To go back to agriculture: 1
To avoid pollution: 12	No violence: 1	To improve the community (bigger and more modern): 6
To avoid changes because they might cancel traditions: 7	To get organized with other classmates: 1	More trade and cars: 1
Rubbish collection and recycling: 7	Health and hospital: 6	Tourism: 1
Zoo: 3	Education: 3	Technological progress: 3
Renewable energy and renewable products: 1	University: 3	More welfare. Integration between modernity and the environment: 2
Environmental programs: 1		Urbanization: 1

Source: Interviews with Comaltepec's secondary school students, 2012.

These results were commented with some stakeholders such as the National Forest Commissioner, whose opinion was that in fact Comaltepec is unable to provide the young with opportunities and that the community did not have a clear plan to solve the problem. Reality was taking care of it through migration.

3.1.1 Social problems

Migration is a phenomenon that affects each and every sector of Comaltepec. For instance, in La Esperanza, three out of ten citizens have migrated at least once in their life. Considering Comaltepec as a whole, the proportion of migrants reaches half the population. The fact of the matter is that many families rely on remittances to get by²⁴.

Stakeholders are aware that migration is the result of the lack of employment opportunities. Agriculture is for self consumption, and forest-related activities can only give employment to a small number of people. Interviews revealed that only 10% percent of the population works in the industries associated to it, e.g., sawmill, the restaurant, ecotourism.

In this respect, external stakeholders like ERA and The Rain Forest Alliance were cautious about the impact migration in the future of Comaltepec. Migration is a big drain flow which is leaving Comaltepec with the least prepared people. However, efforts are on their

²⁴The large majority of remittances are spent on food, home repairs and on unforeseen events like illness or death. There is no strategy to invest remittances productively.

way to attract them to get back and stay. Examples of these efforts are the ecotourism and the sawmill projects. Few young professional have decided to stay to run such firms.

As said before, alcoholism is a relatively serious social problem. What makes alcoholism worrying is the violence associated to it and that it spreads across the community. Interestingly enough, the solution adopted to face these problems was named "*mano blanda*" (soft hand). Instead of adopting authoritarian or repressive measures, a music band was organized.

Most stakeholders, such as the Committee for Indigenous People and even the Forest National Commissioner, regard these initiatives as positive ones. To show support to such initiatives, the Committee for Indigenous People, for example, has provided some funds for the band and, even more importantly, has broadcast on local radio stations some of the performances the band has participated in. Nevertheless, the community seems to have a more optimistic view of the problem since it does not seem to reach high proportions.

Finally, it must be said that women's exclusion from major decision-making processes is widely conspicuous in Comaltepec. Women are relegated to housework and are educated to become good housewives. The argument is tradition. Legally, women can and do participate in institutional arrangements, but their role is very minor. From an outsider's point of view, this situation is seen as abnormal unfair. However, it does not seem to create problems within the community. The division of labor between men and women is considered functional and efficient. Many stakeholders, with the exception of ERA, have a male point of view on the matter. The argument put forward is that in the absence of infrastructure or public services to look after the children and the elderly, women have to do the job. It is functional to everybody.

3.1.2. Institutional and governance problems

As for the institutional and governance issues, stakeholders seem to accept the current institutional arrangements. The conflict with the paper company helped the community to understand the advantages of being cohesive and organized. However, the system of having to perform jobs without payment is a source of growing concern. As has been mentioned, *tequio* represents an effort increasingly difficult to afford. In the interviews, several stakeholders insisted on the need for considering the possibility of being paid. This is particularly true for those who having being elected to perform an institutional role have to move out of their own town.

There is an increasing reluctance of people, particularly the young, to perform community jobs without payment²⁵. The opportunity cost of working for the community seems high.

Another issue related to the institutional arrangements is the perceived asymmetry that exists amongst the major towns. The conflict emerges from the fact that La Esperanza and Zoyolapam do not receive the same amount of resources as does Comaltepec. The

²⁵According to Professor Newton's estimates, this means that between six and half and ten years of every male adult efforts are donated to the community, which means paying around 15% of taxes on every adult's income.

resources are distributed on an unequal basis²⁶. Most of the distribution proceedings are kept by Comaltepec, something which is felt as unjust²⁷.

An institutional problem facing the population in the study area is the weak relationship that families have with government organizations and policies. Although it was proved that the state and federal government agencies are present in the community, it is also true that the effect of their programs is felt only at the macro level. The same cannot be said at the micro level, *i.e.*, families. One reason for this “disconnection” at the family level derives from the fact that federal agencies demand the potential users to be organized in accordance with legal schemes families are not used to practicing. As stakeholders referred, they work individually, not in groups. One of the major effects is that credit for peasants is nonexistent. The same happens with technical assistance.

The Ministry of Agriculture and other federal agencies argue that the asymmetry referred to by the commoners is not the institutions' fault. It is an institutional arrangement set by the Ministry of Finance on which they do not have leverage. Moreover, these institutions' view is that, working together; commoners can gain from economies of scale, which could produce higher return rates with the same or less effort. The technical argument put forward by institutions is not enough to convince commoners and to make them change their production forms.

3.1.3. Ecological problems

Stakeholders are quite aware of ecological problems. During the interviews, stakeholders repeatedly referred to how environmental changes have taken place. The rainy season is not as regular as it used to be²⁸. When rains come, they are heavy or even accompanied by hail which destroys the crops²⁹. Another problem is the appearance of previously unknown plagues. Now, they have to use more herbicides and insecticides to fight such plagues³⁰. Different views exist about when the environment and the climate started changing. For some, the eighties is the decade when changes started. Others point out the sixties.

Other stakeholders like the National Forest Commissioner insisted on the need to adopt strategies to mitigate the effects of climate variability—something Comaltepec lacks. More contacts with the Ministry of the Environment were recommended. However, commoner counterattacked saying that they have had deaf ears to their petitions.

3.1.4. Economic problems

²⁶See first section.

²⁷The reason given by the authorities to explain such unequal distribution of resources is the number of people living in each town. Being Comaltepec the largest town would explain why it keeps most of the money.

²⁸Those interviewed mentioned that in the past it rained for two weeks continuously. This is considered to be good for agriculture and the forest.

²⁹Stakeholders refer to this damage as the “being burned by the hail”.

³⁰Soldier swarm is more persistent now.

