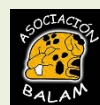


Evaluating Conservation Agreements as a Tool for Conserving Nature and Improving Wellbeing of Rural Households in the Maya Biosphere Reserve, Guatemala



June, 2016

A White Paper produced with the support of the United Kingdom's Darwin Initiative and the Department for Environment, Food, and Rural Affairs (DEFRA), and Conservation International



Wildlife Conservation Society, Guatemala Program



ABSTRACT

The Wildlife Conservation Society, the National Council of Protected Areas (CONAP), Asociación Balam, and Fundación ProPetén implemented four community-based Conservation Agreements in the Maya Biosphere Reserve (MBR) to evaluate their efficacy in conserving nature and reducing poverty in rural communities. Results obtained during implementation periods ranging between 1-6 years included a 49.9% reduction in the number of hectares deforested and a 34.9% reduction in the number of active fires (hot points) when compared to expected amounts based on tendencies prior to agreements. Significant improvements in access to basic necessities were reported among 178 households surveyed within three partnering communities ($P=3.77E-12$); on average, local households increased their access to basic necessities by 5.9%. Within five different participating community groups we detected considerable awareness and support of agreements among those surveyed; on average 67.4% (SD=18.0%) of community respondents were aware of agreements; among those familiar with agreements 88.6% (SD=12.5%) considered agreements to be “good” or “regular”; when including those unfamiliar with agreements 59.1% (SD=15.8%) of community respondents considering agreements to be “good” or “regular”. Agreements reinforced land tenure for local communities living in protected areas through improved compliance with their obligations vis-à-vis the State, while increasing opportunities for women and youth through targeted projects and investments in education. They also demonstrated value for money by leveraging nearly one million dollars of additional investment during the six years of agreement implementation, building local capacity among communities and partnering organizations, responding directly to needs prioritized by rural communities, fostering ownership of conservation and development commitments, and ensuring effective use of resources. As implemented in the MBR, agreements helped resolve a number of weaknesses identified in traditional Integrated Conservation and Development Projects (ICDPs), Community-based Natural Resource Management (CBNRM) and Payments for Ecosystem Services (PES) initiatives. Despite some limitations encountered, we recommend Conservation Agreements as a useful approach for pursuing the dual goals of conservation and poverty alleviation in rural conservation contexts, particularly in areas where the accompaniment of governmental institutions is a viable option.

CREDITS

The white paper entitled “*Evaluating Conservation Agreements as a Tool for Conserving Nature and Improving Wellbeing of Rural Households in the Maya Biosphere Reserve, Guatemala*” is a collaborative production made possible by the generous support of the United Kingdom’s Darwin Initiative, and the Department for Environment, Food, and Rural Affairs (DEFRA).

The project was implemented through Grant No. 20-008 provided by the Darwin Initiative to the Wildlife Conservation Society. Additional funding was provided by the UK/DFID/Governance and Transparency Fund, Conservation International’s Conservation Stewards Program, the Prince Albert of Monaco Foundation, the Foundation for Maya Cultural and Natural Patrimony (PACUNAM), the U.S. Agency for International Development, the U.S. Department of Interior, the Wildlife Conservation Society and the Orozco Family Foundation, as well as significant counterpart support from Guatemala’s National Council of Protected Areas (CONAP) and partner implementing organizations.

The production of this white paper was greatly improved through the participation of implementing partners, including CONAP, Asociación Balam, and the Fundación ProPetén. Additional contributions were provided by “Witness of Honor” organizations, including the Association of Forest Communities of Petén (ACOFOP), The Center for Conservation Studies of the University of San Carlos (CECON), the Municipality of San Andres, Petén, Rainforest Alliance, PACUNAM, and Tikal National Park.

Authors and their institutional affiliations include:

M.A. Roan Balas McNab / Wildlife Conservation Society
M.B.A. Miriam Castillo / Wildlife Conservation Society
T.U. Julio Zetina / Wildlife Conservation Society
Ing. Agr. America Rodriguez / Wildlife Conservation Society
Ing. Victor Hugo Ramos / Wildlife Conservation Society
Bch. José Nery Solis / Wildlife Conservation Society
Ing. Agr. Daniel Trujillo / Asociación Balam
M.A. Ronaldo Chacon / Asociación Balam
M.Sc. Oscar Obando / Fundación ProPetén
M.Sc. Anita Castellanos / Fundación ProPetén

We thank Julie Kunen, David Wilkie, Jeremy Radachowsky, and Patricia Cremona for reviews of the manuscript, as well as Rony Garcia and Samantha Strindberg for support with statistical analyses of the household data.

Suggested Citation:

McNab, R., Castillo, M., Zetina, J, Rodriguez, A., Ramos, V.H., Solis, N., Trujillo, D., Chacon, R., Obando, O., and A. Castellanos. (2016). “*Evaluating Conservation Agreements as a Tool for Conserving Nature and Improving Wellbeing of Rural Households in the Maya Biosphere Reserve, Guatemala*”. Wildlife Conservation Society Guatemala Program, Technical Paper No. 01.

TABLE OF CONTENTS

ABSTRACT	1
CREDITS	2
INTRODUCTION	7
BACKGROUND	8
Poverty in Guatemala and the MBR	9
Natural Resources and Rural Households	9
Threats and Drivers	10
Mixed Results of Conservation Investments	11
Integrated Conservation and Development Projects	12
Community-based Natural Resource Management.....	12
Payment for Ecological Services & Incentives	13
Conservation Agreements in the Maya Biosphere Reserve	13
Questions Addressed	14
Project Goal	14
Project Support	14
METHODS	17
Conservation Agreement Negotiations	17
Conservation and Social Development Incentive Payments	20
Legal and Social Frameworks of Agreements	23
Periodicity of Agreements	23
Community Conservation & Social Development Commitments	26
Sanctions and Conditionality	26
Administration of Incentives	27
Evaluations	27
Areas of Influence of Conservation Agreements	27
Environmental Indicators	28
Socioeconomic Indicators	28
Social Awareness Indicators	30
Additional Evaluations	30
Case Studies and Testimonials	30
RESULTS	32
Environmental Impacts	32

Socioeconomic Impacts	34
Specific Changes in Basic Necessities	34
Education and Employment (BNS+)	36
Benefits of Agreements.....	43
Gender Participation.....	46
Leveraging Conservation Agreement Investments	47
Support for Conservation Agreements within Communities	49
Support for Conservation Agreements among Other Institutions	51
Application of Sanctions during Implementation	52
Case Studies of Select Interventions, Impact, and Leveraging	54
Case Study No. 1: BioItzá-Corozal-Zotz	55
Case Study No. 2: Carmelita	58
Case Study No. 3: Paso Caballos	62
Case Study No. 4: Uaxactún	70
Testimonials by Community and Government Partners.....	77
Error and Imprecision in Sampling Methods.....	83
DISCUSSION.....	83
Environmental Impacts of Agreements: Deforestation and Fire.....	83
Environmental Impacts of Agreements: Wildlife.....	86
Improved Wellbeing & Reduction of Poverty	88
Social Awareness and Support	91
Land Tenure.....	93
Key Factors Influencing Reported Outcomes.....	94
Strengths and Limitations of Conservation Agreements.....	94
CONCLUSION.....	102
Recommendations.....	104
LITERATURE CITED	107
APPENDICES.....	112
APPENDIX 1	112
APPENDIX 2	112
APPENDIX 3	112
APPENDIX 4	113
APPENDIX 5	118
APPENDIX 6	118

TEXT BOXES

Text Box 1: MBR Background.....	11
Text Box 2: Implementing Partners	15
Text Box 3: Community Partners.....	16

TABLES

Table 1: General Characteristics of Proposed Conservation Agreements.....	18
Table 2: Financial Details of Conservation Agreements Implemented in the MBR.....	21
Table 3: Conservation and Social Development Investments in MBR Conservation Agreements.....	22
Table 4: Community Commitments within Conservation Agreements	26
Table 5: Goods and Services used as Indicators in MBR Basic Necessities Surveys.....	29
Table 6: Deforestation Before and During MBR Conservation Agreements.....	32
Table 7: Fire Hot Points Before and During MBR Conservation Agreements	33
Table 8: Changes Detected in BNS Indicators during Project Implementation (Including +/- changes in the percent of households for each BNS indicator/village, and the average change among all villages; variations of +/- 2% or less were considered “stable” and are denoted by yellow)	35
Table 9: Estimates of Direct Benefits from Conservation Agreement Incentives during Two Years of Implementation	44
Table 10: Participation of Women in Key Leadership Positions within Community Groups engaged in Conservation Agreements	46
Table 11: Sanctions Applied during Implementation of Conservation Agreements in the MBR	53
Table 12: Critiques of Community-based Initiatives addressed (or otherwise) by Conservation Agreements in the MBR.....	98

FIGURES

Figure 1: Map of MBR Zoning and Management Units	8
Figure 2: Map of Areas of Implemented Conservation Agreements within the Maya Biosphere Reserve	19
Figure 3: Timeline of Conservation Agreement Implementation Stages within the Maya Biosphere Reserve	25
Figure 4: Box Plot Depicting Evolution between the Baseline (BL) and 2015 in Inter-quartile Results in the Basic Necessities Index of Wellbeing among All Households, Carmelita, Uaxactún, and Paso Caballos.....	34
Figure 5: Level of Education in Carmelita in 2011 and 2015 based on Responses to BNS+ Community Surveys	36

Figure 6: Sources of Employment in Carmelita in 2011 and 2015 based on Responses to BNS+ Community Surveys	37
Figure 7: Level of Education in Paso Caballos in 2009 and 2015 based on Responses to BNS+ Community Surveys	38
Figure 8: Sources of Employment in Paso Caballos in 2009 and 2015 based on Responses to BNS+ Community Surveys	39
Figure 9: Level of Education in Uaxactún in 2009 and 2015 based on Responses to BNS+ Community Surveys	39
Figure 10: Sources of Employment in Uaxactún in 2009 and 2015 based on Responses to BNS+ Community Surveys	40
Figure 11: Level of Education among BioItzá Members in 2015 based on Responses to BNS+ Community Surveys	41
Figure 12: Sources of Employment among BioItzá Members in 2015 based on Responses to BNS+ Community Surveys	41
Figure 13: Level of Education in Corozal in 2015 based on Responses to BNS+ Community Surveys	42
Figure 14: Sources of Employment in Corozal in 2015 based on Responses to BNS+ Community Surveys	42
Figure 15: Benefits cited by Respondents Familiar with Conservation Agreements in BioItzá, Carmelita, Corozal, Paso Caballos and Uaxactún	46
Figure 16: Additional Investments Leveraged by CSO Partners and Community Organizations during Implementation of MBR Conservation Agreements	47
Figure 17: Awareness of Conservation Agreements among Corozal, BioItzá, Uaxactún, Carmelita, and Paso Caballos community members in 2015	49
Figure 18: Percentage of Respondents Considering Agreements to be Good, Regular, or Bad in 2015.....	50
Figure 19: Percentage of Respondents Reporting Direct Benefits to their Household from Conservation Agreements	50
Figure 20: Map of the BioItzá-Corozal-Zotz Conservation Agreement Area.....	55
Figure 21: Map of the Carmelita Conservation Agreement Area	58
Figure 22: Map of the Paso Caballos Conservation Agreement Area.....	62
Figure 23: Immigration of New Settlers into Paso Caballos (1986-2013).....	64
Figure 24: Number of Agricultural Plots Burned and Forest Fires Reported in the Paso Caballos Agricultural Zone (2011-2015)	66
Figure 25: Map of the Uaxactún Management Unit and Agricultural Zone within the Maya Biosphere Reserve	70
Figure 26: Evolution of OMYC’s Debt in Quetzales between 2007 and 2013.....	71
Figure 27: Map depicting relocation of Uaxactún’s “satellite agricultural plots” within the permitted agricultural zone.....	72

Figure 28: Deforestation (ha/year) Registered in the Maya Biosphere Reserve, Laguna del Tigre National Park and the MBR Multiple Use Zone, and Active Fires (“hot points”) across the MBR during Agreement Implementation..... 84

Figure 29: Map of Conservation Agreements and their Contribution to the Maintenance of Jaguar Habitat in the MBR (*Note: darker shades of green indicate higher quality habitat for jaguars*)..... 87

Figure 30: Number of Active Nests and Successful Scarlet Macaw Fledges in the Peñon de Buena Vista, adjacent to Paso Caballos 88

INTRODUCTION

This white paper presents the results of an extensive evaluation undertaken by the Wildlife Conservation Society and national partner organizations to quantify and publicize the impacts of conservation incentives agreements implemented in the Maya Biosphere Reserve, Guatemala. Commonly known (and formally referred to herein after) as “Conservation Agreements”, the approach consists of the negotiation and delivery of financial and material incentives to conserve nature and reduce poverty among inhabitants of rural communities that live in close contact with, and depend upon biodiverse environments.

Conservation Agreements are developed through a formal procedure including a preliminary feasibility assessment undertaken with participating community members and partners. If the feasibility assessment demonstrates viability, agreement negotiations are initiated, and assuming satisfactory negotiation among the diverse stakeholders involved, this results in a formal written contract detailing the commitments of participating community organizations, national government partners, and Civil Society Organizations to collaborate in the implementation of activities and report results.

This evaluation was undertaken with the support of the Darwin Initiative, and the Department for Environment, Food, and Rural Affairs (DEFRA) of the United Kingdom. Additional financial and material contributions were leveraged during a six-year period (2009-2015) to implement four agreements in the Maya Biosphere Reserve (MBR), and monitor impacts obtained.

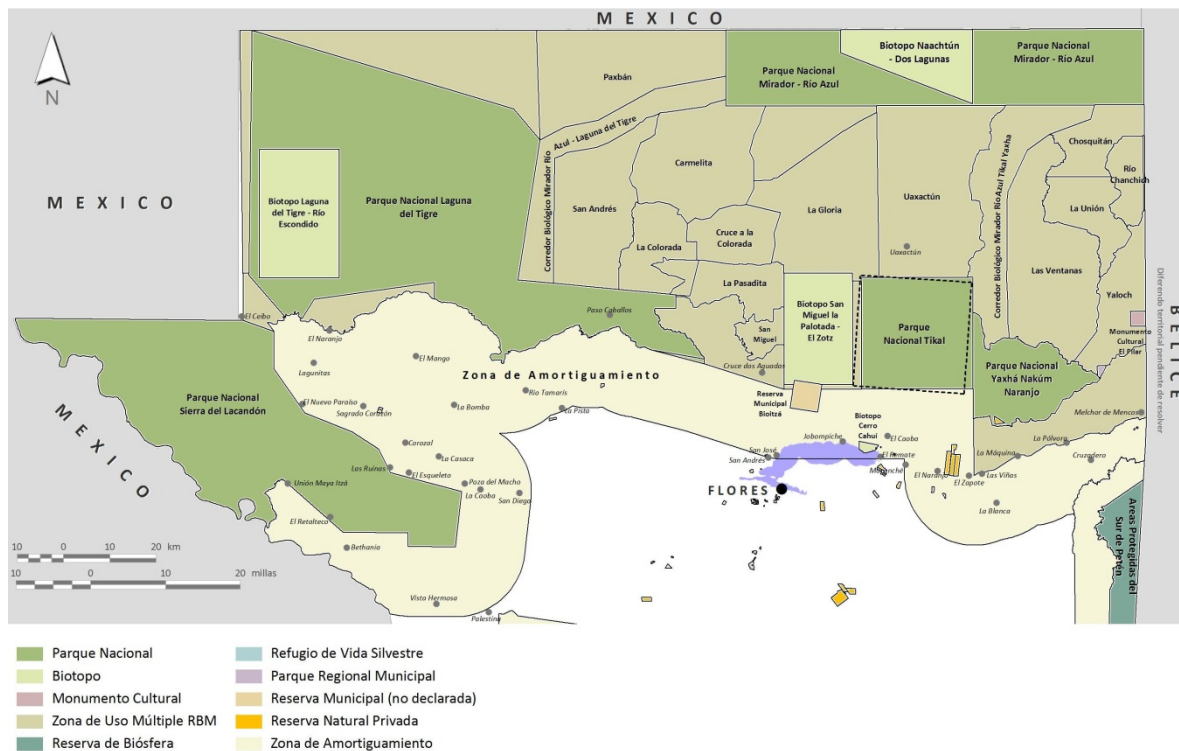
The evaluation summarizes the results of monitoring conducted using ecological indicators, socioeconomic indicators of community poverty/wellbeing, and social awareness indicators to generate conclusions about the impacts obtained and present lessons learned. National partners in agreement implementation included Asociación Balam, Fundación ProPetén, and the Guatemalan National Council of Protected Areas (CONAP). Participant community groups included members of the Asociación BioItzá, and inhabitants of the villages of Carmelita, Corozal, Paso Caballos, and Uuxactún.

BACKGROUND

The Maya Biosphere Reserve, Guatemala’s largest protected area, embodies the challenge of balancing conservation and development priorities. In line with more than 2000 Biosphere Reserves recognized by the United Nations Educational, Scientific and Cultural Organization (UNESCO), the 2.1 million hectare reserve is designed to support differentiated levels of human impact to “safeguard natural and managed ecosystems [and] promote innovative approaches to economic development that are socially and culturally appropriate and environmentally sustainable” (UNESCO 2015).

The Maya Biosphere Reserve (MBR) is located at the heart of the largest contiguous block of forest in Mesoamerica, the central *Selva Maya* of Guatemala, Belize, and Mexico (Ramos 2005). It anchors the northern section of the Mesoamerican Biological Corridor, providing a refuge for threatened wildlife and hundreds of ancient cities once populated by a sophisticated pre-Colombian Maya civilization. The reserve also contains two Ramsar wetland sites¹, Tikal National Park and UNESCO World Heritage Site, and an innovative system of community-based and private industry forest management within the reserve’s multiple use zone.

Figure 1: Map of MBR Zoning and Management Units



¹ Wetland sites of global importance that have been recognized under the United Nations Convention on Wetlands of International Importance signed in Ramsar, Iran, in 1971. Ramsar sites in the MBR include: 1) the highly threatened wetland site of Laguna del Tigre National Park, and 2) Yaxha-Nakum-Naranjo National Park. http://www.ramsar.org/sites/default/files/documents/library/sitelist_0.pdf

Yet despite its global recognition and recent advances obtained by Guatemalan agencies and partners in reducing the rate of habitat loss (CONAP/WCS 2015), the MBR's environmental and social challenges remain considerable. For example, since its creation in 1990, the reserve's natural habitat has been reduced by roughly one percent annually², reflecting Guatemala's national ranking of the Western Hemisphere's third highest rate of deforestation (Hansen et al. 2013). At the same time, the MBR's human population continues to grow³ well above the national average (MSPAS 2015), which is particularly notable since Guatemala retains the highest human fertility rate in the Western Hemisphere (UNEP 2015).

Poverty in Guatemala and the MBR

Most of the world's biodiversity occurs in countries with high levels of poverty and political instability (Wilshusen et al. 2002). Guatemala is no exception: 54% of the population lives in poverty, and 13% in extreme poverty. In rural municipalities (44% of the country's population), almost eight out of ten people are poor (UNWFP 2015). The MBR is home to approximately 187,000 people (CONAP/WCS 2013); in 2008 60% of the MBR's population was estimated to live in poverty or extreme poverty (MFEWS 2009), with San Andres, the MBR's largest municipality, registering a poverty rate of 80%, the national rural norm (PNUD 2011). Likewise, in regard to political instability Guatemala is considered a "high risk" country by The Economist (2015), a ranking borne out by the arrests of the country's president and vice president for corruption charges in 2015.

Natural Resources and Rural Households

Guatemala retains the largest economy in Central America (World Bank 2014), yet in terms of income distribution it remains one of the most unequal countries in the world (UNWFP 2015). This marked economic disparity has propelled the MBR's rural populations towards a strong dependence on natural resources, including agriculture and ranching as the most common livelihoods. A minority of MBR residents depend on forest resource extraction despite the existence of well-organized community-based forest concessions within the MBR multiple use zone (Radachowsky et al. 2011). Most MBR communities lack access to large forest tracts; at least twenty are also technically "illegal" since they were established in national parks or core zones after the creation of the reserve, in some cases more than a decade after. Other communities are formally recognized by CONAP⁴ through cooperative agreements allowing their temporary presence in the reserve⁵ and their access to land for subsistence agriculture, sometimes also within national park boundaries. In short, the conservation context within the MBR remains replete with social challenges: a human population increasing at a rapid rate while governmental investments in social services face

² However, in the one-year period from 2013-2014, rate of habitat loss in the MBR had decreased to 0.55%, below the average of 1.04% annual habitat loss registered between 1990 and 2014 (CEMEC/WCS 2015).

³ A human population growth rate of 3.93 was estimated in 2013 for the MBR during a seven year period (2007-2013). The estimate was generated indirectly by counting the number of houses within settlements in the MBR in 2007 and 2013, and extrapolating the human population based on an estimate of 5.33 individuals per household. Despite continued migration into the MBR, the human population growth rate decreased significantly from 2000 when the rate was approximately 7.0% annually (CONAP/WCS 2013).

⁴ However, in some cases municipalities and Federal ministries recognize illegal settlements without official recognition by CONAP.

⁵ Here we consider all three management zones of the MBR, including the Buffer Zone which is home to approximately 65% of the MBR's population (CONAP/WCS 2013).

significant shortfalls. And, as in other Central American landscapes, these challenges exist within an exceedingly complex context of threats.

Threats and Drivers

The MBR spans 19% of Guatemala's terrestrial surface area. In such a large conservation arena, the political and social complexities define a diverse spectrum of threats and drivers which impact conservation and social development alike. Deforestation and fire are the most severe proximate threats, with unsustainable natural resource use as creeping threats that are typically less acute, and more difficult to quantify. Indirect threats that spur deforestation and fire include cattle ranching and intensified palm plantations, typically led by elites with political power. Drivers (i.e. underlying factors) include weak governance systems, corruption, poverty, landlessness, rapid human population growth, climate change, and economic globalization. Due to the MBR's geostrategic position at the border with Mexico, the influence of narco-trafficking is undeniable, with the most evident repercussion being the laundering of money through the establishment of illegal ranches and cattle within reserve areas (McSweeney et al. 2014). A synopsis of the MBR's management history is provided as **Text Box 1**.

Text Box 1: MBR Background

During the initial decade after the MBR's establishment (1990-1999), the central focus consisted of strengthening CONAP's management capacity, and the management of the MBR's national parks and biotopes (core zones; IUCN Category II). A total of 7 core zones were created, spanning 40% of the reserve. Even at that early stage, the MBR boasted an uncommon characteristic compared to the majority of UNESCO biosphere reserves: the location of these "core" zones along the reserve's periphery, with the reserve's *de facto* heart assigned to a multiple use zone spanning 36% of the reserve. The remainder of the reserve's area (i.e. 24%) comprises an ineffective and largely unmanaged buffer zone consisting of a 15-kilometer wide swath established along the reserve's southern edge, in theory to promote sustainable agro-pastoral activities. Complementary investments included establishing a framework for, and implementing pilot community-based forest concessions, and advancing the potential of sustainable natural resource management initiatives (timber, xate palms, allspice), and tourism. By the end of the decade, the principal donor (USAID) and CONAP supported a notable shift in emphasis from park management to community-based management regimes.

In the second decade (2000-2009), although modest support for core protected areas continued, the priority became the establishment and strengthening of community-based forest concessions within the MBR's multiple use zone (IUCN Category VI). This new approach, considered a notable innovation at the time, allowed Guatemala to comply with the 1996 Peace Accords while engaging rural stakeholders in managing the MBR's biodiversity. To date, conservation investments in the MBR have maintained a largely balanced approach, with both national government investments and CSOs (and their largely international funding sources) supporting protection activities including fire prevention, improving community-based management regimes, and monitoring and evaluation. During the second decade however, threats to the reserve increased substantially as vast sections of were "lost" to deforestation propelled by colonization, organized crime, cattle ranching, and narco-trafficking.

In response, during the current, third decade (2010-2019), the establishment of effective governance has become an overarching theme across the MBR. This has propelled increasing collaboration among government authorities, CSOs and donors to strengthen participatory management systems and improve the ability of State institutions to apply the law in response to the severe threats detailed above.

Notable actions since the end of the second decade have included the eviction of powerful illegal cattle ranchers, leading to 120,000 hectares recuperated by the State within both national parks and community-based management areas. Another crucial line of action has been the continued strengthening of community-based partners through technical support, Conservation Agreements, and Memoranda of Understanding established with the government. Evaluations of the state of deforestation across the MBR have revealed either no significant difference in the comparative efficacy of core zones and community-based management units in halting deforestation (Blackman 2014), or slightly lower deforestation rates in community-based and/or FCS-certified forest concessions (Bray et al. 2008; Hodgdon et al. 2015).

