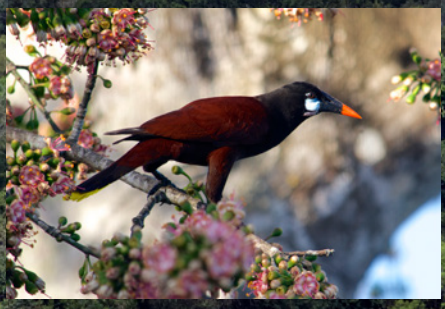

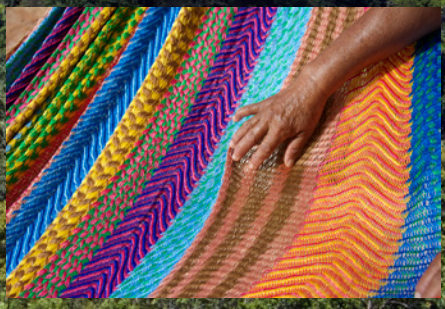

# EXPERIENCES ON SUSTAINABLE RURAL DEVELOPMENT AND BIODIVERSITY CONSERVATION IN THE YUCATAN PENINSULA

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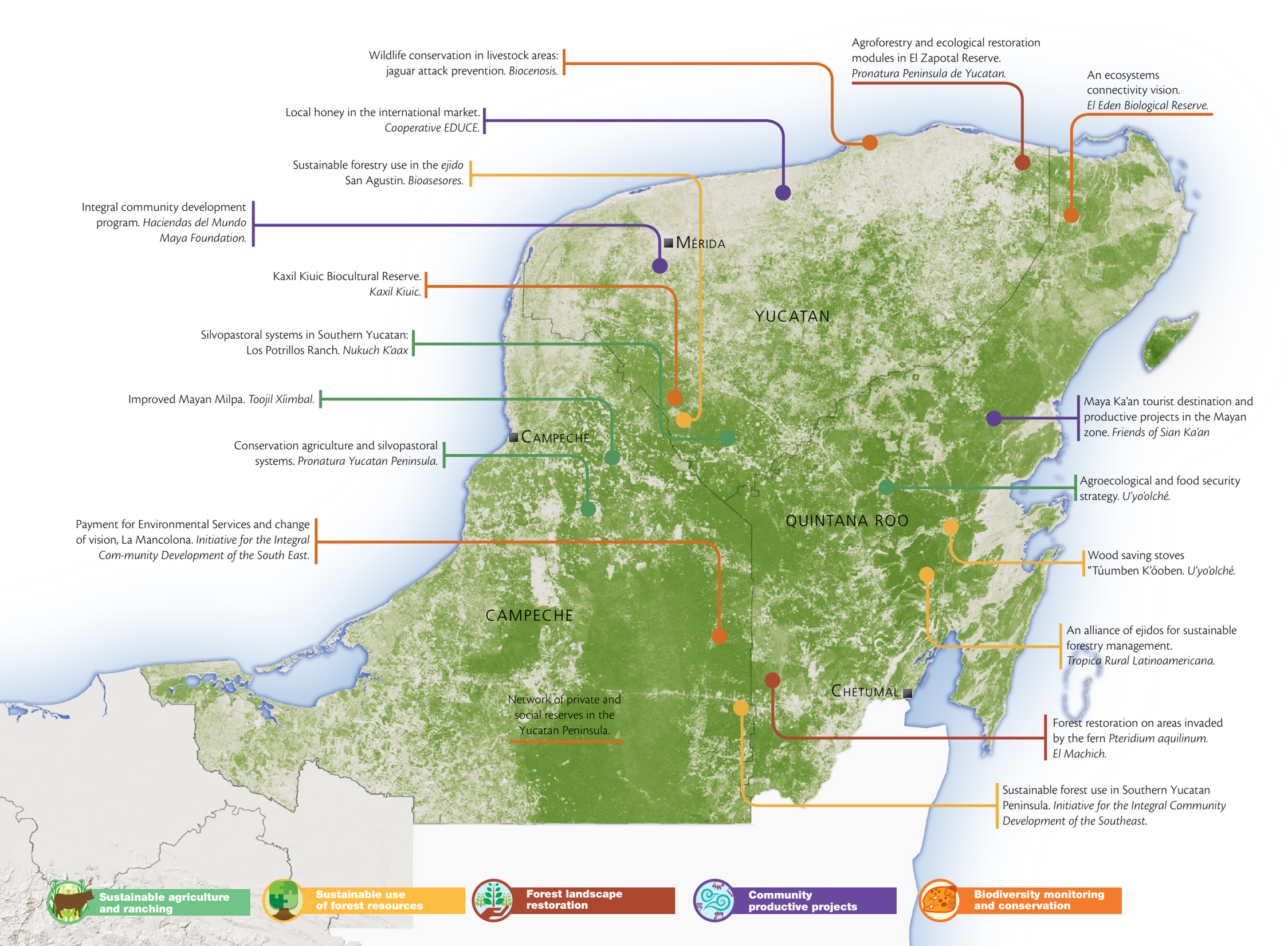
Wildlife conservation in livestock areas: jaguar attack prevention. *Biocenosis.*
Local honey in the international market. *Cooperative EDUCE.*
Sustainable forestry use in the *ejido* San Agustin. *Bioasesores.*
Integral community development program. *Haciendas del Mundo Maya Foundation.*
Kaxil Kiuic Biocultural Reserve. *Kaxil Kiuic.*
Silvopastoral systems in Southern Yucatan: Los Potrillos Ranch. *Nukuch K'aax*
Improved Mayan Milpa. *Toojil Xíimbal.*
Conservation agriculture and silvopastoral systems. *Pronatura Yucatan Peninsula.*
Payment for Environmental Services and change of vision, La Mancolona. *Initiative for the Integral Com-munity Development of the South East.*
Agroforestry and ecological restoration modules in El Zapotal Reserve. *Pronatura Peninsula de Yucatan.*
An ecosystems connectivity vision. *El Eden Biological Reserve.*
Maya Ka'an tourist destination and productive projects in the Mayan zone. *Friends of Sian Ka'an*
Agroecological and food security strategy. *U'yo'olché.*
Wood saving stoves "Túumben K'óoben. *U'yo'olché.*
An alliance of ejidos for sustainable forestry management. *Tropica Rural Latinoamericana.*
Forest restoration on areas invaded by the fern *Pteridium aquilinum.* *El Machich.*
Sustainable forest use in Southern Yucatan Peninsula. *Initiative for the Integral Community Development of the Southeast.*
Network of private and social reserves in the Yucatan Peninsula.
MÉRIDA
CAMPECHE
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YUCATAN
QUINTANA ROO
CAMPECHE
Sustainable agriculture and ranching
Sustainable use of forest resources
Forest landscape restoration
Community productive projects
Biodiversity monitoring and conservation


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# EXPERIENCES ON SUSTAINABLE RURAL DEVELOPMENT AND BIODIVERSITY CONSERVATION IN THE YUCATAN PENINSULA

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# CONTENT



## Sustainable agriculture and ranching



## Sustainable use of forest resources

## Forest landscape restoration



## Community productive projects



## Biodiversity monitoring and conservation

# FOREWORD

In Mexico, about half of the jungle and forested areas are owned by communities and *ejidos*.[1] In the Mayan Forest of the Yucatan Peninsula, this ratio is 61.3%. As a result, people have the ability to make decisions to define the fate of the forest.

Currently, the Mayan Forest faces numerous challenges. One is climate change, which because of the location and geography the peninsula presents, and will continue presenting, significant impacts: more pronounced droughts, hurricanes, and increased soil erosion, among other impacts affecting ecosystems, people and producers.

Another major threat is the gradual erosion of biodiversity. Food chains are affected mainly by the fragmentation and deterioration of wildlife habitats. For example, populations of large mammals are declining to such an extent that many are now endangered.

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**1** Mexico's Agrarian Law Office defines ejido as a population center composed of lands, forests and water covered by an endowment, and the group of individuals holding land rights.

The deterioration of communities' livelihoods is another symptom of this process. On one hand, food security is being affected, and this has an impact on productive landscapes. The Mayan *milpa*,[2] including the *solar*,[3] *t'olche'*[4] and other practices of high cultural value and compatible with the sustainable management of natural resources and landscapes, are experiencing a rapid transformation. Markets, including those for forestry, agriculture and livestock products, provide little incentive for sustainable production and few farming activities truly improve farmers' well-being.

In view of this, many communities –accompanied by civil society organizations– have decided to experiment with new ways to achieve conservation and sustainable rural development, which must be compatible with biodiversity; as well as to help mitigate and adapt to the impacts of climate change. These pioneers work together to experience, learn, and innovate by testing original models and schemes, in order to achieve a development compatible with natural resource preservation.

To accompany these processes, a significant civil society ensemble has been built in the last 30 years. Nonprofit organizations play a key role in monitoring the development processes in the territories of the region. They contribute, for example, with raising funds from international agencies and organizations in order to create processes of change in the short and medium term, and act as agents of local development.

On their part, community leaders and producers have taken significant risks: some risk their production to test improved agricultural practices; some invest their time to acquire new skills. Others risk assets and resources to promote community and private conservation. All these communities and leaders are essential to pilot actions that allow true, sustainable territorial development.

The aim of this book is to present a series of experiences, communicated by the producers and local non-profit organizations that accompany them, which contribute substantially to changes

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**2** According to Fao, milpa is the traditional Mesoamerican farming system and is defined as a field that is intercropped with maize, beans and squash, often with other minor species and in which edible leafy weeds are tolerated and harvested.
**3** Mayan term referring to edible forest systems.
**4** Mayan term meaning a tree line.

in resource management. Their commitment and dedication to operate programs and projects in the field, hand in hand with the communities and producers, will enable a model of a true sustainable rural development that is critical for the Yucatan Peninsula.

Therefore, this book presents a wide range of experiences, where a new paradigm of sustainable rural development will complement traditional conservation actions. The presentation of these experiences has been documented in this book's article format, alongside a virtual platform where you can also access videos (available in Spanish only).[5] We hope that the processes and lessons of each experience will contribute to motivate young professionals and community members to try to contribute to this change. This book also marks a new stage in the strengthening of civil society in the Yucatan Peninsula: local nonprofit organizations, communities and institutions are increasingly forming alliances, learning communities and regional networks that enable, reinforce and scale successful actions. This movement, necessary to cover a larger part of the territory, allows the inclusion of more communities, and strengthens civil society through increased specialization and professionalization.

Finally, it is important to recognize the documentation work done by Biosakbé, an organization that accepted the challenge of exploring this vast region and of listening to the voices of those who are on the ground actively making a difference. We also want to thank the following organizations for their invaluable support, WK Kellogg Foundation, the Claudia and Roberto Hernández Foundation, and the Harp Helú Foundation.

Sébastien Proust
Coordinator for the Yucatan Peninsula Mexico REDD+ Alliance
The Nature Conservancy

[5] Website: http://biosakbe.com/desarrollo_rural_sustentable

# INTRODUCTION

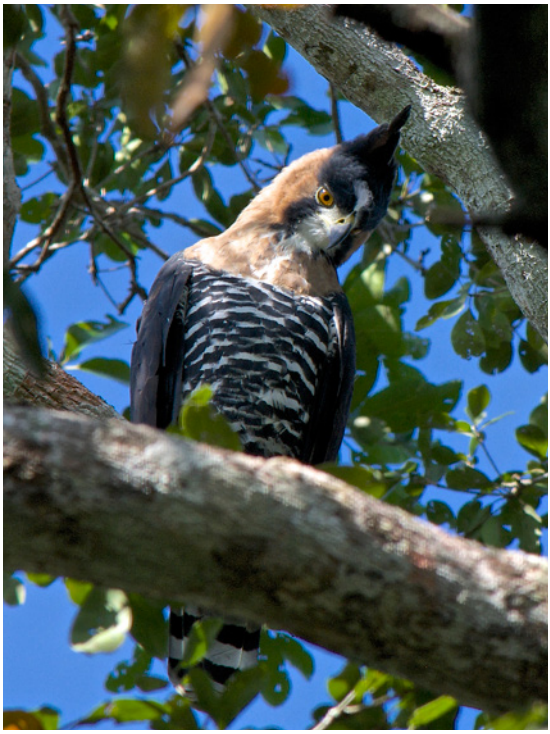
A forest that witnessed the splendor of a civilization hides hundreds of Mayan pyramids as silent vestiges of those times. The Mayan Forest of the Yucatan Peninsula is one of the last refuges where the jaguar still maintains a high population density and shares the territory with four other large felines: cougar, ocelot, *tigrillos* and jaguarundi. It is also home to other species of high biological value, such as the tapir, three species of monkeys, one of which is endemic, and two species of peccary, among others. It is a forest that sustains thousands of families who manage their natural resources with a holistic perspective. However, in recent decades there has been a rapid advance of the agricultural and urban frontiers that began to fragment the landscape with the subsequent threat to the biodiversity of the region and the livelihoods of communities. This situation has encouraged many organizations to search for production and governance strategies to confront the forces that lead to the deterioration of the Mayan Forest.

The mechanism for Reducing Emissions from Deforestation and Degradation (REDD+) presents an opportunity to address these challenges, for which the Yucatan Peninsula is considered a priority region. In order to strengthen low carbon rural and forestry

Mayan Forest of the Yucatan Peninsula

development, the Mexico AMREDD+ Alliance was created, an initiative comprised by The Nature Conservancy, Rainforest Alliance, *Espacios Naturales y Desarrollo Sustentable* and the Woods Hole Research Center. The Alliance operates at three different levels: local, state and national; as it aims to test tools and approaches at the local level, and provide lessons learned to refine state and national strategies. This approach allows both local involvement -in the implementation of strategies to reduce deforestation and promote sustainable production- and to advocate for a framework of public policies at the state and national levels.

In this context, in 2012 a group of organizations met for the creation of a REDD+ Learning Community (CAREDD+) for the Yucatan Peninsula, which seeks to strengthen capacities by sharing knowledge on issues related to low-carbon-emission sustainable development. Complementary with these objectives the Itzincab Alliance was created; composed of many of the CAREDD+ non-governmental organizations and aiming to consolidate a network of areas covering critical and representative habitats of the ecosystem diversity under a scheme of conservation, management and sustainable use in approximately two million hectares of the Yucatan Peninsula.



Ornate Hawk-Eagle
(*Spizaetus ornatus*)

This work is an effort to document the experiences of some of the sustainable rural development initiatives and projects that contribute to reducing deforestation in the region, and thus make their contribution to the conservation and sustainable management of the Mayan Forest in the Yucatan Peninsula. The range of projects represented here allows us to categorize them in efforts of 1) sustainable agriculture and ranching, 2) sustainable use of forest resources, 3) forest landscape restoration, 4) community production projects and 5) monitoring of biodiversity and conservation. In its thematic diversity and regional scope we can see the added significance of these practices and their potential for change at the local level.

# Sustainable agriculture and ranching

Conservation agriculture in Francisco Mujica, Hopelchén, Campeche.

# CONSERVATION AGRICULTURE AND SILVOPASTORAL SYSTEMS

Organization
**Pronatura Península de Yucatán, AC - Campeche**
Project Start Year
**2014**
Location
**Francisco Mujica and Ramon Corona communities, Municipality Hopelchén**


## Introduction

The region known as Los Chenes, in the state of Campeche, is recognized for its high biological value. However, some 30 years ago, the advance of the agricultural frontier has gradually been reducing its natural capital. Because of these factors, along with the Puuc area in Yucatan, this region was designated as a strategic area for the REDD+ initiative. A portion of the agricultural production is under the model of traditional subsistence, but a greater percentage is represented by mechanized agriculture. In this context, Pronatura Península de Yucatán is testing a technique of conservation agriculture with three basic principles: minimum soil movement, soil surface cover of crop residues and crop rotation; which in turn is based on a strategy model developed by the MasAgro program of the International Maize and Wheat Improvement Center (CIMMYT). This project seeks to maintain soil fertility, reduce the use of fossil fuels and increase yields per hectare. Therefore, the goal is to maintain the level of production in areas designated for agriculture and avoid the conversion of new forest areas into crop fields.

Conservation agriculture in Francisco Mujica, Hopelchén, Campeche.

## Initial situation

In a territorial analysis assisted by satellite images, a heterogeneous tapestry of forests interspersed with small and large deforested plots can be seen. Visiting the territory allows one to notice that the landscape is dominated by the meeting of two contemporary cultures: traditional Mayan and Mennonite villages. The project's objective is to achieve a change in farming practices of both populations; although the methodological tools to be used require a different approach, depending on whether one is working with a Mennonite or Mayan traditional village. The last and most ambitious goal, worth the effort, is to reconcile the conservation of the natural heritage of this region with the welfare of their inhabitants.

"The first steps were difficult because the project did not render interest among the potential participants", recalls Carlos Cecilio Zi Dzib, then Pronatura field manager of sustainable agriculture. He recalls the first introductory workshop on conservation agriculture, for which they invited forty people in the community and only five attended. Soon after, people began to come closer because they were interested in learning about the proposal. "It's

Left, cob in conventional agriculture; right, conservation agriculture.

logical," said Carlos Cecilio, "for generations people have been plowing the land and applying agrochemicals. For example, if they have an attack of the fall armyworm in maize, they think: how can I not apply insecticide? What is harder for them to see is that crop rotation breaks the pest cycle and reduces pesticide use".

The proposal aims to demonstrate that with the slightest movement of the topsoil, the physical and chemical properties of the soil profile, as well as their water storage capacity, are conserved. Leaving the stubble (crop residue) on the ground helps maintain soil moisture, while incorporating organic matter. Finally, crop rotation not only breaks the natural cycle of the pests but also brings new nutrients into the soil; for example, if after corn we have a bean cycle we will be providing nitrogen for the next crop.

## Key moments

It has been key for the project to "learn by doing", and with the support from the Mexico AMREDD+ Alliance they began working with five producers from the community, who were invited

to establish modules of sustainable practices. "For example, says the field expert, now is the time to leave the stubble; so we bring people to the field to give a talk about the importance of this practice, and the farmers can check by themselves how humidity is maintained below that stubble. Through these conservation practices we can achieve higher productivity compared to conventional agriculture".

When first visiting the plots they were still a few days away from harvesting and then measuring crop yields. Nonetheless, the field expert randomly got two cobs, one from the land with conservation agriculture and the other from a control plot under conventional agriculture. The result was in view of everyone there: maize produced with conservation agriculture had a more complete cob. This is even more relevant when one considers that under conservation agriculture tractor use decreased by 50%, as did the equivalent of fuel consumption.