As has been mentioned in different parts of this report, in Santiago Comaltepec, agriculture, cattle rising, trading and forestry are the main activities. In agriculture, for example, the average size of the plots of land varies from a quarter of hectare in Comaltepec to up to three hectares in Zoyolapam³¹. Productivity also varies. While in Comaltepec productivity levels can be as small as 100 kgs per hectare, in Zoyolapam yields can reach two or three tons per hectare. Cattle rising is not as extended as agriculture is. However, it is used as a way of complementing income. Sugar cane and horticulture are also practiced on a small scale for self-consumption.

The major difficulties facing these activities are the lack of credit support and technical assistance. However, an additional difficulty is added. Due to their small size and lack of protection, most of the field plots are very vulnerable. Climate change poses a serious threat to what in fact is the basis for living of the Comaltepec people³². If the weather changes, as it has, people will become much more exposed.

Forestry is a market oriented activity. The sawmill operated from 1988 to 1993 and from 2001 to the present, but because of economic losses, it shut down from 1994 to 2000. In 2004, a new attempt for the sawmill to resume operations took place, but because of the high costs and the slow production, the community decided to close it again³³. Since January 2012, sales have been growing³⁴. Although in the case of the sawmill the problems are more of commercial and technical nature, climate change is not absent from its horizon. Should the weather change, forest productivity would drop accordingly and this may affect output.

On this issue, the points of external stakeholders, in particular the Ministry of Agriculture was emphatic: lands must be used according to its production capacity. The idea of keeping growing corn in Comaltepec in comparison to what is done in Zoyolapam represents a complete misallocation of resources. Economy must prevail over tradition. They also insisted on the idea of introducing more technology and new varieties of seeds more resistant to the changing climatic conditions. The clash between two views, the commoners' and the technicians', was evident.

3.2. Vision on possible solutions

Solutions given by stakeholders vary according to each circumstance. However, a general perspective points out to relying largely on their own capabilities. It is clear to them that whatever should be done has to be decided on from their perspective and *modus operandi*. Stakeholders have stressed the view that economic progress has to come by and large from what they are doing. However, it is not clear to them what exactly means. A broader perspective is perceived as necessary.

³¹The main crops are maize, beans and zucchinis. Although the production is for self-consumption, it is not enough. Families have to buy "imported" maize at the shops. This is particularly true in the case of Comaltepec. Maize growers in Zoyolapam export their surpluses to Comaltepec.

³²People receiving remittances are better equipped to face fluctuations in their economic activities than those who only depend on what they produce.

³³From 1988 to 2011, the sawmill was in a location difficult to be accessed due to the road's bad condition. Potential buyers had to make a lot of effort to find the location. Now, it is located on the side of the main road. This fact makes it much more accessible and visible to clients.

³⁴During 2012, the sawmill has sawed 3000 m³ of wood, 2000 m³ bought from the 'Unidad de Aprovechamiento Forestal Cerro Comal' and 1000 from nearby communities.

One way of showing that perspective was their initiative to organize a seminar to discuss the impacts of climate change on forestry organizations³⁵. Representatives of COMET-LA research groups which attended the field work shared their experiences. Representatives of government agencies also showed the programs they have and peasant organizations discussed their views about their role in the forest communities.

4. By way of summary: a SWOT analysis of the case study

This fourth section of the report addresses the results emerging from the analysis of strengths, weaknesses, opportunities and threats (SWOT analysis) upon the Comaltepec case. SWOT analysis is a practical tool to identify both, internal and/or external factors that influence the scenario in which a project develops, and it helps to discuss future planning to improve the present conditions. This chapter of the report nourishes from data that were collected in interviews with different stakeholders³⁶. The stakeholders interviewed include commoners, as well as community members with no political “cargos”, local government stakeholders, national and regional environmental agencies, NGOs and representatives of the cooperatives. It is worth mentioning that most of the persons interviewed can be said to belong in more than one group of stakeholders, making it almost impossible to distinguish when someone is answering, let us say, as a mere commoner or in his role of representative of the local government.

4.1. Diagnosis

From a macro perspective, Comaltepec is one of the fewest rural communities in Mexico that has a common pool natural resource management system³⁷. This sustainability is based on a strong social capital structure which has been kept throughout generations³⁸. A regional view shows that Comaltepec is an important natural resource center. This is due to the size of its forest area³⁹. In the Mexican context, Comaltepec represents a good case in point to understand how, in spite of external pressures, the local way of managing natural resources still prevails. In the context of Comaltepec's small economy, community members make their living out of a combination of what it is able to produce internally⁴⁰ and the resources generated externally (remittances sent by migrants).

³⁵The whole program of the seminar can be consulted in Appendix B.

³⁶ The SWOT analysis was made with the feedback of Professor Alice Newton critical observations, which gives to the analysis a more objective outcome.

³⁷Ostrom, 1999.

³⁸ See Section 2.

³⁹ Comaltepec has 18,366 hectares

⁴⁰ There are some surpluses which are sold in the market. A case in point is the production of maize in Zoyolapam.

4.2. SWOT Analysis

This table summarizes the components of a SWOT analysis by Comaltepec authorities. They are discussed at length below.

Table 3. SWOT Analysis by Comaltepec Authorities.

Strengths	Weaknesses
<ol style="list-style-type: none"> 1. Territorial extension 2. Diversity of forest (mesophyl) 3. Water 4. Community assembly 5. Communal statute 6. Indigenous language 7. Cargo system 8. 'Tequio' 	<ol style="list-style-type: none"> 1. Women 2. Population 3. No medical assistance during the week and having only one hospital 60 km away make it a weakness. 4. Migration 5. Low income 6. Economy 7. Neglect of agriculture 8. Low productivity 9. High maintenance costs of transport and tractor 10. Lack of credit for productive activities 11. A risk-averse society
Opportunities	Threats
<ol style="list-style-type: none"> 1. Added value goods from the forest 2. Sale of environmental services 3. High-value agricultural crops 4. Production of orchids, bromeliads, and <i>araceae</i> plants 5. Medicinal plants can be taken from the forest 6. Bottling mineral water 7. Expanding certified eco-tourism activities 8. Building a petrol station 9. Thinking of migration as an asset 	<ol style="list-style-type: none"> 1. Climate variability impacts on agriculture 2. Climate variability impacts on forest 3. Negative influence of both television and the Internet via the encouragement of values that collide with the community's (e.g. individualism vs. collectivism) 4. Perceptions of returning migrants 5. Property rights of natural resources 6. Potential privatization of territory 7. Lack of educational reform based on the needs of our town

4.2.1. Comaltepec's Strengths

Comaltepec has abundant natural resources. Its territory goes from 160 m up to 3000 m over sea level, stretching out a vast territory with abundant natural resources. There are no water shortage problems, and the diversity of the forest ecosystem is characterized by rich natural resources.