Mixed Results of Conservation Investments

Over the 25-year history of the reserve, considerable funding has been provided to assist Guatemalan government institutions, Civil Society Organizations (CSOs), and rural communities to address the interrelated challenges of environmental sustainability and poverty. As in most major conservation landscapes, the MBR's history is replete with projects that have produced tangible, well-consolidated results, those yielding modest effect, and, as detailed by Sundberg (1998) some that have left no noticeable trace or have perpetuated conflict within participating communities. How then, within the complex context of the MBR, can conservation resources yield a positive impact and increase the probability of lasting success when working with local communities? The following sections review three potential approaches towards addressing this challenge, while highlighting some of their reported limitations.

Integrated Conservation and Development Projects

This challenge is best viewed through three lenses, the first being the considerable literature produced reviewing Integrated Conservation and Development Projects⁶ (ICDPs). Numerous authors have argued that, for diverse reasons, ICDPs fail to deliver tangible conservation results. For example Hughes and Flintan (2001) identified six major concerns regarding ICDPs: (1) Impact: unproven ability to deliver biodiversity conservation and improve rural livelihoods; (2) Linkages: questionable assumptions that improved livelihoods lead to decreased pressure on natural resources; (3) Equity: inadequate involvement of local stakeholders, existing political structures in local communities, and gender in project design and management; (4) Threats: over simplification of threats, with a general failure to consider underlying drivers and threats caused by (powerful) external actors; (5) Monitoring and evaluation: the lack of baselines and comprehensive tracking of outcomes; and (6) Sustainability: unproven ability to maintain projects over time, contrasted against the inherent long-term timescale required to solve conservation and rural development challenges. Additional critiques include an over-dependency on outside consultants (Worah 2000; Hughes and Flintan 2001), and the absence of protection components (particularly patrolling and law enforcement) as a key conservation interventions (Terborgh 1999, Wilshusen et al. 2002).

Conversely, authors have also highlighted that ICDPs hold potential based on: (1) Some examples of successful ICDPs (Hughes and Flintan 2001); (2) Democratization: ICDPs can expand the base of participation in decision making, and ensure that local people have a voice in decisions that affect their livelihoods (Garnett et al. 2007); and (3) Learning process: it is reasonable to expect a learning curve in the implementation of ICDPs as a comparatively new approach to conservation (Wilshusen et al. 2002).

Community-based Natural Resource Management

A second relevant framework consists of Community-based Natural Resource Management (CBNRM). According to the World Wildlife Fund, CBNRM is “*an approach to conservation and development that recognises the rights of local people to manage and benefit from the management and use of natural resources.*”⁷. Following Fabricius and Collins (2007), CBNRM “*focuses on the collective management of ecosystems to promote human well-being and aims to devolve authority for ecosystem management to the local (community) level*”.

But despite significant support from the donor community for CBNRM (USAID 2013, IFAD 2006), some authors have concluded that implementation often (Leach et al. 1999) or “*notoriously*” (Fabricius and Collins 2007) falls short of expectations due to conflicts, financial mismanagement, mismanagement of natural resources, high turnover of leaders, political and economic instability, changes in markets, and interference from top-down development projects as the most notable.

⁶ ICDPs are defined as “biodiversity conservation projects with rural development components” (Hughes and Flintan, 2001), which seek to address biodiversity conservation objectives through the use of socio-economic investment tools.

⁷ http://www.panda.org/what_we_do/where_we_work/project/projects_in_depth/cbnrm/

Payment for Ecological Services & Incentives

A third relevant lens consists of more recent literature highlighting considerable uncertainties regarding the impacts of conservation incentives payment systems with rural inhabitants. Commonly known as Payments for Environmental Services (PES), these initiatives “*generally consist of voluntary and conditional transactions whereby an ecosystem service is purchased by at least one service recipient from at least one service provider*” (Norbu, 2012). One common example of PES is the growing suite of projects to reduce emissions from deforestation and degradation (REDD); another example includes payments for the conservation of intact watersheds required for hydrologic functions. PES has been promoted as a major benefit-sharing approach which provides monetary incentives to the people who are responsible for good environmental practices that sustain healthy ecosystem services.

As in the case of ICDPs and CBNRM, authors have identified significant concerns with PES approaches. For example, Naeem et al. (2015) conclude that “*many projects are based on weak scientific foundations, and effectiveness is rarely evaluated with the rigor necessary for scaling up and understanding the importance of these approaches as policy instruments and conservation tools*”. Pattanayak et al. (2010) echo these concerns, stating that there is a dearth of empirical evidence surrounding the impacts of PES on poverty reduction and deforestation, adding that particularly in developing countries PES face a “*plethora of institutional design and governance challenges*”. Additional critiques include the potential displacement of environmental challenges (e.g. deforestation) by small projects to other areas, uncertain financial sustainability, weak “conditionality” (evidence of sanctions for non-compliance), a lack of clear “additionality” (land use changes or social benefits that would otherwise not have occurred), and concern that crowding out pro-social preferences (e.g., conservation ethic) with private incentives (e.g., payments) could be irreversible. Pham et al. (2013) also pointed out concern with elite capture and equity in a review of benefit sharing mechanisms within incipient REDD+ incentives programs in 13 countries.

In response, some researchers have indicated that under certain conditions incentives payments and PES hold considerable potential. Among them, Ingram et al. (2014) document four incentives payment systems for ecosystem services, concluding that “*PES schemes can result in both improved condition of biodiversity-based ecosystem services, and locally meaningful economic contributions to impoverished rural families and communities, even in nations with relatively weak institutions and low governance capacity.*” They continue to note that common factors among successful PES projects include: (1) a focus on ecosystem service enhancement; (2) the provision of significant local support to the participating communities; (3) inclusive community-based governance models, and (4) conditional payments that were made by the buyer only if the service of interest was delivered.

Conservation Agreements in the Maya Biosphere Reserve

Conservation Agreements were implemented in the MBR taking into consideration the shortfalls and critiques of the previous approaches. The approach utilized in the MBR was not necessarily a “new” model, rather one that attempted to build upon lessons learned while ensuring the social support required for effective, long-term conservation success.

That said, it is key to once again recognize that the agreements were not developed in a “new” conservation or development landscape⁸. Instead, they were influenced by considerable social and institutional histories amongst both the local communities and their diverse institutions (**Text Box 2**) and conservation organizations (**Text Box 3**).

But despite dozens of interventions since the MBR’s creation, an acute need remains for greater, more effective investment in most MBR communities. Social indicators continue to lag, and most local people consistently expressed a desire for greater economic opportunities and basic services. At the same time, between 2000 and 2009 the rates of deforestation and fire effectively doubled across the reserve, once again highlighting the need for more effective conservation and development interventions.

Questions Addressed

Despite the aforementioned critiques, ICDP (Robinson and Redford, 2004), CBNRM and PES approaches have expanded globally, while at the local scale integrated conservation and development funding continues to flow into the MBR. Important questions therefore emerge, particularly due to an increasing recognition of the importance of evaluating project impact to demonstrate value for money⁹. For example: Do Conservation Agreements produce positive conservation and poverty alleviation outcomes? Do Conservation Agreements resolve any of the weaknesses of ICDPs, CBNRM, and PES systems? What are the exact roles and responsibilities of the government and the accompanying CSOs? Will they also be held accountable for their commitments? Do Agreements ensure that donors know exactly what they are funding through their investments? Can Agreements be sustained long enough to ensure lasting impact, and scaled up beyond individual sites? And if so, what types of limitations might exist?

Project Goal

To answer these questions, the Wildlife Conservation Society (WCS) and partner organizations implemented a three-year project (2013-2016) to evaluate the effectiveness of community conservation incentives agreements (i.e. “Conservation Agreements”) at simultaneously conserving biodiversity while reducing poverty in Guatemala’s Maya Biosphere Reserve. We evaluated ecological, socioeconomic, and social indicators to determine the impact of four Conservation Agreements, their value for money, and whether they can provide a scalable model for simultaneously achieving poverty alleviation and biodiversity conservation goals within a challenging conservation frontier.

Project Support

The project was undertaken with the financial support of the UK/Darwin Initiative. Additional funding was provided by the UK/DFID/Governance and Transparency Fund, Conservation International, the Prince Albert of Monaco Foundation and the Foundation for Maya Cultural and Natural Patrimony (PACUNAM), the U.S. Agency for International

⁸ For example, WCS began supporting community-based conservation in 1996, and as of 2000 helped establish the *Proyecto Pavo*, a unique PES project focused on ocellated turkey sport hunting and conservation in select MBR villages (Baur et al. 2012; Ingram et al. 2014).

⁹ In 2015 Darwin Initiative produced a briefing paper urging projects to incorporate adequate monitoring protocols: <http://www.darwininitiative.org.uk/assets/uploads/2015/10/What-is-ME-FINAL-Briefing-Paper.pdf>

Development, the U.S. Department of Interior, the Wildlife Conservation Society, and the Orozco Family Foundation, as well as significant counterpart support from Guatemala's National Council of Protected Areas (CONAP) and partner implementing organizations.

Text Box 2: Implementing Partners



Wildlife Conservation Society activities in the MBR began in the early 1990's with wildlife research focused on community forests and national parks. In 1997, WCS initiated support to the community of Uaxactún and their efforts to obtain a forest concession contract with CONAP; the community prevailed, receiving a tract of forest spanning the majority of their traditional area of influence. To date, this remains the largest block of forest managed by a single community in Mesoamerica. Since then, WCS has assisted Uaxactún's *Organización, Manejo y Conservación* (OMYC) as an "accompanying NGO".

In 2008, WCS began working with the village of Paso Caballos to assist community members in complying with their obligations acquired as a result of a cooperative agreement signed with CONAP in 1997. Paso Caballos is an agrarian village dependent on the use of fire to clear land and enrich the soil prior to planting. WCS conservation activities focus on assisting the village to adapt fire use methods during the burning season to avoid impacting adjacent areas of Laguna del Tigre National Park.



Asociación Balam, the implementing CSO of the Carmelita Conservation Agreement, was established in 2002 as a Guatemalan organization dedicated to the conservation of the protected areas of Peten. Balam supported CONAP's management of Mirador-Rio Azul National Park (2002-2012), and in 2007 began supporting community-based tourism initiatives in MBR communities including Carmelita. In 2012 Balam began implementing the Carmelita Conservation Agreement. The agreement was sustained in full during a 2-year term, and since that point Balam assisted the community with partial funding to continue some of the key activities outlined within the original agreement.



ProPetén is a Guatemalan Foundation dedicated to the conservation and sustainable development of the Department of Peten. ProPetén was established in 1992 as a project supported by Conservation International to pioneer community-based initiatives and develop sustainable economic alternatives to habitat degradation. Initial projects included support for the community of Carmelita to obtain a forest concession from CONAP, resulting in a 53,797 hectare tract awarded in 1996. They also provided technical support to the community of Paso Caballos during negotiations with the government to assist the village in obtaining tenure within Laguna del Tigre National Park. In 2002 ProPetén became an independent Guatemalan Foundation, consolidating their focus on improve rural living standards while conserving the natural environment of Petén. Since 2014 they have implemented a Conservation Agreement with the agrarian village of Corozal, the leaders of the BioItzá Municipal Reserve, and the El Zotz Biotope managed by CECON.



CONAP is the leading governmental institution responsible for protected areas and biodiversity in Guatemala. They lead management of 30 % of the terrestrial surface area of Guatemala with an operative budget of roughly US \$13 million annually (2015). They manage three national parks in the MBR, supervise co-management agreements with partners, monitor and authorize community-based co-management and usufruct agreements, monitor threats, and coordinate protection activities.

Text Box 3: Community Partners

Uaxactún (OMYC; COCODE): The village of Uaxactún was established in the early 1900's as a chicle camp, and formally recognized as an "aldeia" within the Municipality of San José in 1950. During participatory workshops in 1995, the village identified their traditional area of influence as approximately 120,000 hectares (McNab, 1999). In 1999, the *Organización Manejo y Conservación* (OMYC) was established as a community-based non-profit organization to manage an 83,558 hectare forest concession granted by CONAP. OMYC selected three organizations to accompany the early years of concession management: WCS, *Naturaleza para la Vida – NPV*; and the *Organización Nacional para la Conservación y el Ambiente – ONCA*. WCS support was maintained over time after the programs of the other two organizations eventually receded. OMYC also received significant technical support from the *Asociación de Comunidades Forestales de Petén* (ACOFOP), and the Rainforest Alliance. The Community Development Council (COCODE) of Uaxactún is also a signatory member of the Conservation Agreement. To date, Uaxactún's economic foundation continues to be the harvest of timber, xate (forest palm fronds), and employment in governmental institutions.

Paso Caballos (COCODE; Council of Elders): Similar to Uaxactún, Paso Caballos was originally established as a chicle camp during the 1950s. The village was subsequently abandoned as chicle lost economic importance (Schwartz, 1990) at the end of the "era of white gold", and recolonized by Q'eqchi' migrants beginning in the early 1990s, the majority arriving after the establishment of the MBR. Paso Caballos was formally recognized by the State in 1997, through an "Acuerdo de Intención". The agreement allowed colonists to establish a village at the headwaters of the *Rio San Pedro de Martir*, and provided each family with approximately a *caballeria* (46 ha) to undertake subsistence agriculture within Laguna del Tigre National Park. The agreement provided the village with access to 5,236 hectares of land, and included clauses requiring the community to avoid impacting adjacent areas of the national park. Community representation in Paso Caballos is led by the Paso Caballos Community Development Council (COCODE), and the Council of Elders ("*Consejo de Ancianos*") as a traditional institution within Q'eqchi' Maya communities. Agriculture focused on corn, squash, and beans remains the most important source of income for Paso Caballos households.

Carmelita (Carmelita Cooperative/COCODE): The village of Carmelita was founded during the 1920's as a remote forest chicle camp, and in 1956 recognized as an "aldeia" within the Municipality of San Andrés. In 1997, the village obtained a 53,797 hectare forest concession and in 1998 established the *Cooperativa Carmelita* to lead community-based forest management and tourism activities. ProPetén provided key support to Carmelita during the initial years of concession management, supporting timber, non-timber, and tourism projects. In 2008, Asociación Balam began supporting community-based tourism activities focused on the growing national and international interest in the ancient Maya site of *El Mirador*, located 50 kilometers north of Carmelita. In 2010, a group of NGOs including ACOFOP, Asociación Balam, Conservation International, Counterpart International, the Foundation for Archaeological Research and Environmental Studies (FARES), the Foundation for Maya Cultural and Natural Patrimony (PACUNAM), Rainforest Alliance, and WCS, joined efforts with Carmelita Coop. leaders, the Carmelita COCODE, and CONAP to promote a conservation agreement that was finally implemented in 2012. Timber, xate, tourism, and agriculture are the main sources of income for Carmelita households.

BioItzá/Corozal (Asociación BioItzá/Corozal COCODE): This agreement is unique in that it links two community groups with the Center for Conservation Studies of the University of San Carlos, Guatemala (CECON) to promote shared conservation and development goals. The traditional Itzá Maya community has a history dating back at least 500 years in the Peten; in 2004 the BioItzá Association obtained legal authority for the management of the BioItzá Municipal Reserve ("BioItzá Biosphere"), a 3,600 hectare forest tract within the Municipality of San José to conserve traditional natural resources and cultural practices. Immediately adjacent to the BioItzá reserve, the agrarian community of El Corozal was legally recognized by the Municipality of San José in 1979. This Q'eqchi' Maya community is comprised of immigrants from southern Peten and the Department of Alta Verapaz. ProPetén has been providing technical assistance to the Asociación BioItzá since the 1990's, and supporting Corozal farmers to mitigate the impacts of fire since 2012. CECON manages the San Miguel la Palotada-El Zotz Biotope, a 35,174 hectare MBR core zone area legally established in 1989, which is adjacent to both the BioItzá Municipal Reserve and the community of Corozal. El Zotz.

METHODS

Four Conservation Agreements were implemented with communities representing a range of ecological, socioeconomic, and cultural contexts in Guatemala's Maya Biosphere Reserve (**Table 1**). Agreements consisted of formal contracts designed and managed with local communities to protect biodiversity and provide economic incentives. WCS accompanied implementation of agreements in Uaxactún and Paso Caballos, whereas the Carmelita and BioItzá agreements were led by Asociación Balam and ProPetén, respectively. The locations of the four agreements are provided in **Figure 2**. During the pre-evaluation processes two potential agreements were rejected (Buen Samaritano, and Yaloch). In the case of Buen Samaritano, an agreement was determined to be unviable due to the presence of powerful ranchers rumored to have links to organized crime that had usurped community lands. In the case of the Yaloch forest concession, a participatory viability study undertaken with community managers and CONAP initially affirmed the potential for an agreement. But during the negotiation of the specific responsibilities within the agreement, concession leaders rejected several clauses (for example, the requirement to use a CONAP-sanctioned form for reporting effort and threats encountered during patrols) and they expressed concern that CONAP would use the agreement to monitor the concession more closely and intervene (i.e. "interfere") in concession management. The final outcome was the abandonment of negotiations and the subsequent advance with the BioItzá/Corozal/Zotz agreement.

Conservation Agreement Negotiations

Agreements were developed in coordination with Conservation International's Conservation Stewards Program (CSP), using CSP's "Conservation Agreement Model"¹⁰ as the framework for each initiative. Community commitments were negotiated with full participation of pre-existing community leadership structures, and subsequently ratified in open assemblies. "Witness of honor"¹¹ institutions were engaged during the entire process to the degree that they were able to participate. The levels of financial incentives provided were distinct in each case, and specific commitments were adapted to the context of each community; incentives for protection activities focused on addressing the major threats to biodiversity identified through participatory evaluations.

Stages of agreement development included: (1) Site selection, rapid initial assessment, and feasibility analysis based on a formal evaluation; (2) Engagement, consisting of initial exchanges and consultation with local leaders; (3) Design via collaborative determination of the components of the agreement, additional evaluations if required, and identification of potential sanctions for non-compliance; (4) Formal consultation with community organizations including organized groups, existing leadership structures, and community general assemblies, as well as CSO and/or governmental "witnesses of honor" as interested stakeholders; (5) Signature and implementation following a public signing ceremony; and (6) Evaluation, including participation of signatories and witnesses of honor.

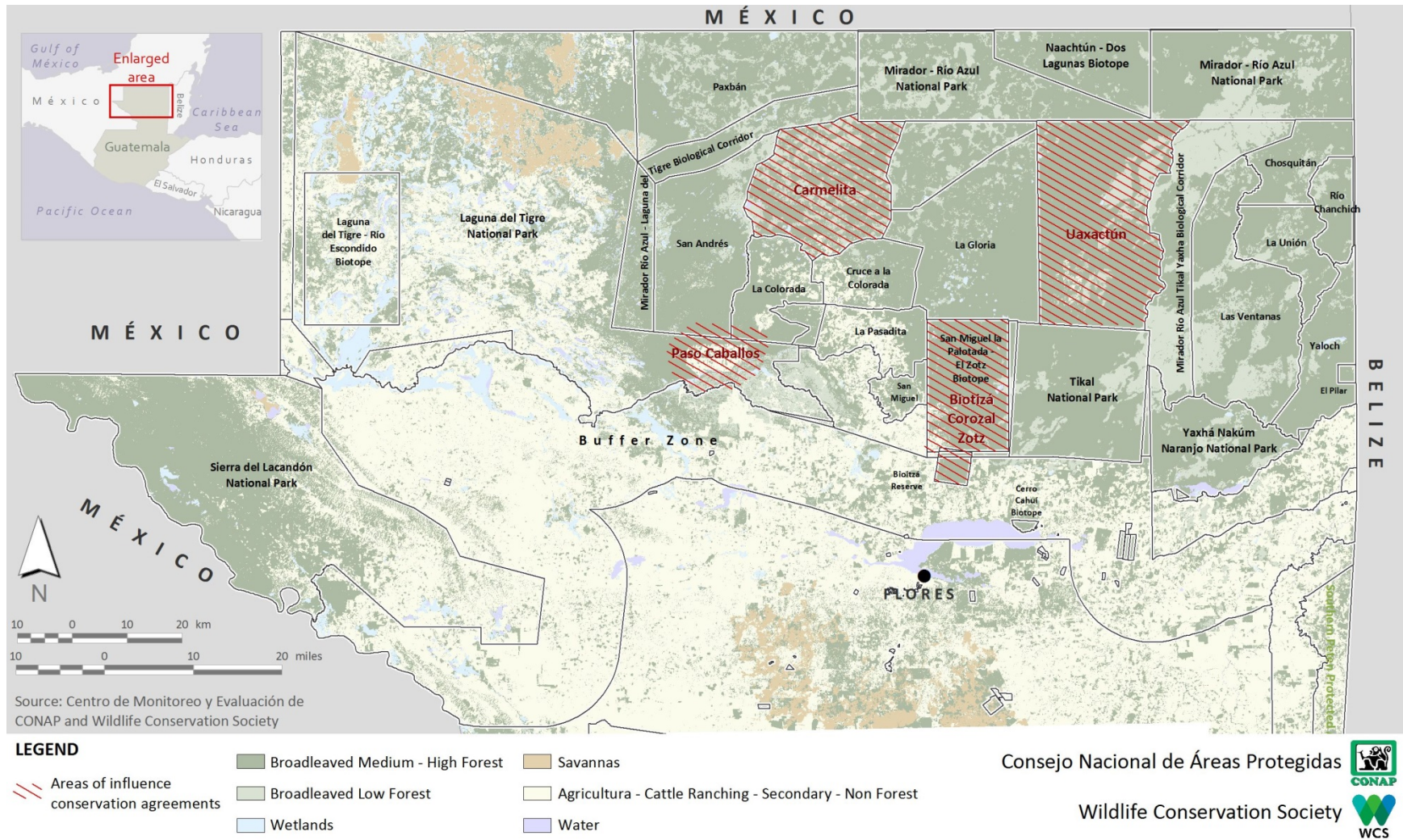
¹⁰ CSP, 2007: http://www.conservation.org/publications/Documents/Conservation_Agreement_Model.pdf

¹¹ Witnesses of honor included governmental and CSO organizations considered important stakeholders and "friends of the community" that could add to the impact of the agreement and/or could play an independent advisory role in support of community groups.

Table 1: General Characteristics of Proposed Conservation Agreements

DETAILS	Uaxactun	Paso Caballos	Carmelita	BioItzá/Corozal/Zotz	Buen Samaritano	Yaloch
Feasibility Study	2009	2010	2011	2014	2014	2014
Feasibility Result	Positive	Positive	Positive	Positive	Negative	Positive
Community Response	Approved	Approved	Approved	Approved	N/A	Declined
Date Initiated	2009	2010	2012	2015	N/A	N/A
Number of 2-year Phases	3	2+	1	1	N/A	N/A
Community Organizations	OMYC; COCODE	COCODE; Council of Elders	Carmelita Coop.; COCODE	BioItza; Corozal COCODE	N/A	N/A
Implementing CSO	WCS	WCS	BALAM	PROPETEN	N/A	N/A
Witness CSOs ¹	ACOFOP; RA; BALAM	AFISAP; BALAM; Muni San Andres	ACOFOP; CPI; RA; WCS	Tikal National Park; RA; WCS	N/A	N/A
Govern. Representative	CONAP	CONAP	CONAP	CONAP, CECON ²	N/A	N/A
Partner Human Population	770	1562	344	800	N/A	N/A
Population Residence	Within Management Area	Within Management Area	Within Management Area	(Partially) Within Management Area	Within Management Area	Outside Management Area
Area of Influence (Ha)	83,558	9,848	53,797	38,983	N/A	N/A
MBR Management Zone	Multiple Use	National Park	Multiple Use	Multiple Use & Biotope	N/A	N/A
Date Settlement Established	1908	1992	1920	Bioitza: N/A; Corozal: 1979	1992	N/A
Land Tenure Basis (Year)	Municipal Recognition (1950) & Forest Concession (1999)	Settlement Agreement (1997)	Municipal Recognition (1956) & Forest Concession (1997)	BioItza: Municipal Recognition (2004); Corozal: Municipal Recognition (1979)	Settlement Agreement (1997)	Forest Concession (2000)
Livelihoods Foundation	Forest Management	Agriculture	Forest Management	Agriculture; Forest Management; Non-residents ²	Cattle Ranching; Agriculture	Forest Management
Ancestry	83% Mestizo; 17% Indigenous	97% Q'eqchí Maya; 3% Mestizo	90% Mestizo; 10% Indigenous	Bioitza: 100% Maya Itzá Corozal: 78% Q'eqchí Maya & 22% Mestizo	70% Mestizo; 30% Q'eqchí Maya	Mestizo
Major Threats	Fire; In-migration; Unsustainable Nat. Res. Use; Debt	Fire; Unsustainable Agriculture; In-migration	Deforestation; Fire; Cattle Ranching; Debt	Deforestation; Fire; Cattle Ranching	Cattle Ranching; Fire	Fire; Timber Poaching
Threat Level	MEDIUM-HIGH	VERY HIGH	MEDIUM-HIGH	HIGH	VERY HIGH	MEDIUM
¹ "Witnesses of Honor" = CSO partners consulted during agreement design and evaluation; ACOFOP = Association of Forest Communities of Peten; AFISAP = Asociación Forestal Industrial de San Andres, Peten; CPI = Counterpart International; RA = Rainforest Alliance; Tikal = Tikal National Park						
² With exception of guards, BioItza Municipal Reserve members do not inhabit the reserve; CECON participants are field guards and technicians assigned to manage the area by the Center for Conservation Studies of the University of San Carlos, Guatemala; Corozal villagers inhabit the conservation agreement area.						