Less than a year into the project, a key moment was when the producers saw the benefits of the conservation agriculture system after two months of drought. Producers who did not carry out such practices got smaller cobs, and those that made conservation practices achieved more developed ones. "And still producers have to see the result of leaving the stubble on the soil and rotating crops", says Carlos with optimism.

Alongside conservation agriculture, Pronatura Península de Yucatán has been piloting improved practices for livestock production through silvopastoral systems. These systems imply the improvement of pastures by combining them with high protein shrubs such as Leucaena leucocephala cv. cunningham, and establishing additional tree species in the periphery such as cedar, mahogany, guava and nance, available to be used for livestock and humans.

## Lessons learned

"The best way to induce change is by showing it, not only with theoretical explanations," says Carlos Cecilio. Five producers began in this project, and within a year from starting they got thirty more people in the community of Francisco Mujica, plus another

Forested area behind the conservation agriculture plot.

twenty from Ramon Corona who wanted to become involved. "At this early stage we aim to change ways of thinking, of producing, of doing things; and the next stage is to improve yields and have surplus for the market".

Less than a year from starting, the field expert believes they have already partially succeeded in stopping deforestation. "That strip of forest, says pointing out to a forested area, was in the plans of being felled by a producer. But when seeing the good yields of his crops this year, it remained untouched, and we expect that behavior to be maintained over time. We have seen a change in the community, there is now more movement, they clean their streets, they no longer fell the forest and have more courage to work the fields".

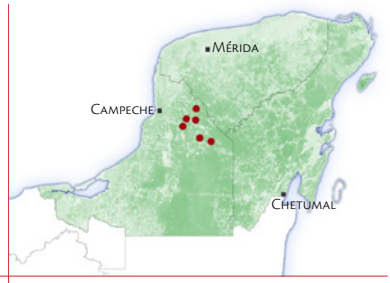
**MasAgro strategy. SAGARPA-CIMMYT**

MasAgro is a strategy developed by CIMMYT, and its objective is to enable farmers to achieve higher and more stable yields, increase their income and contribute to mitigate the effects of climate change. For the implementation of the strategy the program was designed in innovation nodes, also called "hubs". The most recent of these innovation nodes is denominated Yucatan Hub, beginning activities in the year 2014. During the first year the approach of this hub has been to create capacities in technical advisers about conservation agriculture, such as no-till, stubble management and crop rotation. By the year 2015, the Yucatan Hub plans to implement its strategy consolidating a scheme as an experimental platform, modules of sustainable practices and extension areas. The experimental platforms are extensions that will generate technologies, as well as to investigate and develop capacities. The modules of sustainable practices will serve as promotion amongst leading farmers in order to apply the knowledge in the areas of technology extension. The experience of Pronatura, strategic partner of MasAgro in the region, will be considered as a module of sustainable practices.

The family in the garden.

# SUSTAINABLE MAYAN MILPA

Organization
**Toojil Xíimbal Sociedad Cooperativa**
Project start year
**2011**
Location
**Municipality of Hopelchén, Campeche**




## Introduction

Toojil Xíimbal is a Mayan indigenous organization that was legally constituted as a cooperative in 2011. Since 2009 its members work on issues such as participatory planning, culture and identity, food sovereignty, integrated agroecological areas and natural resources, among others. Toojil Xíimbal means "*justice that walks*" in Mayan language, and that is why the organization emerged with a mission to strengthen their identity in a context that has displaced native seeds and original traditions.

The organization's main objective is to transmit the traditional farmer's knowledge to new generations, retrieve knowledge, reappraise and re-apply. "But not everything new involves a threat," say the members, "so through workshops and participatory processes we review the most useful of both worlds, what we learn from our grandparents and the innovations available today in order to promote sustainable agriculture". In 2013, with support from TNC and under the Mexico REDD+ Alliance, Toojil Xíimbal initiated a project on sustainable Mayan Milpa, which applies agroecological practices to the millenary *milpa* tradition. Alongside this initiative, the most ambitious project of the organization is the creation of a rural school based on Hopelchén.

Family in demonstration plot in Suctuc.

## Initial situation

For seven years, Toojil Xíimbal organizes a seeds festival along with nine communities: Xcalot Akal, Xkix, Sahcabchén San Juan Bautista, San Francisco Suctuc, Hopelchén, Dzibalchén, Iturbide, Crucero San Luis and Ich Ek. They prefer to talk about a festivity, not a fair, because it involves a non-commercial concept and a celebration of life through the seeds. Toojil Xíimbal members believe that it is very difficult to change the idea that the most important thing is money, downplaying the diversity and health of the family. In the *milpa* it is not possible to achieve the same economic profit than in a mechanized hectare, but it provides other important benefits in return, such as the elimination of chemicals that can negatively impact the health of farmers and the environment. When speaking of sustainable *milpa*, the organization promotes the protection of the polyculture system, as well as soil conservation practices to maintain or improve fertility. In this way, migratory farming could be eliminated, which consists of abandoning the plots every three to five years with the ensuing need to deforest new areas for cultivation, and people would then practice more sedentary farming.

They also considered that another way to rescue ancestral farming practices could be through a rural school. The school was planned to be finished in ten years, but during the first three years of planning it has already become a reality. For this purpose, Toojil Xíimbal got a terrain in Suctuc, near Hopelchén, with a history that reflects the reality they seek to change. Some 30 years ago this area was forested, but for some reason it was cut down and it was the scenery for mechanized agriculture. Once abandoned, the land was overrun with Johnson grass (*Sorghum halepense*) and nutsedge (*Cyperus* sp.): two very difficult exotic species to eradicate. Under these conditions, members of the Toojil Xíimbal started working in the land with agro-ecological principles, and the process of transformation has provided valuable lessons.

## Key moments

Gradually more people were taking over the initiative of the seed festival, and Toojil Xíimbal helped organize it under the concept of a *fiesta de semillas*, or festivity of seeds. "When we started these festivals we had four corn varieties, and today we can already find nine varieties grown in the area", says Madhavi Tello, administrative head of the cooperative. In the seventh seed festival, which was held in May 2014 and was attended by representatives of all the Yucatan Peninsula, the *ejido* of Dzibalchén took the organization of the event almost entirely. This has huge value, recognized the members of the cooperative, as it shows that communities are aware of the importance of recovering native seeds.

In addition to organizational issues in the communities, other areas of work addressed by the cooperative focus on vermicomposting and simple compost techniques, breeding of Mexican hairless pig, management and control of pests, bocashi preparation, keeping melipona bees, growing vegetables and Mayan *milpa*. It began as just training, but today it works in defined spaces in Hopelchén and Suctuc. In 2014, under the Mexico AMREDD+ Alliance, the project to develop a model of sustainable Mayan *milpa* begins, combining the traditional technique with some improved techniques; such as achieving a sedentary

Hibiscus.

*milpa* instead of a migrating one, elimination of burning and incorporation of organic fertilizers.

## Lessons learned

"We believe that having a non-profit organization is not a means to make a living, but a means for the life of the community, for people who are organizing themselves because they want to transform their reality," says Madhavi. In that sense, the seeds festival was pivotal because it led to the organization of people; and most importantly after the festival people actually planted the varieties they received. Elizabeth Mena, community adviser for the cooperative, considers that the most important thing is that people themselves are convinced by the value of rescuing the Mayan *milpa* as a way to crop, as opposed to changing their farming methods as mere response to external incentives. This is a time consuming process because the producers themselves are discovering the advantages of not relying on technological packages, and people end up realizing that there is a benefit to the health of people and the land.

Doña Leticia Carmen Dzib, promoter in the communities, began to farm in the Suctuc terrain. There she grows peas, hibiscus, pepper, tomato, radish, coriander, Lima beans, among other

Mexican hairless pig.

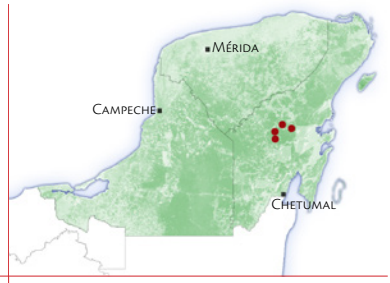
things. "My husband, says Dona Leticia- plants on 30 hectares of mechanized *milpa*; but this year he experimented with 7 hectares without agrochemicals and had a good squash harvest. Moreover, he is already beginning to join in the cooperative farm, and even my son asks me to go to the farm to plant". For Jose Trinidad (Mahatma), Toojil Xíimbal's forestry technician, the major satisfaction of rescuing the *milpa* as a cultivation technique is the creation of a family work environment, where everyone is going to work because they want to, not because of money. "We may have an idea, says Mahatma, but the most important thing is to reach the communities and listen to what people want and feel, it is there where the best ideas arise".

Genuine adoption of sustainable *milpa* practices could have a positive impact in the medium term to reduce deforestation locally. This is because the maintenance of soil fertility, along with increased productivity and reduced costs, make it unnecessary to abandon the plots and to incorporate new arable areas. Moving from a migrating agriculture to a sedentary scheme means that the presence of forest areas adjacent to the *milpa* would have one less threat to their survival; and a further step towards the sustainable management of these forests. This could be the way to guarantee the preservation of this millenary agricultural practices altogether.

Garden in Laguna Kaná.

# AGROECOLOGICAL STRATEGY AND FOOD SECURITY

Organization
**U'yo'olché, AC**
Project start year
**2012**
Location
**Laguna Kaná, Chunhuás, Betania, Dzulá, X-Yatil, Felipe Carrillo Puerto Municipality, Quintana Roo**




## Introduction

U'yo'olché, a local organization based in Felipe Carrillo Puerto, has at its core of its activities, an Agroecological Strategy that promotes food security in communities through organic production, exchange experiences and the rescue of traditional farmers' knowledge. Thus far, they have been promoting the consolidation of community gardens sustained by a collective of producers of organic vegetables. Each group is provided constant training in agroecological practices, monitoring, and in some cases they are funds for infrastructure, such as the implementation of solar powered irrigation systems. Life around the garden features a family atmosphere in the fieldwork, cooperation between the families of the community involved in the rural school, and a sense of collaboration between neighboring communities. The initial objective of empowering communities to secure organic food for their own consumption is being achieved, and at this time they have managed to produce a surplus with which they hope to be able to commercialize with added value.

Seedling bed in Betania.

## Initial situation

"The project idea came about as an inter-agency committee led by UNDP, the Commission for Indigenous Development (CDI), the Department of Economic Development of Felipe Carrillo Puerto, the Mesoamerican Biological Corridor (CBM), the Mayan Intercultural University (UIMQROO) and other experts aiming to create a rural school", said Maria Antonieta Bocanegra, co-coordinator of the strategy of sustainable agriculture in U'yo'olché. "We made a team with the aim of managing funds and creating capacities on this topic, and that's why we took a trainers' course for rural schools that was developed in the U Yits Ka'an agriculture school, in Maní, Yucatan. The original idea we had was to create a school for farmers in Felipe Carrillo Puerto, but with the 20 years of experience handed down to us from Maní we realized it would be better not to bring farmers out of their context but to work in the field with them". That meant fundraising efforts for school infrastructure could be re-addressed for making the school in the communities' fields, and setting up an outdoor school environment where learning has harnessed farmer to farmer.

Habanero peppers harvested in Laguna Kaná.

## Key moments

When the project started many people in the communities had economic expectations that were not met, and this is the reason why some quit and the group was reduced. Thus, few people stayed but with great commitment, devoting time to work and convinced of organic production, says Maria Antonieta. "We always want more people involved, but it is no easy task because we did not pay for the work. The benefit is consumption, and any surplus is sold in the local market. If we learn to organize and save, we could expand the garden and reinvest in it, but it is a slow process", says Maria Antonieta. Currently, the organization is working with five communities to strengthen community gardens; they are busy securing funds for further training, seeds and infrastructure, while sharing resources such as computers and fomenting a spirit of collective impact.

A key moment for the project was the incorporation of staff in the technical team, as it was very much necessary to count with an interdisciplinary approach and lots of commitment to continue supporting the process. Putting the team together was a challenge, because it required long-term work that not always pro-

Organic fertilizer made in Laguna Kaná.

vides economic stability; and commitment is necessary to provide continuity, explains Maria Antonieta. For example, the incorporation of Alfredo Alvarez and Leobardo Teh as advisers to the project was very important. Alfredo, as co-coordinator of the agroecological strategy, has been involved in fundraising and in organizing exchanges of experiences that have helped communities share their learnings and exchange seeds. Leobardo speaks Mayan and visits communities once or twice a week. During his visits, Leobardo talks about crop rotation, compost making, families of plants and pest control, among other topics.

"Here we are placing an arnica barrier to repel harmful insects", explains Leobardo, "but we also use hoja santa, epazote and basil." Don Paulino Cob Canul, producer from Laguna Kaná, says that they are growing peppers, tomatoes, onion, chives, cilantro, radish, lentils, cassava, plantains, taro, yams, melons and beans. "If I lose in any crop, I win in another," explains Don Paulino, "here we are preparing organic fertilizer to use in plants with pods, like jabín and tzalam, sheep manure and dry leaves, making sure the layers have enough moisture and turning it during a month and a half", explains Don Paulino. "The challenge is

Harvest of lentils in Laguna Kaná.

to ensure soil nutrition and make it sustainable, strengthen pest control and finally marketing," says Alfredo Alvarez.

The objectives are changing, says Alfredo, because at first the idea was to have large groups to work on issues of food security for the whole community. But the groups were reduced and thereafter began to have surplus production, which they wanted to commercialize. "The challenge is not only to ensure production and organization", Maria Antonieta explains, "but we now have to enter the market, offering quality and maintaining production. What we are doing is creating a network that is growing stronger every time we meet; a collective fund is growing for the purchase of seeds and inputs, and the next step is navigating the organic produce market".

## Lessons learned

William Servando Pérez, Chunhuás producer, tells that he has learned a lot about crop rotation, compost preparation, organic

Family garden in Chunhuás, Quintana Roo.

insecticides, fertilizers and live barriers. "We have been learning how to plant different crops in seasons, how to avoid some pests, identifing some harmful insects and using organic insecticides prepared with chili, onion, garlic, nopal and neem", says William. Rufino Canul Dzib, producer of the Betania community, says that before working with organic crops he had the experience of producing tomatoes in a greenhouse. "As the plants in the greenhouse are high, and they are sprayed three times a week, when agrochemicals are applied at the top the product falls on whoever is applying it, and it has happened that we are left with a dry mouth, a numb tongue, burns in the skin and eyes. But here, working in the outdoors with agroecological techniques there are no chemicals that affect our health", says Rufino.

Another advantage implied in this form of farming is to intensify crop production in a single terrain, as opposed to migrate continuously to new spaces, as was traditionally done in *milpa* systems. "Before we could only work the *milpa* for two or three years," says William, "and then we had to open new space in the forest to continue farming… What struck me about these gardens is that you can create soil and continue growing. "The difference with the traditional *milpa* is that they no longer move

to another field, but rotate crops and incorporate fertilizer continuously," says Leobardo. Not abandoning the plots every two or three years also means not incorporating new areas of cultivation, which takes pressure off the remaining forests near the *milpa*. Currently, the team is working with milperos to rescue and share practices that also improve the sustainability of the *milpa*, through the project of Improved Mayan Milpa.

"Here in Chunhuás thirteen families began to work in the garden," says William, "but people want money, and when they see that the process is slow, they leave. We are a few, but now we are harvesting and selling some of the produce. We do not have much money, but we have enough to buy what we need and our food is healthy". "The garden is a place where the family shares," says Alfredo, "and this has encouraged young people to participate in agricultural activities; we have seen solidarity in the community strengthen."

Jose Jeremías Palomo Kú at his ranch Los Potrillos.

# SILVOPASTORAL SYSTEMS IN SOUTHERN YUCATAN: RANCHO LOS POTRILLOS

Organization
**Asociación Regional de Agrosilvicultores del Sur de Yucatán, Nukuch K'áax AC**
Project start year
**2006**
Location
**Municipality Tekax, Yucatan**


## Introduction

In 2004, Conafor initiated a national program to strengthen forest management and incentivizing formal organization of forest producers. In this context, Nukuch K'áax was created, initially an organization composed of a small group of livestock producers, who began to spread agrosilvopastoral practices from farmer to farmer with field demonstrations in Southern Yucatan. In 2006, civil association Nukuch K'áax is created with a clear mission: to generate a culture of conservation and entrepreneurship as a development mechanism in rural populations of the region. The number of producers signing up for the proposal began to grow. In addition to providing advice and monitoring projects among members, the association promotes the National REDD+ Strategy, promoting silvopastoral systems, improved *milpa* systems and sustainable forest management as practices that reduce deforestation. Currently, Nukuch K'áax is integrated by 32 *ejidos*, five small land owners and three groups of organized women.

Jagüey in Los Potrillos ranch.

## Initial situation

In 2011, a forest survey was conducted in the region known as UMAFOR 3106, and included ten municipalities where Nukuch K'áax operates. Satellite images from 1978, 1988, 2000 and 2008 were analyzed for this study. The results show that a little over 30 years ago a major process of deforestation began, having 81% of forest cover in 1978 and 54% in 1988. This period coincides with the National Clearing Programme, but it was discontinued in the 1980s. By 2000, the forest cover had recovered up to a 75%, and had a small fall to 73% in 2008 (Bioasesores 2011). "However", says José Jeremías Palomo Kú, now president of Nukuch K'áax, "while many pastures were abandoned and forest cover has been recuperated, many species have disappeared." While walking through his ranch, Los Potrillos, he speaks: "When I entered this field 10 years ago this was an acahual[1] that I have been knocking down in order to establish grass, because my plan was to work as it was done 40 years ago. But over time I changed the vision, and moved from promoting extensive ranching to silvopastoral systems;

[1] The term acahual referes to abandoned areas of secondary vegetation or lying fallow in different successional development stages.

T'olche', strip of vegetation in the outline of pasture.

I began incorporating huaxín trees (*Leucaena leucocephala*), and in the borders of the trails I was leaving swaths of *t'olche'*".

## Key moments

Around 2006, Mr. Palomo Kú began testing rotational grazing facilitated by the use of an electric fence, and thus had better control in managing his pasture. And so he began searching for alternatives to improve productivity of his livestock; since under conventional management in the dry season much weight is lost, and even many farmers must get rid of their animals. It was about five years ago, he says, when the Fundación Produce came up with the proposal to implement a silvopastoral system. During those years, Nukuch K'áax together with Conafor carried out an assessment of the main causes of deforestation in the area, as well as the potential for implementing a system of payment for ecosystem services (PES) for carbon sequestration. The major causes of deforestation identified were ranching and traditional *milpa*, so a proposal for the dissemination of silvopastoral systems and improved *milpa* between Nukuch K'áax partners began.