Comaltepec has a strong social capital that allows managing their natural resources based on communal rights of property and on collaboration and cooperation. In this rural community there exists a high environmental awareness, which has led to collective forms of work passed down through the generations establishing interactive patterns that have strengthened the sense of social cohesion. This is true despite high migration rates⁴¹. Some almost ancestral social work forms, such as *tequio* and the *cargo* system, function today as they have. Also, the use of *chinanteco* as main language shows the social cohesion of the community. The communal status has helped in maintaining the social and political organization forms.

Cultural manifestations also serve the purpose of strengthening the social fabric. An example of this is the violence and vandalism problem that was addressed by recruiting youngsters to form a music band⁴² and the subsequent promotion of the band all around the area to subtly encourage youngsters to join the band and to stop their antisocial activities.

Another strength is the condition to produce Certified Forestry Products and Services. These certified products and services are important because they might generate additional value to forest output.

4.2.2. Comaltepec weaknesses

From an external viewpoint, there is a perception of few opportunities for women. However, it is quite complex to get a good understanding of how the gender issue is embedded within the community. It seems that women play the key role of uplifting environmental awareness although their action is not completely visible or socially acknowledged because of the context of a highly hierarchical male society.

There is evidence of a high birth rate in this community. The data show that on average Comaltepec's population birth rate is around 20%, which is considered close to high world levels (see Table 4). However, over the past few years this rate has decreased.

Infrastructure in the study area is better than in most rural communities in Mexico. There are new educational buildings. However, health infrastructure support is almost nonexistent⁴³. The gap between health needs and the available services is ample. Major

⁴¹According to INEGI, 2010, migration on average from 1990 to 1995 grew at a rate of 11%; from 1996 to 2000, 15%; from 2001 to 2005, 10% and from 2006 to 2010, 24%, accumulated increment during each period. Nevertheless, migrants never lose touch with their families.

⁴² In the Sierra de Oaxaca, music bands are a tradition. They participate in many important celebrations *e.g.*, Patron Saint's Day.

⁴³ According to Plan de Desarrollo Municipal 2010, there is only one clinic in the whole municipality. The clinic is located in Comaltepec. Some doctors occasionally visit patients living in the municipal agencies.

illnesses can only be treated at distant places like Ixtlán⁴⁴.

Table 4. Comaltepec birth rate (1990-2010)

Comaltepec birth rate: 1990-2010			
Years	Population	Birth	Birth rate (‰)
1990	1941	56	28.85
1991	1899	48	25.27
1992	1858	54	29.06
1993	1818	39	21.45
1994	1779	48	26.98
1995	1752	39	22.26
1996	1700	42	24.71
1997	1649	28	16.98
1998	1600	30	18.75
1999	1553	37	23.83
2000	1525	29	19.02
2001	1494	33	22.08
2002	1464	33	22.53
2003	1435	26	18.12
2004	1406	19	13.51
2005	1386	14	10.10
2006	1319	23	17.44
2007	1255	19	15.15
2008	1194	14	11.73
2009	1136	19	16.73
2010	1115	20	17.94

Source: INEGI: Archivo Histórico de localidades y Censo de Población 2010

Brain drain is a major concern. This ongoing trend will impair the efforts to maintain the natural resources sustainability management. The reason for constant migration can be found in the search of economic opportunities beyond local boundaries. Almost all younger commoners interviewed have migrated once to the USA. The main reasons are the lack of job opportunities and low wages in their community.

Another weakness the interviewed stakeholders identified is the neglect of agriculture, closely related to their traditional practices that result in low productivity. Although local residents value their cultural identity, one of whose manifestations are precisely their agricultural practices, the fact of the matter is this way of using resources is not meeting the needs of population growth (still another reason for migration). Geographical location aggravates the problem because transportation costs are high.

There is also an inbreeding process in the community due to intermarriage between close relatives. This, in the long term, may result in a relatively high rate of disabling diseases or malformations very costly to treat.

4.2.3. Economic Weaknesses

As has been said, the supply of credit for economic activities in the community is nonexistent. Although federal organizations offering credit are present in the study area, their schemes of work do not correspond to those used in the community.

Long-standing traditional practices are not in line with individual entrepreneurship. This

⁴⁴The nearest hospital to Comaltepec is 60 kilometers away. It is in Ixtlán.

means that individual decision making which requires executive decisions find many difficulties to prosper. Every proposal has to be approved in plenary with all the consumption of time such method entails.

Migration is very strong in Comaltepec. Moreover, Comaltepec lacks a strategy for diversifying job opportunities. One simple example is the inexistence of a market, which could easily contribute to job creation. Another missed opportunity for the creation of jobs is the underutilization of the natural diversity. Even though the traditional products are obviously yielding a low economic output, people in the area stick to such products and do not try diversification.

In a traditional society like Comaltepec, job opportunities for women are confined mainly to housekeeping. Hence, there are no formal jobs for women.

In Comaltepec there is a contradiction between educational levels and the job market. In towns, students can do technical studies, but there are no jobs for the alumni. The net result of that is, once again, either migration or low paid jobs.

As has been mentioned before, Comaltepec's is a risk-averse society. If we consider that any new initiative involves a certain amount of risk and uncertainty, Comaltepec's society risk aversion becomes a trap difficult to escape from. What is required is a more adaptive strategy to deal with threats.

4.2.4. Comaltepec opportunities

The forest in Comaltepec offers a menu of opportunities to exploit goods and services in a sustainable way. Several examples can be mentioned. One of the most interesting opportunities could be the production of added value goods. For instance, the production of furniture, window frames, doors, handicrafts, huts and cabins are some of the several possibilities which could be developed⁴⁵.