Figure 2: Map of Areas of Implemented Conservation Agreements within the Maya Biosphere Reserve



Whereas the development of the four MBR agreements largely coincided with the CSP Conservation Agreement model, some elements did differ slightly. For example, CONAP was included as a signatory in all conservation agreements to ensure official engagement and supervision of the outcomes. A key reason for this included the potential need to implement sanctions in the case of incompliance by community partners. Yet this also provided local communities with recourse in the case of CSO incompliance, particularly in the event that incentives were not delivered as promised.

A second distinction in the MBR conservation agreements consisted of consulting the general assemblies of each village to obtain their free, prior and informed consent as a key, last step prior to agreement implementation. This was done through the laborious process of reading the detailed clauses of the agreements, and holding an open vote on agreement approval/rejection after answering any questions. In the case of the Paso Caballos agreement, the final document was translated into Q'eqchí Maya and shared with community members to ensure their ability to track compliance over time.

A third difference was the determination of the incentive amounts for each agreement. Since limited funding was available, a general target amount for each agreement was determined prior to initiation of negotiations. Within that financial threshold, community, CSO, and government partners collaborated to identify the threats and social investments that could be addressed by the scale of investment proposed; each agreement was designed with this threshold in mind. Economic valuations with community counterparts were then used to identify viable amounts for compensating individuals for their opportunity (labor) and operative costs (equipment, supplies, etc.). Daily wages varied from the full competitive amount in the existing local labor markets (i.e. Uaxactún, Carmelita), to an “incentive” amount covering a partial daily wage (i.e. Paso Caballos, BioItzá). Valuation of the ecosystem services conserved was not taken into account.

Conservation and Social Development Incentive Payments

In most agreements, roughly half of the financial incentive was targeted at conservation actions, and half at local development including improved social services and/or livelihoods. The exception in this case was the BioItzá/Corozal agreement, where the majority of the funding focused on patrolling and fire prevention. Written agreements included details on the annual financial investment for each specific conservation and social development intervention as agreed to during participatory negotiations undertaken with all parties, including community members. **Table 2** provides general information on financial investment in the four Conservation Agreements, and **Table 3** details amounts of specific investments in conservation and social incentives in each agreement.

Table 2: Financial Details of Conservation Agreements Implemented in the MBR

DETAILS	Uaxactún	Paso Caballos	Carmelita	BioItzá/Corozal/Zotz
Date Initiated	2009	2010	2012	2015
Years Implemented	6	5+	2+	1
Implementing CSO	WCS	WCS	BALAM	PROPETEN
Partner Human Population	770	1562	344	800
Population Residence	Within Management Area	Within Management Area	Within Management Area	Agriculture Within Management Area
Area of Influence (Ha)	83,558	9,848	53,797	38,983
Annual Incentive Amount (\$) (2014-2015)	\$43,000	\$25,000	\$42,500	\$16,000
Annual Cost Tech. Support (\$) (2014-2015)	\$36,412	\$18,000	\$16,400	\$8,000
Average Annual Additional Costs (\$)	\$14,000	\$2,000	\$3,500	\$0
Total Annual Cost (\$)	\$93,412	\$45,000	\$62,400	\$24,000
Annual Protection Incentive (\$) ¹	\$20,297	\$12,360	\$21,250	\$12,800
Annual Social Investment (\$) ²	\$22,703	\$12,640	\$21,250	\$3,200
Annual Protection Cost/Ha (\$) ³	\$0.24	\$1.26	\$0.40	\$0.33
Annual Social Investment/Person (\$) ⁴	\$29.48	\$8.09	\$61.77	\$4.00
Total Annual Cost/Ha (\$) ⁵	\$1.12	\$4.57	\$1.16	\$0.62
Total Annual Cost/Person (\$) ⁶	\$121.31	\$28.81	\$181.40	\$30.00
¹ The Annual Protection Incentive was defined as the total amount of investment made in activities directly focused on habitat and/or species protection, including salaries or daily wages of guards during patrols, food, supplies, as well as fire prevention and equipment.				
² The Annual Social Investment was defined as all those expenses providing a social benefit, with the exception of the salaries provided to compensate opportunity costs of days labored within protection incentives				
³ Calculated as The Annual Protection Incentive / The Area of Influence within each agreement				
⁴ Calculated as the Annual Social Investment / The Partner Human Population				
⁵ Calculated as the Total Annual Cost / The Area of Influence within each agreement				
⁶ Calculated as the Total Annual Cost / The Partner Human Population within each agreement				

Table 3: Conservation and Social Development Investments in MBR Conservation Agreements

INVESTMENT DETAILS	Uaxactún	Paso Caballos	Carmelita	BioItzá/ Corozal/Zotz
Partner Human Population	770	1562	344	800
Annual Incentive Amount (\$) (2014-2015)	\$43,000	\$25,000	\$42,500	\$16,000
CONSERVATION INCENTIVES TOTAL INVESTMENT	\$20,297	\$12,360	\$21,250	\$12,800
Fire prevention and control	\$1,799	\$4,135	\$5,500	\$6,400
Control and vigilance (patrolling)	\$13,514	\$8,225	\$6,000	\$6,400
Xate palm reforestation/population enrichment	\$3,784	\$0	\$3,000	\$0
Removal of cattle from management area	\$0	\$0	\$3,750	\$0
Territorial Land Use Planning (" <i>Ordenamiento Territorial</i> ")	\$1,200	\$0	\$3,000	\$0
SOCIAL INCENTIVES TOTAL INVESTMENT	\$22,703	\$12,640	\$21,250	\$3,200
Xate palm frond incentive	\$15,946	\$0	\$0	\$0
Education (teacher salaries, supplies, equipment, classroom construction)	\$6,757	\$4,529	\$5,000	\$3,200
Financial administration	\$0	\$0	\$7,500	\$0
Health (medical technicians, medicines, campaigns, outreach)	\$0	\$644	\$7,250	\$0
Strengthening of COCODE	\$0	\$3,517	\$1,500	\$0
Agricultural diversification	\$0	\$3,950	\$0	\$0

Legal and Social Frameworks of Agreements

A key strategy of the agreements consisted of working with established community institutions to ensure their compliance with pre-existing obligations obtained with the State. Legal frameworks included CONAP's community forest concession contracts with Uaxactún and Carmelita, CONAP's "*Acuerdo de Intención*" with Paso Caballos, and the contract ceding the Municipal land to the Asociación BioItzá. These frameworks included different conditions and rules for natural resource use and livelihoods alternatives based on the zoning of the reserve, with the greatest restrictions placed on Paso Caballos as the sole community located within a national park core zone. In distinct cases community compliance with obligations (i.e. control and vigilance, fire control, halting migration, adequate financial management of concessions) obtained through the aforementioned legal frameworks was marginal, placing the natural habitat at risk while simultaneously risking the "standing" and negotiated tenure of these communities within the reserve.

CSOs, CONAP, and community partners alike thus concurred that investments would be most effective if they helped communities benefit from becoming partners in conservation. This in turn would increase the likelihood of communities extending or maintaining their contracts or cooperative agreements with CONAP, and securing their usufruct rights to land and above-ground natural resources.

Social frameworks for the agreements were defined by the existing community and technical support or partnership institutions in place at each site. All agreements included the local Community Development Council (COCODE), the institution typically led by the village Mayor, who coordinates a council of twelve members with diversified responsibilities (education, health, women's issues, etc.) as part of the Municipal government. In the cases of Carmelita and Uaxactún, the Carmelita Cooperative and the Organización Manejo y Conservación (OMYC), respectively, were key partners due to their signatory roles in obtaining forest concessions from CONAP. Paso Caballos benefitted from the participation of their traditional Council of Elders in the negotiations and implementation of the agreement. In the case of the BioItzá reserve members, their interests were represented by the Asociación BioItzá.

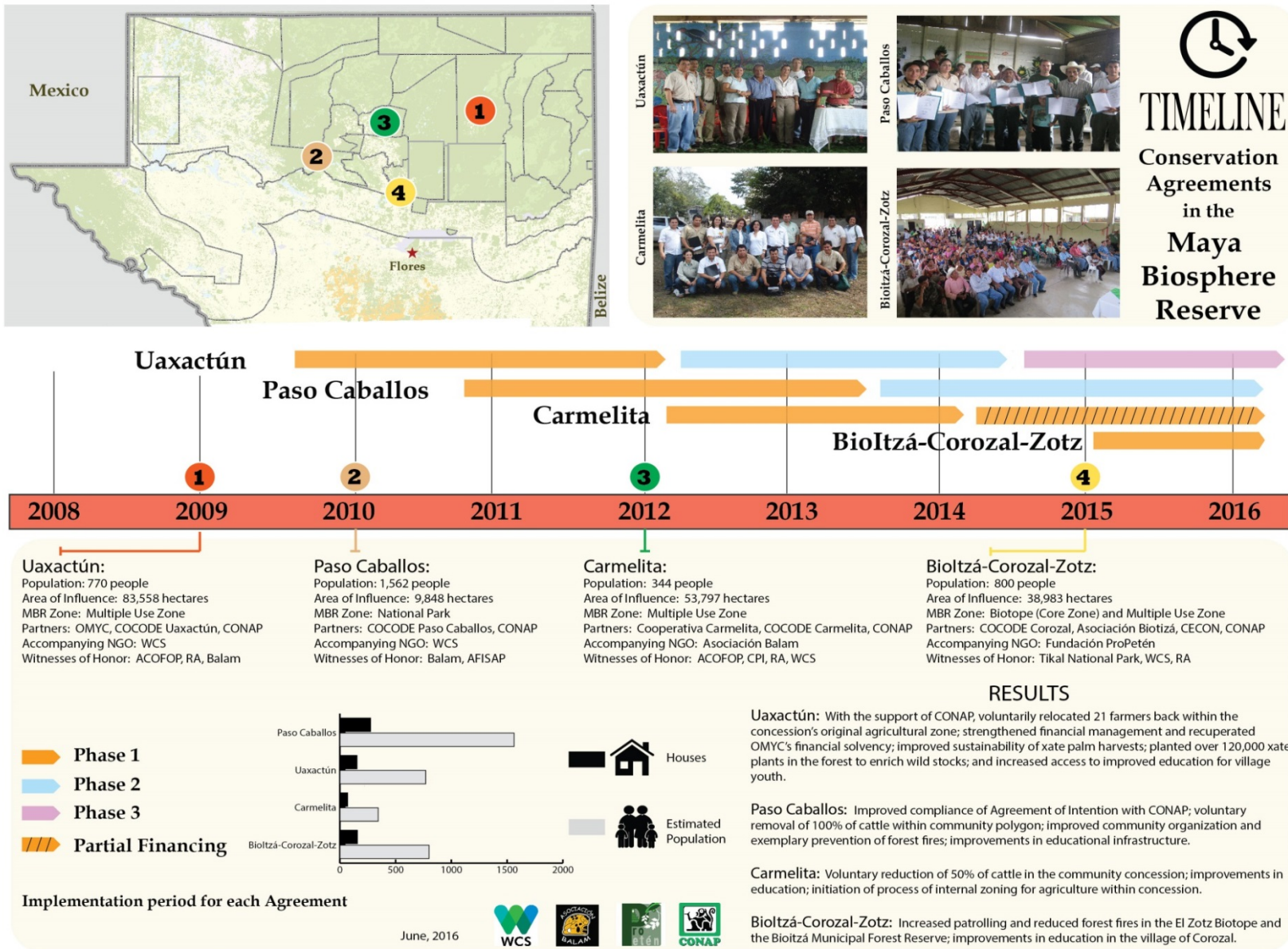
WCS led the implementation of two agreements in villages where the project had established collaborations with the local communities (Uaxactún and Paso Caballos). Asociación Balam led agreement implementation in Carmelita, and ProPetén led in the multi-partner agreement with BioItzá/Corozal/Zotz. Both local CSOs had significant pre-existing foundations of engagement and support within the respective communities. Balam and ProPetén also had extensive experience in implementing conservation and sustainable livelihoods strategies prior to their adoption of the Conservation Agreement methodology. Finally, CONAP (all agreements) and CECON (BioItzá/Corozal/Zotz) were selected as partners due to their legal management responsibilities in their respective areas.

Periodicity of Agreements

In all cases Conservation Agreements were signed for two-year periods, and evaluated at the end of each period to determine the impacts obtained and identify improvements. Pending the availability of funding, agreements were extended for another two-year term. Two exceptions did occur during the project: (1) The Paso Caballos agreement was extended for a fifth year due to uncertain funding for a complete third 2-year period; and

(2) due to a change in funding priorities by a project donor, the Carmelita agreement was only implemented with full funding for one two-year term. Balam was subsequently able to obtain partial funding to continue some of the agreement's key interventions, providing the opportunity to better understand how such vagaries in funding cycles can impact both the results in conservation and development outcomes, and local perceptions about the agreements themselves. **Figure 3** provides a graphic timeline of the four agreements.

Figure 3: Timeline of Conservation Agreement Implementation Stages within the Maya Biosphere Reserve



Community Conservation & Social Development Commitments

In each agreement, commitments of partner communities differed as a result of distinct legal frameworks, environmental threats, social priorities, and the amount of financing available. Community responsibilities were listed explicitly within the Conservation Agreement contracts, including specific counterpart contributions if relevant. Details of the specific conservation and social development commitments by community partners are provided in **Table 4**.

Table 4: Community Commitments within Conservation Agreements

CONSERVATION COMMITMENTS	Uaxactún	Paso Caballos	Carmelita	BioItzá/ Corozal/Zotz
Prevent and control fire	YES	YES	YES	YES
Implement Early Warning System for fire	YES	YES	YES	YES
Promote use of fire breaks in agricultural areas	YES	YES	YES	YES
Undertake control and vigilance (patrolling)	YES	YES	YES	YES
Avoid/reduce deforestation	YES	YES	YES	YES
Enrich wild stocks of xate palm	YES	NO	YES	NO
Harvest xate more sustainably (reduce xate waste)	YES	NO	NO	NO
Update and respect agricultural zoning	YES	NO	YES	NO
Establish 25-meter forest buffer along access road	YES	N/A	NO	N/A
Remove at least 50% of standing herd of cattle	N/A	YES	YES	NO
Prohibit entry of cattle and cattle ranching	YES	YES	YES	NO
Avoid illegal colonization of adjacent protected areas	N/A	YES	NO	NO
Comply with forest concession contract w/ CONAP	YES	N/A	YES	N/A
Comply with "Agreement of Intention" w/ CONAP	N/A	YES	N/A	N/A
Prohibit immigration and/or access to land by "outsiders"	YES	YES	YES	N/A
SOCIAL COMMITMENTS	Uaxactún	Paso Caballos	Carmelita	BioItzá/ Corozal/Zotz
Provide assistance to farmers during burning season	YES	YES	YES	YES
Strengthen financial administration	YES	NO	YES	N/A
Public updates on community enterprises finances	YES	NO	YES	N/A
Request increased social investment by government	YES	YES	NO	NO
Maintain community investment in Education	YES	NO	NO	NO
Collaborate with CONAP & governmental partners	YES	YES	YES	YES
<i>N/A: Does not apply to the agreement</i>				

Sanctions and Conditionality

All agreements described potential sanctions and processes for resolving unmet obligations by community partners and implementing CSOs. CSOs were required to provide periodic reporting to community partners and CONAP, detailing financial expenditures and programmatic results against set benchmarks. Sanctions for CSOs included the potential

suspension of the agreements by the leading State agencies, and by implication, the possibility of reduced income for staff compensation and operations.

Incompliance by communities was addressed by a tiered response system in which the first line consisted of community organizations citing those responsible for infractions and providing written warnings, and/or internal sanctions. If inadequate, a second line of defense of agreements consisted of CONAP engagement in an attempt to resolve conflicts, and/or impose sanctions. A third and final line of defense consisted of the potential reduction of the amounts of incentives provided to local communities if the previous two tiers were ineffective. These details were explicitly included in the agreement contracts, helping to ensure the conditionality of the financial and technical support provided.

Administration of Incentives

Incentives consisted of cash deposits, in-kind resources, and technical assistance depending on the formality of the administrative mechanisms existing in each community organization. In Carmelita and Uaxactún, the Carmelita Cooperative and OMYC respectively both received cash deposits on a quarterly basis due to their formal administrative structures which allowed CSO partners to comply with legal financial reporting requirements in Guatemala. In the cases of Paso Caballos (WCS) and BioItzá/Corozal/Zotz (ProPetén), CSOs administered incentives to provide in-kind and technical support based on pre-established budgets. Minor adjustments to agreement budgets were permitted based on a set system of prior consultation to ensure adaptive management in the face of demonstrable need and impact.

Evaluations

Agreements were evaluated based on three sets of core indicators: (1) Ecological; (2) Socioeconomic; and (3) Social perceptions. Baselines for each set of indicators were established shortly after the initiation of conservation agreements. Given that the four agreements were initiated sequentially, in 2009, 2010, 2012, and 2014, respectively, the amount of time elapsed between the baseline and the final evaluations differed considerably (6, 5, 4, and 1 years). In the case of the most recent, BioItzá/Corozal/Zotz agreement, the amount of time elapsed was considered inadequate to detect change among the socioeconomic indicators; other indicators were evaluated 12 months after signing, and 10 months after initiating implementation. Final evaluations were undertaken for all the indicators among the other three agreements (Uaxactún, Paso Caballos, and Carmelita). Two independent external evaluations of the project impact were also undertaken, and reported separately.

Areas of Influence of Conservation Agreements

In the cases of Uaxactún and Carmelita, the agreement areas covered the entirety of each community-based forest concession management unit (83,558 ha and 53,797 ha respectively). The Paso Caballos agreement's area of influence (9,848 ha) was defined as the Paso Caballos community polygon (5,236 ha) with an additional 3 kilometer buffer surrounding the polygon to account for the historical impacts on adjacent sections of Laguna del Tigre National Park. The BioItzá-Corozal agreement's area of influence (38,983 ha) was defined by summing the areas of the three distinct actors engaged in the

agreement, including the agricultural expanses of the community of Corozal, the BioItzá Municipal Reserve, and the El Zotz Biotope administered by CECON.

Environmental Indicators

Core indicators used to evaluate the ecological performance were generated by the Center for Monitoring and Evaluation of CONAP (CEMEC) by comparing deforestation and fire statistics within the area of influence of each agreement, prior to and after agreement implementation.

In the case of deforestation, the baseline consisted of the average annual rate of vegetative cover lost/gained over a three-year period prior to initiating each agreement. Baselines were compared to the annual rate of vegetative cover lost during the implementation of the conservation agreement. The amount of vegetative cover lost/gained was determined using digital classification methods of LANDSAT (TM, ETM and OLI) images.

Baselines for fire impacts consisted of the number of active fires (i.e. “hot points”) detected by the MODIS TERRA and AQUA satellites¹² within each conservation area during the 8 to 10-year period prior to the initiation of each agreement¹³. In conservation landscapes with agricultural zoning, hot points detected within legitimate agricultural areas were duly registered and classified separately from those detected within conservation zones.

Due to the lack of high resolution baselines, long-term fire and deforestation impact evaluations were based on LANDSAT images. However, each year after the dry season (February-May) an annual performance report was produced for each agreement using the highest resolution imagery available including Rapideye, ASTER and SPOT. These performance reports were used to promote adaptive management during implementation, and detect any potential violations of the commitments defined by the agreements (i.e. deforested and burned areas in conservation zones).

CEMEC’s annual reports summarizing each agreement’s environmental performance based on deforestation and fire data were subsequently shared with accompanying CSOs and community leaders, and CONAP. In cases where potential violations were detected, community patrols and CSO technical staff undertook field visits to ground-truth each point and verify accuracy. If confirmed, the procedures established for internal sanctions were triggered. The complete methodology employed to evaluate the environmental performance of agreements is detailed in **Appendix 1** (Final Environmental Performance Report).

Socioeconomic Indicators

The core socioeconomic indicators were developed through the use of modified Basic Necessities Surveys (BNS), following the methodology outlined by the WCS Living Landscape Program¹⁴. This method was preferred to collecting information on daily wages

¹² Fire Information for Resource Management System (FIRMS) operated by NASA/University of Maryland

¹³ Longer baselines were utilized because fire patterns are highly susceptible to climatic events and therefore subject to considerable variation. By contrast, deforestation rates tend to be much more stable. Due to data limitations eight (8) years of data were used to develop the Uaxactún baseline, nine (9) years of data for the Paso Caballos baseline, and ten (10) years for the Carmelita baseline.

¹⁴ http://mande.co.uk/blog/wp-content/uploads/2008/04/WCS_Modified_BasicNecessitiesSurvey.pdf; See also: <http://mande.co.uk/special-issues/the-basic-necessities-survey/>

and household income using standardized definitions of “poverty” and “extreme poverty” since the compilation of accurate income data is notoriously elusive (Sanders, 2006, Fisher et al. 2010), and can also be considered intrusive.

We identified necessary or indispensable goods and services through consultations with focal groups within three partnering communities, and established a common set or “basket” of 31 goods and services shared among the participating communities (**Table 5**). CSO technical staff, local teachers, and students trained in survey techniques selected households randomly, and then gathered data by visiting households; heads of households were informed of the objective of the survey and told that participation was voluntary. In Paso Caballos surveys were conducted in Q’eqch’í with the assistance of a native speaker.

Table 5: Goods and Services used as Indicators in MBR Basic Necessities Surveys

No.	Category	Sub-Category	English	Spanish
1	Goods	Commodity	Television	<i>Televisión</i>
2	Goods	Commodity	Shower/Bath	<i>Baños Lavables</i>
3	Goods	Commodity	Solar Panel	<i>Panel Solar</i>
4	Goods	Commodity	Sink	<i>Pila</i>
5	Goods	Commodity	Generator	<i>Planta Eléctrica</i>
6	Goods	Commodity	Motorcycle	<i>Motocicleta</i>
7	Goods	Commodity	Cell Phone	<i>Celular</i>
8	Goods	Commodity	Refrigerator	<i>Refrigeradora</i>
9	Goods	Commodity	Latrine	<i>Letrinas</i>
10	Goods	Commodity	Stove	<i>Estufa</i>
11	Goods	Education	Computer	<i>Computadora</i>
12	Goods	Food	Orchard	<i>Huerto Familiar</i>
13	Goods	Food	Fowl	<i>Aves de Corral</i>
14	Goods	Food	Three Meals/Day	<i>Comer 3 Veces/Día</i>
15	Goods	Food	Domestic Animals	<i>Animales Domésticos</i>
16	Goods	Food	Wild Game Animals	<i>Animales Silvestres</i>
17	Goods	Health	Medical Kit	<i>Botiquín</i>
18	Goods	Labor	Chainsaw	<i>Motosierra</i>
19	Goods	Labor	Axe	<i>Hacha</i>
20	Goods	Land	Agricultural Plot	<i>Trabajadero</i>
21	Goods	Livestock	Pigs	<i>Cerdos</i>
22	Goods	Livestock	Horses/Mules	<i>Equinos</i>
23	Goods	Transportation	Car	<i>Carro</i>
24	Goods	Transportation	Bicycle	<i>Bicicleta</i>
25	Goods	Water	Water Storage	<i>Tinaco</i>
26	Services	Education	Internet	<i>Internet</i>
27	Services	Health	Doctor	<i>Medico</i>
28	Services	Health	Garbage Disposal	<i>Basurero Comunal</i>
29	Services	Health	Health Clinic	<i>Unidad de Salud</i>
30	Services	Transportation	Road Access	<i>Carretela</i>
31	Services	Water	Piped Water	<i>Entubada</i>

We recorded family names to track the status of each household over time, but reported all information anonymously. A total of 182 households were surveyed in three agreement areas; of these 178 contained complete data sets permitting analysis, including 38 in Carmelita, 61 in Uaxactún, and 79 in Paso Caballos. The percentage of households surveyed in each community was 51%, 33%, and 30% respectively.