Cattle ranch
in Los Potrillos.

In 2013, through the Mexico REDD+ Alliance, TNC supported a project with Nukuch K'áax to implement silvopastoral demonstration plots in five *ejidos*: Xul, San Juan, Becanchén, Ek Balam and San Isidro, which added to the practices already started in Los Potrillos ranch. These plots are having a positive impact on the region, as other producers begin to show interest in the proposal. This is because, during the time of drought, huaxín is a good forage supply that adapts to environmental conditions, and this is reflected in animal weight gain. Livestock graze the shrube when it is about one meter high, and if any given tree has dominance, the idea is to leave it to serve as seed source. Furthermore, in agriculture they have worked on an improved Mayan *milpa* system using organic fertilizers, planting furrows and rotating crops, among other practices.

Improved Mayan Milpa at Los Potrillos Ranch.

## Lessons learned

Back in the day I only thought of doing large pastures", says Palomo, "because I thought I was saving on work, the cows were grazing for a month and a half and I did not need to go every day to the ranch. Eventually I realized that the opposite was true, if we want to make sustainable animal husbandry and not have a degraded pasture, we have to target small paddocks and make a constant grazing rotation. For this it is useful to have an electric fence, allowing switching of grazing sites daily. But it is not only about implementing some of these changes, a silvopastoral system has many components, such as huaxín lines, the cultivated t'olche' and natural regeneration, rotational grazing and implanted pastures, among other practices, because as the name suggests, it is a system".

The change is already seen in Los Potrillos Ranch: the cattle does not lose weight, and it is not necessary to buy balanced food during the dry season. The vision is that the ranch is self-sustaining, and as a system, agriculture is a component. Palomo said that when his grandparents cultivated the *milpa* they left a swath

Honeybee plant specie in the pasture ranch "Los Portrillos".

of trees that served as protection against strong winds, and also to be a source of regeneration of forest species jabín (*Piscidia piscipula*) or tzalam (*Lysiloma latisiliquum*). "By encouraging t'olche' we invest in the future," says Palomo, "because the species that manage to develop will serve as fodder, fuel, food, shade, niches for birds and beneficial insects, and also we can extract plants useful as food, medicine and for construction".

In the words of José Jeremías Palomo Kú, "we do not have much to teach the farmers but we do need to remind them; because our ancestors originally planted one hectare of Mayan *milpa*, not in ten or twenty. In that hectare they grew maize, beans, Lima beans, pumpkin, sweet potato; they had at least ten or fifteen crops. The benefit is always present when you put a tree on the ground".

Increased production per hectare, along with the planting of trees as an essential component of the ranching landscape, reduces the pressure on the forest that is still very well represented in this area. Farmers stop seeing the forest and the trees as an enemy of productivity, and prove that a higher yield can be achieved with relatively simple changes in management practices

and that deforestation of a greater amount of hectares for grazing is unnecessary.

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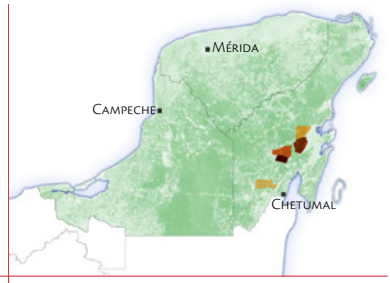
# Sustainable use of forest resources

Mahogany in El Huasteco forestry *ejido* reserve, Noh Bec.

# AN ALLIANCE OF EJIDOS FOR THE SUSTAINABLE MANAGEMENT OF FORESTS

Organization
**Trópica Rural Latinoamericana, AC**
Project start year
**2011**
Location
***Ejidos* Noh Bec, Felipe Carrillo Puerto, X-Hazil, Petcacab and Bacalar, Quintana Roo**




## Introduction

While on many places of Mesoamerica mahogany is practically extinct, the Mayan Forest is one of the last refuges where it still is present in densities and volumes that can be utilized. The state of Quintana Roo has more than a century of wood extraction, mainly mahogany, but also cedar (now protected) and sapodilla gum extraction. In the beginning, logging was in private hands or under concession, as was the case of the company MIQRO, but today it is mostly under the administration of *ejidos*. Many of these *ejidos*, with technical support, have managed to make a sustainable management of forest resources, achieving a balance between the economic viability of the activity and conservation. However, in less than a decade the market conditions have changed, and many forest companies have started to decrease in profits, to the point of threatening the activity itself.

Sustainable forest management has proven one of the most effective approaches to forest conservation. However, when this activity becomes unprofitable, degradation and deforestation start to take over. Local communities need to sustain their livelihoods through other means and resort to land use changes

Mahogany from nursery of tree species in Noh Bec.

for agriculture and ranching. Herein lays the importance of sustaining these efforts in the forests of Quintana Roo through the promotion of cost-effective management practices and a clear connection to markets.

In this context and with the support of organizations like Trópica Rural Latinoamericana AC and U'yo'olché AC, five *ejidos* in southern Quintana Roo have taken the initiative to form an Alliance of Forest Ejidos with the clear aim of giving new impetus to the activity, convinced that forest management is one of the most effective conservation tools in the Mayan Forest.

## Initial situation

Felipe Carrillo Puerto, Noh Bec, Petcacab and its annex Polinkin, X-Hazil and annexes, and Bacalar are five *ejidos* in southern Quintana Roo with very different histories. But they have something in common, that which once generated competition and today unites them: the abundance and diversity of their forest resources. In 1983, the Forest Pilot Plan was a first attempt to promote sustainable use of timber in the region, and this policy initiative managed to promote a forestry vocation in the region.

Trópica Rural Latinoamericana (TRL) is an organization that has worked with forest *ejidos* since its inception; for example in 1998 they prepared the forest management plan for the *ejido* Noh Bec. According to Abraham González Sosa, ejido dweller and 34-year-old forestry engineer: that was the beginning of a golden age.

In 2009 Abraham was treasurer in the *ejido*; by then they were exporting wood to Sweden and Germany. In 2008, they obtained FSC certification for mahogany, blackwood and ciricote wood and began exporting to the United States, Japan and Italy. Then the "golden age" was challenged by unforeseen events that radically challenged forest management, says Claudia Palafox from TRL, Hurricane Dean hit Quintana Roo in 2007 and almost all the management programs of the five forest *ejidos* had to be renewed: much forest biomass had been lost and the usable volumes were no longer the same. Not all the *ejidos* were affected equally, but in that year there was also a severe drought that resulted in large wildfires.

This context, matched with lower timber volumes, increased operating costs due to increased diesel costs and a fall in the price of wood, created a costly business in a highly competitive market. Don Elías Be Cituk, former president of the *ejido* Felipe Carrillo Puerto, remarks: "It was clear we needed join forces, organize beyond *ejidos* and agree on timber prices, so in 2011 we began to think of the creation of an Alliance of Forest Ejidos".

"The *ejidos* realized they needed to be united to face common problems," said José Antonio Arreola Palacios, Director of U'yo'olché, "because although the essence is forest management, there are issues related to agriculture, administrative and tax matters that would be more convenient to work in a coordinated manner". "For example, explains Don Elías, environmental impact studies are very expensive, and if we are united we can do one that covers the five *ejidos*. The same applies for certification from the Forest Stewardship Council (FSC), granted to forest operations that meet environmental, economic and social standards. Today only the *ejido* Caobas has it, which is not yet part of the alliance, and Noh Bec; while Petcacab is in the process of obtaining it this year".

Noh Bec sawmill.

## Key moments

Between 2011 and 2012 a series of meetings to begin shaping the proposal of the Alliance of Forest Ejidos took place. The Noh Bec and Felipe Carrillo Puerto *ejidos* were the first to promote the idea, then Petcacab, Bacalar and X-Hazil joined the conversation and agreed to the proposal. Caobas is another *ejido* with a forestry vocation that has interest in joining the alliance, but does not yet have formal agreements. "TRL has been central in shaping the alliance," says Don Clementino Ku Pakab, current president of the *ejido* county of Carrillo Puerto, as they have been responsible for convening the meetings, and its director Alfonso Argüelles has tirelessly worked on strengthening forest management in the five *ejidos*; as well as engineer José Antonio Arreola from U'yo'olché who has also driven this project.

During the year 2014 a process of appointing delegates from each *ejido* through assemblies took place, explains Claudia Palafox. As it is a union of *ejidos* it will be managed as a meeting with their delegates, who in turn are the presidents of the five *ejidos*. This structure would give transparency to the alliance, in part because decisions cannot be unilateral. While the alliance

has an executive director who manages it, decisions are taken by consensus by the board of directors, composed of the presidents of the *ejidos*; delegates are informed and they carry information to the *ejido* assemblies.

Mr. Elías Be Cituk was one of the initiators of the alliance in the *ejidos*, says Clementino, current executive president of the alliance, but it has been a long road for it to become consolidated. "The job is still not finished, but it already is in the public records and we have approval from taxing authorities; in the early days of 2015, the account was opened and we began operating as the Mayan Forest Alliance of Quintana Roo". "The alliance is already a fact, mentioned Don Clementino, nobody objected to the process, we all injected optimism in the meetings, we always knew it was something that would benefit the five *ejidos*".

## Lessons learned

Consolidating the alliance is a major step forward, but five years had to pass before it obtained legal status and could begin to function officially, mentioned Abraham González Sosa. In part this is because the *ejido* authorities change over time, and therefore so do the delegates to the Alliance's Council, which means we must take the time to update them on the process. We had to be patient, but it was worth it. In that sense, Arreola Palacios says, "some institutions tried to accelerate the alliance's formation, but we resisted the pressure because we believe that this is a process that needs to be created and owned by the local communities, which means it may take longer but it is more legitimate. Building trust to talk about issues such as transparency and accountability is not something that happens overnight. You need to be willing to take it slow."

"Some forest *ejidos* have been disappointed with forest management activities," said Arreola, "because they no longer have the timber volumes they did 40 years ago." The reasons behind this decrease in production lie in resource management techniques, industry and market dynamics, and in other aspects that may not have been adequately integrated in the strategies of some *ejidos*. It has been fully demonstrated that the *ejidos* that have good forest management are the ones who maintain a

Mahogany in El Huasteco Forest *ejido* Reserve, Noh Bec.

healthy forest. "There are many nearby *ejidos* that have no management plan and depleted their resources, that is why through good forest management we not only conserve the resource, but also the livelihoods of communities , which in turn generated the incentive to avoid losing it." It is very important to give new impetus to forestry, and the alliance is an ideal platform to accomplish it.

# SUSTAINABLE FOREST MANAGEMENT IN THE EJIDO 20 DE NOVIEMBRE

Organization
**Iniciativa para el Desarrollo Integral Comunitario del Sureste, AC**
Project start year
**2000**
Location
***Ejido* 20 de Noviembre, Municipality of Calakmul, Campeche**


## Introduction

When walking along the trails of the *ejido* 20 de Noviembre, a huge number of species of birds gradually appear on the scene, including the majestic ornate hawk-eagle. Continuing along the path, the fresh tracks of a tapir reveal the biodiversity sustained in this forest, which even houses the mythical jaguar. The *ejido* 20 de Noviembre is a forested area southeast of Campeche surrounded by neighboring *ejidos* with deforested areas for crops and ranching. This begs the question: what enables this *ejido* to maintain their forest in good conditions? The answer is 20 years of sustainable forest management and a well-organized group of 67 landowners with ongoing technical support from Iniciativa para el Desarrollo Integral Comunitario del Sureste AC (DICOS).

## Initial situation

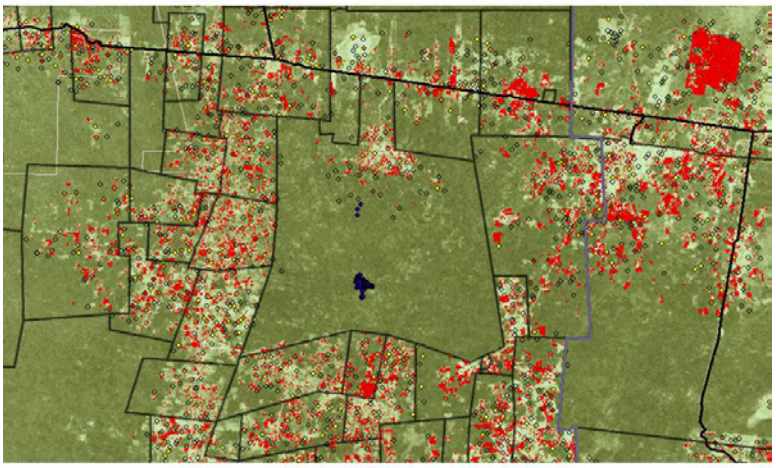
Don Elías Cahuich, Municipal Commissioner and leader in the community, says that 30 years ago there was no forest management in the *ejido*, which meant the resource has being harvested everywhere." But in 1994, with technical support, the *ejido*

Wood processing in *ejido* 20 de Noviembre. Photo TNC.

made its first inventory of 5,000 hectares, producing the first forestry management plan, at which they decided to allocate an area of 1,913 hectares for permanent community conservation. In 2005 a second forest management plan was approved to include 8,000 hectares; and in 2006 the management plan for the entire *ejido* is developed. As a result, the community's economy fully revolved around wood production and forest management, and with ongoing technical advice 20 de Noviembre has managed to maintain 90% of their forests in good condition.

## Key moments

Juan Alberto Villaseñor, from DICOS, emphasizes the importance of the 2006 *ejido* management plan and how critical it was to enable community ownership of this vision through participatory processes. Another milestone that marked the *ejido*'s forest vocation and gave momentum to their ability to offer processed wood was in 2010, when a sawmill was purchased with support from The Nature Conservancy (TNC) and the National Forestry Commission (Conafor). TNC's interest to make the case for REDD+ in the Yucatan Peninsula fostered further collaboration with 20 de



Satellite image of 20 de Noviembre and deforestation in neighboring *ejidos*.

Noviembre which in 2013 led to a study to assess $CO_2$ emissions from forestry practices. Measurements were made to assess impact throughout the harvesting process and the study provided interesting reflections for IDICOS but, most importantly, engaged the community in the collection of data and understanding of the results, explains Juan Alberto. Following the study, the *ejido* incorporated a series of improved management practices to reduce greenhouse gas emissions generated by the activity, towards a low-carbon forestry model.

In 2013, an obstacle arose for 20 de Noviembre: the municipal land use plan concluded that the permanent forest area of the *ejido* was to be considered a protection and research area because of its good condition. This situation complicated the renewal of permits for logging, which negatively impacted the economy of the *ejido*, which depends 80% on this activity. Josué Isaías Kú, president of the *ejido* county, mentioned that the Federal Ministry of Environment and Natural Resources (Semarnat) has provisions to renew the permit, but that a change is needed in the municipal land use plan, and that they are working on it. "While we wait for the permit renewal, says Josué, the *ejido*'s economy revolves around the production of honey and some temporary employment programs, which unfortunately are not as economically significant as forestry".

Flower of tajonal.

## Lessons learned

One of the most important lessons for the *ejido* 20 de Noviembre revolves around this last obstacle on the need to diversify economic activities. While over the years they have proven to be very good forestry entrepreneurs, experience has shown them that an unforeseen delay in logging permits can ruin years of work without another source of income. In that sense, Juan Alberto Villaseñor says there has been a significant change in attitude to start considering other activities like beekeeping, improved *milpa*, conservation and ecotourism. "The greatest potential of the *ejido* will remain forest management, but we have the idea of exploring other options that complement local income".

"One of the best decisions in all these years of work, says Juan Alberto, has always been making decisions in a participatory manner". The *ejido* is very well organized, and is considered an example of good forest management in the region, characteristics that have allowed them to interact with other organizations such as TNC, UNDP and People and Plants International. Perhaps

the next step would be to strengthen administration and marketing skills toward improved management of the wood company".

"It's nice when you work in a group, with sixty-four people everything's done quickly. The community is united and organized; in the assemblies we have 90% attendance. We have an agreement to organize ourselves, and that has good results", said Mr. Elías Cahuich, highlighting again the importance of these elements for successful forest management at the territorial level.

Benustiano Cutz Mex, recording diameter growth.

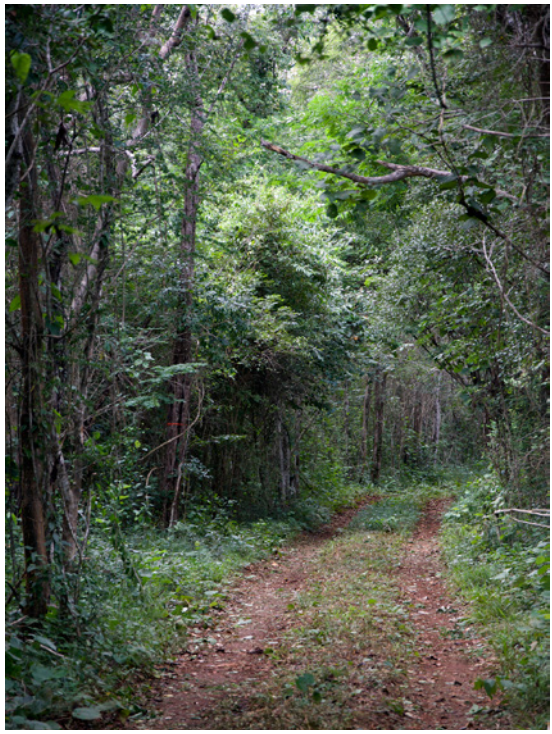
# SUSTAINABLE FORESTRY IN THE EJIDO SAN AGUSTÍN

Organization
**Bioasesores, AC**
Project start year
**management 2009, logging 2013**
Location
**Municipality of Tekax, Yucatan**


## Introduction

In 1965, Mr. Benustiano Cutz Mex arrived to start a new community from the henequen region of the *ejido* Tekantó, in the north-center of the state of Yucatan. Back then, the *ejido* Tekantó was seeking new lands in response to population growth, but there was no more land for a new endowment. It was then that the federal government proposed to deliver 37 thousand hectares of public lands in the Southwest to found a new *ejido* and community. The offer was tempting, a large tract of land the inhabitants of Tekantó needed.

The obstacles were many: it was a distant land, with no roads or services, only lush jungle that few wanted to go to. Despite these conditions, about a hundred people came from Tekantó to establish the *ejido* San Agustín and the community that they called Salvador Alvarado, thought-out to house about six hundred people. However, the environmental conditions were hostile, and soon people started to return to Tekantó until only seven people remained in the community, including Don Benustiano Cutz Mex. Today there are 360 landowners in the records of the National Agrarian Registry, out of which only 29 are living in the



Access to the forestry use area in *ejido* San Agustín.

community; and together with some other neighbors the population registered in Salvador Alvarado is something less than a hundred inhabitants.