Other possibilities arise with the expansion of selling environmental services. They already exist but can be enlarged⁴⁶. Other opportunities are also open in the production of timber bark, resins⁴⁷ and other products like moss⁴⁸. In Zoyolapam, cedar and mahogany stocks are available and could be used to produce high value timber. Moreover, the cedar project could also be used as a biological control for moth.

In the area of agricultural products, several opportunities could be seized. In the low valleys like Zoyolapam, high value agricultural crops such as coconut, organic coffee, pineapple and other tropical fruits could replace traditional ones (corn, beans.). Herbal products and dairy herd could also be considered.

Another avenue of opportunities opens up in the production of orchids, bromeliads, and

⁴⁵A carpentry shop existed but was abandoned. Financial problems were the cause of its decline.

⁴⁶There are three projects already established with companies such as Televisa (Mexico's largest T.V. company), Gamesa (cookies and crackers manufacture), and Corona (Mexico's major beer transnational).

⁴⁷The production of resins is not a new activity in Comaltepec. However, as in the case of the carpentry, the project was not properly designed and therefore failed.

⁴⁸ Projects such as fresh moss exportation demand investment of infrastructure which could go beyond the local present capabilities.

araceae plants which have lucrative markets⁴⁹. Furthermore, medicinal plants can either be taken out of the forest to be sold or forest areas can be open to tourism for *in situ* observation. The same applies to the use of mineral water reserves which exist in the region and that can be the basis for a bottled water industry.⁵⁰ Raising trout could also be considered because in the region there are water conditions to establish this kind of aquaculture.

Ecotourism is already an ongoing activity in Comaltepec. However, it is still one whose potential has been scarcely developed. Infrastructure is very simple and security measures have not been assured. In Comaltepec, as far as ecotourism is concerned, there is still a long way to go. More investment and training are required⁵¹. Certification of good practices in ecotourism can produce credentials to be sold in the marketplace.

Ecotourism can evolve to different sophistication levels. As in the case of products, ecotourism services can be diversified. In Comaltepec, ecotourism can be offered to scientists, people liking extreme sports, and students going camping.

The area of services is also an opportunity. People traveling across the "Sierra Norte of Oaxaca" find few petrol stations. In Comaltepec a petrol station could solve the problem of gasoline supply on the road Oaxaca-Veracruz. The same could be said of establishing a car and truck repair shop. This would spare people from having to go all the way down to Ixtlan⁵² to either repair mechanic breakdowns or to refill their car gas tanks.

At the moment, migration is only seen as a loss to Comaltepec. And indeed it is. However, it could also be understood as an opportunity. Migrants are both customers and suppliers. On the customer side, as it is happening in other parts of Mexico, migrants like the products from their own hometown (especially food). So, the opportunity arises from occasion to send, to where migrants are, the products manufactured in Comaltepec. On the supply side, we must remember that migrants send money to their families. At least some of that money could be invested in different kinds of projects and/or used to establish small microcredit organizations which could offer loans to local residents.

The multiple use of infrastructure already in place in town could also be a source of opportunity. This proposal would have the advantage of not having to devote resources to build new spaces. These resources could instead be applied to more productive aims. Micro hydroelectric plants could generate energy to be sold to costumers either in town or to neighbors.

Finally, to adopt a different legal status could be an advantage to relate natural resources and the market. One example would be to organize a microcredit firm using the remittances. Another example would be to establish producer associations to insert the community into the market through a value chain, for instance: the production of organic foodstuff, flowers or medicinal plants and the manufacture of furniture with FCS certification.

⁴⁹An *araceae* plant as a piece of branch could cost up to 20€ each at a florist's; a bromeliad, 20€ each in a florist; an orchid, about 25€ each in a florist.

⁵⁰ For instance, "agua mineral de la Sierra de Niebla".

⁵¹ Investment is required for equipment, well trained monitors and insurance policies.

⁵² If one lives in Comaltepec and requires petrol, has to go to Ixtlan which is 60 km away in a very winding road.

4.2.5. Comaltepec Threats

Climate variability is the major threat to Comaltepec's fragile economy. If the weather changes, as it has done according to commoners, agriculture and cattle ranching will suffer because productivity levels will lower. Self-consumption producers will have to depend more on their capacity to buy primary products such as maize, beans and meat.

The major impact of climate variability will be on the forest. For example, high temperatures and scanty rains would mean less production of wood and everything that derives from it. Forest fires could also appear more frequently or be more devastating, posing a hazard to community assets. What we can call the socially distributed economic output would weaken.

Another perceived threat, which belongs in a very different category, is the influence of media on the local population. Repeatedly, Comaltepec dwellers refer to the danger television programs and the internet represent *vis-à-vis* the present social awareness and cohesiveness.

A new road connecting the highway with Puerto Eligio, running through Zoyolapam and connecting the *ejidos* from Valle Nacional is being built. Although this road materializes a lifelong aspiration⁵³ because it will facilitate communication among Chinalteco towns, it is also perceived as a threat. Outsiders will now be able to visit Comaltepec and could bring ideas which are not compatible with the locals'.

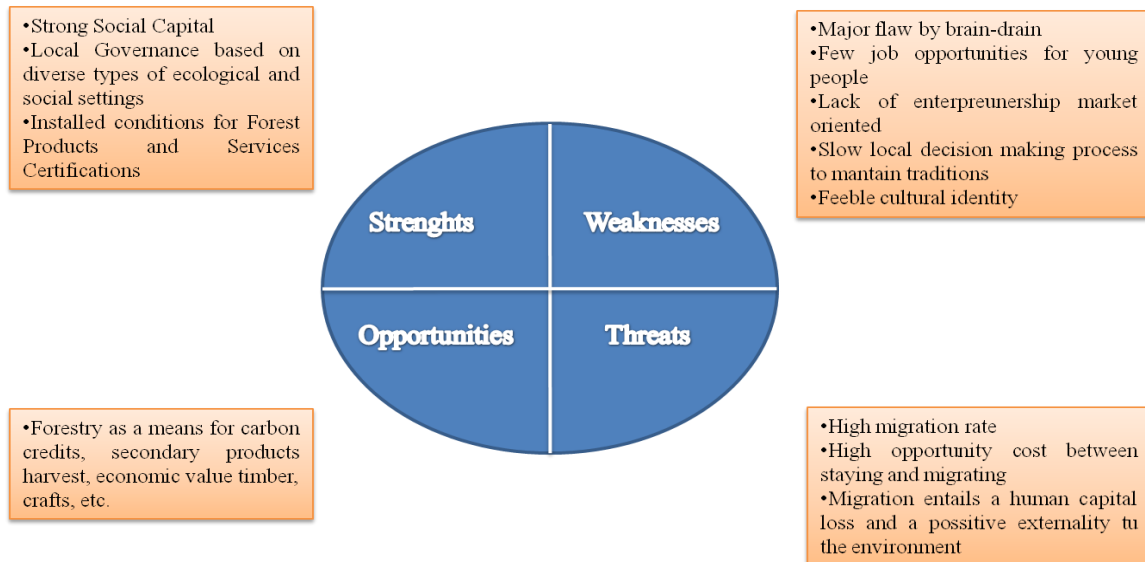
As we mentioned in the section of opportunities, migration can have at least two sides. One is the advantage remittances can mean in promoting local micro credit financial services. However, there is a second side which is considered as a threat. Migrants are exposed to different things in the host city or country, and when they return to town, they are perceived as bringing along "strange ideas".