Final information produced included evaluations of the Index of Wellbeing¹⁵ at the baseline measurement and the final measurement in 2015 for each household, as well as the mean for each community, and the mean for the entire set of 178 households. Data also permitted evaluations of the trends for each one of the basic goods or services included within the common basket of indicators. Statistical analyses consisted of a paired t-test. The complete methodology employed to evaluate well-being using the BNS+ surveys is detailed in **Appendix 2** (Final Socioeconomic Report).

Additional data were collected during household surveys to determine the educational level and key sources of employment of household members. The entire set of data captured was labeled “BNS+” by project partners.

Social Awareness Indicators

Core social indicators were collected through the use of a survey instrument designed to capture the degree of awareness of, and support for, the agreements among participating community members. A total of 10 questions inquired about the importance of wildlife, clauses within the agreement, knowledge of the participating institutions, and a qualitative evaluation of the degree of support for the agreement. The same households surveyed during the BNS evaluations were surveyed to evaluate social awareness.

Additional Evaluations

Complementary evaluations undertaken during the project included: (1) Annual participatory evaluations with community leaders and signatory partners including CONAP and Witness of Honor CSOs¹⁶; (2) Formal end-of-period (i.e. every 2 years) evaluations by CONAP; (3) A survey by an independent consultant on knowledge about, and support for, Conservation Agreements among CSO and governmental partners; and (4) A final evaluation of project impact by an independent consultant. In this case, an independent consultant reviewed the scope of the project and interviewed numerous community members and leaders, making field visits to each implementing site to obtain independent verification of project impacts. Governmental and CSO partners were also surveyed, and invited to a formal workshop to present the results of the independent assessment and receive comments.

Case Studies and Testimonials

Project partners also prepared case studies describing the relevance and impact of select interventions, as well as testimonials by partners and participants to help enrich the

¹⁵ This is known in the literature as the “Poverty Index”, but we describe it as a “BNS Index of Well Being”, to facilitate return of the data to the participating communities. The Index is scored from 0%-100%, with 0% representing a complete absence of all essential goods and services, and 100% a complete presence; the higher the score, the higher the well-being.

¹⁶ These included Tikal in the case of the BioItzá Agreement, and the Municipality of San Andres in the Paso Caballos agreement.

qualitative and institutional assessments of the agreements. Finally, throughout the 5+ years of Conservation Agreement implementation, CONAP and WCS collaborated to monitor the trends in deforestation, fire, and human population growth across the entire Maya Biosphere Reserve, thereby facilitating the evaluation of the impact of Conservation Agreements against background trends reserve-wide.

RESULTS

Four Conservation Agreements were implemented and evaluated. The average time of agreement implementation was 46.5 months (3.8 years) led by Uaxactún (77 months), and followed by Paso Caballos (52 months), Carmelita (46 months)¹⁷, and BioItzá-Corozal (11 months) respectively. A total human population of 3,476 inhabitants¹⁸ was targeted as participants in the five social groups included within the four agreements.

Environmental Impacts

The average amount of annual forest change recorded during agreement implementation declined in all conservation areas (**Table 6**), with the greatest reduction recorded in the area of Paso Caballos both in terms of total number of hectares (214 ha), and in percentage (64%). Paso Caballos was followed by Carmelita (34 ha; 44.2%), Uaxactún (24 ha; 21.6%), and BioItzá-Corozal (14 ha; 27.5%) respectively, with Uaxactún yielding the lowest rate of forest change in terms of percentage.

Table 6: Deforestation Before and During MBR Conservation Agreements

Parameter	BioItzá-Corozal	Paso Caballos	Uaxactún	Carmelita	All Agreements
Years of baseline data	3	3	3	3	
Years of deforestation data during agreement implementation	1	5	6	4	
Base line: average annual forest cover loss (ha)	51.0	334.7	111.3	77.7	574.7
Average annual forest cover loss during agreement (ha)	37.0	120.4	87.2	43.4	287.9
Net change in the average annual amount of forest cover lost (ha) during agreements compared to baseline ¹	-14.0	-214.3	-24.1	-34.3	-286.7
Net % change in annual amount of forest cover loss: baseline compared to agreement implementation ¹	-27.5%	-64.0%	-21.6%	-44.2%	-49.9%

¹ Negative numbers represent a reduction in the average number of hectares deforested

¹⁷ The Carmelita agreement was implemented in full force for a span of 24 months. Subsequently, select activities of the agreement were sustained through continued collaboration between the Carmelita Cooperative and Asociación Balam, who was able to provide approximately 50% of the funding originally provided in the agreement.

¹⁸ Representing 87% of the 4,000 rural inhabitants proposed originally to Darwin/DEFRA. We estimated the human populations conservatively to avoid overstating impact. During the study we concluded that indirect estimates had over-estimated populations, particularly in Uaxactún and Paso Caballos.

Collectively, during the complete and variable lifespans of agreements, 49.9% of the expected forest loss (based on baseline rates) did not occur. During the entire six-year period contemplated in this study (2009-2015), forest loss declined by a total of 1,367 hectares compared to the amount expected based on the average trends during the three years prior to agreements. During the three-year Darwin Initiative project lifespan, forest loss declined by 908 hectares compared to the amount expected.

The average annual number of MODIS active fires (hot points) declined by 34.9% during agreement implementation as compared to the baseline annual averages for the four areas (**Table 7**). The greatest reduction was obtained in Carmelita (71.2%), followed by BioItzá-Corozal (47.4%), and Paso Caballos (39.2%). Surprisingly, Uaxactún averaged 2.5 additional hot points per year, although 80% of these occurred in areas zoned for agriculture. In these areas, the use of fire is permitted to clear land prior to planting, as long as farmers install fire breaks and take appropriate measures to ensure fire does not spread into intact forest.

Table 7: Fire Hot Points Before and During MBR Conservation Agreements

Parameter	BioItzá-Corozal	Paso Caballos	Uaxactún	Carmelita	All Agreements
Years of base line data	10	9	8	10	
Years of hot point data during agreement implementation	1	5	6	4	
Average annual number of hot points during baseline	7.6	42.1	3.5	2.6	55.8
Average annual number of hot points during agreement	4.0	25.6	6.0	0.8	36.4
Average annual number of hot points detected within agriculturally zoned areas during agreements	2.0	23.0	4.8	N/A	29.8
Average annual number of hot points detected in forested, non-agricultural areas during agreements	2.0	2.6	1.2	N/A	5.8
Change in the average annual number of hot points: baseline compared to agreement implementation ¹	-3.6	-6.5	2.5	-1.9	-19.5
% change in the average number of hot points: baseline compared to agreement implementation ¹	-47.4%	-39.2%	71.4%	-71.2%	-34.9%

¹ Negative numbers represent a reduction in number of hot points

During this study Carmelita villagers had not yet completed zoning their agricultural polygon, thereby obviating a distinction between hot points linked to permitted agriculture and those in Carmelita's conservation zones. Nevertheless, for the other three areas with agricultural areas defined, the lowest number of hot points in defined conservation zones

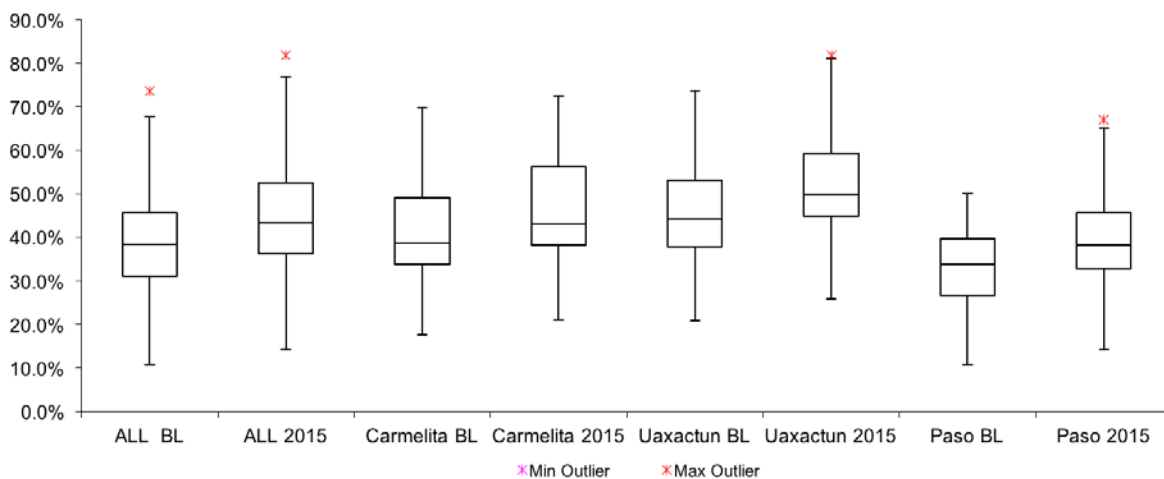
was registered by Uaxactún followed by BioItzá-Corozal, and Paso Caballos, respectively. An overwhelming concentration of Paso Caballos’ fire points were detected in their agricultural areas (89.8%), highlighting the dependence upon agriculture within that community.

Socioeconomic Impacts

Basic Necessities Surveys and data on education and livelihoods (BNS+) were used to evaluate the socioeconomic changes within communities implementing Conservation Agreements. Evaluations were undertaken in three of the four agreement sites; only the BioItzá-Corozal agreement was not evaluated against an established baseline due to its recent initiation only 12 months prior to this evaluation. Survey results with 178 households (Uaxactún: 61 households; Carmelita: 38 households; Paso Caballos: 79 households) revealed a strongly significant improvement in the BNS “Index of Wellbeing” among the pooled set of 178 households ($P=3.77E-12$); within Carmelita among 38 households ($P=0.007732$); within Paso Caballos among 79 households ($P=4.76E-10$), and within Uaxactún among 61 households ($P=0.000662$). Specific statistical results are detailed in **Appendix 3**.

Mean differences in access to the goods and services included within the BNS survey increased in all cases, with the greatest increase reported in Paso Caballos (6.1%), followed by Uaxactún (5.9%), and Carmelita (5.4%); when pooled, all households reported a 5.9% increase in access to basic goods and services.

Figure 4: Box Plot Depicting Evolution between the Baseline (BL) and 2015 in Inter-quartile Results in the Basic Necessities Index of Wellbeing among All Households, Carmelita, Uaxactún, and Paso Caballos



Specific Changes in Basic Necessities

Among the 178 household sampled within the three agreement sites, we detected an average improvement of 5.7% in the 31 basic necessities measured (**Table 8**). When considering the three villages collectively, 15 basic necessities increased in availability, 9 remained “stable”, and 7 decreased. Uaxactún (6.2%) perceived the greatest overall gains in access to basic necessities, followed by Paso Caballos (5.6%) and Carmelita (5.4%).

Table 8: Changes Detected in BNS Indicators during Project Implementation (Including +/- changes in the percent of households for each BNS indicator/village, and the average change among all villages; variations of +/- 2% or less were considered “stable” and are denoted by yellow)

BNS Indicators	Uaxactún	Paso Caballos	Carmelita	Average Change
	+/-	+/-	+/-	
Piped Water	6.6	1.3	100.0	35.9
Doctor	44.3	8.9	47.4	33.5
Solar Panel	57.4	19.0	7.9	28.1
Road Access	42.6	31.6	7.9	27.4
Water Storage Tank	18.0	30.4	0.0	16.1
Cell Phone	9.8	30.4	7.9	16.0
Television	19.7	11.4	13.2	14.7
Pigs	19.7	11.4	10.5	13.9
Motorcycle	29.5	-1.3	2.6	10.3
Orchard	-6.6	13.9	21.1	9.5
Sink	11.5	8.9	7.9	9.4
Generator	13.1	6.3	5.3	8.2
Computer	16.4	5.1	2.6	8.0
Latrine	3.3	3.8	5.3	4.1
Shower/Bath	9.8	1.3	0.0	3.7
Car	-1.6	-1.3	7.9	1.7
Chainsaw	1.6	0.0	2.6	1.4
Internet	-1.6	0.0	5.3	1.2
Refrigerator	4.9	1.3	-2.6	1.2
Axe	-14.8	7.6	7.9	0.2
Domestic Fowl	6.6	17.7	-23.7	0.2
Horses/Mules	0.0	-1.3	0.0	-0.4
Garbage Disposal Area	-1.6	2.5	-5.3	-1.5
Three Meals/Day	4.9	0.0	-10.5	-1.9
Agricultural Plot	-13.1	3.8	2.6	-2.2
Domestic Animals	-4.9	0.0	-5.3	-3.4
Stove	-3.3	0.0	-7.9	-3.7
Medical Kit	-13.1	1.3	-10.5	-7.5
Wild Game Animals	-36.1	-12.0	2.6	-15.1
Health Clinic	3.3	-12.7	-36.8	-15.4
Bicycle	-34.4	-15.2	2.6	-15.7
Net Change in BNS %	6.2	5.6	5.4	5.7
<i>* Colored cells denote indicators in which the baseline was "0"</i>				

Uaxactún demonstrated robust increases in access to solar panels (+57.4% of households), access to a doctor (+44.3%), improved road access (+42.6%), and possession of a motorcycle (+29.5%). Notable improvements in Paso Caballos included improved road access (+31.6%), presence of water storage tanks (+30.4%), and possession of a cell phone (+30.4%). In Carmelita, the installment of a water delivery system benefitted 100% of the households surveyed; access to the services of a doctor and an orchard (i.e. land) increased by 47.4% and 21.1% respectively.

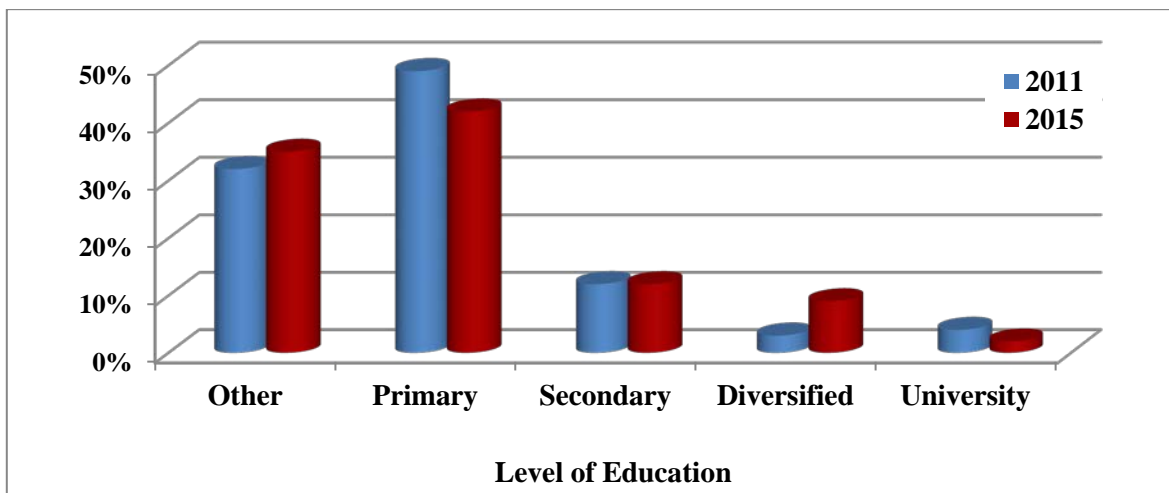
Paradoxically, Uaxactún also reported the greatest number of negative BNS indicators (11), followed by Carmelita (8) and Paso Caballos (6), respectively. No single BNS indicator reported negative trends in all three villages. For example, decreased access to an orchard (-6.6%) in Uaxactún was not repeated in Carmelita nor in Paso Caballos. The five BNS indicators with the most negative trends consisted of a bicycle (-15.7%), access to a health clinic (-15.4%), consumption of wild game animals (-15.1%), access to/presence of a medical kit (-7.5%), and presence of a stove (-3.7%).

Among the 7 decreasing (red) indicators, Uaxactún provided the largest negative contribution to their collective decrease (-14.5%), followed by Carmelita (-7.5%) and Paso Caballos (-4.9%) respectively.

Education and Employment (BNS+)

Changes in education and employment were based on information collected during the BNS+ household surveys in the three sites where agreements had been implemented for sufficient time to permit analysis of change (Carmelita, Paso Caballos, and Uaxactún). For members of the Asociación BioItzá and inhabitants of Corozal, we report only the data collected during the baseline survey undertaken in early 2015. In all cases, we grouped persons not of school age, self-taught readers (*empiricos*), self-reported illiterates, and respondents who did not provide information on education in the category of “Other”.

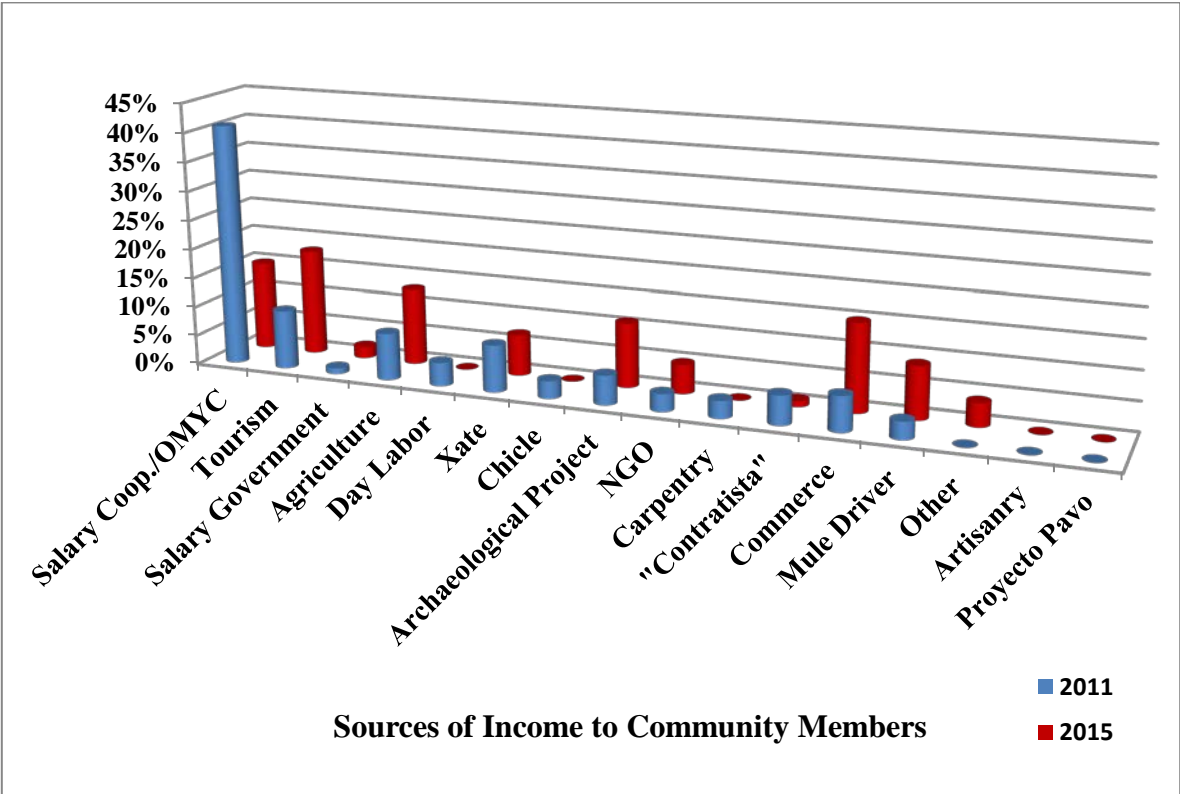
Figure 5: Level of Education in Carmelita in 2011 and 2015 based on Responses to BNS+ Community Surveys



In Carmelita, education levels varied modestly (Figure 5), with the greatest changes consisting of a reduction in the number of those with and/or studying a primary education, and a tripling of the number of graduates from diversified (technical) schooling (from 3% to 9%).

More significant changes occurred in the main sources of household income reported by Carmelita residents (Figure 6). Strong increases in income reported from tourism, agriculture, archaeological projects, commerce, and transportation using mules (linked to tourism and archaeological projects) compensated for decreased household reliance on the Carmelita Cooperative, xate, chicle, and work as “contratistas” or natural resource brokers who work as middlemen in the xate and/or chicle industries. Nevertheless, reliance on agriculture more than doubled during the same period.

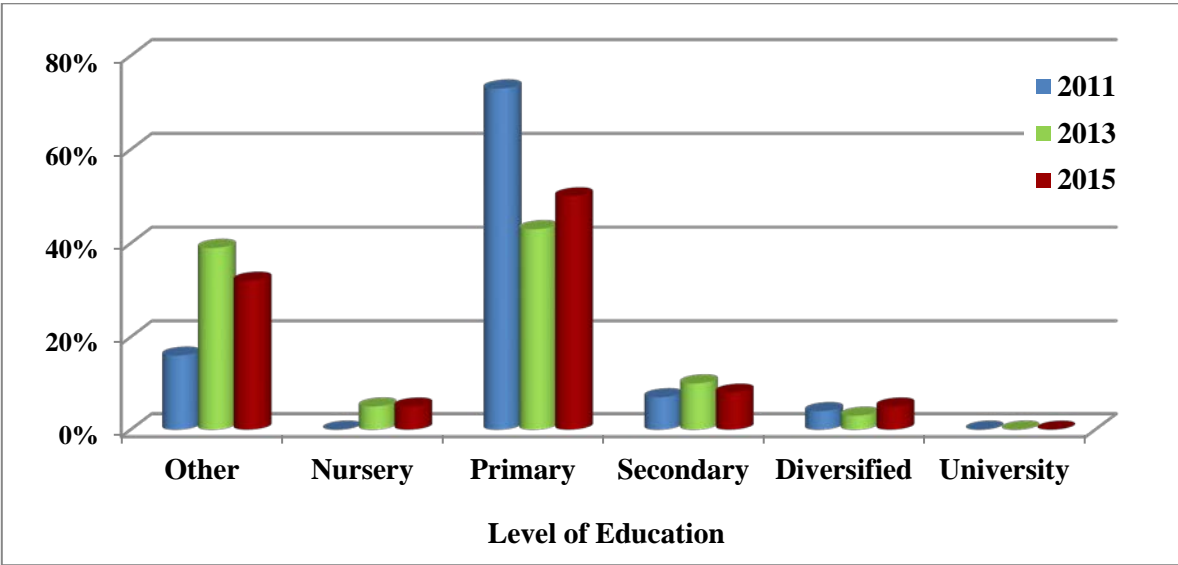
Figure 6: Sources of Employment in Carmelita in 2011 and 2015 based on Responses to BNS+ Community Surveys



In Paso Caballos, education levels remained comparatively low, with a large increase in the number of “Other” respondents, including those who failed to provide information, or lacked formal schooling (Figure 7). A large decrease in the number of inhabitants recording primary education was also correlated with access to nursery schooling¹⁹. The percentage of graduates of secondary, diversified, and university programs was the second lowest amongst the five community groups surveyed.

¹⁹ Project field staff did not record the number of students attending nursery school during the initial 2011 survey.