## Initial situation

From 1994 onwards, PROCAMPO subsidies fostered a process of clearing the area to incorporate farmland, but in a few years the inspections became more spaced in time and the *ejido* stopped to fell the mountain altogether. Since 2007, Conafor gave support to forestry projects and payments for ecosystem services (PES), partly due to the large expanse of forests, which for several reasons are still preserved.

In those years, Claudio Franco Chulín, who had been visitor from the Attorney General's Agrarian Office and knew the area well, was part of the board of Bioasesores, a civil association that provides technical assistance in natural resource management and community development, among other activities. Mr. Benus-

tiano was president of the *ejido*, and also secretary of Nukuch K'áax, another civil association of agrosilvopastoral producers from various *ejidos* in the area. The conditions were conducive so that in 2006, Bioasesores with the *ejido* San Agustín submitted the first application to Conafor for getting support for forest enterprises. They received support for reforestation, environmental compensation for land use change and PES. In 2009, an application was submitted to develop a plan for sustainable forestry use in the vast expanse of well-preserved forests that characterize these lands today.

In the beginning, the inhabitants of Salvador Alvarado had not understood the implications and the benefits the project had, since in the region there were similar initiatives. A general feeling was that it would be for the benefit of landowners and not for the entire community. Additional to this, the idea of forest conservation had already begun to be part of a common vision in the population, which also began to dream of an ecotourism project. Partly because of lack of knowledge on the activity, the proposal for sustainable use was mistakenly associated with deforestation. Those who believed in the project continued, and a first market study indicated they should ideally start with charcoal production. For this, a secondary growth forest in the boundaries with another *ejido* seemed to meet the requirements they sought.

## Key moments

In November 2011 forest exploitation was authorized after two years of negotiations with Semarnat. However, it was not until 2013 that the environmental impact assessment was finalized and approved, and with it the *ejido* began its forestry operations. During this interval of time and with the support of the "Diversification of logging on the NCPA San Agustín, Tekax" project funded by the Small Grants Program-UNDP, a portable sawmill was acquired and trainings were conducted on measuring trees and their growth rates with minimal impact harvesting, charcoal production, and even on how to apply for grants. Learning exchanges with the Noh Bec (Quintana Roo) and 20 de Noviembre (Campeche) *ejidos* also took place, and materials such as the furnaces for charcoal production were purchased.

Production of coal and furnace in the *ejido* San Agustín.

It took four years to move from the forest inventory to the first sale, which was not charcoal, but tutors (wooden rods of 5 cm in diameter). The sale of the first batch of tutors to the Company Valle del Sur (Municipality of Tekax) is possibly the first major milestone in the project, because it showed the community that it is possible to have economic resources without depleting the forest. This realization made more people in Salvador Alvarado approach the leaders of the project and participate. By allowing anyone in the *ejido* to join including youth, children and grandchildren of *ejido* dwellers, as well as women, this also proved that forestry was not just for landowners. In order to strengthen the process, and to not only make landowners work, the Forest Producers Society of San Agustín, Tekax SPR de RL was created. This society is composed of women, youth and community dwellers, who take decisions at meetings. Moreover, they were continuously present in the areas under management reduced the incidence and pressure from external poachers. Thus, by increasing their ownership of their forest territory and unlocking its value, threats to their resources also decreased.

## Lessons learned

Humberto Gonzalez Parra, technical adviser for Bioasesores AC, says that he has participated in many processes where permission to harvest the forest was obtained; but there was never any use of the resource. As Humberto mentioned, "technicians can make the inventory, but it takes more than an inventory to achieve the sustainable use, much more than that, and in the case of San Agustín it was achieved because there was always follow-up". In San Agustín there was a great effort in training while waiting to have the legal approval and carry out the development; since the technical, social and environmental feasibility existed. Don Benustiano Cutz Mex highlights the importance of training new officials in the county who begin new periods as representatives, as well as the younger generations of the community; and this is something always taken into consideration in San Agustín.

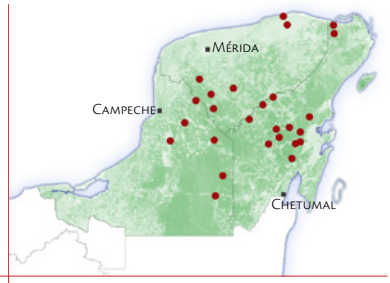
An important lesson is that you must know very well the laws that regulate the activity in order to avoid mistakes. For example, when the environmental impact assessment was drawn up, the presence of Grisons (*Galictis vittata*) was mentioned by mistake. However, the fact is that there is not even evidence of them; but that mistake made the approval more difficult. Semarnat indicated that at least 700 hectares should be excluded as compensation, almost a third of the total land use area (2,254 hectares). Over 1,000 hectares of conservation area that the *ejido* had could not be considered as compensation area because they were located away from the area of forest use. The accepted proposal was to allocate another 700 hectares for conservation adjacent to the area of forest use. Finally, the consequences were unexpectedly positive, and today the 700 hectares have a PES program of matching funds, plus another area that has PES by Conafor.

Don Benustiano Cutz Mex recalls, "once a visitor came and said to us: 'you are rich, you are sitting on a lot of money', and I asked where is it? He replied 'wealth is there, all you have to do is open your eyes'. For me this is a dream that is coming true. We have not reached our final goal and are still improving our forest management, but we are on the right path to doing so and with a solid community to continue along this journey".

Wood saving stoves at home in the Uh-May community, Quintana Roo

# WOOD SAVING STOVES
# TÚUMBEN K'ÓOBEN

Organization
**U'yo'olché, AC**
Project start year
**2006**
Location
**Based in Felipe Carrillo Puerto, Quintana Roo. Action in 35 communities of the Yucatan Peninsula**




## Introduction

The traditional way of cooking in the Mayan communities of the Yucatan Peninsula is placing three stones on the ground as support, the fire is lit in the center and the food is placed over it. This type of cooking, known as K'óoben in Yucatecan Mayan, is used inside the house and the smoke goes rises to create soot that covers the guano palm with which the roof is built, eliminating insects and giving a longer life span to the material. However, it also causes severe respiratory problems especially in women who spend more hours around the kitchen. In this context, the civil association U'yo'olché begins the Túumben K'óoben project, which means "new stove" in Mayan. The aim is to reduce greenhouse gas emissions as well as indoor pollution through wood saving stoves in communities in the Yucatan Peninsula.

Family members have to go to travel often and significant distances into the forest to look for firewood, a resource that is becoming scarce in some communities. With a Túmmben K'óoben stove, finding firewood takes place only every two or three weeks, which also reduces pressure on the resource. Moreover, U'yo'olché developed the stove through a participatory design

Wood saving stoves Túumben K'óoben, Ana Pat Caamal.

process, side by side Mayan women the stove was adapted to meet cultural needs, and has developed a business model that makes this eco-technology affordable to the families.

## Initial situation

The project idea emerged during a workshop on carbon sequestration, in which a researcher native to Michoacan spoke about strategies to fight climate change and showed a picture of wood saving stoves. At the workshop there were people from Felipe Carrillo Puerto *ejido*, and it was them who asked to have one built in their community. The first one was built in a nursery of the *ejido*, and the technology attracted much attention. A first lesson was that the constructed model (Patsari) and the materials used were not suitable for the region. An example of this is the absence of mud in the Yucatan Peninsula, which makes the use of partition walls very expensive. In addition, the model used was not appropriate to the ways of cooking in the tropics, a fact that became an important initial barrier for local technology adoption. Thus, it was decided to develop –in a participatory way– an appropriate wood saving stove for the Yucatan Penin-

Firewood in Mayan area.

sula. To achieve this, workshops were convened with construction workers (builders) and women cooks (users) who were asked to imagine the different components of the stove. With these ideas, prototypes were created, which were then tested by the local participants themselves in order to reach a consensus on the "best" technology. That is how the Túumben K'óoben model was born: with two large griddles to meet cooking needs, and built from the same materials with which the Mayan pyramids were constructed. This mix of local materials (sascab, lime, etc.) allows construction at home and easy repair if damaged. After this stage, U'yo'olché continued with the evaluation and gradual improvement of the Túumben K'óoben stove, in order to further improve the model and adapt it to the conditions of this Mayan region. "In 2006, says Dulce Magaña, project coordinator, we took on the task of revising the stoves that already existed in the region, in order to identify those that were never used, which ones were abandoned and which ones demolished. During the monitoring, 600 stoves were identified as working, some even with 9 years of use. If given maintenance the stove keeps working. But it was important to understand what had happened to the program where the stoves were abandoned".

Home of María Magdalena and Fernando in the Uh-May community.

## Key moments

The first large-scale Túumben K'óoben program was in 2006, and the community of Uh-May was one of the first beneficiaries. "In that program stoves were given out and a large percentage were never used, or were spoiled", says Dulce. "In those years we did not budget for monitoring and stoves were built near the pigsty, outdoors, or in places away from everyday use. These stoves did not work, and we understood that the stove has to be in the kitchen. Some people also leave the stove at an early stage, when they have not yet learned to use it".

Doña María Magdalena, beneficiary of a stove in Uh-May, explains that learning how to use the stove takes time. The first few times it is difficult because the stove is still wet, but the fire itself helps to dry it. "I suffered a lot, says María Magdalena, the tortillas ripped through and I thought I could never cook well, but everything changed after two weeks of use and now I wouldn't change it for anything. My neighbors like it because there it does not emit smoke inside the house as with the traditional three-stone fire". Dulce adds that the problem of smoke in Mayan cooking is an important health issue. María Magdalena points to the ceiling and says, "Just see the guano palm ceiling where my old stove used to

Firewood of rosewood.

emit smoke, it is completely black with soot… just imagine how my lungs might be!" Her husband, Don Fernando, adds: "I used to go for firewood on my tricycle every two or three days, but now the load of a tricycle lasts two to three weeks. Imagine, I only have to ride for 2 km to go for firewood but a lot of people in Carrillo Puerto have to go travel at least 7 km, and as firewood is scarcer sometimes they even have to travel further".

In 2011, U'yo'olché was unable to get additional grants to scale the initiative. However, convinced that the program could not stop, the organization and the leaders of the Túumben K'óoben initiative consolidated a cooperative that brought about major changes. The cooperative works with a revolving fund for materials, construction and maintenance, and the users can pay back with credit facilities. "This allows us to include more beneficiaries, but it is not easy for people who want to pay when elsewhere there are government subsidized programs", says Dulce, "but this was a key moment, the people who build the stoves are really convinced, they own it because they put resources, and since then we have not had any cases of abandoned stoves". The Túumben K'óoben team understands that the economy of the communities is going through many difficulties and the cost

of the stove is relatively high, but when the beneficiaries cannot make their payment they try to get alternative financing.

The inclusion of a local promoter was also instrumental in the project. A promoter is a woman leader of the community that monitors, motivates, organizes events, explains how her health has improved and shows her stove to whoever wants to learn. It is the case of Mrs. Ana Pat Caamal, promoter in Felipe Carrillo Puerto, who has for the last nine years opened her kitchen to those who want to see her stove and know about her experience. "One of the first things that I say, says Mrs. Ana, is that before this stove I lived with influenza and respiratory problems, and today I have no memories of being sick".

## Lessons learned

"Anything that is gifted t is not well valued, that is why our new microcredit program has worked", says Dulce. "We have created a microcredit system in which the people who really want the stove participate, people who will value and use it. The microloans are paid with very low interests, and other incentives are included; for example, solar cookers are given to those who pay within six months, which has worked very well."

Stoves that were not used from the beginning were not built in the right place or with the right materials, and there was no training or monitoring. "Before Túumben K'óoben we did not follow up the way we do now, and it is necessary to spend some time teaching users how to use the stove". Dulce explains that the stove now comes with a visual manual and user training at the time of delivery. The challenge remains on how to pay monitoring, ongoing training and maintenance. "For these purposes the revolving funds implemented by the cooperative are not enough. We still need to seek co-financing, such as this year, when we entered a certification program for carbon credits through avoided emissions with the wood saving stoves".

Dulce also explains that key enabling factors include spending time with the people in their communities, understanding their needs and making changes to the stove to adapt it to the cultural environment. For example, a lot of people living in the Yucatan Peninsula have come from Tabasco, Campeche and Veracruz,

and traditionally cook standing up, but the Mayan people cook on benches almost at ground level. "This seems like a trivial detail but it is really important, says Dulce, because at first all cooking stoves were designed for cooking standing up; we did not know that would mean a big cultural change. Today we offer the possibility of making an oven at ground level, it is optional".

Something similar happened with the fact that the stove eliminates the smoke inside the house, which provides food preservation benefits. In the Mayan region refrigerators are not used, and it is very common for people to hang a basket above the kitchen, and place there tortillas, pepper, seeds, and sometimes a slice of pork over the stove and smoke the products in order to conserve them for a few months. The project team had to think around this and came up with a solution: cooks have the option of removing the griddle for smoking within the house. If the cook will be in the kitchen, she can place the griddle and the smoke will go up the chimney, but if she leaves she can leave the stove on with an open griddle for smoking.

Dulce says that she is very happy with the results of the project and what she has learned. "A stove involves other important issues such as family environment, empowerment of women, happiness, among other things. How do you measure happiness? A family changes their life with a stove, and the best indicator that the project works is when we come to the houses and see that people are happy to share their experience."

The project continues to evolve to include innovations. For example, although the benefits of the technology are known in detail at the household level, little is known about the impact on the forested area, the environment, and climate change. In the Yucatan Peninsula, firewood remains the main source of energy in rural communities, and there are signs of water scarcity in some regions with heavy deforestation or major demographic pressure. The Túumben K'óoben team has partnered with scientists from UNAM to investigate the issue of wood extraction, and model scenarios for future resource availability. With the results, the team hopes to propose public policy changes, with a focus on avoided degradation, but also to allow communities achieve energy security. In addition, the team aims to complement the installation of wood stoves with local and adapted strategies for resource management, such as management of t'olche' or reforestation with wood energy species.

# Forest landscape restoration

*Pteridium aquilinum* fern.

# FOREST RESTORATION IN AREAS INVADED BY THE *Pteridium aquilinum* FERN

Organization
**El Machich SPR de RL**
Project start year
**2000**
Location
***Ejido* Laguna Om, Poblado Nicolás Bravo, Municipality of Othón P. Blanco, Quintana Roo**


## Introduction

*Pteridium aquilinum* (L.) Kuhn, (fern, cilantrillo, crespillo, warkan, xtok' xiw) is a fern with worldwide distribution that has developed an amazing ability to survive, because once it colonizes a pasture or agricultural area it is very difficult to eradicate, the soil practically becomes unusable and producers end up leaving the area. The solution to this problem has been, from the beginning, one of the concerns of the society of producers called El Machich. This association was formed in 2002 by thirteen *ejido* dwellers from the Laguna Om *ejido* which focuses on forestry, agroforestry and beekeeping. The group leader is Pedro A. Macario Mendoza, *ejido* dweller and researcher at El Colegio de la Frontera Sur (Ecosur), with ample experience in the ecological study of the stages of forest succession. Among the plots at "El Machich", Macario conducts research on secondary growth, management of *acahuales*, enrichment of the forest, and certainly forest restoration in areas invaded by the fern, a field of study in which he has become an authority.

Pedro Macario with the fern *Pteridium aquilinum.*

## Initial situation

"In 1992, says Macario while he walks through a forest that appears to be a few decades old, this was one deforested hectare. We started to make enrichment of *acahuales* with mahogany and cedar trees and today they already have buttresses and an average of 30 cm in diameter… it is amazing how they have grown!". "Enrichment, he explains, is necessary so that management of secondary forest is economically viable, because a cubic meter of any kind of wood, be it tzalam, chacah, etc., other than mahogany, cedar or ciricote is currently sold at the local market at 1,600 pesos; while the total cost to extract the cubic meter is 1,500 pesos. If we enrich with mahogany or cedar the panorama changes, because the cubic meter of this species has a current price of 5,000 pesos with the same extraction cost of 1,500 pesos. "*Acahual* enrichment is not a plantation where there is only one species, yet it is about planting species of value in the forest with natural growth". In this way, and while showing his plots of 15, 21 and 29 years of secondary growth, Macario explains the beginnings of his research on enrichment and diameter growth in *acahuales*.

Monitoring growth rate in restoration program.

A few meters ahead on the path, Macario stops his truck and says: "this jungle in 2000 was only ferns, here I started my tests with the fern, you can see the change that occurred in 15 years. Besides fighting the fern, in this plot they did *acahual* management and reforestation with cedar and mahogany. We have another plot in the fifth year of restoration, and another that serves as witness. This is a forest island surrounded by 200 hectares of bracken, all of which were once *milpas* or pasture and are now in various stages of restoration (40, 29, 21, 15 and 5 years)".

Later Macario shows a remnant forest of 50 years, and marks a zapote (*Manilkara zapota*) of over 100 years, a survivor of the logging that took place in the 70s. "This is a sign of what this area of forest is to become", explains with the passion of a great teacher. "This remnant islet trees are over 50 years with jobo (*Spondias mombin*), zapote (*Manilkara zapota*), copal (*Protium copal*) and palms such as guano kum (*Cryosophila argentea*) that are typical of the rainforest". Macario argues that these 200 hectares, in accordance with "El Machich", are intended to show other peers in the *ejido* and whoever is interested, that restoration is possible and only requires will, advice and a few pesos, of course.

Area invaded by *Pteridium aquilinum* at a landscape level.

## Key moments

It could be said that the key moment is when, after 15 years of having started with the treatments, we see that the restoration has worked out and the fern has been controlled. "This plot has already been five years without burning (witness plot)", says Macario while lifting a biomass mattress from the soil made of dry ferns. "And this one also has another five years without burning (plot with treatment), with not so much combustible materials and grasses already beginning to dominate". The dry biomass is very flammable, but the fern has underground rhizomes which do not die with fires, and within weeks it sprouts again. That is their strategy to dominate the space, everything else dies but the fern. "There is only one thing that inhibits the growth of ferns, and that is shade. So if the vegetation grows, the fern stops growing; it does not disappear, but it ceases to invade. The problem is that the forest takes too long to grow and the ferns are burnt frequently, that's why they dominate if there is no treatment or intervention".

The question is how to accelerate the succession process without the fern winning? "In the literature you can find some control methods that have been tested, but none of them mentioned the

Area invaded by *Pteridium aquilinum*.

slashing which is what we propose", Macario said. "The problem with the classical methods of control is that they all assume that after fighting the fern agriculture will come; that is, a change of use that includes restoration, and that is why they mention the plow and harrow to expose the rhizomes to the open air, or roller to crush the fern… others mention herbicides, but this is not good if we want to allow the vegetation to regenerate again".