Another threat could come true if natural resources property rights are not honored. If, for instance, medicinal plants which exist in the forest are used by pharmaceutical companies and they do not pay royalties, this becomes a threat.

The SWOT matrix of field work which groups the variables included for each attribute (strengths, weaknesses, opportunities and threats) is shown below. This matrix contains views of the commoners and observations of the researchers.

⁵³ See the section on the history of Comaltepec, in particular the reference to the conflict with the paper company.

Figure 3: Comaltepec SWOT Matrix of field work



Source: Newton, A., and own elaboration, 2012.

An interesting comparison can be made between the SWOT developed by the commoner (authorities) and the one resulting from workshops. When it comes to the strengths, one of the coincidences lies in the great importance that both groups attach to the role of culture, the communal statute and variables like infrastructure to preserve the territory. It is also noticeable that even though the community holds an FSC, this fact was not even mentioned by the commoners.

In the SWOT the research group constructed with its observations during field work, it can be noticed that the perception of weaknesses greatly differs from the view expressed by the commoners. For example, the slow decision making procedure, associated with the lack of entrepreneurship, does not seem to worry the community authorities. In contrast, other apparently minor issues (from the researchers' stance) like the presence of the doctor or the problems with the tractor appear as more important. Something in which both groups coincide is the negative effects migration has on the community.

As for opportunities, authority's SWOT puts a great emphasis on the possibilities which can be developed if working with government agencies. This despite the fact that the criteria such institutions demand are alien to the traditions they practice. On the other hand, the SWOT developed during field work insists more on the advantages that environmental services can bring about to Comaltepec. It looks as if two very different views coexisted. Nevertheless, coincidences can also be found. Federal agencies could be an important contributor to the environmental initiatives as much as those which are presently being carried out offer.

Finally, let us look at the threats. The SWOT developed at Comaltepec's authorities seem to emphasize the fear they feel that the regime of collective property rights now in place could give way to a new order where private property would be the rule. They also show a preoccupation about the possibility of federal agencies deserting the region and the

consequences this could have on budgets. Education is also a matter for concern: they feel they need more education, but they fear the influence political parties, can get in their internal affairs. As for the threats captured in the SWOT derived from field, migration seems to be the greatest problem. However, at the same time, and as said before, migration is also seen as good opportunity to introduce new avenues and ideas about how to obtain a greater development for the community.

5. Conclusions

Santiago Comaltepec's geographical location allows for a wealth of natural resources such as a vast biodiversity, varied weather and important water resources. Forestry is the main economic activity. However, agriculture is also a source of income for families. The environmental conditions would allow for a larger agricultural diversity, but the entire community prefers growing basic self-consumption produce such as maize and beans.

Access to credit and crop insurance is nonexistent. While forestry activities are for the benefit of the community, much of the economic activities are only for subsistence. Comaltepec, in spite of its rich and large forest areas, still looks like the rest of rural Mexico, where subsistence agriculture, high migration and poverty are the rule.

The governance system structure has made possible the sound management of the community's major natural resource: the forest. However, it also has some limitations, such as a time-consuming decision-making process. Local rules are respected, especially those related to forest use. Currently, the main users of the forest are the lumberjacks, gatherers, and farmers in *acahuales*.

The main conflicts are based on inequities in decision-making among communities that are part of the socio-environmental system. Another internal problem is migration. External conflicts are driven by the intention of installing hydroelectric plants on the river and negotiations made with timber suppliers and buyers.

The history of Comaltepec accounts for two major events. One is to maintain a social structure based on communal property. This kind of property rights has derived in a set of institutions which have fostered sustainability as a prime cultural value. However, sustainability is not a guarantee to meet people's present and future needs. Although asymmetries are not an important characteristic of Comaltepec's society, those connected with the market through migration and trade have brought about the need for expanding the economy.

Traditions are good but not enough for living. Modernization is required. However, a possible way out means the combination of both in a sustainable path.

The tension between tradition and modernization manifests in the reluctance of the young to perform the roles that have been established for centuries. Work without payment is seen as unjust and with a high opportunity cost.

Public organizations along with their policies reach the community. However, they do it only at the macro level. Families cannot benefit from public policies because their design is asymmetric. Federal institutions demand from potential users schemes of organization which are alien to local society. Although the society is organized collectively, the main



economic activities, except for those related to the exploitation of the forest ones, are organized on a family basis.

SWOT analysis of Comaltepec is a powerful and rich tool to explore the different attributes (strengths, weaknesses, opportunities and threats) such society has. As can be noticed, there are lots of opportunities and strengths which can be taken advantage of. However, the relationship amongst these attributes has to be acknowledged.

The qualitative analysis of Comaltepec's economy and society shows that sustainability is at stake. Were sustainability to be assured, different obstacles would have to be overcome. In the long term, there seem to be growing difficulties which can impair the viability of development in such community.