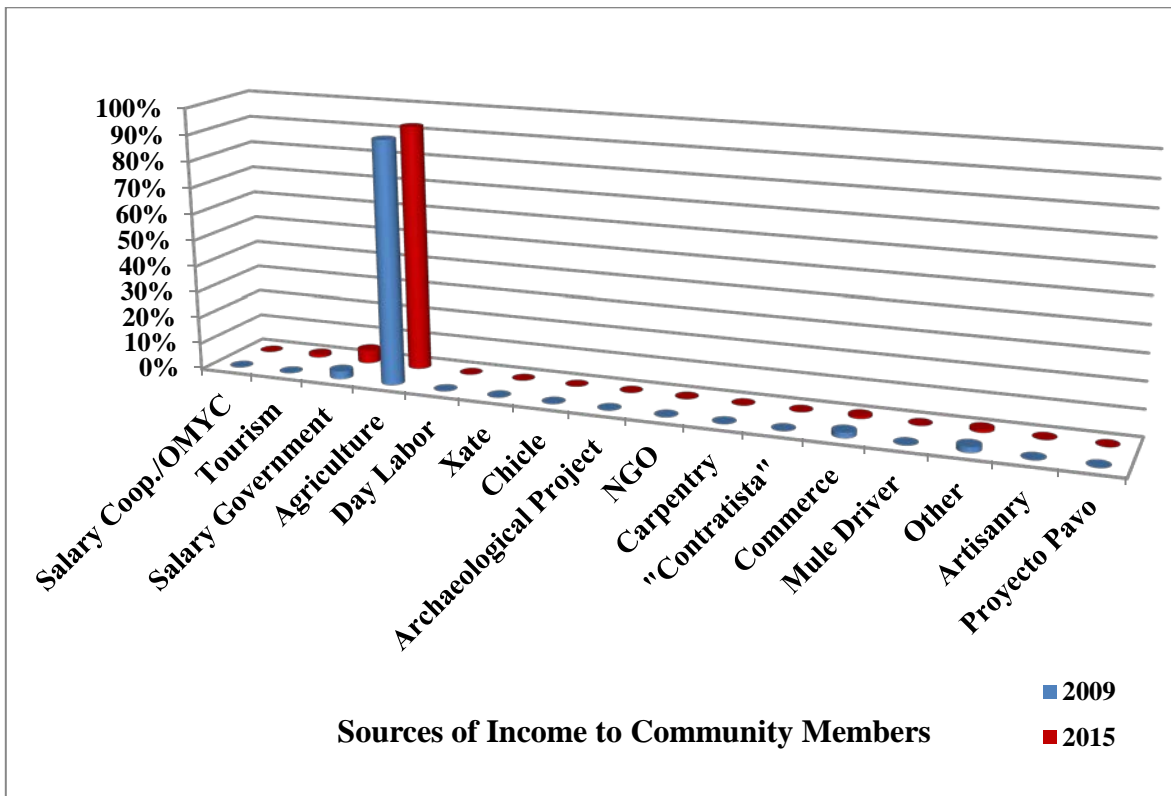
Figure 7: Level of Education in Paso Caballos in 2009 and 2015 based on Responses to BNS+ Community Surveys



Surveys revealed remarkable stability in sources of household income in Paso Caballos between 2010 and 2015 (**Figure 8**). The combined importance of farming corn and squash²⁰ varied by only one percent over the study period (from 92% to 93%), while income from government salaries grew from 3% to 5%. Otherwise the socioeconomic foundation of the village remained stable and extremely dependent on agricultural income. In 2015 tourism finally registered as an economic activity (1%).

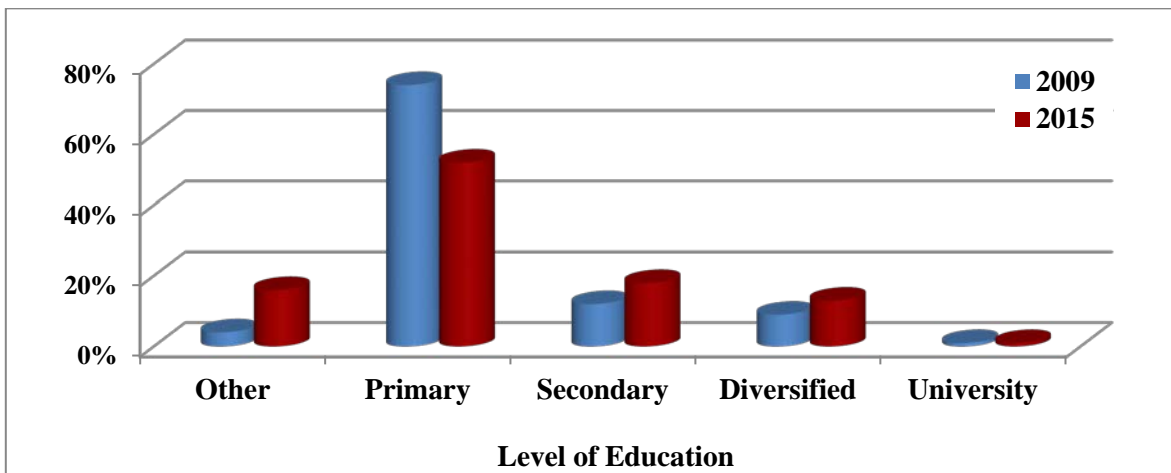
²⁰ In Paso Caballos, we obtained data regarding the comparative economic importance of corn and squash. In 2010, corn (45%) and squash (47%) were reported by household heads as their most important sources of income (92% combined). In 2015, corn (39%) and squash (54%) registered at 93% combined.

Figure 8: Sources of Employment in Paso Caballos in 2009 and 2015 based on Responses to BNS+ Community Surveys



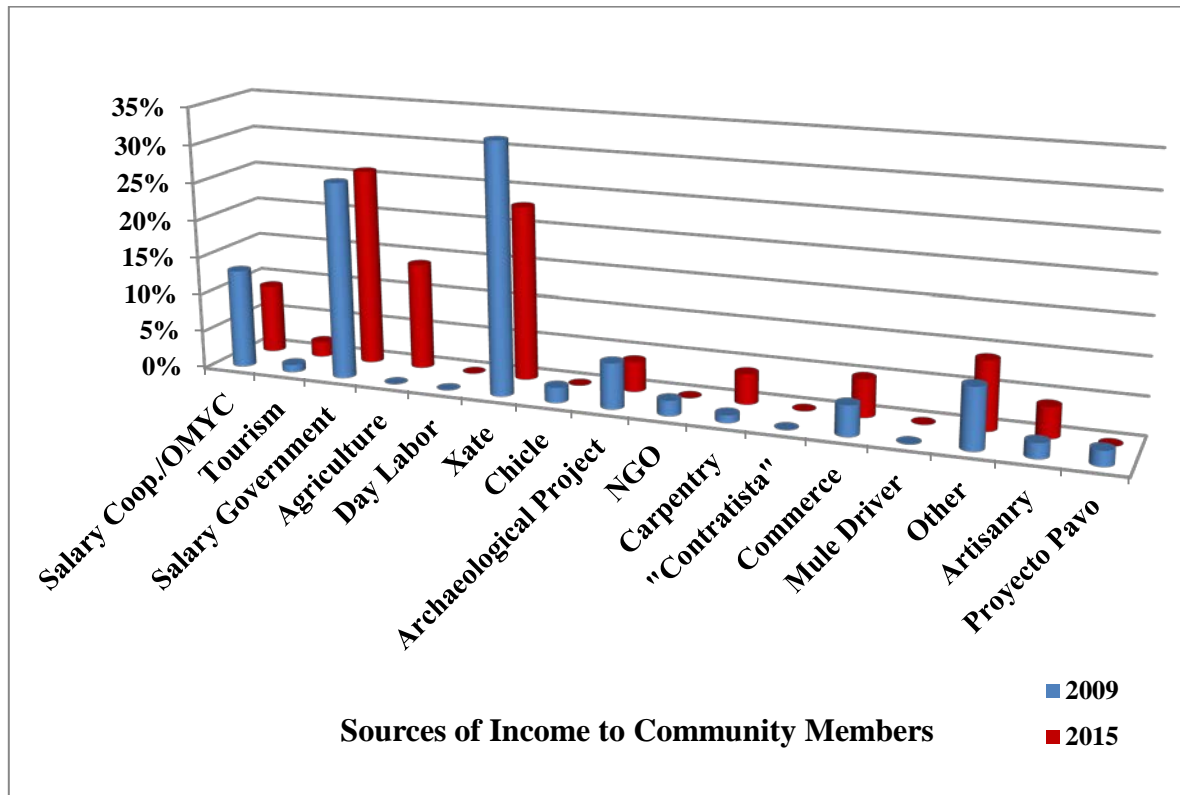
In Uaxactún, educational levels at the secondary and diversified levels demonstrated a combined 10% increase growing from 21% in 2009 to 31% in 2015 (Figure 9). University graduates registered at 1% on both occasions. Once again, an 18% decrease in the number of inhabitants recording primary education was linked to an increase in the number of individuals classified as “Other”, and the entry of household members into the secondary and diversified levels.

Figure 9: Level of Education in Uaxactún in 2009 and 2015 based on Responses to BNS+ Community Surveys



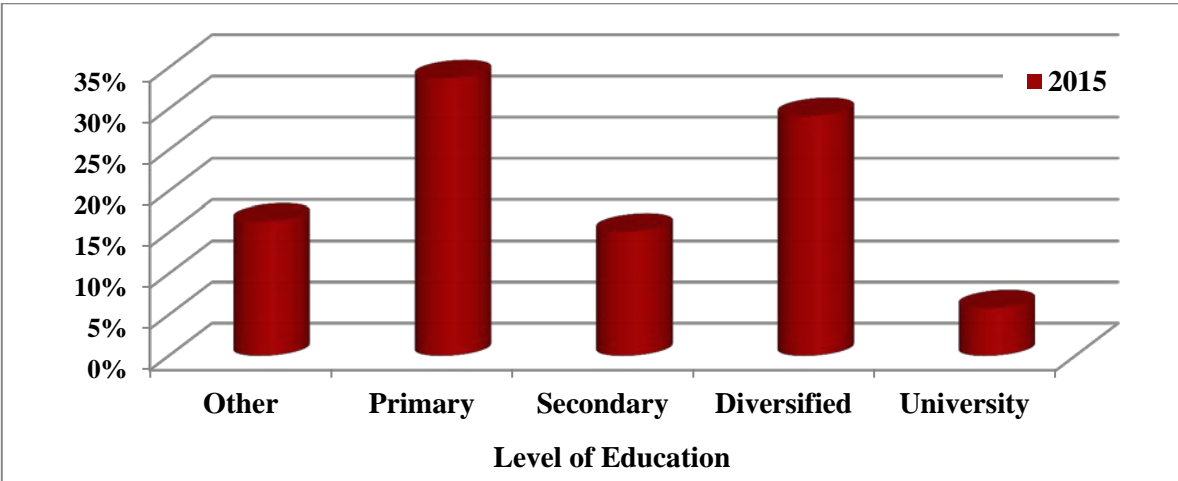
Changes in household income in Uaxactún mirrored to some extent the patterns detected in Carmelita (**Figure 10**). Dependence on the community-based organization responsible for forest management (OMYC) declined, as did dependence on xate and chicle. The declines were again compensated by increased reliance on agriculture (notably from just above 0% to 14%) and tourism, carpentry, and artisanry. Unlike Carmelita, sources of income from archaeological projects decreased. “Other” sources included working as a chauffeur, washing clothes, hunting, government pension, and family support.

Figure 10: Sources of Employment in Uaxactún in 2009 and 2015 based on Responses to BNS+ Community Surveys



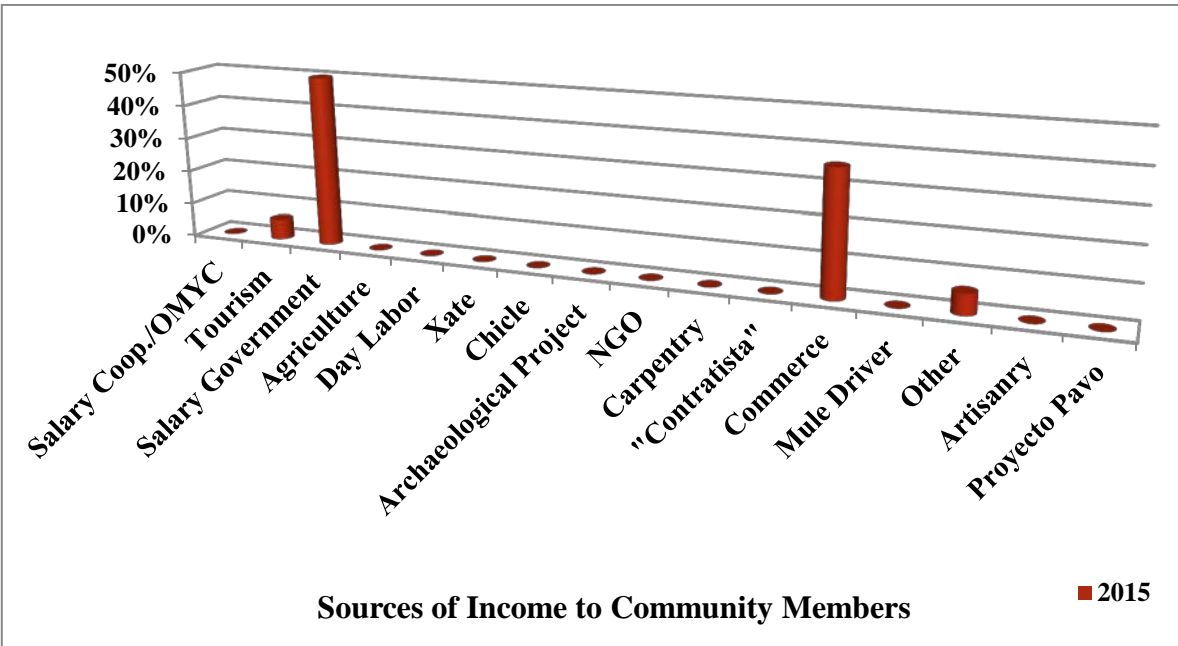
Education levels of BioItzá members were the highest among all the participating community groups, with 50% of the respondents with secondary, diversified, or university education (**Figure 11**). The next closest village was Uaxactún (32%), followed by Carmelita (23%), Paso Caballos (12%), and Corozal (10%). A majority of BioItzá members live in and around the central urbanized area of San José, a municipal capital on the northern shore of Lake Petén-Itzá. As compared to the other four villages, sources of employment are more abundant for graduates of technical (diversified) and university programs, making it less likely that they translocate in search of employment.

Figure 11: Level of Education among BioItzá Members in 2015 based on Responses to BNS+ Community Surveys



BioItzá members reported 50% of their household income from governmental sources (Figure 12), ranking them as the most effective group in this regard, far surpassing Uaxactún’s 26%. The second most important source of income consisted of diverse types of commerce (36%), including private businesses, work as mechanics, masonry, and carpentry, with tourism and other miscellaneous sources of income tied for third place at 6% each.

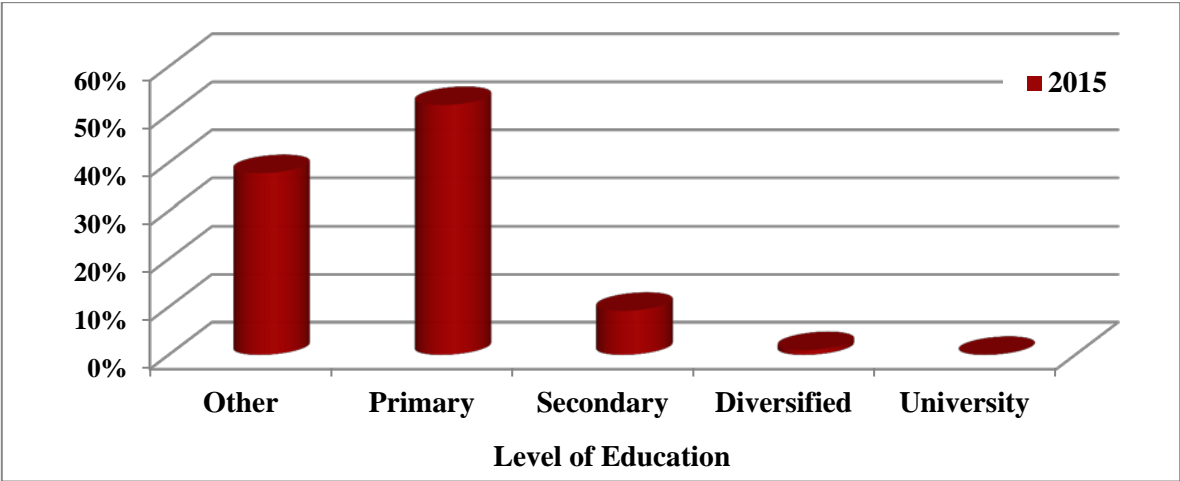
Figure 12: Sources of Employment among BioItzá Members in 2015 based on Responses to BNS+ Community Surveys



Corozal village reported the lowest total education levels among the five participating community groups (Figure 13). As in the case of Paso Caballos, Corozal is predominantly

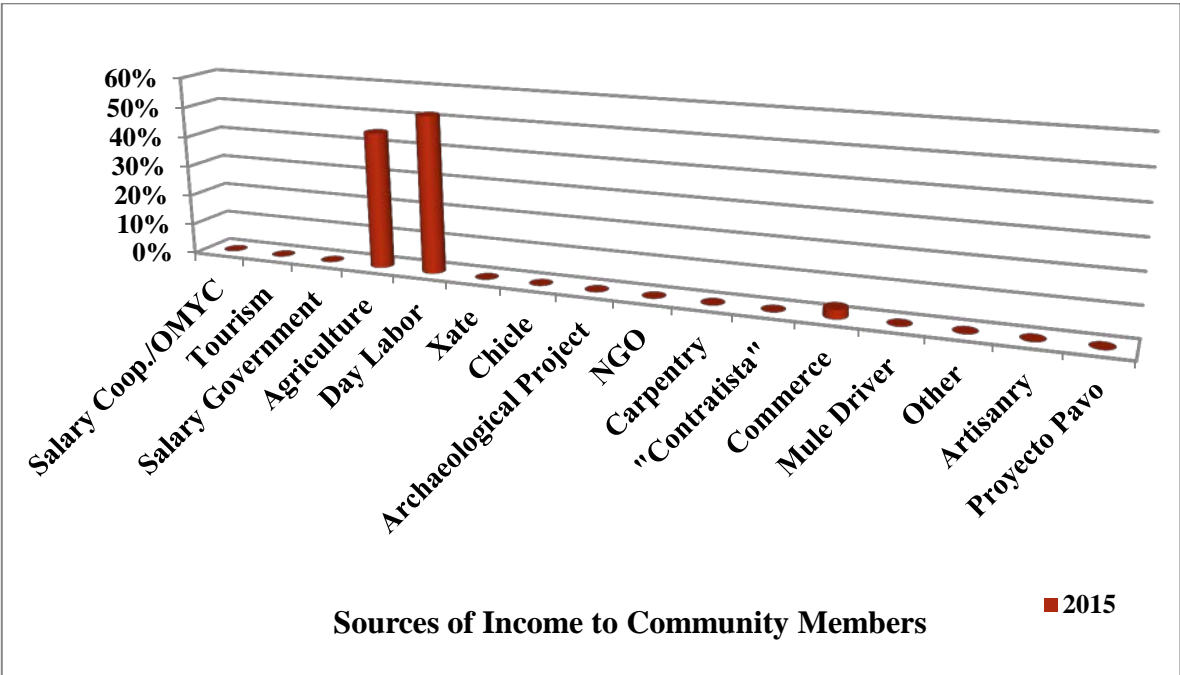
an agricultural village, with marginal education infrastructure and few alternatives for employment. It is notable that in 2015, Corozal registered the highest level of “Other” respondents, with only Paso Caballos (2013), and Carmelita (2011, 2015) registering similar levels.

Figure 13: Level of Education in Corozal in 2015 based on Responses to BNS+ Community Surveys



Due to the agricultural vocation of the village, sources of income in Corozal reflect the patterns in Paso Caballos, with the main distinction being that the largest single source of income are wages paid for daily labor (Figure 14).

Figure 14: Sources of Employment in Corozal in 2015 based on Responses to BNS+ Community Surveys



Benefits of Agreements

Project personnel tracked the number of individuals per gender benefitted by specific activities to evaluate the distribution of agreement incentives throughout the community. **Table 9** details the number of direct and indirect beneficiaries for each agreement during the first, and the final years of implementation. We distinguished between benefits from social investments and those from conservation investments, and provide a conservative estimate of the total number of individuals to receive some type of direct benefit annually, be it a cash payment, or personal reception of a good or service supported by the agreement²¹. We also calculated the ideal annual per capita benefit for social and conservation investments, assuming an equal distribution of benefits among all registered participants.

²¹ Direct benefits consisted of monthly employment, daily employment, and provision of equipment, work supplies, educational supplies, medical supplies, teacher salaries, as well as per diems for community leaders traveling to Municipal government headquarters to obtain greater governmental investment in their villages. We also classified the provision of assistance by community fire brigades financed by the agreement as a direct benefit to each farmer. Direct beneficiaries were counted estimated conservatively based on individuals known to have received a payment or service. Single individuals were potentially included within tallies of the number of individuals benefitted by social incentives and protection incentives. However, when the total number of beneficiaries was tallied for each particular agreement, individuals were only counted once.

Table 9: Estimates of Direct Benefits from Conservation Agreement Incentives during Two Years of Implementation

DETAILS	Uaxactún		Paso Caballos		Carmelita		BioItzá/Corozal/Zotz
Date Initiated	2009		2010		2012		2015
Implementing CSO	WCS		WCS		BALAM		PROPETEN
YEAR OF BENEFICIARY DATA	2009-2010	2014-2015	2010-2011	2014-2015	2012-2013	2014-2015	2015
Partner Human Population	770	769	1562	1384	344	N/A	800
Direct Beneficiaries Social Incentives ¹	156	304	163	283	121 Adults	N/A	150
Average Annual Per Capita Social Incentive ²	\$146	\$75	\$78	\$46	\$176	N/A	\$21
Direct Beneficiaries Protection Incentives ³	174	177	184	275	65 Adults	N/A	7 (BioItzá) + 31 (Cor) ⁷
Average Annual Per Capita Protect. Incentive ⁴	\$117	\$115	\$67	\$45	\$327	N/A	\$337
Total Direct Beneficiaries ⁵	230	308	184	283	161 Adults	N/A	188
Total Indirect Beneficiaries ⁶	770	769	1562	1384	344	344	800
¹ The total number of individuals receiving a direct financial incentive (payment), good, or service as a result of Social Incentives within the Conservation Agreement over a 12-month period							
² The average annual value of the payments, goods, and services to direct beneficiaries of Social Incentives in US Dollars assuming an equal distribution of benefits							
³ The total number of individuals receiving a direct financial incentive (payment), good, or service as a result of Protection Incentives within the Conservation Agreement over a 12-month period							
⁴ The average annual value of the payments, goods, and services to direct beneficiaries of Protection Incentives in US Dollars assuming an equal distribution of benefits							
⁵ The total number of individuals within the partner human population to receive direct benefits from Social and/or Protection Incentives							
⁶ The total number of individuals within the partner human population to receive indirect benefits from Social and/or Protection Incentives							
⁷ The BioItzá-Corozal-Zotz agreement also provided benefits (i.e. supplies) to 64 guards from CONAP, Tikal, CECON, SIPECIF, and DIPRONA							

Indirect benefits were more difficult to document, but in all cases community counterparts suggested that indirect benefits accrued to the entire target population of each agreement. The most common indirect benefit was an enhanced sense of security among participants regarding their rights to land and/or usufruct of natural resources, particularly in the village of Paso Caballos²². Members of Carmelita and Uaxactún manifested increased confidence that their community forest concession contracts would be renewed as a result of positive engagement with CONAP facilitated by the agreements. Additional indirect benefits included: 1) Uaxactún: recuperation of OMYC's financial solvency²³ and confidence in the community forest concession among village inhabitants; 2) Paso Caballos: the recuperation of a supportive working relationship with CONAP; 3) Carmelita: the inclusion of the Carmelita agreement as the initial field activity of a large scale reduced emission from deforestation and degradation project (REDD+) entitled "*GuateCarbon*"; and 4) BioItzá/Corozal: strengthening of the multi-stakeholder collaboration between Corozal village, the BioItzá Association, CECON, and Tikal National Park led by ProPetén.

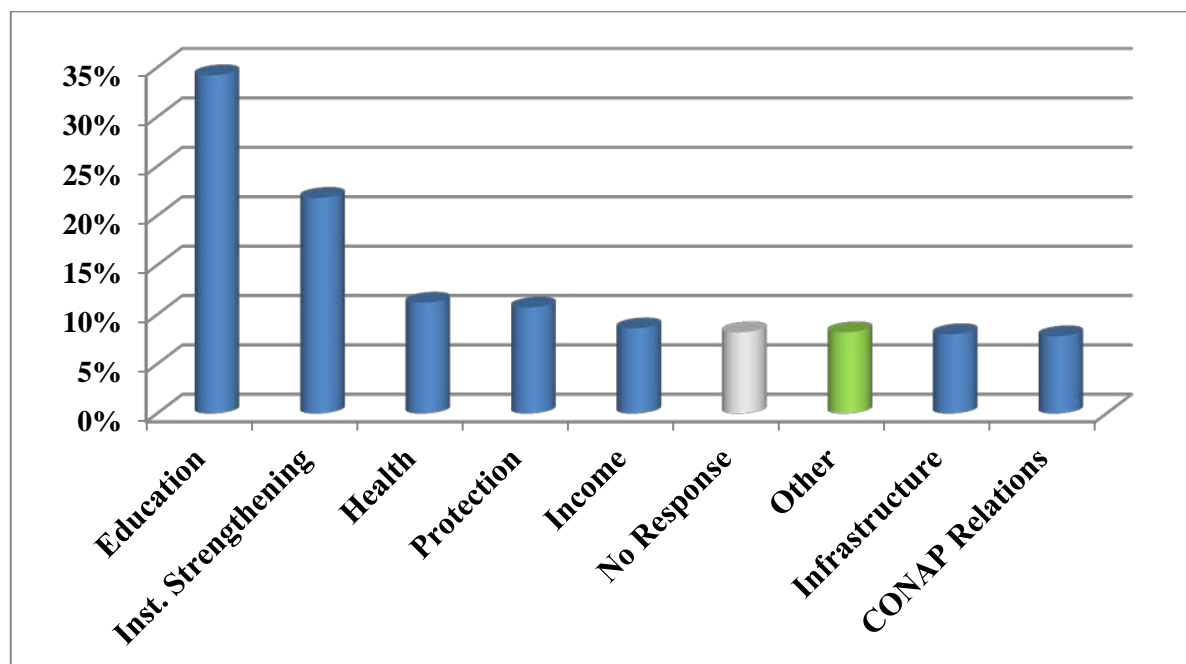
It was not viable to report specific information on the per capita equity in benefit capture among participants in agreements. That said, despite broad distribution of direct benefits resulting from the design of specific incentives (i.e. the incentive payment for harvesting only quality xate in Uaxactún, the education and investments in all agreements, the health investments in Paso Caballos and Carmelita, etc.), the equity of benefit distribution remained far from the "ideal" or equal distribution calculated in **Table 9**. This observation thus raises interesting questions about whether the way benefits were negotiated and implemented was in fact equitable enough to sustain broad support among the participating communities. To answer this question more completely we rely upon the results of the community surveys on attitudes regarding the agreements, reported in the following pages.