The treatment proposed by Macario are constant slashing, and for evaluation he has plots with different treatments: slashing every month, every two months, every three months and certainly a witness without any slashing. "The one that works best is the monthly one, because three months is a long period and the fern recovers again and behaves almost the same as the control (untreated area). But of course, the cost of labor is higher". Macario has also studied the cost of restoration, which is 22,000 pesos per hectare for a period of 10 years from the year of initiation. The largest investment is in the first year with slashing every 15 days for 3 months, and every 30 days during the next 9 months. From the second to fifth year the intensity of the treatment decreases slightly, and from the fifth to tenth is only looking out that no burning takes place in the dry months.

"This other forested area has 15 years of treatment, he explains, and some ferns are still seen, dimmed as a rhizome, but it does not disappear. This lot went from fern to *acahual*, and is now a secondary forest enriched with cedar and mahogany". It is amazing that when starting the treatment, the *acahual* begins to grow with over 40 tree species that colonize it. That means that the fire does not kill their seeds and their vegetative parts, but rather the fern does not let them grow. We believe that these species already have "adjusted" to the incidence of fire. "Today we can say that we have a clear control method for the fern *Pteridium*", Macario explains.

"Regardless of the investigation, says Macario, what we are looking for is how to finance new areas of restoration. Right now we are watching over 50 hectares with 5 years of treatment, so now an annual treatment is needed; but this step is critical because if it is abandoned, the fern will invade again, it is not yet sufficiently covered by shadow". Macario with pride and passion tells that "he saw this restored area (with 5 years of treatment) when it was a fern field almost 50 years ago, and often dreamed of restoring it. Now I see my dream come true, of course with the support of my colleagues in El Machich, the National Forestry Commission, the National Council of Science and Technology and Ecosur; we all contributed with will, advice and various pesos. The mission is still not accomplished, we need to continue for 10 years and then start another long way for the use or management of the area... that is the lesson that follows".

## Lessons learned

"Legally there is no difference between a mature forest, with great forestry potential, and an *acahual*. This creates a perverse incentive, says Macario, because the use of an *acahual* is not as profitable as a well-managed forest. However, since a 10-year *acahual* is a forest according to law, inventory and management plans are needed, and they are very expensive". Given this scenario, the most common choice among producers is to fell and make *milpa* or pasture. "In Calakmul, he explains, we are doing a technical study on *acahual* management, and next to that we are working with specialists to propose an amendment to the

forest law". The will to make a change is there, what is difficult is to define what an *acahual* is and at what point it ceases to be that and is considered a forest. This change could make a big difference in land use, because if you could reduce the cost of managing the *acahual*, in the third year farmers could make a profit and would have an incentive to begin to recover or restore the forest. If so, the restoration of degraded forest areas would become economically viable.

Agroforestry system in El Limonar. Coconut and corn.

# AGROFORESTRY MODULES AND ECOLOGICAL RESTORATION IN EL ZAPOTAL RESERVE

Organization
**Pronatura Península de Yucatán, AC**
Project start year
**2002**
Location
**Municipality Tizimín, Yucatan**


## Introduction

In 2002, with support from TNC and the North American Wetlands Conservation Act (NAWCA), Pronatura purchased 2,358 hectares of forest in the municipality of Tizimín, with the main goal of conserving an important habitat for birds and alleviating pressure on the agricultural frontier adjacent to the Biosphere Reserve Ria Lagartos. In 2006 the El Zapotal Reserve was registered through Conanp as a voluntary conservation area for perpetuity. Over time, Pronatura has been adding more land to El Zapotal, which currently has an area of 4,100 hectares in four sections.

Pronatura has also developed academic research activities, including studies of flora in collaborationwith CICY, bird monitoring, and study of the jaguar population with the Institute of Ecology of UNAM. The analyzed surface was not limited to the polygon of the reserve, but covered some 52,000 hectares in conjunction with neighboring *ejidos*. Pronatura is the provider of technical services for several *ejidos* in the area of influence on issues such as PES, reforestation, sustainable rural development and forest fire prevention.

Agroforestry system in El Limonar.

From the year 2013, together with Conafor, Pronatura started a restoration project of the forest landscape in the reserve, and in the context of the REDD+ initiative it incorporated an agroforestry project in the *ejido* El Limonar, adjacent to the reserve. Together, these activities aim to restore the original landscape within the reserve and promote productive management with the incorporation of trees in the buffer zone outside the polygon of the reserve.

## Initial situation

Leyla Ucán Dzul, president of the *ejido* El Limonar, community adjacent to the reserve, tells that their parents and grandparents worked the land for two years, then the ground began to produce less and they went on to other lands, and then they had to cut down the forest. Because the area around El Limonar had suffered a fire shortly before Leyla came to this land, she began her *milpa* in a new way: an agroforestry system that until now has not stopped producing. When visiting her fields it is possible to see lines of maize and beans interspersed with coconut palms, lemon, orange trees and forest species such as ramón, huaxín, ciricote, tzalam and chacah. "Eventually we'll have to adapt other crops", says Daniel Jiménez, head of the restoration and sus-

Gene bank in El Zapotal reserve.

tainable rural development program at Pronatura, "as the trees grow and probably the maize will not have the same yields due to shading". By then, citrus will be in full production, the huaxín will be good for cutting and livestock feed, the ramón will have lots of timber and non-timber uses, and the chacah hedges could be used as tutors for pitahaya. These resources combined can provide a profitable system, and El Limonar is already a success in agroforestry.

A few meters from the village of El Limonar it is possible to see a secondary forest of about 20 years, and pushing through the mountain it is possible to enter the area of El Zapotal reserve. Once inside, it is hard to imagine that the landscape was a cattle pasture about 10 years ago. Today it is a secondary forest that has had a quick recovery thanks to the intervention of the program with fire-cutting gaps, reforestation and management of *acahuales*. Thus, the restoration within the reserve, and the implementation of agroforestry systems in its area of influence, starts to move towards recovery of a landscape as close to the original as possible.

## Key moments

Early in the process of reforestation in 2008, the plants did not have good survival rates. It was considered to be due to the drought that year; and also because the trees were provided from the Conafor germplasm nurseries, which were not well-suited to the area. Support for a network of community nurseries was proposed, and once the work with local nurseries began, successful seedling survival increased. The work of the nurseries is strengthened inside El Zapotal with a collection of live plants from the gene bank with a hundred native species of traditional, cultural and timber importance, whose funds were provided by CICY and UNDP. An important moment of the restoration project was in 2013, when it gained access to the PES program in the *ejidos* where there was Conafor presence, as this allowed to cover operating costs, increased surveillance of planted trees, fencing of areas that may be susceptible to livestock grazing, opening of fire-cutting gaps and biological monitoring.

Another important project in the restoration area is the management of *acahuales* with productive reforestation. This project began in December 2014, as part of the REDD+ vision, in order to accelerate the process of ecological succession in 10 hectares of secondary forest. Considering all the components of the restoration program within the reserve and neighboring *ejidos*, already 1,800 hectares have been planted with around two million trees.

## Lessons learned

"The most useful aspect of the project, said Daniel Jiménez, is probably the change in the vision of the people who live here, and that is because we are looking towards a productive restoration that aims at benefitting local producers. Before working on these issues there was no awareness about the importance of conservation. Suddenly producers became interested in PES programs, and the change truly began".

Malaquías May Balam is operating assistant of the restoration and sustainable rural development program, and according to his perception producers are very satisfied with the restoration, they can see the results because many wild animals have returned, and economically they are having better results with beekeep-

ing. For Daniel, hiring Malaquías was key because he is from the region and speaks Mayan, which has facilitated communication between Pronatura and local communities.

"As an idealistic biologist, Daniel recalls, one wants the animals preserved and that the forest is as it should be, but it is very difficult to tell people not to cut the forest if their soil is not productive. It is essential to provide productive alternatives, both for self-consumption and marketing, and it becomes essential when you think about the sustainability of the project. If the project lacks funding, productive activities must continue". According to Daniel, in 2014 the agroforestry system was implemented in El Limonar and had a yield of 6 tons of maize; this year it is expected that citrus fruits like lemons and oranges will have produce in order to continue using the area.

Isaías Cupul Dzul, dweller of *ejido* El Limonar and agroforestry module project beneficiary, says that "when we work we are always with the view that it is something that benefits us, but it is also a hope for the future. That's what gives us the courage to work, not just seeing it right now, but looking beyond".

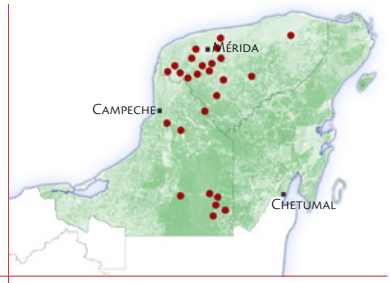
Also, in the context of the Network of Private and Social Reserves of the Yucatan Peninsula, one of the core initiatives of the Itzincab Alliance, the El Zapotal Reserve poses a successful model of forest restoration in an area for perpetual conservation, accompanied by a strategy of improved production practices in the *ejidos* of the area of influence of the reserve. This "dual strategy" of impact is critical to ensure proper land management in the area, as well as the sustainability of conservation actions and production; not to mention that the involvement of neighboring populations to the reserves increases the sense of identity, appropriation and culture of caring in the area.

# Community productive projects

Shop at Casa Montejo, Mérida.

# INTEGRAL COMMUNITY DEVELOPMENT PROGRAM

Organization
**Fundación Haciendas del Mundo Maya**
Project start year
**2002**
Location
**Yucatan and Campeche**




## Introduction

Las Haciendas, a group of hotels operated by Starwood Hotels and Resorts under the Luxury Collection brand, is a sustainable tourism model that started in the 90's from the vision of a Mexican business group denominated Paralelo 19. The proposal contemplates the creation of a successful business endeavor that triggers a local economic and social activation, with the solid intention of improving living standards and the quality of life of rural Mayan communities around the Yucatan Peninsula. Among its main guidelines of operation is the employment of local staff, and as a result more than 90% of the jobs generated by Las Haciendas are in the hands of the inhabitants from the communities where they are located. Furthermore, with the intention of activating local economies, the hotels source 89% of their demands from local suppliers.

Fundación Haciendas del Mundo Maya (FHMM) is an essential part of this business model: their role is to promote de development of self-managing community-based enterprises that are self-sustaining within five to seven years. Its vision is to get to know and understand in order to transform, and the program

Henequen workshop.

has four strategic areas (health and nutrition, education, social enterprises, housing and infrastructure), and two cross-cutting themes (human development and natural resources).

## Initial situation

With Hurricane Isidore in 2002 the conditions in communities worsened, and an impact assessment indicated that the first step should be focused towards the rehabilitation of housing respecting the original typology of Mayan housing. In this context, a process of fundraising began at a national level with the commitment from the business group, and FHMM was created for implementing the proceeds. With this project, safe housing for 2,357 families was provided in Yucatan, and community centers were built to benefit 56 communities in eight municipalities of Campeche through processes of community organization and participation. And so begins the first phase that lasted two and a half years in 23 communities. It was a success to which new targets were added and became an integral community development program, which twelve years later is still expanding.

Henequen styling tool .

## Key moments

When the first housing campaign successfully concluded, people in the community asked technicians and managers of the foundation: "now what's next?" An important social capital had already been built in and out of the communities, and it was necessary to define new goals. The question echoed in the hallways, and the answer came fast. In 2003, through an agreement with the Ministry of Rural Development and Fisheries of the State of Yucatan, the opportunity opened to support productive enterprises for women. Given that the group of haciendas already had experience in promoting crafts workshops, this was the profile of the first projects in eight communities. The program was conceived as a way to rescue crafting techniques that had been eroded in the age of henequen. To accomplish this, great craftsmen and women still found in the region were hired to train the local communities in crafts such as in the use of bark for dying, embroidery, silver filigree, weaving hammocks and jipi japa (hat made from palm leaves), among other crafts; always seeking high quality products. Thus, the projects that began in this next fase of work all based themselves on Mayan tradicional knowledge and techniques.

Mrs. Damiana Chan reaping in her garden.

In 2004, the Spa project started in five haciendas located in Yucatan and Campeche to give service to hotels, and in 2008 it became the first fully self-managed cooperative. In 2005, the craft workshops project was the subject of a thorough analysis where its scope and initial objectives were rethought. Following this it was decided that, in order to be sustainable as generators of local revenue, they should move from creating workshops and craftswomen to creating enterprises and entrepreneurs. In 2007, through a local cooperative, the Izamal Training and Cultural Center was created in the community of the same name. The center has a museum of folk art, with works from great masters of the country, which is run by people from the community, and this space has generated a momentum for youth training in topics related to the hotel industry at the highest international level.

All these cooperatives started with exclusive contracts on haciendas, because it was a time when demand exceeded production capacity, and moreover one of the great challenges in productive enterprises is marketing. In 2008 it was considered that the best scenario would be to create a craft retailer, so the program was reformulated and the Rural Enterprises Seedbed was created with two brands that represent the crafts cooperatives working

with FHMM: Taller Maya for crafts, and Traspatio Maya for food.

The salt project at Celestún is one of the most illustrative examples that opportunities exist everywhere. Carola Diez, director of the foundation, said: "In 2011 we visited the salt pan of Celestún, and the workers indicated an area that we could not visit, because the salt there was spoiled, it was pink. We know that pink salt has higher value in the international market, but we could not generate only one brand of salt to supply an entire market chain. We hired a food engineer and created three types of gourmet salt: pink, fleur de sel and salt foam. This is the project that generated most revenues since the first year".

The program currently has 19 social enterprises, including four self-managed ones, in which there are 179 craftswomen cooperative members (98% women), and about 150 more artisans who work in production for these companies. They are women that had a rate of 80% illiteracy, and today are billing electronically, doing online banking, and have clients in other countries that they contact via internet. Other important components of the program are libraries, the rescue of traditional Mayan medicine with its botanical garden and professional support, backyard orchards, the dejection of infant mortality, the eradication of open air defecation, sanitation campaigns and aquifer protection, strategic reforestation actions and waste management programs.

## Lessons learned

Initially the foundation supported the establishment of craft workshops, but as it progressed, this scheme turned out not to be a viable strategy for poverty mitigation and access to more development opportunities. This was mainly because the craft activity is typically influenced by a multitude of factors that impede the artisan to access a fair payment for his work. Speculation of these various factors made it very difficult for the crafts from these communities to compete on price against other products made in series by no craftsmanship, of lower quality and directed to a mass market.

Therefore, the FHMM team decided to refocus the artisan workshops project addressing the expectation of artisan groups to strengthen the frequency and volume of the revenues generated and transform them into social enterprises. This brought the

design and implementation of a training program that included administrative, accounting, financial, organizational and commercial development aspects. With the creation of the brand Taller Maya, a strengthening of the business identity and branding of the products was achieved, enabling them to reach new markets with their own distribution centers in buildings of great heritage value in Izamal, Mérida and Campeche.

With the experience of the Spa initiative a great learning was generated. When the cooperative was created, the earnings of women were considerable, and this brought with it a crisis in the community and in its families because of gender issues. It was understood to be a potential conflict, and with the group of salt producers the same could happen. In order to benefit the largest possible number of people with opportunities of a fair income, a corporation was created to reinvest all profits into new social enterprises. With that corporation a partnership with a group of twelve women who process salt was created, and the distributor is responsible for placing it on the market.

Another great learning was to invest on people. Operating Las Haciendas through Starwood under the Luxury Collection brand was a great challenge given that its business model is aimed at a high class audience that is looking for an experience in culturally rich areas in the world. Enabling hotels and employing the local population in them, led to people who perhaps had never used sheets, beds, linens, among other things, to have to prepare a room carefully or serve a table. Therefore, it was very important for the business group to integrate the figure of the resident manager who lives on the estate, who knows, accompanies and models the service of each employee. The key in the foundation was to maintain a strong and clear commitment that would go beyond the formal job. "The result is clear, Carola Diez mentioned, the estates were always among the top ten experiences of business hotels in the world, and we must be aware that the brand has hotels in castles in Europe and in the most exotic seas. In 2013, Santa Rosa de Lima was chosen as the best global experience, the number one, and that for us is an incredible achievement", she says proudly.

In the words of Carola: "What promotes human development is the individual growth to foster a shared vision of the future,

Tortilleros from artisan workshops.

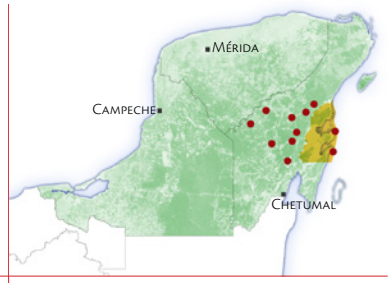
participation and organization. We aim to promote human development in each and every one of the people we work with; to find the expression of growth that people perceive for themselves, the surprise they feel when they see that they can express themselves and that their expression has value; that as people they have value. I think that is the expression we have seen in the communities and that gives value to our work."

The achievements of creating self-managed social enterprises with high local training are a sign that the human development approach is successful if sustainable development of resources is to be achieved in the mid and long term. From this point of view, investing in human resources and in strengthening the social fabric of communities is the basis for strengthening the livelihoods from which communities are dependent on. From there it is viable to move towards an upward spiral in strengthening other components of their livelihood, such as financial and natural capital. In the case of the communities with which FHMM works, the first step of livelihoods' strengthening has already been achieved; and sustainable rural development is a fundamental starting point when thinking about conservation strategies in the Mayan Forest where these communities live.

Ak Kuxtal wooden crafts.

# MAYA KA'AN ECOTOURISM DESTINATION AND PRODUCTIVE PROJECTS IN THE MAYAN AREA

Organization
**Amigos de Sian Ka'an, AC**
Project start year
**2014**
Location
**Quintana Roo with emphasis on the Sian Ka'an Biosphere Reserve's area of influence**




## Introduction

Amigos de Sian Ka'an has worked since 1986 for the conservation and sustainable development of the Yucatan Peninsula, with a focus on Quintana Roo. Since its foundation, Amigos de Sian Ka'an considered it necessary to first address the needs of income of the Mayan communities in the State if they wanted to continue working on conservation issues. After several years of working with community groups, in 2005 a diagnosis of the producer groups was carried out, specifically on the type and quality of available products and the level of organization in communities. Crafts with rattan, embroidery, seeds, wood and honey were some of the products that could be found in the communities, but there were two weaknesses: product quality and marketing.