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Appendix A: Seminar Program (August 12th-15th 2012)

Proyecto COMET-LA

Programa detallado de actividades en Santiago Comaltepec, Oaxaca. 12 al 15 de agosto

HORA DE VERANO	ACTIVIDAD		LUGAR.	PARTICIPANTES
DOMINGO 12 DE AGOSTO DE 2012.				
07:30	A partir de esta ahora, check out y acomodo de equipaje en el autobús		Cerca del hotel	
8:00-9:00	Desayuno		Hotel Casa Antica	Grupo del proyecto
9:00-9:30	Conferencia de Prensa		Salón Sor Juana Ines de la Cruz del Hotel Casa Antica	Grupo del proyecto y medios informativos.
9:30-10:30	Presentación del Programa de trabajo		Salón Sor Juana Inés de la Cruz - Hotel Casa Antica	UNAM y ERA
10:45	Salida a Santiago Comaltepec			
14:15	Llegada a Santiago Comaltepec.			
14:15-14:30	Bienvenida		Atrio de la iglesia.	Autoridades: Municipal, Comunal y Consejo de Ancianos
14:30-15:30	Comida		Atrio de la iglesia.	Grupo del proyecto, Autoridades: Municipal, Comunal y Consejo de Ancianos
15:30-16:00	Conferencia con la Radiodifusora XEGLO La Voz de La Sierra.		Salón de asambleas	Grupo del proyecto, Autoridades; Municipal, Comunal, cuerpo de apoyo y Consejo de Ancianos.
16:00-17:00	Instalación de visitantes.		Casas familiares en Comaltepec.	Grupo del proyecto
TEMA I. ESTRUCTURA DE GOBIERNO				
17:00-18:00		La estructura organizativa de la Comunidad de Santiago Comaltepec.	Salón de Asambleas.	Expositor: C. Profesor Víctor Hernández García.
				Presidente Municipal.
		La administración de los bienes comunes		Jesús Hernández Hernández; Pte del Comisariado de Bienes

					Comunales.
18:00-18:30			El Cuerpo de Apoyo y su estructura organizativa.	Salón de Asambleas.	Expositor: C. Silverio Francisco López.
					Coordinador general del cuerpo de apoyo.
18:00-18:30			El Consejo de Ancianos y su estructura organizativa.	Salón de Asambleas.	Expositor: C. Rafael José Hernández Castellanos.
					Coordinador general del Consejo de Ancianos.
18:30-19:00			Las Agencias municipales	Salón de Asambleas.	Agentes municipales
19:00-20:00			Sesión de preguntas		Grupo del proyecto, Autoridades, cuerpo de apoyo, caracterizados.
20:00			Cena	Atrio de la Iglesia.	
21:00			Hospedaje en Comaltepec.	Casas familiares	
LUNES 13 DE AGOSTO DE 2012					
TEMA II. CRONOLOGIA DE ECHOS CRITICOS E HISTORIA RECIENTE					
Poblado de Comaltepec					
8:00-9:00			Desayuno	Casa familiar.	
09:00-9:15			Organización del trabajo de campo	Auditorio Municipal.	Grupo del proyecto.
9:30-14:00			Taller con informantes clave y autoridades para construir la cronología de Comaltepec	Comaltepec, La Esperanza, Zoyolapam	Autoridades, cuerpo de apoyo, caracterizados.
14:00-15:00			Comida	Atrio de la Iglesia	Grupo del proyecto y participantes en los talleres
16:00 - 20:00			Revisión de documentos y entrevistas semi-estructuradas a actores clave sobre historia	Archivos municipales y familiares, casas, poblado	
20:00			Cena.		
21:00			Hospedaje en Comaltepec.	Casas familiares	
Poblado de la Esperanza					
09:15			Traslado hacia la Esperanza		Equipo asignado a La Esperanza

11:00-11:30		Bienvenida y entrevista con las Autoridades de la Agencia.	Oficinas de la Agencia Mpal	Equipo del proyecto y Autoridades de la Agencia	
11:30-14:30		Taller con informantes clave y autoridades para construir la cronología de La Esperanza.	Oficinas de la Agencia Municipal	Autoridades de la Agencia, Autoridades Comunales, Municipales, Comisionados y Caracterizados	
14:30-15:30		COMIDA	Casa familiar	Participantes en el taller.	
15:30-19:30		Taller: "Percepción sobre los cambios ambientales"	Casas familiares y poblado	Sub-grupo del proyecto,	
20:00		Cena.	Comedor familiar.		
21:00		Descanso	Casa Familiar.	Sub-grupo del proyecto.	
Poblado de Zoyolapam					
09:15		Traslado hacia Zoyolapam		Costado de la Iglesia	Equipo asignado.
11:15-11:30		Bienvenida y entrevista con las Autoridades de la Agencia.	Oficinas de la Agencia Mpal		
12:30-14:30		Taller con informantes clave y autoridades para construir la cronología de Zoyolapam".	Oficinas de la Agencia Municipal	Equipo asignado, autoridades, caracterizados y comisionados.	
14:30-15:30		COMIDA		Comedor familiar.	Participantes en el taller
15:30-19:30		Taller "Percepción sobre los cambios ambientales"	Poblado de Zoyolapam.		
20:00		Cena.	Comedor familiar.		
21:00		Descanso	Casas familiares		
MARTES 14 DE AGOSTO DE 2012.					
TEMA III. LOS USUARIOS DEL SISTEMA SOCIOAMBIENTAL					
08:00-9:00		Desayuno		Casas familiares	Equipos de trabajo en Comaltepec, La Esperanza y Zoyolapam
9:15-14:00		Taller con "Los usuarios del Sistema" (definir tipo de actividades, dimensión y relación)	Oficinas municipales en Comaltepec, La Esperanza,	Autoridades Comunales, Municipales, Comisionados y Caracterizados.	

			Zoyolapam		
14:00-15:00		Comida		Comedor familiar	
15:00-16:00		Programa radiofónico sobre "Gobernanza participativa de las ANPs"	Auditorio Municipal	IUCN, Comuneros, CONANP	
16:00-18:00		Entrevistas semi-estructuradas con usuarios familiares del sistema: Fuentes de ingresos, migración, problemas sociales, institucionales, ecológicos, económicos	Poblado y casas familiares		
		Entrevistas con encargados de las empresas: Monte, aserradero, ecoturismo, autobús, molino, tienda comunitaria.			
18:00			Regreso de Zoyolapam	Equipo de Zoyolapam	
18:30			Regreso de la Esperanza	Comedor familiar. Equipo de La Esperanza	
21:00			Hospedaje en Santiago Comaltepec.	Casa Familiar.	
MIERCOLES 15 DE AGOSTO DE 2012.					
INTEGRACION ANALISIS DE INFORMACION					
HORARIO DE VERANO	ACTIVIDAD	LUGAR.	PARTICIPANTES DEL GRUPO.		
8:00-9:00	Desayuno	Casa familiar	Todos los equipos.		
9:00-12:00	Sistematización de información por cada equipo	Salón o auditorio en Comaltepec	Todos los equipos.		
12:00-14:00	Integración de información	Salón o auditorio en Comaltepec	Grupo del proyecto		
14:00-15:00	Comida				
15:00-19:00	Taller de análisis e integración final con stakeholders	Salón o auditorio en Comaltepec	Todos los participantes.		
20:00	Cena	Casas familiares			

Appendix B. Seminar's program about community challenges and climate change



Primer seminario del proyecto COMET-LA:

El Desafío de las comunidades ante los retos ambientales.