In regard to the local awareness of benefits received from agreements, respondents familiar with Conservation Agreements among all five social groups collectively mentioned investments in education as the most commonly recognized benefit of agreements (**Figure 15**). This was followed by recognition of the importance of institutional strengthening of the local community-based organizations, investments in health services, improved protection of natural resources, improved income sources, infrastructure investments, and improvements in relations with CONAP, respectively. A total of 8.2% of respondents could not reply to the question, and 7.8% of respondents identified other related benefits.

²² In 2007, select families in Paso Caballos supported an organized movement to illegally occupy land in Laguna del Tigre National Park adjacent to the village. Approximately 80 families were forcefully evicted in 2008, leading to a deteriorated relationship between CONAP personnel and Paso Caballos.

²³ Prior to initiating implementation of the Conservation Agreement in Uaxactún, OMYC was saddled with a Q. 2.3 million debt, and nearing bankruptcy. One of the specific stipulations of the agreement called for improved financial management and transparency in financial reporting to OMYC's general assembly. CONAP and WCS also joined forces with OMYC to finance a professional financial manager as a key clause of the agreement. At the mid-point of the third year of the agreement, the debt had been totally repaid, and to date OMYC remains free of any significant debt.

Figure 15: Benefits cited by Respondents Familiar with Conservation Agreements in BioItzá, Carmelita, Corozal, Paso Caballos and Uaxactún



Gender Participation

The role of women in the agreements and their capture of benefits varied significantly among the four agreements (Table 10). Gender distribution among leadership positions within the most relevant community institutions (i.e. the four village COCODEs, the Carmelita Cooperative, OMYC, the Paso Caballos Council of Elders, and the Asociación BioItzá) underscore the variable degree of women’s involvement within rural community-based institutions in the MBR. Among these institutions, the participation of women in leadership roles was greatest in Carmelita, followed by Uaxactún, BioItzá, Corozal, and Paso Caballos²⁴.

Table 10: Participation of Women in Key Leadership Positions within Community Groups engaged in Conservation Agreements

Agreement Area	%♀ Total Pop.	%♀ Representatives COCODE	%♀ Members OMYC/Coop.	%♀ Leaders OMYC/Coop.	%♀ BioItzá Members	%♀ Council of Elders
Uaxactún	44%	33%	26%	30%		
Paso Caballos	49%	1%				0%
Carmelita	46%*	46%	48%**	20%		
Corozal	49%	0%				
BioItzá					45%	

²⁴ We recorded 1 woman holding a leadership position in the Paso Caballos COCODE over a six-year period. Each COCODE has an average of 12 representatives, and a new COCODE is elected each year. We recorded no female members of the Council of Elders (usually 5 members).

* 2011; in 2007♀ participation was 45%; **2011

Due to low representation of women in the COCODE and Council of Elders in Paso Caballos²⁵, the accompanying CSO (WCS) addressed the issue through “soft” approaches designed to increase gender equity over time. These included the consultation of the draft agreement in the Paso Caballos General Assembly, ensuring that women had the opportunity to vote for/against its approval, and the employment of a female field technician to lead all of WCS’s activities in the village. This latter approach led to a temporary period in which the WCS technician had to “win the confidence” of her male counterparts in Paso Caballos’ leadership positions. After that initial period, her efficacy increased as she became a trusted and known source of support for (male) village leaders. In the fourth year of implementation, the COCODE of Paso Caballos named a female inhabitant to assist the WCS technician as a project assistant. This represented a step forward, albeit a minor one given the continued lack of female representation in leadership positions. Additional long-term strategies included those focused on generational changes, such as the broader investments in education which benefitted at least two hundred female students²⁶ each year. A final and most recent strategy included the implementation – with the support of the village COCODE and the Council of Elders – of an integrated family planning and reproductive health component led by a female village nurse. A more detailed summary of gender participation in each agreement is provided in **Appendix 4**.

Leveraging Conservation Agreement Investments

Civil society organizations (CSOs) and community organizations leveraged at least \$992,561 of additional investments during the implementation of Conservation Agreements (**Figure 16**). Perhaps most notable, 76% of this funding (\$731,243) was obtained by the demand-side requests and energetic effort of the Community Development Councils (COCODES) of Paso Caballos and Uaxactún, who successfully worked with municipal governments and federal agencies to bring projects to their communities.

Figure 16: Additional Investments Leveraged by CSO Partners and Community Organizations during Implementation of MBR Conservation Agreements

Site	Year	Description	US \$	Source	Notes
Biotizá-Corozal-Zotz	2015	Fire prevention and control	\$ 15,000	ProPetén / CNCG / USAID	Protection of Tikal National Park and El Zotz Biotope
Carmelita	2012 - 2014	50% technical assistance and operative costs	\$ 24,456	Asociación Balam	Match provided during Agreement Phase 1
Carmelita	2014 - 2015	Specific investments in agreement activities	\$ 23,000	Asociación Balam	Continued support provided after Phase 1

²⁵ According to Grandia (2009), Q’eqchi’ communities retain a highly egalitarian social ethic, and opportunity exists for Q’eqchi’ women to become community leaders and members of the Council of Elders. Grandin (2011) however, notes that Q’eqchi’ “women never held regional or community leadership positions” (p. 135) despite their significant influence on local political economy.

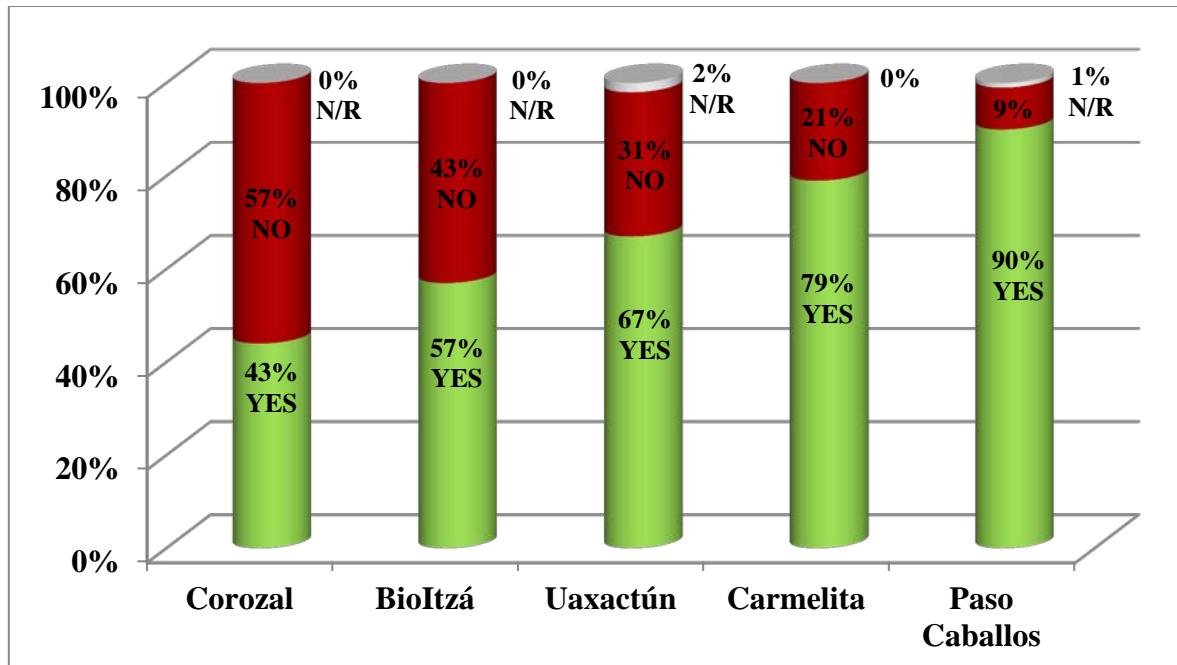
²⁶ Q’eqchi’ girls often fail to continue in school beyond the initial primary education typically ending around 12 years of age (see: <http://www.artcorp.org/projects/view/99>).

Site	Year	Description	US \$	Source	Notes
Paso Caballos	2013	Maintenance of access road (La Ceibita-Paso Caballos)	\$ 243,590	San Andrés Municipality	Requested by COCODE; 100% completed
Paso Caballos	2015	Road improvement in Paso Caballos' urban area	\$ 141,026	San Andrés Municipality	Requested by COCODE; 50% completed
Paso Caballos	2015	Construction of village health center	\$ 51,027	San Andrés Municipality	Requested by COCODE; 15% complete
Paso Caballos	2015	Teachers assigned to new school	\$ 18,810	Ministry of Education	Requested by COCODE; 100% completed
Paso Caballos	2015	Family Health and Planning Project	\$ 6,730	Orozco Family Foundation	50% implemented
Uaxactún	2011	Reforestation in recuperated ag. areas	\$ 897	WCS/GAO	Reforestation completed
Uaxactún	2012	Seed funding for acquisition of saw mill	\$ 32,000	MINECO-PDER	100% completed, leveraged by RA
Uaxactún	2013	Investments in education	\$ 897	Asociación Balam	
Uaxactún	2013	SMART patrolling	\$ 2,604	WCS	
Uaxactún	2015	Solar panel electrification project	\$ 295,600	NRECA Ltd. and INDE	Requested by COCODE and OMYC
Uaxactún	2009 - 2015	Maintenance of xate nursery in Uaxactún	\$ 38,772	WCS	
Uaxactún	2011 - 2013	OMYC carpentry workshop equipment	\$ 46,936	FUNDAECO BALAM	With support of WCS & OMYC
Uaxactún	2011-2012	Strengthening of OMYC tourism committee	\$ 1,013	PACUNAM	
Uaxactún	2012 - 2013	Strengthening of OMYC patrolling	\$ 3,590	Asociación Balam	
Uaxactún	2012 - 2015	Strengthening of OMYC tourism committee	\$ 8,674	Asociación Balam	
Uaxactún	2013 - 2015	50% salary, OMYC financial administrator	\$ 27,693	WCS	
Uaxactún	2013-2014	Forestry research and education project	\$ 5,769	CONACHI	
Uaxactún	2014-2015	Scholarships for continued education	\$ 4,477	WCS	
TOTAL			\$992,561		

Support for Conservation Agreements within Communities

Community participants were surveyed on diverse topics including their awareness of and degree of support for the agreements, whether they had personally received benefits, the types of benefits received, and their degree of satisfaction with agreements. In **Figure 17**, results summarize the responses of all community participants who were interviewed.

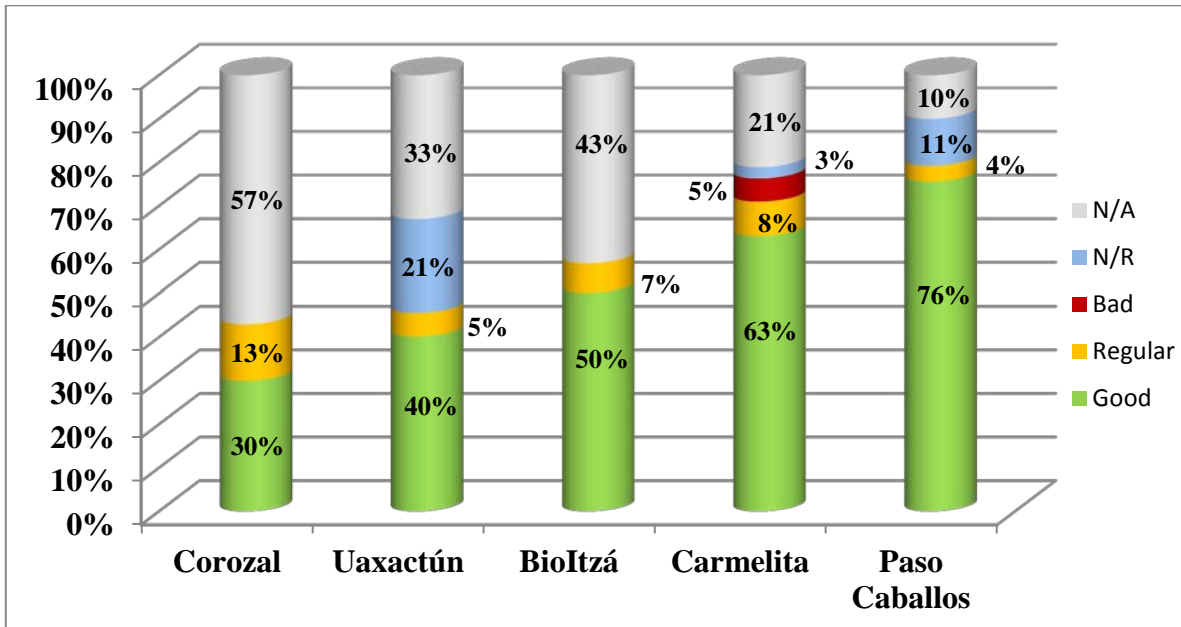
Figure 17: Awareness of Conservation Agreements among Corozal, BioItzá, Uaxactún, Carmelita, and Paso Caballos community members in 2015



With the exception of Uaxactún, there was a modest correlation between the level of awareness of the agreements in the communities, and the number of years of agreement implementation. Also of note, the level of awareness of the agreement in Carmelita remained extremely high despite not being continued in full since 2014.

When asked about their overall opinion regarding agreements, responses varied greatly among the five community groups. Results in **Figure 18** include respondents who were unfamiliar with the agreements (N/A = do not apply), as well as those who did not provide a response (N/R). The average percentage among all five social groups considering agreements to be “good” was 52%. The Paso Caballos agreement registered the highest level of support among all villages, with 76% of surveyed households considering the agreement to be “good”, followed by Carmelita (63%), BioItzá (50%), Uaxactún (40%), and Corozal (30%), respectively. Surprisingly, 21% of the surveyed households in Uaxactún did not respond to the question. Only in Carmelita did household members respond that the agreement was “bad”, with 5% responding negatively.

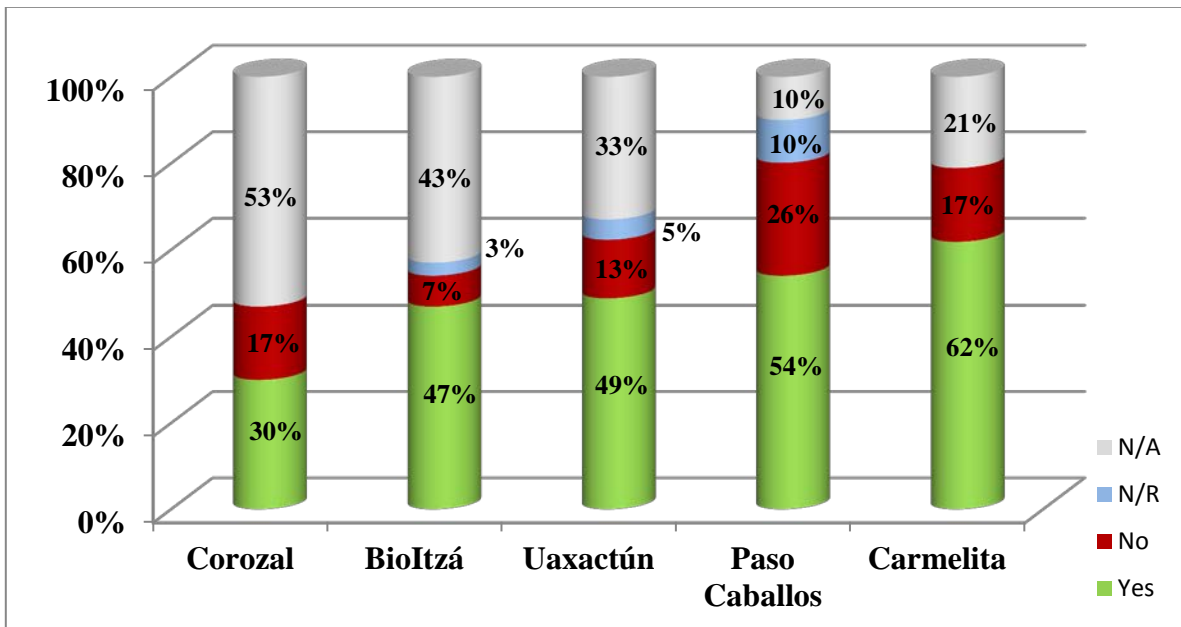
Figure 18: Percentage of Respondents Considering Agreements to be Good, Regular, or Bad in 2015



*N/R = No response; N/A = Do not apply = persons unfamiliar with agreement

When queried as to whether their households had received some type of direct benefit from the agreement (**Figure 19**), results once again varied considerably with 62% of Carmelita's households reporting benefits, followed by Paso Caballos (54%), Uaxactún (49%), BioItzá (47%), and Corozal (30%) respectively.

Figure 19: Percentage of Respondents Reporting Direct Benefits to their Household from Conservation Agreements



*N/R = No response; N/A = Do not Apply = persons unfamiliar with agreement

Paso Caballos registered the greatest percentage of households familiar with the agreement that could not report a direct benefit, or were not able to respond (36% in total). It is notable that in the case of Uaxactún, more households reported a direct benefit (49%), than households that considered the agreement to be either “good” or “regular” (45%). In all other cases the number of households that reported a direct benefit was less than the sum of those two categories. Viewed together, among all five community groups the average percentage of surveyed households reporting some type of direct benefit was 48%.

Support for Conservation Agreements among Other Institutions

A survey with 10 questions was administered by an independent consultant to 27 representatives of 8 institutions to evaluate their awareness of, and support for Conservation Agreements. Participating organizations²⁷ included national CSO partners in agreements (Asociación Balam and ProPetén), as well as CONAP and official witness of honor institutions that had accompanied agreement implementation. Complete results are available in **Appendix 5** (External Evaluation of Support by Other Institutions).

All respondents reported being aware of the agreements, with 37% aware of three agreements, 33% aware of four agreements, 15% aware of two agreements, and 15% aware of only one. Respondents were most familiar with the Uaxactún agreement (81%), followed by the Paso Caballos agreement (74%), and the Carmelita and BioItzá-Corozal agreements (67%), respectively, correlating with the time that each agreement has been in place.

When queried about the objectives of Conservation Agreements, 41% mentioned the dual goals of “conservation and economic incentives” as the principal objectives of Conservation Agreements; 26% identified “the participation of communities in conservation activities”; 11% “increasing community compliance with obligations to CONAP”; 11% noted the “protection of nature”; and 11% responded “strengthening rural development and conservation”.

When queried about the environmental impacts, 11% considered the environmental impacts of agreements to be “excellent”; 78% “good”; 4% “regular”; and 4% “weak”. Three percent (3%) did not reply.

When asked to provide reasons for their responses regarding environmental impact, 29% mentioned improved fire prevention and conservation; 19% increased empowerment and adoption of processes by local actors; 14% indicated support for a balanced approach between supporting nature and local people; 10% responded that agreements fills gaps left by CONAP and improves relationships with local actors; 5% mentioned a lack of strategies by CONAP; and 5% responded that agreements support economic alternatives. One individual considered that the time span of agreements is too short, and that only communities with good track records were selected. The single person replying that impacts of agreements were “weak” suggested that agreements do not promote empowerment, and they strengthen control over the population.

²⁷ Asociación Balam, Asociación Forestal Integral de San Andres Peten (AFISAP), CECON, CEMEC, CONAP Peten and CONAP Guatemala, Inter-american Development Bank, ProPetén, Rainforest Alliance, and Tikal National Park.

In regard to the ability of agreements to improve the quality of life of rural participants, seven percent (7%) of respondents considered agreements to be “excellent”, 52% considered them “good”; 15% responded “regular”; 11% considered agreements “weak”; and 4% considering them to be “bad”. Eleven percent (11%) did not respond.

When asked about ways to improve agreements, increased financial sustainability was the most common response (22%), followed by strengthening CONAP’s accompaniment (15%), increasing economic alternatives (15%), and institutionalizing agreements to increase resources and political support (11%). Respondents also recommended improving benefits (7%), providing more feedback to CONAP (7%), increasing empowerment of communities (7%), and the need for development plans (4%).

All respondents considered that Conservation Agreements hold potential as a useful conservation and development approach. When asked “why?” the most frequent response (22%) was that agreements are a viable approach for rural communities. Other answers included their potential for replication (11%), they help empower local people and raise awareness (11%), they are participatory (11%), and that they hold potential to become adopted by CONAP as an official conservation strategy (11%).

Application of Sanctions during Implementation

No major infractions occurred during agreement implementation, resulting in most of the detected agreement violations being addressed using the internal sanction procedures established within each Conservation Agreement. However, in at least three cases, the complexities associated with reaching ambitious targets did lead to considerable engagement by CONAP, and isolated tension. These cases consisted of: 1) the sale of land to non-residents by select Paso Caballos residents; 2) the implementation of a plan to restore the original agricultural zone in Uaxactún, and 3) the removal of cattle from the Carmelita forest concession. Continued engagement by CONAP, and sustained support from community leaders helped partners find solutions to these challenges and, as detailed below, in most cases negotiate adequate outcomes. This in turn helped avoid major in compliance and external sanctions by CONAP against the community organizations, which could have led to the ultimate penalty of fiscal sanctions (i.e. reductions in the incentive payments) or project cancellation; a possibility outlined in the agreements which never occurred.

Fourteen minor sanctions were addressed within the participating communities; 8 in Paso Caballos; 5 in Uaxactún, and 1 in Carmelita. In one case, an individual in Uaxactún was sanctioned a second time for the same minor violation related to the clearing of agricultural land within the 25-meter set-back buffer along the access road to Uaxactún designed to conserve the scenic nature of the route for tourism. CONAP participated in over a third of the sanctions (5/14), reinforcing sanctions emitted by community organizations. A complete list of the sanctions emitted and results obtained is provided in **Table 11**.

Table 11: Sanctions Applied during Implementation of Conservation Agreements in the MBR

No.	Year	Month	Site	Persons	Reason for Sanction	Sanction Type	Result
1	2011	Mar	Paso Caballos	2 residents	Entry of 3 cows into community polygon	Written sanction by CONAP	Removal of cattle from community
2	2011	Nov	Paso Caballos	2 residents	Sale of agricultural plot	Verbal sanction by COCODE & Elders Council	No effect/Sale proceeded
3	2012	Jul	Uaxactún	1 resident (* see No. 6)	Clearing vegetation within 25-meter buffer, Tikal-Uaxactún road	Written sanction by OMYC	Agreement to allow plot to recuperate
4	2012	Oct	Paso Caballos	2 residents	Failure to install fire break around agricultural plot	Verbal sanction by COCODE and by CONAP	No effect; sanctioned again in 2013
5	2012	Oct	Paso Caballos	1 resident	Rental of agricultural plot to non-resident	Written sanction by CONAP	After harvest, non-resident evacuated the community
6	2013	Jan	Uaxactún	1 resident (*repeat)	Clearing vegetation within 25-meter buffer, Tikal-Uaxactún road	Verbal and written sanctions by OMYC	Agreement to allow plot to recuperate
7	2013	Jan	Uaxactún	1 resident	Farming outside of agricultural zone	Verbal and written sanctions by OMYC	Farmer signed agreement and abandoned area
8	2013	Feb	Paso Caballos	2 residents	Inadequate fire break around agricultural plot	Verbal sanction by COCODE	Fire break improved and sanction lifted
9	2013	Jul	Paso Caballos	5 residents	Fishing outside of permitted area	Verbal sanction by COCODE in General Assembly	Increased compliance of fishing regulations
10	2014	Aug	Paso Caballos	2 residents	Fishing outside of permitted area	Verbal sanction by COCODE	Agreement to avoid fishing in prohibited areas
11	2014	Nov	Uaxactún	1 resident	Farming outside of agricultural zone	Verbal and written sanctions by OMYC	Farmer signed agreement and abandoned area
12	2014	Aug; Oct	Carmelita	5 residents	Possession of cattle within community concession area	Written sanction by CONAP	Two owners subsequently removed cattle from area
13	2015	Feb	Paso Caballos	1 resident; 1 non-resident	Sale/purchase of agricultural plot (28 <i>manzanas</i>)	Written sanction by CONAP	Non-resident abandons effort to buy agr. plot
14	2015	Feb	Uaxactún	1 resident	Clearing of vegetation outside of agricultural zone	Verbal and written sanctions by OMYC	Farmer signed agreement and abandoned area

Case Studies of Select Interventions, Impact, and Leveraging

Project personnel and partners identified notable results obtained during the lifespan of agreements and developed individual case studies to highlight the impacts of implementation. Case studies included two types of results: 1) those considered notable by project staff and community partners, and 2) those that addressed some of the differences detected in the Basic Necessities Index of Wellbeing.