With resources from an award given by the Whitley Fund for Nature Foundation, Amigos de Sian Ka'an began to implement a comprehensive strategy in the area of influence of the Biosphere Reserve for marketing the community's products in the Mayan area. In 2009, with support from the Multilateral Investment Fund of the Inter-American Development Bank (IDB), the proj-

Sijil Noh Ha, ecotouristic destination in the Quintana Roo Mayan area.

ect became part of a larger proposal: to create a new destination that integrated local ecotourism operators and production projects already initiated, under a regional scheme of promotion, marketing and sustainable development. In 2014, under the Tianguis Turístico México, the destination was formally presented as Maya Ka'an to the international community.

## Initial situation

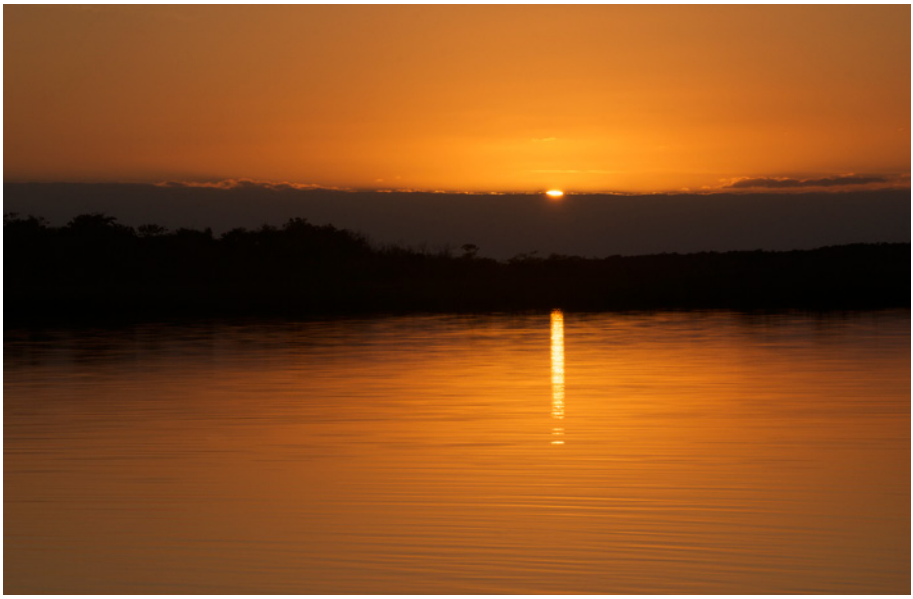
In the year 2000, Amigos de Sian Ka'an increased its efforts to promote the integration of productive workgroups in the communities, and the need to advance in an organizational process to coordinate the activities became evident. According to Basilio Velázquez Chi, then office coordinator in Felipe Carrillo Puerto, artisans were individually going to hotels to sell their products, which of course meant a limitation in marketing. In 2005 a regional marketing strategy was initiated as a response, which had six stages: diagnosis, strategy design, training, strengthening of productive groups, environmental education and exchange of experiences, and finally marketing.


Pitahí.

In 2009, Amigos de Sian Ka'an and U'yo'olché, together with the artisans, created Mayak'ab (Mayan Hands) cooperative, a platform dedicated to promote local brands exclusively on the market. Its function is to create product catalogs, be the link with customers, answer emails and phone calls, receive and coordinate purchase orders, manage bank accounts and billings.

One of the most emblematic projects is Ulu'umil beh (Soil from the path), a group of women form the Chumpón community that was established in 2006 to produce dragon fruit, papaya and pineapple jams under the Pitahí brand. The group began meeting in 2005 with seventeen women, but the first steps encountered many obstacles, and the group was reduced to eight people. With the support of Amigos de Sian Ka'an and other organizations they were able to buy more equipment for the bottling plant and expand its sales channels, which are strong nowadays. Another local brand that integrated into the cooperative is Ak Kuxtal, mainly with wooden crafts and products from the Melitzaak hive.

In those years, the Amigos de Sian Ka'an team was thinking of giving a new momentum to the region so that communities could benefit from the high ecotourism potential they have. With

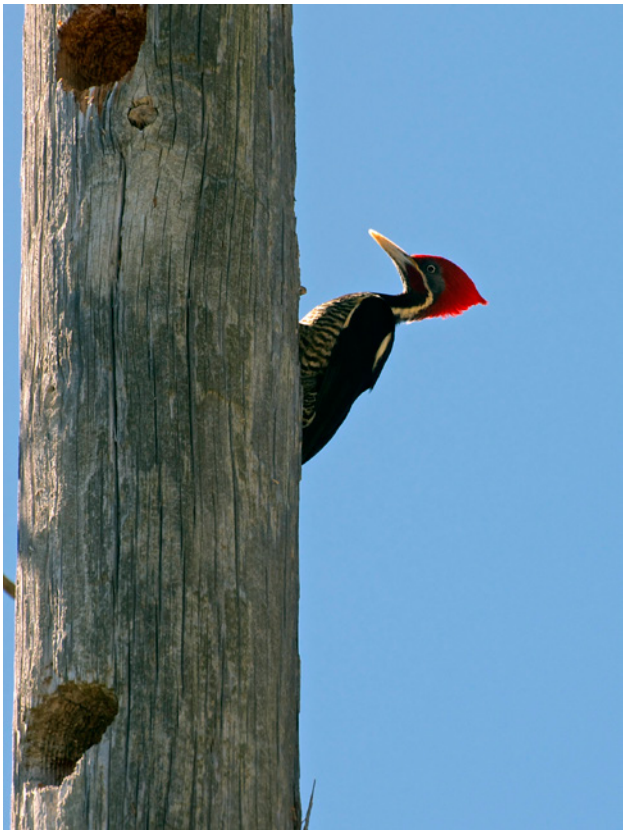


Sunset at Sijil Noh Ha.

the support of UNESCO through TNC, a trip to Costa Rica was organized with businessmen and landowners of Felipe Carrillo Puerto to get to know the example of a country that managed to make ecotourism an international attraction and a tool for conservation and development. This led to the dream of being able to locate the area of influence of the Sian Ka'an Biosphere Reserve in the stage of the great ecotourism destinations worldwide, and the dream began to take shape in 2009 with support from the IDB Multilateral Investment Fund. The project called "Diversification of the touristic offer in the Mayan Riviera based on the sustainable use of the attractions of the Sian Ka'an Biosphere Reserve" had included in this initiative, as one of its main objectives, the communities of the region.

## Key moments

In the 90s, Amigos de Sian Ka'an created a boat tour through the canals of Muyil to raise money. Over the years, the Chunyaxché community saw the benefits of the project and requested permission from the authorities to perform the ride commercially themselves. Amigos de Sian Ka'an and others supported them in



Lineated woodpecker, *Dryocopus lineatus.*

training, access to finance, business strengthening, among other aspects, and in 2000 the complete eco-touristic space is given to the Chunyaxché and Punta Allen communities.

Since 2009, they managed to give a boost to ecotourism operated by communities themselves inside and outside the Reserve through a regional strategy for development and sustainable tourism. Vicente Ferreyra, then Sustainable Tourism Director of Amigos de Sian Ka'an, explains that the project to create a tourist destination under the Maya Ka'an brand is an important component in training, local empowerment and teamwork; while it emphasizes the design of tools for the promotion and marketing of seventeen tourist centers that they are currently supporting.

"One of the most important milestones, Vicente mentions, has been the establishment in 2013 of the Consultative Council as an advisory and consultative body. This allowed access to new finan-

cial incentives for agencies interested in supporting the proposal, and also led to the official launch of the Maya Ka'an brand in the 2014 Tianguis Turístico México, the largest fair in the country in this sector, and this marked one second important milestone".

Another key moment was the link with the Department of Tourism of the Secretariat of Environment and Natural Resources (Semarnat), which funded the diagnosis of twelve companies in the area for getting the NMX-133 certification for ecotourism. In 2014, seven companies in the region were certified, thus ensuring sustainability in their operations. Moreover, Maya Ka'an has its own sustainability criteria to be met by those who adhere to the brand. It is an innovative tourism model that seeks to reduce the pressure for development in Sian Ka'an while generating development opportunities for Mayan communities in the surroundings, based on the natural and cultural wealth they have.

## Lessons learned

Basilio Velázquez Chi said that in the beginning the idea was to open sales channels for products and that community groups followed the process, but it is difficult to tie the trading system to community life, the pace of life is different. "Keep in mind that many producers rely on a phone booth and a messenger, or at best they access email once a week". For this purpose it was essential to create the marketer, which is responsible for receiving the orders, and studying what is the quality of the product that the market requires. "Moreover," says José Gaspar, Commercial Manager of the Mayak'ab cooperative, "often the client needs a product with immediate delivery, and the craftsman takes time to get the parts. The cooperative reconciles this situation having a stock to supply in a timely manner."

Doña Homobona Borges Dzul, president of the Ulu'umil beh group of women producers, says that at first there were many steps, time, money and many meetings without receiving any income, which discouraged some women who had been there from the beginning. Also "some of us decided to continue without incomes, and today we have the reward of having a job in our community and be with our families." This initiative has given Mayan women the courage to face gender issues and the free-


Homobona Borges Dzul.

dom of having their own money. The change was very important, Doña Homobona says, "We have learned a lot and we like to support other groups. This consolidated work is never going to end; it will end when the world ends. Our grandchildren will see this company through the years", she says confidently.

"As for ecotourism projects, Vicente Ferreyra says, communities are very good at giving field tours and telling local experiences, but they need to strengthen the commercial aspect. The purpose is to create an ecotourism network that in four years will operate the destination, that is to say, as Mayak'ab is in charge of marketing productive projects, the idea is that an Ecotourism Network will become the vendor of the Maya Ka'an ecotourism destination, and that communities become independent. For example, Muyil is a success story in which the community realized that they could be economically sustainable and provide a quality service. One of the main challenges is to let the communities know that they are entrepreneurs, and they need to have the tools to make projects viable." Gonzalo Merediz adds that the success of this network and Maya Ka'an in general, will be based on an independent body to manage the destination and monitor their sustainability and good use of their brand.

Braiding of the henequén fiber at Señor, Quintana Roo.

According to Damián Gómez Xool, president of the Community Tourism Network of the Mayan Region, the most useful thing for communities is to have come out of the bubble, and become known at a national and international level with the launch of Maya Ka'an in the Tianguis Turístico México. To talk about ecotourism in a community is difficult, Damián accounts, "it is a task that we must constantly work on." "At first people are very jealous of their traditions, but they must be given time, and then communities begin to share their knowledge, tales, legends and stories. To grow as an entrepreneur is a new experience; it is about sustainable rural ecotourism".

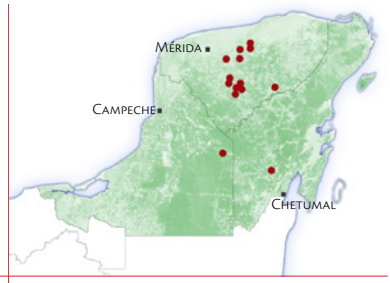
The success of the Amigos de Sian Ka'an's productive and touristic strategies is based on not being isolated, but being an integral part of an institutional vision that encompasses the decree of and support to the management of protected areas, promotion of a network of private and social reserves, the creation of a payment mechanism for environmental services, promotion of wastewater treatment technologies, design of ecological planning programs, scientific research of natural resources and environmental education. Since the Reserve's decree there are voices in the region expressing the view that the reserve is an obstacle

to local development. "With Mayak'ab and Maya Ka'an we will demonstrate that the nature and culture of the Mayan area, and the presence of a World Heritage site, are the engines of a new model of development and environmental conservation," concludes Merediz.

Beehive. Photo: Juan Ocaranza, Educe Cooperative.

# EDUCE COOPERATIVE, A LOCAL HONEY IN THE INTERNATIONAL MARKET

Organization
**Educe, Sociedad Cooperativa de RL**
Project start year
**1997**
Location
**Quintana Roo, Yucatan and Campeche**




## Introduction

Educe Cooperative is an initiative that arises from the Educe AC civil association. The association began its work in 1989 with the youth of Hopelchen, Campeche; and one of the first initiatives was to promote beekeeping and honey production as an option to improve the quality of life in the communities. This initiative was well received and funds for training and technical assistance were obtained, so over the years they managed to produce high quality organic honey. This was the result of the effort and dedication of a committed group, but the last obstacle had to be eluded: marketing. The honey was sold to middlemen, and the difference in quality that the producer group was able to offer was not financially compensated. The response was immediate, and a group of partners from the civil association suggested the idea of seeking a proper marketing mechanism in the form of a cooperative. Thus Educe-Coop was born, which now exports 98% of the production of its partners and associates directly to Europe, being able to meet the highest standards of marketing with certified organic and fair trade honey. Its greatest achievement has been to provide ongoing training, technical and sales support, and creating marketing opportunities.

## Initial situation

Initially the cooperative started working with some groups of producers in southern Quintana Roo and Campeche. The main objective was to shorten the value chain so that a greater percentage of the final price would fall into the producer's hands. Until that time honey was sold to a middleman, who usually sells at a small gathering center, which in turn sells to a higher collection center that then sells it to an exporter. Juan Ocaranza, project coordinator of Educe-Coop, mentions that the first direct exports were made in 1998, mainly through the efforts of Miguel Ángel Munguía, director of the cooperative. However, so far the delivery volumes were not large enough to have a real impact on price formation and reducing operating costs.

## Key moments

"The first key moment, Juan Ocaranza explains, was around the year 2000 when Educe-Coop initiated a learning process on technical assistance, marketing and negotiation with clients, a period that was necessary if one considers that the goal was to place the product with organic and fair trade certification, which was achieved". In the first stage the main limitation was the time required for the learning process, and there was a stabilization period in which the handled volumes did not allow to lower the costs. In 2010, with all the success that had been achieved and with consolidated trade relations, the cooperative members felt it was time to grow so as to have a greater role in the honey market. Moreover, the headquarters of the cooperative are located in the Yucatan state, and the groups of producers were in Quintana Roo and Campeche. It was time to start promotion work to include producers of Yucatan. They began by organizing meetings to explain the Educe-Coop proposal, attended by up to one hundred producers. However, Juan explains, most beekeepers are discouraged to hear that the cooperative does not bring in money, and that it is an organization of peer-to-peer workers seeking organic certification, fair prices and a scheme where everyone wins.

The result was that those who were really willing to make joint efforts remained, ie. between ten and twenty producers in each


Honey harvest. Photo: Juan Ocaranza, Educe Cooperative.

of the thirteen communities of Yucatan. In order to receive financial support, in 2011 the groups were established in thirteen cooperatives, and received a small grant from Semarnat for the purchase of equipment. "This step was crucial, Juan says, because before starting to produce they were already receiving support, and this greatly encouraged producers. Then financing was achieved to cover half of the costs of organic certification, which was finally obtained in 2013, year in which the increase in price and farmers' income was perceived." Added to this, the Global Environment Fund (GEF) gave support to the thirteen groups for the construction of storage facilities and purchase of equipment, in exchange for a commitment to develop strategies for improvement of the forest and the melliferous flora. In addition to the direct benefit of having the infrastructure to achieve a product isolated of contamination, this support encouraged producers even more.

While the cooperative has managed to place its products on one of the most demanding markets, there is a great threat, Juan explains. In 2013, the European Court determined that if marketed honey has residues of transgenic pollen it should be labeled, although nowadays there is an amendment to this provision. That


Presentation of honey in the European market.

means that placing honey on the shelf in Europe that has transgenic crop residues, people will simply not buy it. There is a threat today that transgenic soy will be planted in the peninsula. "If contamination occurs whether it is legal or not, business is over".

## Lessons learned

According to Manuel Euan Chan, president of the Flor de X'tabentún cooperative, organizing themselves involves making commitments, setting rules, and that brings benefits, he explains. Construction of collection centers would have hardly been achieved without organization, and "in other communities they ask me: Don Manuel, how did you do it?" he says with obvious pride. Juan Ocaranza explains that good organization is essential to reach fair trade certification, which in the case of the Yucatan groups is in the process of being accomplished. That market involves quality standards, time and volume commitments, among other things. But it has advantages, such as the 60% that is delivered to the cooperative as pre-financing. This advanced payment is key because the producer has immediate costs to cover, and if they are not paid at the time of loading they will prefer selling their honey to a middleman for a lower price but with immediate income.

"The first major step we take is to ensure that people have the will to change," Juan explains. When they have the will and the

Work at the hives. Photo: Juan Ocaranza, Educe-Coop.

necessary tools to create change, power is built so that they can change. Partners in the beginning had the will to change, the cooperative provided technical assistance and training, communities contributed with their knowledge, and thus the power to change was generated. Don Manuel says that "in Educe-Coop there is mutual respect, a consolidated trust between the business side and the producer's side", to which Juan adds that "the only way to build organization is through trust… That would be my big take away".

Currently, Educe Cooperative also explores the relationship between beekeeping and land use. The health of ecosystems is very important to ensure honey production. Bee colonies depend on the forest, but also on compatible production systems, such as corn and the creation of acahuales in order to maintain a production throughout the year. In this sense, beekeeping is compatible with sustainable landscapes promoted through sustainable rural development actions.

# Biodiversity monitoring and conservation

Observation tower at Kaxil Kiuic Biocultural Reserve.

# MONITORING JAGUAR AND ITS PREY AT THE PUUC BIOCULTURAL STATE RESERVE

Organization
**Kaxil Kiuic, AC**
Project start year
**2013**
Location
**Oxkutzcab, Yucatan**


## Introduction

Meeting point in the forest, or K'aax in Mayan, and its archaeological site called Kiuic are the origins of the name Kaxil Kiuic Biocultural Reserve of 1,642 hectares, located in the heart of the Puuc Biocultural State Reserve. But its value is not only for its historical heritage, but also for its natural capital, since it has a medium semi-deciduous forest in good condition and high biological value. Proof of this is the confirmed presence of the five feline species cited for the Yucatan Peninsula, including the mythical jaguar. It also has 19 cases of endemism, including two species of amphibians, five reptiles, nine birds and three mammals (Callaghan and Pasos 2010).

## Initial situation

When the new century was just beginning, James Callaghan, director of Kaxil Kiuic Biocultural Reserve (KKBR), had a casual encounter that would mark the destiny of the reserve. The photograph shown to him of a female jaguar killed by hunters in an area near the reserve was a moment to remember. This meant

Overview of the Kaxil Kiuic Biocultural Reserve. Photo: Todd Fry.

not only the presence of the species, but also reflected the difficult reality of coexistence between humans and jaguars. After this episode, there were many stories that led to suspect of the presence of a stable population of jaguars in the Puuc region.