Santiago Comaltepec, Oaxaca - México; 16 de agosto del 2012

PRESENTACION

El cambio climático es un hecho ya incuestionable que está provocando alteraciones en todos los ámbitos. Ningún país en el mundo está exento de sufrir sus efectos, ni tampoco las comunidades y las familias.

A la fecha existe un sinnúmero de eventos, foros, programas y otras acciones con las que los Gobiernos intentan responder a los cambios que se están presentando. Cada vez un mayor número de académicos de diferentes disciplinas se concentran en tratar de entender las transformaciones que se están dando en todo el mundo. Los inversionistas también analizan y reaccionan. Sin embargo esta discusión no ha llegado a quienes cotidianamente tienen que lidiar con los resultados del calentamiento global: las comunidades locales. Hasta ahora las familias y el ciudadano común han tenido pocas oportunidades de contar con información de primera mano sobre lo que está sucediendo con respecto a este fenómeno y por lo tanto están sujetos a las decisiones de terceros. En México y particularmente en Oaxaca, hay toda una historia de acciones de la sociedad civil organizada que ha permitido enfrentar diferentes desafíos de manera colectiva y organizada. En aras de contribuir a entender el papel que las comunidades locales pueden jugar ante los cambios ambientales que se están suscitando el equipo del proyecto COMET-LA en colaboración con la Comunidad de Santiago Comaltepec, están organizando el Seminario "El Papel de las Comunidades frente al cambio climático".

PROGRAMA

HORA DE VERANO	ACTIVIDAD	NOMBRE DEL PONENTE	INSTITUCION
09:00:00	Registro de participantes		
09:15:00	Inauguración del Seminario	C. Víctor Hernández García.	Presidente del H. Ayuntamiento Constitucional de Santiago Comaltepec.
Panel 1: Los retos socioambientales frente al cambio climático en los países del proyecto COMET-LA Coordinación: UNAM			

09:30:00	Los desafíos sociambientales frente al Cambio Climático.	María del Mar Delgado Serrano, Phd	Universidad de Córdoba
09:45:00	Los desafíos de las comunidades locales frente al Cambio Climático en Argentina.	Por definir	Consejo Nacional de Investigaciones Científicas y Técnicas
10:00:00	Los desafíos sociambientales frente al cambio climático en Noruega.	Por definir	Norsk Institute for Luftforskning
10:15:00	Los desafíos de las comunidades locales frente al cambio climático en Colombia.	Por definir	Universidad Javeriana
10:30:00	Los desafíos socioambientales en México frente al Cambio Climático.	Roberto Escalante	UNAM
10:45:00	Comentarios y preguntas		Plenaria
11:00:00	Receso		
Panel 2. Cómo es que las Instituciones en México y en Oaxaca están enfrentando los retos del Cambio Climático y que papel juegan las comunidades? Relator CDI			
11:15:00	Políticas Públicas ante el cambio climático y el papel de las Comunidades	Ing. Ricardo Ramírez	Comisión Nacional Forestal
11:30:00	Políticas del Gobierno Estatal ante el Cambio Climático y el rol que juegan en ellas las comunidades locales	Ing. Helena Iturribarria	Instituto Estatal de Ecología.
11:45:00	Comentarios y preguntas		
Panel 3. El papel de las Organizaciones ante los retos del cambio climático Relator: Francisco Chapela			
12:15:00	Acciones de las ONGs para reducir los riesgos del calentamiento global	Eugenio Fernández	Rain Forest Alliance
12:30:00	Las ONGs locales y su papel frente al calentamiento global	Yolanda Lara	Estudios Rurales y Asesoría
12:45:00	El papel de las Organizaciones de base en México para reducir los riesgos del calentamiento global	Eusebio Roldán	Unión Zapoteca Chinanteca
13:00:00	Las Comunidades locales frente al calentamiento global	C. Juventino López Hdez.	Comunidad de Comaltepec
13:15:00	Comentarios y preguntas		Plenaria
13:30:00	Conclusiones de los paneles	Relatores	Plenaria
14:00:00	Conclusiones y propuestas	Roberto Escalante	Plenaria



Stakeholders' Vision on the Socio-Ecological System (SES)
situation in Mexico. A Case Study



	Finales		
14:30:00	Fin del Seminario		

Mayor información: Israel Hernández López israel_hdz_lopez@hotmail.com
Roberto Escalante semerena@servidor.unam.mx

Appendix C. Ethical considerations check-list

INFORMED CONSENT

**Place and date: Santiago
Comaltepec, Oaxaca Mexico. August, 17, 2012**

You have been invited to participate in this workshop of the COMET-LA Project, whose purpose is to analyze socio-ecological systems and governance. Your participation is truly important for the development of the Project, especially because you are the people managing natural resources. Your participation will also enhance a collective learning process among various stakeholders.

The information provided by you within this workshop, both in singular group discussion and full meeting sessions will be **kept in private and will be used exclusively for academic purposes**. The coordinating teams of the Project (Universidad Nacional Autónoma de México, Estudios Rurales y Asesoría Campesina Asociación Civil and the municipal authorities) are committed to return the report of this workshop to the participants here present, in order to get feedback from their opinions and comments.

The approximate length of the workshop is 4 hours. Your participation is completely voluntary and you are able to leave the workshop when you desire.

In this specific moment we ask the people who agree on the terms presented above to raise their hands.