In BioItzá-Corozal, a single case study was produced summarizing increased cooperation between the Asociación BioItzá, the COCODE of Corozal village, CECON, and Tikal National Park. In Carmelita, studies summarized the reduction of the standing herd of cattle in the forest concession, and the initiation of an internal zoning plan for agriculture. In Paso Caballos, case studies focused on the extraction of cattle from the community polygon, reduced immigration into Paso Caballos, improved fire prevention, and education. In Uaxactún, case studies related experiences with the recuperation of OMYC's financial solvency, land use planning for agriculture, improved xate management, and the installment of solar panels in the village.

Case Study No. 1: BioItzá-Corozal-Zotz

**BioItzá-Corozal-Zotz Conservation Agreement
Maya Biosphere Reserve Multiple Use Zone and El Zotz Biotope**

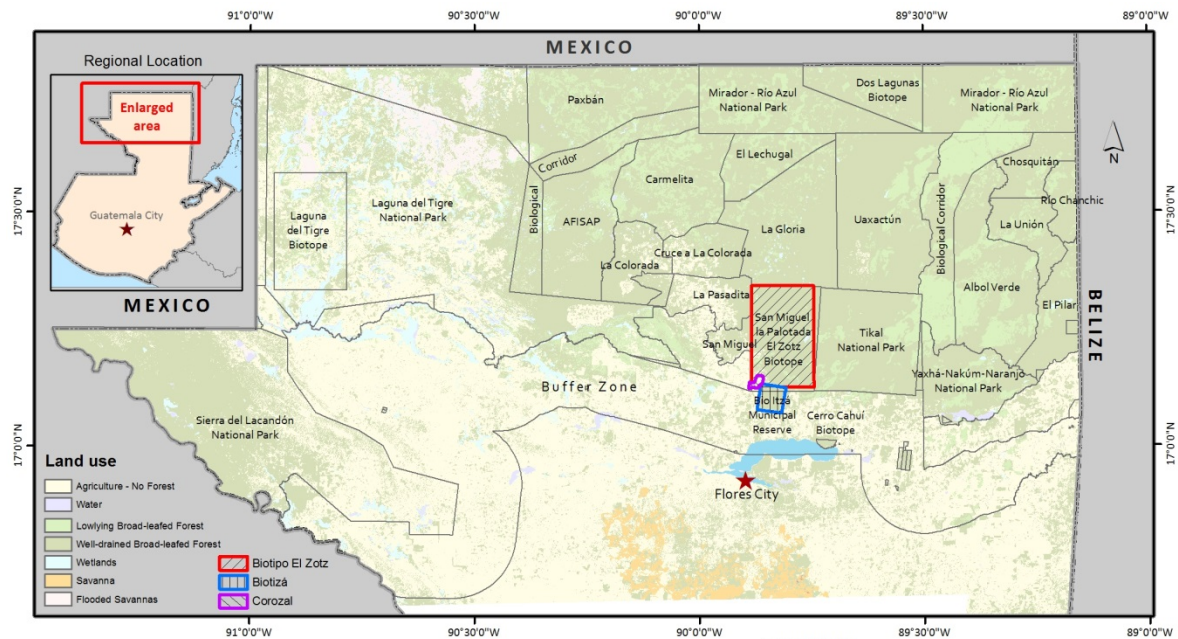
Institutional Collaboration to Reduce Deforestation and Fire

On January 28th 2015, the public signing ceremony of the Conservation Agreement for the BioItzá Indigenous Community Reserve, the Corozal agricultural polygon and the San Miguel La Palotada (“El Zotz”) Biotope took place in the community of El Corozal in San José, Petén. The agreement was signed to reinforce protection patrols and the prevention and control of forest fires across 38,534 hectares.



The community of El Corozal is adjacent to the BioItzá Municipal Reserve and the El Zotz Biotope (Figure 20). However, due to zoning restrictions Corozal residents do not have access to forest resources, and in the past they have engaged in agricultural and pastoral activities detrimental to the aforementioned protected areas.

Figure 20: Map of the BioItzá-Corozal-Zotz Conservation Agreement Area



Bioitzá-Corozal-Zotz Conservation Incentive Agreement

In this context, the participation of local authorities such as the president of the Community Development Council (COCODE), the village Mayor, the Deputy Mayor, as well as the

Community Committee for the Prevention of Forest Fires has reduced the threat of fires originating from the use of fire for agricultural in the community lands and farms.

“In Petén, it’s the first time that a Conservation Agreement has been implemented in an area that includes two communities and different stakeholders sharing the same landscape. Collaboration in this landscape brings different challenges, but also the opportunity to obtain greater impact”. (Castillo, M. 2016)

Signatory institutions in the BioItzá-Corozal-Zotz Conservation Agreement included the Corozal COCODE, the National Council of Protected Areas (CONAP), the Center for Conservation Studies of San Carlos de Guatemala University (CECON/USAC) and the Asociación BioItzá. Witness of honor organizations consisted of Tikal National Park, Rainforest Alliance, and the Wildlife Conservation Society (WCS). Fundación ProPetén led civil society accompaniment, as the institution responsible for agreement coordination and engagement of stakeholders.

To achieve the objectives of the Conservation Agreement, a Control and Protection Unit (UCP) for the Protected Areas Block was established to promote interinstitutional coordination and implement the forest fire prevention and control and surveillance components of the Agreement. The UCP is composed of representatives of CECON-USAC, Asociación BioItzá, Tikal National Park and CONAP.



Due to the partial presence of community-based rangers in the BioItzá Reserve, agreement partners became engaged in the implementation of the agreement. Their contribution consisted of forest fire prevention activities and short-range patrols with multi-institutional forces focused on control and surveillance of the El Zotz Biotopo and the BioItzá Reserve.



Both of these management units are adjacent to Tikal National Park; as such one additional benefit of the agreement consisted of improved protection of the western and southwestern flanks of Tikal.

Outcomes of this collaboration during 2015 included the maintenance of 34 kilometers of fire breaks, 22 short-range patrols, two combined patrols, and one long-range patrol. These patrols served to dissuade illicit activities such as timber extraction, hunting, and extraction of other natural resources in these protected areas, as well as reducing forest fires.

The following testimonials from the Conservation Agreement participants demonstrate the importance of interinstitutional collaboration in reducing fire and deforestation in the project area:

Mr. Reginaldo Chayax, President of the Asociación BioItzá, stated the following:

“This agreement is of great benefit to us, and it arrived just when we were most in need of support to continue working towards the conservation and protection of the BioItzá Reserve. Working together to prevent fires and conduct surveillance makes us stronger, as the saying goes “one swallow doesn’t make a summer”. Everyone knows about the threats present in the area, but often resources are scarce, and we feel helpless because we don’t receive any assistance to protect natural resources. We are children of Mother Earth, and we have to respect it because it gives us the food we need to live...”

Ing. Marvin Rosales, the Biotope manager responsible for CECON/USAC in Peten, stated the following with regard to interinstitutional collaboration:

“BioItzá doesn’t have rangers at the moment, so we support them by providing our own personnel to conduct patrols in the Reserve area.”

After one year of implementation, the net impacts of the BioItzá-Corozal-Zotz Conservation Agreement include:

- Greater collaboration: between national park personnel (Tikal), protected area personnel from the El Zotz Biotope (CECON/USAC), the members of the Asociación BioItzá, and the community of Corozal, San José;
- Reduction of threats: Deforestation was reduced by 27.5% during the year of implementation, as compared to the average amount of deforestation in the project area during the three years prior to the Conservation Agreement. Similarly, the number of fire hot points was reduced by 47.4% when compared to the ten-year baseline prior to the agreement;
- Improved conservation of the BioItzá Municipal Reserve: Due to the lack of funding for permanent BioItzá guards, collaboration with CECON and Tikal National Park personnel helped improve protection of the BioItzá reserve through increased patrolling and constructive engagement of the residents of the community of El Corozal.

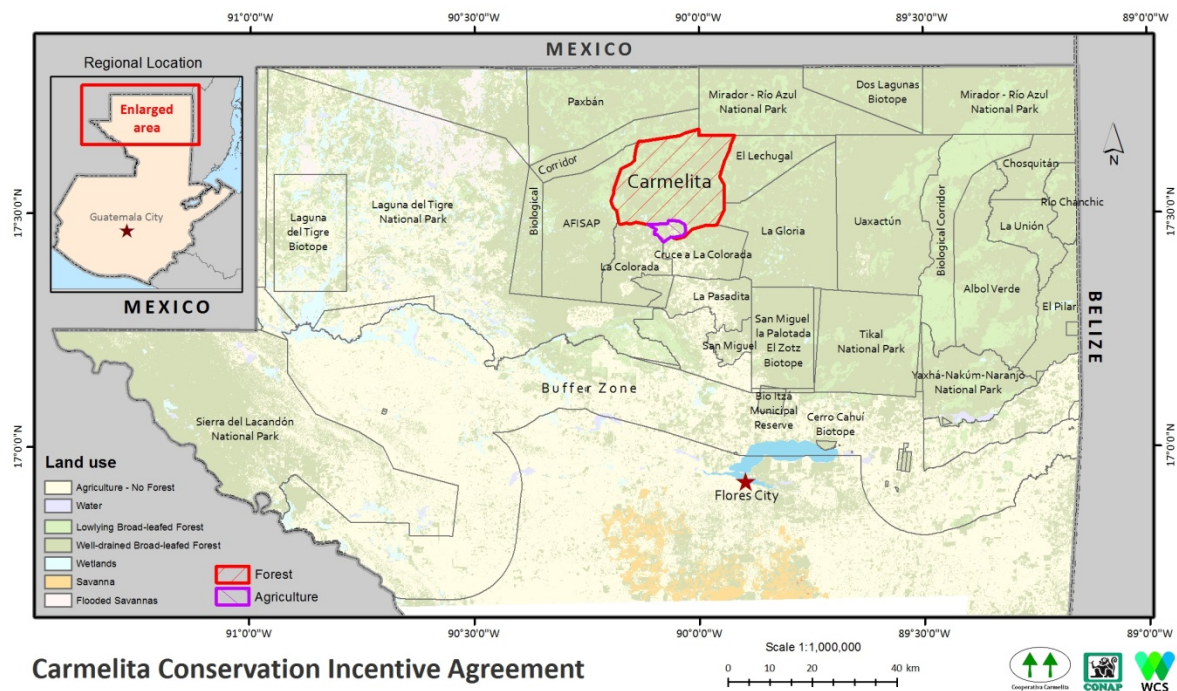
Case Study No. 2: Carmelita

Carmelita Conservation Agreement Maya Biosphere Reserve Multiple Use Zone

Reduction of Cattle Ranching and Advances in Agricultural Zoning

The Carmelita Management Unit has an area of 53,797 hectares, and is located within the MBR Multiple Use Zone (**Figure 21**).

Figure 21: Map of the Carmelita Conservation Agreement Area



The Carmelita Conservation Agreement was signed in February 2012. The agreement spanned a two-year period of implementation with the central objective of assisting the community to comply with its obligations under their community forest concession contract signed in 1997 with Guatemala's National Council of Protected Areas (CONAP).

The signatory parties in the Conservation Agreement included the Carmelita Cooperative, as the community organization responsible for the sustainable management of the forest concession; the Carmelita Community Development Council (COCODE); CONAP, as the lead governmental regulatory agency; and Asociación Balam as the "accompanying NGO". Witness of honor institutions included the Foundation for Maya Cultural and Natural Heritage (PACUNAM) as a donor; the Association of Forest Communities of Peten (ACOFOP), Counterpart International (CPI), Rainforest Alliance (RA), and Wildlife Conservation Society (WCS).

In the agreement, Carmelita community members agreed to prevent forest fires, strengthen patrolling to detect illegal activities, implement an agricultural zoning plan to support farmers and reduce the incursion of agriculture into forest management areas, enhance natural populations of xate, and reduce by 50% the number of cattle in their concession at

the time of agreement signature. The agreement helped co-finance many of these activities, and provided additional investments to improve basic education infrastructure, increase health services, and strengthen administrative and financial management of the concession. Significant effort was focused on assisting Carmelita residents to initiate an updated land use zoning and management plan. This represented a significant challenge since a formal agricultural zone had never been recognized by CONAP. Implementation required sustained negotiations and engagement of farmers because agricultural activities had been slowly advancing into more remote, forested areas, but also since agricultural livelihoods were at stake.



Signature of an agreement to relocate an agricultural area / Photo: Asociación Balam

The agreement also focused on cattle ranching as a major driver of deforestation and land encroachment within the Maya Biosphere Reserve. At the start of agreement implementation, seven cattle owners in the village held a total of 112 head of cattle. Through sustained negotiations, partners identified incentives to extract the cattle from the community concession, and remove them permanently from the MBR's restricted areas. These incentives were based on the number of cattle and included, for example, the donation of roofs for rural sheds, as well as assistance with transportation of cattle to purchasers located outside of the reserve. Carmelita ranchers benefitted by selling their cattle for improved prices as compared to the price they could receive in the concession. Participating ranchers also signed an agreement that they would not purchase and transport any more cattle into the reserve.

By the end of the two-year agreement, 63 cows had been removed from the concession area and the MBR, reducing the herd by 56%. Notably, despite the fact that the Carmelita agreement was not maintained in full force after 2014, by July, 2015 a concession-wide census of cattle indicated that only 35 head of cattle remained in Carmelita; a total reduction of 70%. At present (2016), only three owners retain cattle in Carmelita.



Removal of cattle from the Carmelita Concession / Photo: Asociación Balam

Significant engagement was required by all actors, particularly CONAP, to ensure that reduction in the number of cattle was achieved and sustained over time. In similar fashion the identification of an agricultural zone within the concession required continued engagement by CONAP after the formal end of agreement activities in 2014. Additional support was provided by Asociación Balam, and by witness of honor organizations (ACOFOP, WCS, RA) as the Carmelita Cooperative and CONAP advanced the agricultural zoning plan to fruition.

After one two-year period of full implementation and 2 additional years of partial support, lessons learned of the Carmelita Conservation Agreement include:

- **Improved environmental performance:** Since the agreement was implemented (2012), annual deforestation has been reduced by 44.2% as compared to the average annual amount of deforestation during the three years prior to the Conservation Agreement. Similarly, the number of fire hot points was reduced by 71.2% when compared to the ten-year baseline prior to the agreement.

- Collaboration essential: Partnership between the Carmelita Cooperative, the COCODE, CONAP, and supporting institutions was essential for the successful reduction in the standing herd of cattle and the implementation of the agricultural zoning plan. Without any one of these actors, and without sustained support from witness of honor organizations, the goals would not have been met;
- Forest management and tourism preferred over ranching: Support existed among the vast majority of Carmelita residents for the removal of cattle from the concession, reflecting the strength of local support for economic livelihoods based on integrated forest management and tourism. This suggests that this approach may be replicable in other community-based forest management/tourism areas affected by expanding cattle ranching.
- Two-year period inadequate, but initiative nevertheless sustained: A two-year timescale was inadequate to achieve some of the more ambitious goals set in the agreement, including the full implementation of the agricultural zoning plan. That said, the agreement did propel community members and institutional partners to evaluate the status of the concession and set ambitious goals on a number of fronts, including financial management. This led to a blueprint for a strategy that has been sustained despite only partial support being available for the agreement's activities from January 2014, onward;
- Targeted incentives were effective in reducing the prevalence of cattle: The flexibility in the implementation of financial incentives with cattle ranchers led to the achievement in the initial goal of a reduction of 50% in the standing herd in Carmelita. In particular, the transportation of cattle from "the jungle" to "outside the reserve", in an area where ranchers are present, led to the added incentive of Carmelita ranchers receiving a better price for their cattle and their voluntary collaboration with the cattle reduction plan.
- Lack of "leakage": One key condition imposed upon participating ranchers was that cattle could not remain in the MBR's Multiple Use or Core Zone areas. In agreement with CONAP, cattle were purchased by ranchers in the MBR Buffer Zone, since ranching in this area is legal.

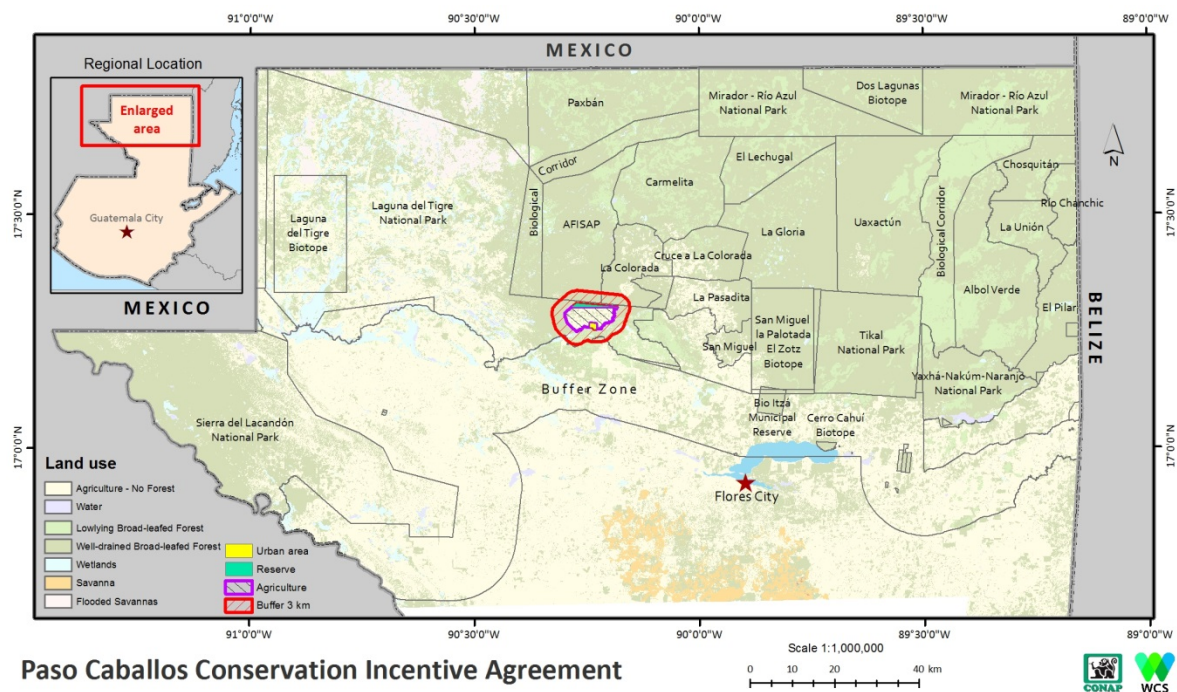
Case Study No. 3: Paso Caballos

Paso Caballos Conservation Agreement

Elimination of Cattle Ranching, Fire Prevention and Control, Reduction of Immigration, and Improved Education

In 2010 the Q'eqch'í Maya community of Paso Caballos signed its first two-year Conservation Agreement. The agreement was developed with the participation of community members and Guatemala's National Council of Protected Areas (CONAP), as well as technical and financial support from the Wildlife Conservation Society (WCS) and Conservation International. The Paso Caballos agreement spans a total area of 9,000 hectares (**Figure 22**), and was the second of its type to be signed in the Maya Biosphere Reserve (MBR).

Figure 22: Map of the Paso Caballos Conservation Agreement Area



Signatories of the agreement included the Paso Caballos Community Development Council (COCODE), CONAP as the national protected areas management institution, WCS as the “accompanying NGO”; Asociación Balam and the Integrated Forestry Association of San Andrés, Petén (AFISAP) also signed as “witness of honor” institutions. A second phase of the agreement was subsequently signed in 2013, including the addition of the municipality of San Andrés as an additional signatory.

The Paso Caballos Conservation Agreement was based upon an “Agreement of Intentions” (*Acuerdo de Intención*) signed in 1997 between CONAP and Paso Caballos shortly after the historic 1996 Peace Agreements. This initial accord provided Paso Caballos with access to a 5,236 hectare polygon within Laguna del Tigre National Park, predicated on compliance

with specific conditions outlined by CONAP. The subsequent 2010 Conservation Agreement was designed to reinforce the original agreement through two components: conservation actions, including the prevention and control of forest fires and patrolling of the community polygon; and social benefits, including support for the COCODE, and investments in health, education, and improved agricultural practices.

In 2007-2008, Paso Caballos experienced a challenging period in which the village's relationship with CONAP became strained as a result of an effort by external colonists and some village members to illegally colonize a section of Laguna del Tigre National Park adjacent to the community polygon. Two years later, Conservation Agreement activities were implemented to help restore that relationship by improving the village's capacity to comply with the 1997 agreement, and by extension the requirements for maintaining standing within the park. These include the prohibition of cattle ranching, the sale or rental of agricultural land to outsiders, and external colonization by outside families, among others.

After five years of implementation, the agreement has led to a vast improvement in Paso Caballos' collaboration with CONAP and yielded significant social and environmental benefits alike. In the following pages, we detail four examples of notable outcomes from the Paso Caballos agreement.

ELIMINATION OF CATTLE RANCHING

Cattle ranching is illegal in all Maya Biosphere Reserve national park and "core" areas; it is also undeniably the most destructive land use across the reserve. In August 2010, President Alvaro Colom of Guatemala announced plans to improve protection of the Maya Biosphere Reserve to reduce illegal, depredatory activities, including an intention to remove cattle from Laguna del Tigre National Park. That same year, Paso Caballos initiated implementation of the first phase of the Conservation Agreement. The agreement included a commitment to remove all cattle within the community's 5,236 hectare agricultural



Cattle removed from Paso Caballos / Photo: WCS

polygon. As in the case of the Carmelita agreement, a modest incentive was provided to cattle owners to facilitate the transportation of cattle for sale in areas outside the reserve (where ranching is legal), thereby providing the owners with access to improved prices for the sale of their stock. The entire village stock, numbering 19 head of cattle, was

subsequently removed in coordination with CONAP and community leaders. As of 2016, cattle remain absent from the community polygon.

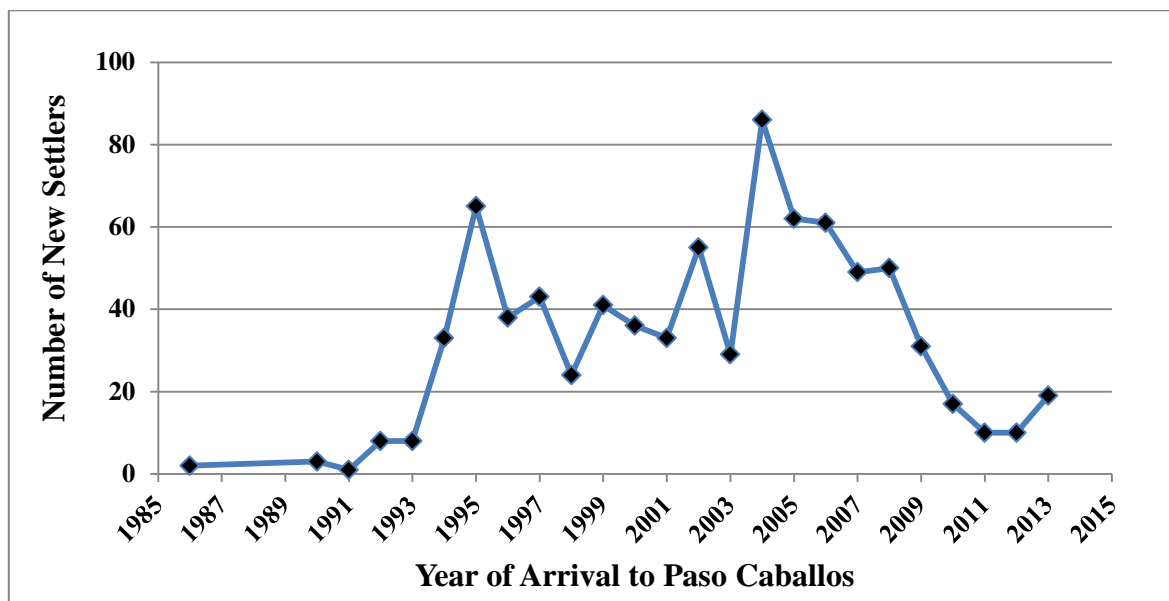
In 2011, shortly after purging the cattle, one family brought 3 head of cattle into the community polygon. After community leaders reported the violation to CONAP, the cattle were subsequently removed under CONAP’s supervision, and the family received a written sanction from the village COCODE. Since that point, no new attempts to enter cattle into the Paso Caballos area have been registered.