In this context, and together with Dr. Markus Tellkamp, from Millsaps College at the time, and biologist Ricardo Pasos, the "KKBR Wildlife Monitoring" program begins in 2005 with a reduced number of trap cameras and the objective to determine and record the species that make use of the habitat. In 2008, with funding from Millsaps College and in collaboration with Biocenosis AC, the sampling effort increases and begins a large data collection of the fauna present in the reserve. Among the earliest finds was a female cougar using the land as a breeding site, as it was photographed repeatedly and at different stages of gestation, even with its offspring. However, it is in 2010 when the most anticipated photo is captured, a female jaguar. That's when a strategy to increase the sampling effort started, with a standardized methodology for big felines and their prey.

## Key moments

The first photograph of a female jaguar in 2010 marked a first milestone, although the monitoring project had not yet begun.

The documented presence increased the interest of a group of benefactors to consolidate a strategy that culminated three years later with the birth of the jaguar conservation project. With that goal, during the years 2011 and 2012, events were organized for raising additional funds. By then, the first efforts in the study of the jaguar in the Yucatan Peninsula, such as the case of El Eden Ecological Reserve in the north of Quintana Roo, and Pronatura in the Zapotal reserve north of Yucatan, among others, began to provide solid data on their populations. This encourages the KKBR to define a previously agreed methodology in the study of the species, based on the methodological framework developed by the Jaguar and its Prey National Census (CENJAGUAR), from the Ecology Institute at UNAM and Conabio.

With sufficient funds raised to purchase trap cameras and the necessary equipment, the project "Jaguar Conservation in the Puuc" starts in 2013 and monitoring jaguar and its prey is defined as the initial objective by Kaxil Kiuic, with the participation of neighbors with private land to the north and the San Agustín *ejido* to the south. For the sampling design, and by recommendation of experts in the study of jaguars, the CENJAGUAR methodology was adapted according to the features of the reserve's landscape, based on the assumption that it presented similar low densities to the north center populations of the peninsula, com-

Trap camera (left) and students at Kaxil Kiuic carrying out fauna monitoring (right).

pared to Southern populations. In that sense, they created alliances with various organizations working under the CENJAGUAR scheme to homologate more appropriate monitoring methodologies that allow the obtained data to be comparable.

Among the adaptations of the methodology to the sampling site, the need to avoid certain areas of the Puuc Biocultural Reserve stands out, due to the high presence of organized hunter groups, which implies a very high probability of loss or damage of the cameras. However, poaching areas where there is a high sighting frequency of cougar and jaguar were also identified. For this reason, a partnership with the Nukuch K'áax alliance was initiated to work directly with the communities that felt threatened by the presence of the jaguar.

Once the project started, in the first sampling season of 2013, five jaguars, eight cougars and a high number of ocelots, in addition to other important mammals such as deer and collared peccary were identified; but in 2014 the cameras did not have records of jaguar. On its second year two new obstacles arose, financial resources to continue to project ran short, and the main investigator from Millsaps College on the reserve, Dr. Markus Tellkamp, leaves the college. This causes a slowdown in the project, which regains momentum in 2014 with the forum developed in Cancun in which an initiative called "Jaguar's Voice" is born. In this event, several organizations allied for the study of

Jaguar, *Panthera onca*, photographed with a trap camera. Photo: Kaxil Kiuic, AC.

this species in the Yucatan Peninsula, adding momentum to this project at a regional level.

## Lessons learned

The Kaxil Kiuic Biocultural Reserve has always had an educational component and a link with nearby communities. Many inhabitants of the region have been benefitted from temporary jobs and many owners of neighboring lands ask to be included in the monitoring program. Private and *ejido* neighboring properties are a fundamental part of the landscape, and must be included in the initiative, mentions Callaghan. Obstacles arise with poachers that do not hunt for subsistence; in this sense the project is beginning to establish collaborative strategies with them. Among the strategies, and in the context of REDD+, a nursery of wild species of economic and ecological importance is strengthened for landscape restoration in communities of the area (see box). Thus, some hunters and relatives of organized groups have already approached and expressed their interest in establishing cooperation agreements in order to be benefited with plants produced in the KKBR and integrate them into their silvopastoral and agroforestry

Tree nursery at Kaxil Kiuic Biocultural Reserve.

systems. "We believe that through dialogue and in the exchange of useful resources we build community. And we have to build community, we are neighbors," concludes James Callaghan.

## Agricultural and forest landscape restoration in the area of the Puuc Biocultural State Reserve

Among the main strategies of forest conservation and restoration is the "conservation and propagation of the genetic material of wild species important for timber and wild fruit", where a gene bank and a nursery are integrated. The strategic location of the reserve allows it to be available to users with restoration programs. Such programs include forest management; habitat restoration for priority species and recovery of forest cover; acahuales enrichment and establishment of agroforestry and silvopastoral plots, the latter under the Mexico REDD+ Alliance, which in the Yucatan Peninsula has largely focused work in reducing deforestation around the Puuc region. Currently, the nursery operates thanks to a donation of the Arbor Day Foundation through The Nature Conservancy, whose objective is the production of one hundred thousand plants by 2016, and ensuring their establishment in 150 hectares of agricultural areas defined in the Mexico AMREDD+ Alliance carried out within the Puuc Biocultural State Reserve and areas of influence.

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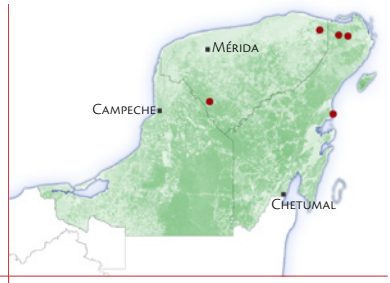
Tree nursery at Kaxil Kiuic Biocultural Reserve.

Jaguar at El Eden Ecological Reserve. Credits: Marco Antonio Lazcano Barrero y Mederick Calleja, El Eden Ecological Reserve; Cuauhtémoc Chávez, Universidad Autónoma Metropolitana-Lerma.

# PRIVATE AND SOCIAL RESERVES NETWORK IN THE YUCATAN PENINSULA

Organization
Amigos de Sian Ka'an, Pronatura Península de Yucatán, Reserva Biocultural Kaxil Kiuic, Reserva Ecológica El Edén
Project start year
2015
Location
Yucatan, Campeche, Quintana Roo




## Introduction

A big part of the Yucatan Peninsula still has forests in good conditions, but the landscape fragmentation and ensuing isolation of protected areas has increased in the last decades. While there are large areas in the region whose preservation is guaranteed because of being inside biosphere reserves, state reserves or other management categories under government management; the truth is that most of the lands that function as biological corridors between protected areas are in private hands or *ejidos*, and in many cases an area of the *ejidos* is destined as reserve with a community character (known as social reserves).

For these reasons, a group of organizations and conservation experts of the Yucatan Peninsula has, for over 20 years, accepted the challenge of innovating with alternative tools for conservation outside protected areas. The task has not been easy, and there have been many proposals, ranging from ecological easements to trusts for the purchase of land. After having gone through a constructive learning process, the proposal now takes new momentum that promises to succeed in these times of re-appreciation of the services provided by ecosystems: a network of private

and social reserves that encourages owners to incorporate their land for conservation purposes.

## Initial situation

Conservation on private lands begins in the 90s, and "among the first experiences are Pronatura's and ours", explains Marco Lazcano, director of El Eden private reserve. Efraím Acosta, technical coordinator of Pronatura Península de Yucatán, mentions that at the end of that decade Pronatura had a National Lands Program in which a series of tools were developed to identify potential private conservation schemes in the country. The idea of forming a network of private reserves has existed for many years and there have been several attempts to make it happen. "In 2005, Marco continues, we organized the 5th Latin American Conference on Private Land Conservation, however successful it did not result in concrete actions for Mexico. At that time we talked to James Callaghan, director of the Kaxil Kiuic private reserve, about the idea of consolidating a network". El Edén and Pronatura had experience in private lands conservation, and "in that event the idea to coordinate efforts seriously starts to rise, but it took 10 years to mature as a project," James Callaghan says.

After that conference, the network promoted by Pronatura México marks a precedent but we were unable to consolidate it, Marco explains. "In 2006 there was a meeting in Monterrey promoted by TNC to initiate a national dialogue about conservation on private lands. A few years later, in 2010, during the 3rd Mesoamerican Congress on Protected Areas held in Mérida, there was a symposium of organizations working on the conservation of social land, and we had a session on social and private lands in which several organizations of the country and South America participated. The idea was to gather the will of those working on private lands in Mexico, but it was no more than an attempt".

A concrete step in moving towards working together in private lands conservation is the Environmental Alliance for the Yucatan Peninsula (AAPY), which was comprised by Amigos de Sian Ka'an, El Edén, Pronatura, Conanp, Niños y Crías and TNC. With funding from the North American Wetlands Conservation Act (NAWCA) and the Neotropical Migratory Bird Conservation Act

(NMBCA), the purchase of 640 hectares of land called San Mateo Ake was completed, adjacent to the Yum Balam Flora and Fauna Protection Area and El Eden, which would be co-administered by the latter and Amigos de Sian Ka'an. The other reserve part of Amigos de Sian Ka'an is Pez Maya explains Gonzalo Merediz, director of the association, an area of 3 kilometers of beach within the Sian Ka'an Biosphere Reserve which has been purchased with support from TNC, an organization that in those years also promoted the purchase of Pronatura's El Zapotal reserve.

## Key moments

After the experience with AAPY, Marco Lazcano continues, the well-known naturalist specialized in birds Barbara Mackinnon and the Claudia and Roberto Hernández Foundation, showed much interest in supporting the initiative to establish a network of private reserves. Thinking of a network of private properties that already exists and that are willing to conserve, is a change in vision, Gonzalo Merediz explains, because focusing trusts for the purchase of land became increasingly inaccessible because of the high prices of land, mainly in Quintana Roo.

In the context of the Itzincab Alliance for the conservation and sustainable management of the Mayan Forest, in which various organizations and government agencies were involved, the exercise was to identify priority issues. Along with the strategic lines of sustainable rural development and sustainable water management, the idea of a private and social reserves network was consolidated. It was necessary to link efforts with Fundación de Haciendas del Mundo Maya, Niños y Crías, Pronatura Península de Yucatán, Amigos de Sian Ka'an, Kaxil Kiuic and El Edén to develop a work plan that was well received within the Alliance. Thus, within the framework of the Itzincab Alliance, a funding opportunity is presented to consolidate the network with clear objectives and a plan of action.

The objectives are basically three, Marco Lazcano explains, "on the one hand is the network consolidation with private and social reserves, which is the first objective. It is not easy to combine both types of reserves because decision-making processes are different; we have to consider that in social reserves decisions

Biological corridors connect ecosystems.

are made in *ejido* assemblies. Finally, we decided to consolidate the private reserves network, and in the program we included a component of support for social reserves, because indeed we need to give it a boost, these reserves have most of their lands with potential for conservation".

The second objective is to generate joint actions on biodiversity monitoring, especially of jaguars and their prey and migratory birds. Adrién Gasse Margat, network coordinator, says it is important to work on the standardization of monitoring methodologies and to share information to enable a broader analysis of the conservation status. And the third objective is to generate tools to make an approach to land owners and multiply efforts. For this component, it is first required to develop rules of operation, i.e. to agree on what features a property must accomplish to be considered a reserve and be part of the network.

"It is great news, says Marco, that the network has managed to insert itself in the process of methodological review of the second national census on jaguars and their prey carried out by the UNAM, and we are expecting a very important regional component. In the first national census, 15 monitoring sites were established at a national level, and for this second census we

are expecting to have only 10 or 15 sites in the Yucatan Peninsula. But beyond monitoring, we can begin to assess the occurrence of jaguars along hypothetical and actual corridors, and thus identify strategic conservation areas. This same process has to be achieved with monitoring of resident and migratory birds to answer how the populations are doing, how much they move, what connectivity they need, what migratory birds do when they get to the peninsula, among other questions".

The important thing for the network is to propose private and social voluntary conservation as an additional mechanism to ensure connectivity and functionality of forests, as well as to protect biodiversity and the environmental services it provides, and that is why we need to attract both private and social landowners, Marco explains. "In return, we must be able to offer long-term incentives that allow landowners to face the high costs of conservation, and to the extent that we succeed in this we will be moving towards conservation in the Yucatan Peninsula".


Beeswax candles made at La Mancolona.

# COMMUNITY CONSERVATION AND A CHANGE OF VISION, LA MANCOLONA

Organization
**Iniciativa para el Desarrollo Integral Comunitario del Sureste, AC**
Project start year
**2008**
Location
**Unión 20 de Junio (La Mancolona), Calakmul municipality, Campeche**


## Introduction

The Calakmul Biosphere Reserve was declared as such in 1989, but in those years there was still a challenge to be solved, given that within the reserve area there was a community. Its inhabitants, of Tzeltal origin, had arrived from Chiapas a few years ago, and the government offered them a series of incentives if they accepted the community relocation. That was how in 1993, forty-three families moved into what had been a gum camp called La Mancolona, and founded a new community.

The government gave each family 50 hectares, and because of their tradition of working in the *milpa*, they started to open plots to farm, and that was the beginning of the transformation of a forest with high biodiversity towards fragmentation. It took little time to discover that the soil was not suitable for commercial agriculture and barely enough for self-subsistence. It seemed more appropriate to aim towards a managed landscape that contemplated natural resources conservation, rather than an agricultural destination. However, that involved a profound change of vision for its inhabitants. Finally, with the support of technical advisers and the implementation of incentives for conservation, women

and men with a great sense of collaboration were involved in a proposal which confirmed the rightfulness of the new community name: Unión 20 de junio (June 20th Union).

## Initial situation

"When the community discovered that soils were unproductive, a feeling of frustration took over", Juan Alberto Villaseñor of DICOS AC explains. In response, organizations with proposals for conservation began to arrive, but this generated mistrust because they had already been relocated once for the creation of a reserve, and feared that engaging with conservation activities could limit their livelihoods. In addition, as community people tell, there were deep-rooted cultural aspects, for example they had the belief that a man is truly a man if he cuts down at least 20 hectares of forest to make a *milpa*. Changing that view was a challenge.

## Key moments

Through training and workshops, the community began to realize that conservation of natural resources is an alternative for landscape management that has the potential to be a source of income, in addition to the benefits provided by the forest as supplier source of food for humans and animals, construction materials, medicinal plants, protection from hurricanes, among other ecosystem services. People began gradually to take ownership of such knowledge, the benefits in air and water quality, the presence of beneficial flowers for honey production, the use of the pepper tree and the opportunity to provide ecotourism services. As a result of this change of view, the community began to receive financial incentives such as PES programs, and thus begun to develop a greater sense of belonging to the forest and a revaluation of the community's resources.

In the case of the PES program, DICOS AC is the technical responsible to 4, and they have to present renewal applications, reports and follow up field work, as well as to ensure that commitments are met. The community is responsible for clearing gaps to prevent fire, placing of nests and troughs for wildlife, posting

María Eugenia,
La Mancolona community.

signs indicating the ban on hunting, illegal logging, extraction of flora and fauna, and installing protective fences in the case that there is cattle in the hinterland, so that there is no grazing inside the premises.

In 2013, the community began to work with an ecotourism project. Julio López, community naturalist guide, expresses that for two years they have been receiving students from England, Belgium and national universities for five or six weeks to monitor biodiversity. "People here know that their natural resources have a great potential," Julio said.

## Lessons learned

"Much of the success in the direction taken through landscape management, which is predominantly a forest in good condition, is because of the way the community is organized, the interest of

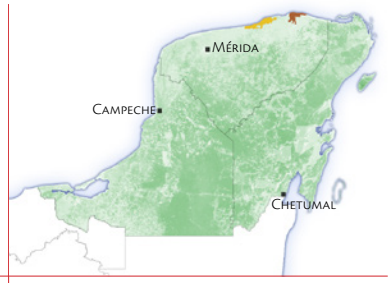
its inhabitants in working together and a strong sense of collaboration", explains Juan Alberto. "This gives us the opportunity to guide them in the proper management of the forest. In the first workshop we focused on defining what is the forest and the services it provides, and we realized that they already know about this, simply by living in contact with the forest. But our task was to organize those ideas, and then they were the ones requesting different topics for the following trainings".

"The workshops were always very participatory and with a positive learning attitude", Juan Alberto says. Here decisions are made together, and women and men participate equally. This community is characterized by joint work and good organization.

A key point was that the inhabitants of La Mancolona (Unión 20 de Junio) were able to reinvest the PES revenues. "While part was to cover their basic needs, they assigned a part of it to enable their apiaries, another part to build *jagüeyes* (watery) and for tourism projects," Juan Alberto says. "All these investments can continue generating revenues beyond the economic incentives received by the program, and people understood that maintaining a landscape managed with a tendency to conserve biodiversity does not mean they cannot do anything with the forest, but they can use it and receive incentives if they do well". La Mancolona experience is instructive, and once again demonstrates how decisions that define the fate of a landscape are in the hands of its own inhabitants and organizations working at that level. Strongly committed supporting organizations, and a community with high social cohesion and a sense of collaboration, managed to change the running course that seemed to inevitably lead to an increasing deterioration of resources and of the community's economy, and they have built a common vision so that the forest provides them resources in a comprehensive way that sustains their livelihoods in a landscape where the forest prevails.

# WILDLIFE CONSERVATION IN RANCHING AREAS: JAGUAR ATTACK PREVENTION

Organization
**Biocenosis, AC**
Project start year
**process initiated in 2000**
Location
**Dzilam State Reserve – Ría Lagartos Biosphere Reserve, Yucatan**




## Introduction

In the early 1990s, within the context of the emerging Mesoamerican Biological Corridor (CBM) initiative, Biocenosis proposed to consider the region known as Sierrita de Ticul as a priority site for the Yucatan state. The CBM was formalized in 1997, but the priorities were directed towards the coastal region seeking to consolidate a corridor between Ría Lagartos reserve, located east of the state, and Celestun on the western end of it. Those were the beginnings of a relationship between Biocenosis and forest corridors conservation in the Yucatan Peninsula. In those years, Biocenosis worked on the proposal, decree, consolidation and development of Kabah, El Palmar and Dzilam reserves, all in Yucatan; but the Sierrita de Ticul had to wait until 2011 to have legal protection when the Puuc Biocultural State Reserve was declared, also through the important role of this organization.