Number of people who express their consent: 160

Total number of participants: 160

Signatures:

Dr. Roberto Escalante
Project Coordinator
Mexico. Universidad
Nacional Autónoma
de México

Ing. Yolanda Lara
Project Coordinator
Mexico. Estudios Rurales
Asesoría Campesina AC

C. Jesús Hernández Hdez.
P. del Comisariado
de Bienes Comunales
Legal Representative of
Santiago Comaltepec, Ixtlán



Ethical considerations checklist

(1) *Issues to consider for introducing the project & obtaining consent to engage with project activities*

Consideration	Yes	No
Have you considered how participants will be informed about the planned activities and their purpose?	x	
<p>We have elaborated two informative brochures (in Spanish), one presenting a general overview of the COMET LA Project and another providing specific information about the Mexican Case and the municipal authorities. These have been handed out to all participants in previous workshops.</p> <p>Additionally, every meeting/workshop starts with a contextualization presenting the Project, the specific objective of the event, and the activities that will be developed. The approach and communication channel between the Universidad Nacional Autónoma de México, Estudios Rurales, Asesoría Campesina Asociación Civil and the municipal authorities will always be conducted through the legal representatives and co-researchers, so all parties will be fully informed and can engage in a joint decision process about the activities to be carried out.</p>		
Have you considered how consent to participation will be indicated?	x	
<p>All the workshops, meetings and forums will start with the reading of the informed consent (see annex). If any questions or objections arise, they will be reported and filed. The declaration of consent will be expressed orally and not written. This has been decided based on the fact that in Mexico asking for a signature might be seen as a having social and legal implications, which might cause suspicion rather than promoting a clear ethical statement around the Project.</p> <p>For the specific case of co-researchers, consent has been already given and has been validated by participants, municipal and authorities of the community. Co-researchers have been selected and approved by authorities to participate in the research process.</p>		
Will the activity involve participants who are not adult (as locally defined) who are unable to give informed consent?	x	
<p>If required, the municipal authorities, through an autonomous and internal decision making process, will design the strategy for obtaining the proper consent from parents and community members, so minors could be ethically involved.</p>		
Does the research involve other vulnerable groups: children, those with cognitive impairment, or where unequal relationships may exist that could affect responses and perceived freedom to cooperate? (e.g. disempowered groups, ethnic minorities)?	x	
<p>The Mexican chapter of the Project works with an indigenous community, which is considered to be an ethnic minority. Indigenous communities have a special rights to govern themselves with their <i>Usos y Costumbres</i> (traditions and customary practices). This guarantees their autonomy over their territory, using methods of direct democracy which helps to build high social capital. The initial discussion about COMET-LA Project and its initial implementation, have been framed into this scenario with the community. Therefore, all the activities and results of the research will consider the autonomy and active participation of the commoners and the municipal authorities. We aim to keep permanent interaction and dialogue to guarantee timely effective responses with the community</p>		
Will the study require the co-operation of a 'gatekeeper' for initial access to the groups or individuals to be recruited? (e.g. students at school, members of self-help group, community leaders?)	x	
<p>The "gatekeepers" are the municipal authorities, who, from the beginning, were consulted about the aims and objectives of the Project. They have and will be participating actively, together with the commoners in various activities. The members of Estudios Rurales y Asesoría is also an important gatekeeper. They have a long relationship with the community and one of its members is a commoner of Santiago Comaltepec. This is important since he</p>		

can help in various aspects of the relationship between the activities the project implies and the Commoners Assembly.		
The individual stands of this person will not be reflected in aspects related to governance and activities that might be linked to the autonomy of Community Councils. His participation in the project is framed into generating the proper conditions for the implementation of activities, research activities and logistics.		
Will it be necessary for participants to take part in the study without their knowledge and consent at the time? (e.g. covert observation of people in non-public places)?		x
No		
Can you foresee any other ethical problems during the design and planning stage?		x
No		

(2) Issues to consider for planning data collection, and participant involvement in project activities

Consideration	yes	No
Is there a possibility that the safety of the researchers and COMET-LA project staff may be in question (e.g. exposure to physical risks, discussion of contentious political or ownership issues)?		x
All the necessary measures will be taken in order to guarantee that the activities and field visits are safe and without risks.		
Is there a possibility that the safety of the participants may be at risk due to the project activities (e.g. due to exposure to physical risks, due to discrimination from other groups)?		x
<i>If yes how will these dangers be eliminated or reduced?</i>		
Could the project plan change, or could the activity involve the sharing of data or confidential information beyond the initial consent given?	x	
In case the Project faces any change, due to contingencies of the context, it is important to state that this would only proceed with the previous consent and authorization of the municipal authorities and the Commoners Assembly.		
Could participants withhold or alter their involvement because of repercussions they perceive? For example, will culturally sensitive or legal topics be discussed?	x	
In regard to cultural or legal subjects, it is always necessary to provide enough time for discussion, socialization and agreement, under a principle of proper representation of the Councils.		
Can you foresee any other ethical problems arising during project activities?		x

(3) Issues to consider after an activity: data analysis. Dissemination of project findings & outputs

Consideration	Yes	No
Will all contributions to the research be acknowledged? (is there a record of what those acknowledgments ought to be)	x	
All the meetings will have a list of participants. Additionally, all the products, notes and reports will specify how the information has been obtained, when and who participated.		

The contributions of the local co-researchers will be acknowledged in the products, specifying their names and the type of contribution. The contribution of the municipal authorities as a whole will also be acknowledged.		
Will there be mechanisms for ensuring participants' feedback have been established?	x	
All the products, notes and reports will be available in English and Spanish. They will be sent to the involved commoners and co-researchers of the municipal authorities, in order for them to offer a feedback. During workshops and field visits, there will always be a time for showing and discussing the systematization and analysis of the information.		
Will participants have good access and awareness to outputs they have contributed to?	x	
During workshops and field visits there will always be a time for showing and discussing the systematization and analysis of the information. The deliverables sent to the European Union will be translated into Spanish. All the information will also be available in the Project web page.		
Will data be confidential to the individual/group that created it, or shared more widely (e.g. within the community)?	x	
Unless a participant expresses explicitly that the information being provided cannot be shared or has to be kept under restricted privacy, all the data that is pertinent to the Project will be published.		
Even if outputs and findings are anonymised, are there any risks to the group(s) that created it (e.g. disfavourable reactions from another group or agency towards the community or a group within the community)?		x
Can you foresee any other ethical problems arising from the use of the project outputs?		x