Biocenosis began working on what now is the Dzilam State Reserve in agreement with US Fish & Wildlife Service for conservation of migratory birds' winter habitat, which already showed damages arising from the advance of the agricultural frontier. With this project it became clear productive pressures were not

Taken by a trap camera. Biocenosis AC.

only affecting the wetlands in prejudice of these birds, but also habitats used by populations of jaguars and other mammals. For this reason, the project evolved in response to the growing problem:; with the expansion of pastures over areas inhabited by big felines, the threat of this predator on domestic livestock intensified. Suddenly the jaguar began to have greater relevance as a national conservation objective, and the project evolved in that direction. In parallel, UNAM made a call to all those working with jaguars to contribute to the first Jaguar and its Prey Census (CENJAGUAR). Biocenosis did not devote emphasized efforts to the monitoring of this species, but managed to have a role in that group of institutions because of its conducted efforts to reconcile the conflict between farmers and the populations of these predators.

## Initial situation

Ranching in the Yucatan Peninsula is relatively new, dating back to about 60 years ago. However, this is enough time for some ranching management customs to be deeply rooted, making it more susceptible to jaguar attacks. As an example, during the

Taken by a trap camera. Biocenosis AC.

day cowboys keep livestock in pens, and when night falls they release them to graze in the forest. These are the hours in which jaguars are most active.

## Key moments

Naturally, an agreement with farmers could not be initiated with the simple pretext of preserving the jaguar. The proposal was directed to benefit neighboring producers of protected areas with the delivery of certain loaned equipment and training aimed at reducing the likelihood of encounters between jaguars and cattle. As a first step, the provision, installation and training for the use of electric fences was proposed. Initially, electric fences were used to instrument a technified-intensive grazing system and thereby increase forage production in areas that were already intended as pasture. Then it evolved as a protective barrier from herd by being placed on the periphery of the so-called overnight fences, where livestock is protected at night.

The provision of equipment was complemented with small irrigation systems to promote the cultivation of cutting grasses, encouraging food production for the benefit of livestock and its

owner. Thus several benefits are achieved, because on one side forage production is promoted while the pressure of livestock grazing in the undergrowth is reduced, which also allows the regeneration of forests in favor of the wildlife that lives there. Moreover, the probability of encounter between jaguars and cattle is decreased, and a barrier is created that limits the access of predators in the areas of custody. Seeking to have greater influence among ranchers of the area, they dug deeper into the various causes of cattle death; which made it evident that there are other causes that affect farmers on a greater extent but are less spectacular such as *derrengue* or paralytic rabies, caused by the bite of carrier vampires. For this reason, the project now also provides training workshops on livestock health management.

Thus, in 2000 it began with four cattle ranches in Dzilam, while it was until 2002 when it was possible to show to the first rancher that the plan worked, and in that way he became an advocate among his peers. And so the project, initially funded by USF & WS, increased its influence zone annually adding two ranches each year until reaching eight. Then there was a lapse in which no support was achieved, but a new project funded by the CBM allowed to add nine more ranches, and later two others supported by Sagarpa. A total of about 18 to 20 farms are directly influenced by the project, and although progress continues, counting with new collaborations with organizations such as The Nature Conservancy and the Mexico REDD+ Alliance and diversifying the areas of influence, there is still enormous work to be developed in order to reconcile the legitimate interests of those engaged in ranching with those seeking the conservation of large carnivores and other wildlife species.

## Lessons learned

One of the biggest challenges, at least in the northern portion of the peninsula, is to change the deeply rooted custom of taking cattle to graze at night. This is because of the agreements made with the owner of the ranch, but who really handles the cattle is the cowboy. We had an instructing case, Carlos Alcérreca says, director of Biocenosis: "in an adjoining ranch to the Celestún Reserve we had installed an electric fence and we helped implement pastures with an irrigation system included. All went well

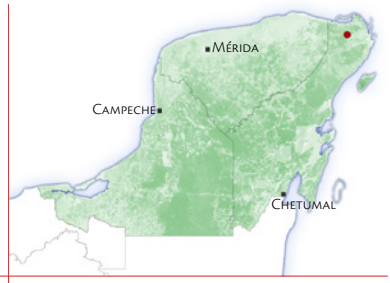
Cattle at Yucatan.

for months, but a weekend the cowboy could not stay at the ranch, and decided to do what he had always done: release the cattle to graze freely, just for once. That first night was enough, a jaguar attacked two calves". This testimony illustrates the importance of permanent training, creativity, perseverance and technical support in solving problems related to the multiple facets implied in efforts to conserve the biological environment. For cases of livestock predation by wild carnivores there is an insurance fund, perhaps unprecedented internationally, that economically compensates producers who are affected, and thus helps to stop the retaliatory reaction towards these carnivores.

Jaguar at El Eden Ecological Reserve. Credits: Marco Antonio Lazcano Barrero y Mederick Calleja, El Eden Ecological Reserve; Cuauhtémoc Chávez, Universidad Autónoma Metropolitana-Lerma.

# EL EDEN ECOLOGICAL RESERVE AND A CONNECTIVITY VISION OF ECOSYSTEMS

Organization
**Reserva Ecológica El Edén, AC**
Project start year
**1993**
Location
**Lázaro Cárdenas, Quintana Roo**




## Introduction

El Eden Ecological Reserve was created in 1993, thus becoming the first private reserve dedicated to research and conservation of biodiversity in Mexico. That was the beginning of a journey full of unexpected challenges, but also of achievements that kept motivation going on what once was the dream of a group of researchers and conservationists, with the renowned ethnobotany specialist Dr. Arturo Gómez Pompa amongst them. Initially, the main purpose of the reserve was to demonstrate that civil society can make conservation and allocate spaces to use for research and education, which over time was consolidated into a critical mass of researchers and technical information useful for conservation and natural resources management at a regional level. El Eden began with an area of 900 hectares which grew at different stages. Today the reserve has 3,000 hectares, and hopes to reach 4,500 in the short term. But the biggest challenge is to maintain the ecosystem connectivity of the region by making the jaguar a primary conservation objective, and for this it is necessary to expand the vision beyond the reserve's borders, and generate partnerships with landowners and other public or private nature reserves.

Cougar at El Eden Ecological Reserve. Credits: Marco Antonio Lazcano Barrero y Mederick Calleja, El Eden Ecological Reserve; Cuauhtémoc Chávez, Universidad Autónoma Metropolitana-Lerma.

## Initial situation

In the late 1980s, Dr. Arturo Gómez Pompa and biologist Marco Lazcano first flew over northern Quintana Roo. The purpose was to identify priority sites for wetlands conservation, and Marco was particularly interested in crocodile's conservation. After this first flyover there was a major fire in northern Quintana Roo, so Gómez Pompa was invited to fly again over the area to assess the status in which ecosystems were left, and on that flight Marco participated as well. After those two flyovers, researchers noticed that the area was immense, very well preserved and with ecosystems different to what was known in the rest of the country. They could see from the air linearly wetlands from north to south, following the Holbox fault, intertwined with forests, cenotes and caves that were not common even in the peninsula. Arturo and Marco knew of the ecosystems fragility, that the agricultural frontier was beginning to accelerate and that very close one of the biggest tourist destinations in the world was also growing. Time began to run in those years, the challenge was huge but so was the dream to preserve this biodiversity treasure, a true paradise.

## Key moments

Once the first 900 hectares of the reserve were purchased, one of the most important moments for El Eden was in 1994, when it was possible to have the infrastructure for a formal biological station that allowed to start inviting researchers to use the property, provide training and develop human resources to build a resources information system of the reserve. The year 1996 was another key moment, Marco says, because there was a large forest fire that forced them to begin a learning journey for vegetation and infrastructure protection, not only from a technical point of view of surveillance and firefighting, but also for coordination with government agencies and neighbors of the reserve.

To start studying jaguars also marked a milestone for the reserve, but it was more an overtime process than a moment in the history of El Eden. From the beginning, Marco was focused on the study of crocodiles in a different way than conventionally, as he began to identify individuals and nests that could be tracked over time. The advantage the reserve offered by having an ecosystem of stable wildlife populations encouraged researchers to begin studying other animal groups. They began by placing video cameras filming for hours and then checking if any mammal passed through the area. In 2005, with the incorporation of the trap cameras technology, it was possible to photograph the first jaguar, and three days later a cougar that went through the same place. "This encouraged us, Marco says, because it was the evidence that cougars and jaguars shared territory".

The year 2005 was key, on one hand the reserve received national conservation recognition for its history, and on the other hand with the addition of trap cameras they moved from documenting traces and footprints to identifying individuals by their spots pattern. This allowed them to record four different jaguars in a three month period, in the same place and with a single camera. That set the tone for them to think that the jaguar population may be large, leading to establish links with other researchers in order to achieve a closer approach at a regional level. The exchange of information with other reserves allowed to recognize that an individual photographed in El Eden in 2006 was the same one that had been photographed by Pronatura in El Zapotal in 2004, 50 km away and across a road.

In 2008, the UNAM Ecology Institute invited El Eden to become part of the first National Jaguar Census, and thus the first population estimate is made in the reserve and was actually high, six jaguars in a 100 km2 area. But photos provided even more information, given that the first image obtained was from a male and female walking together; this was the evidence that the area had reproductive events. The fact that the reserve was a breeding site led to generate a connectivity proposal to ensure genetic exchange of jaguar populations. For that reason, in 2007 a joint work is initiated with different stakeholders such as Pronatura, Amigos de Sian Ka'an, Biocenosis, ONCA Maya, the Center for Tropical Studies of the Veracruzana University (Citro), Conafor, Unidos para la Conservación, and the Independent University of Tabasco. With the information gathered by all of them, a first map of the Yucatan Peninsula is designed, with the location of important jaguar conservation areas and scenarios of possible biological corridors. "With this we realized that to achieve the permanence in time of the populations at El Eden, the conservation strategy had to be broader," Marco points out.

The conservation strategy of El Eden focuses on a regional level in central North Quintana Roo, and that means clearly identifying conservation units that still preserve enough vegetation to sustain a population of at least 250 or 300 jaguars, which is what is estimated for that area. It is very important to work on the connectivity of this region, Marco mentions, because today we know that in the Yucatan Peninsula there are about 2,000 jaguars, nearly 50% of the country's population, and it is essential to maintain genetic viability over time.

In 2009, the Yum Balam Flora and Fauna Protection Area obtained a photo of the same jaguar that had been documented at El Zapotal in 2004 and at El Eden in 2006. In the years 2010 and 2011, El Eden documents again the same jaguar, and with this sufficient evidence was gathered to prove that the individual has a residence in the area of at least seven years, and the area of occupation coincides with those identified as priority in the maps that were generated in 2007. Following this, El Eden together with UNAM researchers Cuauhtémoc Chávez and Sandra Ortiz, placed a satellite collar on a jaguar from which information was obtained for 16 months, being able to prove that this individual

moved 60 km from east to west and 25 km from north to south. With all the information gathered so far, Marco indicates, what we know is that we have a functional unit of continuous ecosystems for jaguar conservation; we know that individuals are there and are using it.

## Lessons learned

"Establishing a private reserve has been a great challenge, Marco states, a complicated learning process of obtaining resources and building capacity. We have achieved this thanks to the fact that it has been a joint dream of several people working together even before having El Eden. Although we have agreements and funding from various sources, today we still do not have a long-term resource guaranteed; but we are at a crucial point because, unlike when we started, the value of biological diversity on a property is recognized".

In the view of Marco, there are now mechanisms that allow, in financial terms, to devote land to conservation, such as the PES. The big challenge is to maintain these PES in the long term, and that other incentives exist for owners and possessors of land to voluntarily allocate land for conservation, because the ecosystems viability depends on the connectivity and genetic exchange of their populations, and that scale is much broader than the limits of a reserve.

# FINAL CONSIDERATIONS

The experiences shared in this publication make evident the importance of promoting conservation and restoration of the original landscape, while also generating incentives for the rational use of resources that sustain livelihoods. Herein lies the great challenge, and throughout these chapters we have seen some examples of initiatives that begin to travel down that road. This starting point opens up in turn an opportunity to further generate targeted and coordinated efforts among the organizations and groups that are currently making decisions that shape the forest landscape.

This book has documented the testimony and experience of many stakeholders involved in creating an alternative model for sustainable development and conservation of resources in the unique context of the Yucatan Peninsula. Among them, we have met experiences of conservation agriculture, sustainable *milpa*, agroecological strategies, and agroforestry systems. Most of the initiatives have in common the rapid generation economic and ecosystem benefits, through which social commitment to experimentation continues. Moreover, with the successful piloting of production systems that reduce costs and increase yields for farmers and ranchers, and a territorial management vision, the trend is a reduction in the acreage unit, significantly decreasing deforestation.

We learned also of the sustainable use of forest resources through the people and organizations that have, for decades now, led this process and moved through its challenges. We learned of a newborn alliance of forest *ejidos* in Quintana Roo, another model case of 20 years of sustainable forest management, the particular case of logging in San Agustín, and a cooperative for the construction of wood saving stoves. Good forest management involves planning, technical support, monitoring, regulation, among other aspects, and if these conditions are met it has already been proven to be one of the best tools for long-term forest preservation. This is important to emphasize, given that the commercial timber scene and the territorial development approach have changed in recent years, and if these changes are not accompanied by adaptation measures to these changing scenarios, forestry begins to face incentives that can drive change in land use or forest degradation. The cases documented in this

book are examples of initiatives that made great efforts to adapt to new scenarios, and thus further strengthen sustainable forest management as an effective conservation approach.

A topic that is currently a prominent issue, and of which there are few documented experiences, is related to forest restoration. It is about complex processes that involve a high degree of knowledge of the successional stages of the forest and the response to different treatments, which requires many years of research. In this book two cases have been documented: one of forest restoration in areas invaded by the *Pteridium* fern and the ecological restoration experience at El Zapotal reserve. The restoration case of invaded areas by ferns is of particular interest, since the fields that have this problem are unable to perform any kind of agricultural or ranching activity, and this situation promotes deforestation due to the search for new arable lands. Forest restoration is presented as one of the possible alternatives to this scenario, but it requires a large initial investment in the early years.

Pronatura's experience of ecological restoration in the Zapotal reserve has been different since it started from long abandoned farming fields. In this case, the most important lessons to be learnt are on the use of local genetic resources and the promotion of plant supplier nurseries near the area to restore. Also, one of the keys to success in restoring El Zapotal was to include in these projects the communities near the reserve, creating jobs and incentives for the implementation of agroforestry systems. This eventually induced local stakeholders, and ultimately local decision-makers, to begin changing their vision, which is essential in order to think about scaling restoration beyond the limits of a reserve.

It is also known that in order to design forest conservation strategies it is essential to understand communities' livelihoods that depend on the forest, and how their decisions affect it. Making a diagnosis of all communities of the Yucatan Peninsula is impossible in practice, but in the chapter on community production projects the experience of three initiatives aimed at self-management has been documented. These include the re-valuation of traditional practices and knowledge, insertion into new markets, and above all things sustainability of the practices. The integrated community development program, the Maya Ka'an ecotourism

destination along with its productive projects and cooperatives for the production and export of organic honey are examples of long-term processes that invest in generating human capital as a solid foundation for the communities' livelihoods. The three documented cases are models that demonstrate the importance of strengthening decision making at a local level through capacity building. Practice shows that there may be sufficient evidence of the high biological value of a forest and political will to preserve it, but ultimately local stakeholders are the ones making the final decision regarding land-use, and for this reason it is essential to include them in conservation and land-use planning. The importance of connecting local projects to sustainable and fair markets was also emphasized, where they value the social and environmental impacts of the initiatives as a way to move from experiment to a successful regional process.

Finally, we have learned about four initiatives whose efforts focus on monitoring and preserving biodiversity. Perhaps this is one of the most difficult schemes for which to generate financial tools that ensure the permanence of such important projects. Fortunately, in recent years the value that biodiversity deserves has begun to be recognized, and with this, in many countries, a series of incentives have been devised that could make pure conservation possible. To achieve these advances it is essential to conduct monitoring of indicator species of the ecosystem's health, such as the efforts of the Kaxil Kiuic Biocultural Reserve and El Eden Ecological Reserve to monitor populations of jaguars and their prey; and El Zapotal, where besides monitoring jaguars population, bird monitoring also takes place. The case of community conservation in La Mancolona, Calakmul, is exemplary, not so much because they managed to implement a PES scheme, of which there are many examples in Mexico, but for the high commitment, involvement and understanding of its inhabitants of the services that an ecosystem offers. Aware that conservation efforts must scale up to large areas in the territory, if genetic viability is to be maintained in the long term, several of the interviewed organizations throughout these chapters have decided to create a network of private and social reserves that promote the inclusion of a greater number of properties with the commitment to consolidate biological corridors that connect already preserved areas.

Like all innovative experiences, the adoption of these techniques by farmers, policy makers and decision makers requires time, demonstration and dissemination efforts. For this reason, the formation of alliances is a fundamental tool to mobilize a change in vision and practices on a larger scale. In this regard, it is important to note that one of the successes that have been mentioned most often during field visits is that the change processes are taking place under a model of "learning by doing". This aspect is extremely important, because often the protagonists of these stories have mentioned that partnerships should be useful from the practical stand point. For this reason, the Mexico REDD+ Alliance and TNC, as well as other regional stakeholders in the Peninsula, are promoting coordination efforts as the main drivers of change.

## Acronyms and abbreviations

| | |
|---|---|
| AAAPY | Environmental Alliance for the Yucatan Peninsula |
| CBM | Mesoamerican Biological Corridor |
| CAREDD+ | REDD+ Learning Community |
| CICY | Scientific Research Center of Yucatan |
| CIMMYT | International Maize and Wheat Improvement Center |
| Conabio | National Commission for the Knowledge and Use of Biodiversity |
| Conafor | National Forestry Commission |
| Conanp | National Commission of Natural Protected Areas |
| Dicos | Initiative for the Integral Community Development of the South East AC |
| Educe | Education, Culture and Ecology – Cooperative |
| ENAREDD | National Strategy for Reducing Emissions from Deforestation and Degradation |
| FHMM | Haciendas del Mundo Maya Foundation |
| AMREDD+ | Mexico REDD+ Alliance |
| NAWCA | North American Wetlands Conservation Act. |
| NCPA | New Center for Agrarian Population |
| NMBCA | Neotropical Migratory Birds Conservation Act. |
| UNDP | United Nations Program for Development |
| PES | Payment for Environmental Services |
| Procampo | Program of direct support to the field |
| REDD+ | Reduction of emissions due to deforestation and degradation |
| Sagarpa | Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food |
| Semarnat | Secretariat of Environment and Natural Resources |
| TNC | The Nature Conservancy |
| Umafor | Forest Management Unit |
| UNAM | National University of Mexico |
| U.S.F&WS | United States Fish and Wildlife Service |

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