REDUCTION OF IMMIGRATION INTO PASO CABALLOS

With a human population hovering around 1,800 individuals, Paso Caballos is one of the largest communities in the MBR. For a number of years the village’s population growth rate reached annual increases of 8% or higher, spurring a three-fold increase in the population since its establishment as a small colony in the early-1990s. This dramatic growth was facilitated by the perception of available land in the area, the largely agricultural vocation of village inhabitants, and the scarcity of social services. Two main mechanisms drove the growth: immigration of new families into the area, and an average fecundity rate exceeding five children per family.

Regulation improved considerably following the implementation of the Conservation Agreement in 2010 (**Figure 23**), however a slight uptick in the number of individuals entering the community was detected in 2013-2014, leading to a renewed focus on this specific commitment by CONAP and the village COCODE.

Figure 23: Immigration of New Settlers into Paso Caballos (1986-2013)



In December 2015, WCS identified additional resources to implement a “Reproductive Health Component” as part of an integrated strategy to address the challenge of explosive human population growth in the village. This new agreement component was implemented in collaboration with the Ministry of Public Health, hiring an experienced community nurse to provide woman-to-woman health services in the community. During the first two months

of implementation, 61 women benefited from access to safe family planning methods, representing a significant step forward for the community.

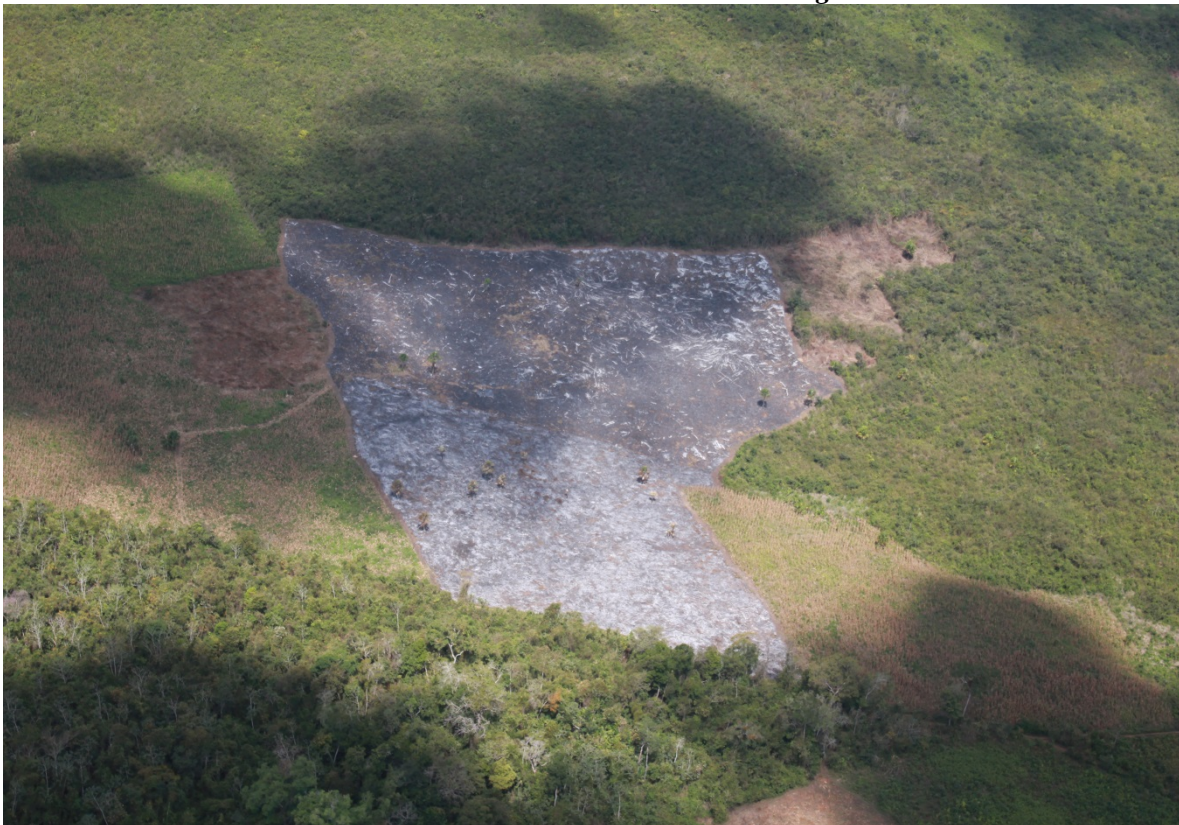
STRENGTHENING COMMUNITY FIRE PREVENTION AND CONTROL

Paso Caballos is primarily a farming community, whose local economy is based on cultivation of maize, pumpkin seeds and beans using traditional agricultural practices including clearing and burning vegetation in areas used in cyclical rotations. Prior to the initiation of the agreement, agricultural fires sometimes unintentionally leaped out of control, deteriorating adjacent, intact areas of Laguna del Tigre National Park.

The Conservation Agreement strengthened the community fire management system by providing equipment (9 leaf blowers and 2 chainsaws), oil, and fuel, to all community farmers to assist with agricultural burns and to ensure that adequate fire breaks (“*rondas*”) were installed prior to burning. Support was also provided to clear 18.7 km as a fire break between the Las Guacamayas Biological Station and the Community Forest Reserve to reduce the risk of fire spreading into intact forest areas.

Prior to burning, farmers organize themselves into four sectors, establish support teams, and provide notice to the community fire official and the COCODE so that a dedicated fire control team can assist the burn.

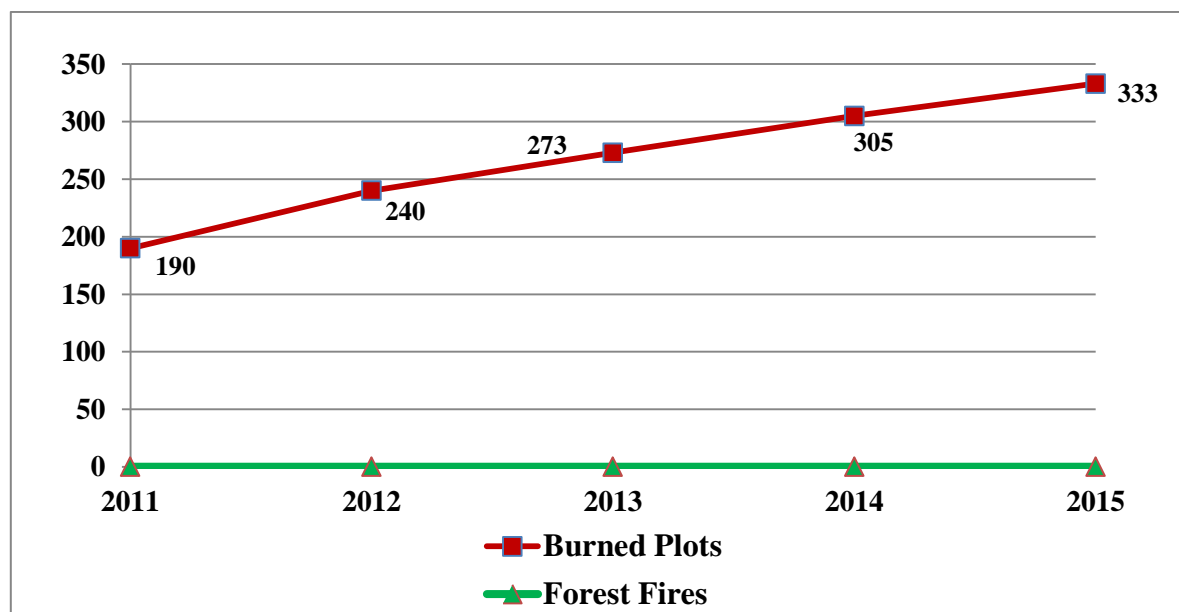
An Agricultural Plot in Paso Caballos after Burning in 2015; Note the Fire Break (“Ronda”) and Intact Fallow Areas around the Burned Plot / Photo: WCS - LightHawk



Between 2011 and 2015, the number of agricultural plots burned increased from 190 to 333 burning events/year (**Figure 24**). During this period no forest fires occurred²⁸. This demonstrates the efficacy of the fire prevention system currently in place, and reinforces one of the secondary objectives of the Paso Caballos agreement: the protection of intact habitat for the threatened wildlife populations of Laguna del Tigre National Park (i.e. scarlet macaw, jaguar, white-lipped peccary, and Central American river turtle).

The Forest Fire Early Warning System²⁹ (*Sistema de Alerta Temprana de Incendios Forestales - SATIF*) was implemented annually by the community, with over 95% of farmers providing due notification of burns and observing the warning flag system designed to avoid the use of fire in unsuitable conditions. For example, in 2013 and 2015 the red flag (used to indicate high-risk drought conditions) was used for an average of three days during the agricultural burn season and no burns took place during these periods, nor were there any disagreements between farmers and the Community Forest Fire Commission (*CIF Comunitaria*).

Figure 24: Number of Agricultural Plots Burned and Forest Fires Reported in the Paso Caballos Agricultural Zone (2011-2015)



Among all Conservation Agreements, “hot points” (i.e. active fires) detected by SERVIR/NASA satellites provide the principal indicator for the degree of success in controlling fire in forest areas. In the Paso Caballos agreement area of influence (9,000 hectares), despite a 75% increase in the number of plots burned, when compared to the 10-

²⁸ One forest fire affecting 25 hectares did occur in late April, 2016 as the report was being concluded.

²⁹ The SATIF is a system of flags used to denote the degree of local risk of fire spreading out of control. A green flag indicates low risk, and permission to burn. A yellow flag indicates moderate risk and permission to burn only with accompaniment by fire brigades assigned to assist farmers. A red flag indicates the use of fire is prohibited. The flag is managed by the village Mayor, in coordination with CONAP and the WCS technical support personnel, who receive daily updates during the fire season from CONAP’s Center for Monitoring and Evaluation regarding the risk of fire, and the number of hot points detected in SERVIR AQUA and TERRA satellites.

year annual average prior to agreement initiation hot points decreased by 39.2% during the agreement's implementation, indicating once again that fire control methods practiced by farmers were extremely effective.

IMPROVING BASIC EDUCATION

Another social benefit provided as part of the Paso Caballos Conservation Agreement consisted of diverse investments in the education system, including improvements to school buildings, support for the management of the COCODE's nursery school (*pre-primaria*), elementary (*primaria*) and secondary (*básica*) education committees, and the establishment of a computer academy. All activities were undertaken in collaboration with the Ministry of Education, providing an annual average benefit to approximately 500 students.

In 2011 there were two school campuses in Paso Caballos: one for elementary level students, and the other for nursery school students in the morning session and secondary level students in the afternoon session. The agreements financed the installment of a fence around the grounds of the nursery school area, and subsequently cement floors in three classrooms and a corridor to replace bare earth floors. This improved the learning conditions for 169 students. The following year, similar improvements were made in the elementary campus, with additional fencing and the installment of cement floors in nine classrooms, benefiting 343 students. The community supported much of this work by donating manual labor at no cost.

In 2014, at the request of families living in the village's most remote neighborhood (*La Pista*), a third scholastic campus was constructed with four additional classrooms, one for nursery school students and three for elementary students (**Figure 5**). This investment benefitted 104 students who no longer needed to walk for a kilometer to get to school. Again, the infrastructure was built with labor donated by community members. The Ministry of Education later assigned additional teachers to Paso Caballos to take advantage of these new classrooms, increasing class room availability and helping to reduce class sizes in the nursery and primary levels.

Students in One of the New Classrooms in the La Pista Neighborhood / Photo: WCS



Finally, a computer academy specializing in information technology and communication was constructed with the support of COCODE and WCS in 2015, and has since taught courses for 38 secondary level students.

Lessons learned during the implementation of the Conservation Agreement in Paso Caballos include:

- Fire prevention strategies effective and replicable: Adaptations undertaken with Paso Caballos farmers to ensure that fire did not spread into forest areas were extremely effective, permitting families to obtain subsistence crops and income despite the large scale of fire use (i.e. over 300 registered burns in 2015). This approach, based on the use of the Early Warning System for Fire, local coordination led by the village mayor, the organization of farmers in sectors and fire brigades, the emission of fire use permits provided by the mayor, and the provision of supplies (gasoline, etc.) and equipment (i.e. leaf blowers to clear fire breaks of organic material) through the agreement provides a replicable model for local adaptation to a warming climate that can be replicated in other well-organized, agrarian communities living in close contact with vulnerable natural areas.
- Increased land tenure: One consequential outcome of the agreement in Paso Caballos is the village's increased security of access to land in Laguna del Tigre National Park. This improvement has been obtained as the result of Paso Caballos' increased compliance with their obligations obtained under the original "Agreement of Intent" signed with CONAP, and their improved working relationship with CONAP.
- Investment in "demand-side" governance paid dividends for social development: With the support of agreement investments in the COCODE, Paso Caballos leaders were successful in obtaining notable investments from government agencies as the result of continuous requests upon Municipal and ministerial governments. One clear example of this was the assignment of new teachers to the school built with agreement resources, a commitment that required numerous trips to the departmental capital, but which yielded an important social investment on behalf of the village valued at \$18,810 annually. This new investment will ostensibly be perpetual. Additional investments were made by the municipal government in basic infrastructure, including repairing bridges, the improvement of roads in the center of the village, and the initiation of a formal health center. These governmental investments obtained by Paso Caballos totaled \$454,453, representing 46% of all the leveraged investments reported among the four agreements implemented in the Maya Biosphere Reserve.
- Institutional cooperation strengthened: As noted above, the improved relationship between Paso Caballos and CONAP increased the village's probability of long-term land-use rights in the area. This was in no small measure due to the village's improved compliance with the stipulations of the "Agreement of Intent", particularly as related to the control of impacts upon the surrounding sections of Laguna del Tigre National Park. During agreement implementation, lines of communication between CONAP and the village were first renewed, and then strengthened considerably. CONAP and Paso Caballos leaders met regularly to address challenges and to plan for future projects. Paso Caballos leaders also established working relationships with the community-based forest managers located adjacent to the community polygon (AFISAP). In another example of the dividends of cooperation, as of early 2016, CONAP and Paso Caballos

leaders have begun plans to implement an agricultural pilot project with the assistance of the Ministry of Agriculture and Ranching (MAGA) and the German Government's International Development Agency (GIZ). In short, in stark contrast to 2008-2009 period when Paso Caballos was at loggerheads with CONAP and affiliated conservation partners, these new partnerships evidence the improved degree of inter-institutional cooperation underway, and portend improved opportunities for community members and nature alike.

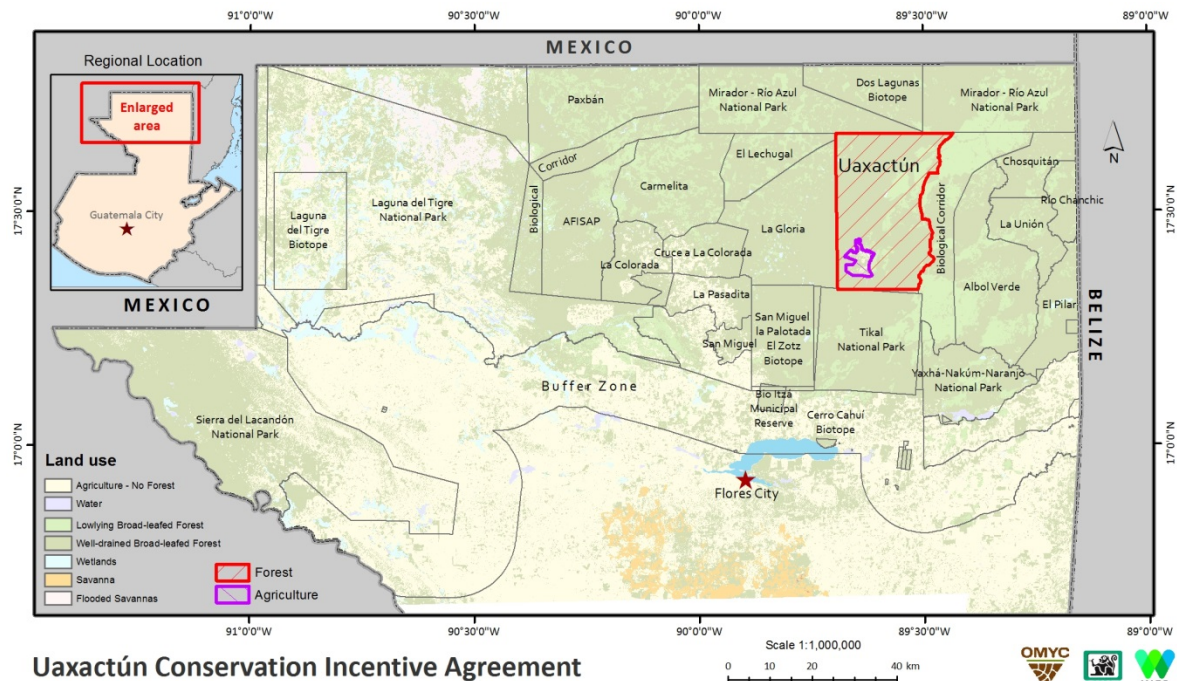
Case Study No. 4: Uaxactún

Uaxactún Conservation Agreement Maya Biosphere Reserve Multiple Use Zone

Administrative Management, Agricultural Zoning, Improved Sustainability of Xate Harvests, Increased Access to Solar Power, and Improved Education

In 2009, the community of Uaxactún implemented Guatemala's first Conservation Agreement in an area spanning 83,558 hectares located within the Maya Biosphere Reserve (MBR) multiple use zone. The village was represented by the *Organización Manejo y Conservación* (OMYC) and by the Uaxactún Community Development Council (COCODE). Signatories also included Guatemala's National Council of Protected Areas (CONAP) as the leading government agency responsible for the MBR's management; and the Wildlife Conservation Society (WCS) as the "accompanying NGO". Rainforest Alliance (RA), the Association of Forest Communities of Petén (ACOFOP), and *Asociación Balam* also participated as witnesses of honor. The village of Uaxactún contains approximately 186 families, and to date three two-year agreement phases have been implemented. **Figure 25** details the location of the Uaxactún management unit.

Figure 25: Map of the Uaxactún Management Unit and Agricultural Zone within the Maya Biosphere Reserve



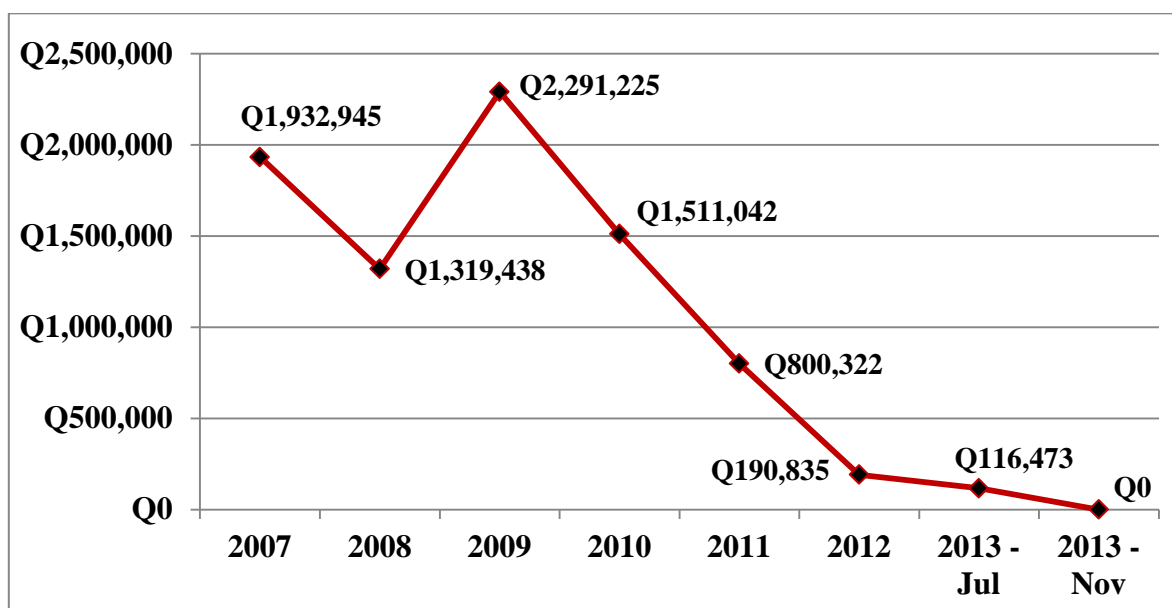
The agreement contained two key components: "Conservation Actions" focused on the prevention of forest fires, control and surveillance, land-use planning, enhancing understory xate palm populations and maintenance of forest cover; and "Community Benefits" consisting of investments in education, incentives for harvesting only market-quality xate, and technical and financial support to improve OMYC's administrative management. Below we highlight four notable outcomes that were either directly produced or leveraged by the investments of the Uaxactún Conservation Agreement since its initiation in 2009.

1) RECUPERATION OF OMYC'S FINANCIAL SOLVENCY

The administrative management component of the Conservation Agreement specified that OMYC's financial resources should be well-managed. This clause was included in the agreement because in 2009, when the agreement was initiated, CONAP, NGO, and community leaders collectively recognized significant weakness existed in OMYC's administrative and financial capacity. This weakness had manifest as a 2.29 million quetzal debt (\$306,000) owed to local suppliers and national lending institutions. The concession was on the brink of bankruptcy and community leaders and CONAP authorities alike recommended that urgent action was required.

Within the framework of the agreement, a financial manager was employed to improve administrative management and assist OMYC to repay its debts. An annual investment plan was developed to define specific administrative procedures for all financial transactions. This process, implemented between 2009 and 2013, allowed OMYC's leaders to implement from cost-benefit analyses for all major transactions, and ultimately resulted in the complete repayment of OMYC's debts (Figure 26).

Figure 26: Evolution of OMYC's Debt in Quetzales between 2007 and 2013



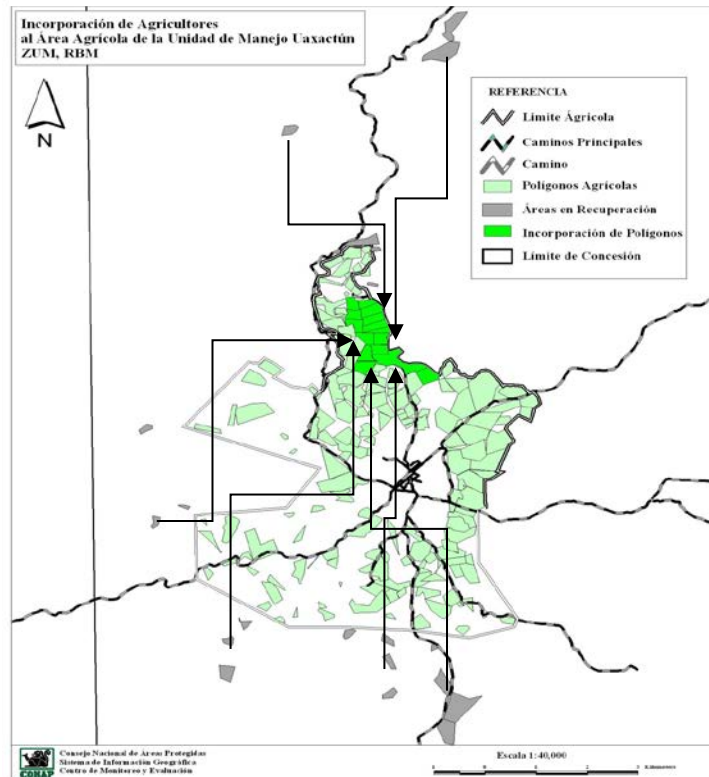
Due to a strong commitment by OMYC's community leaders, OMYC has subsequently been able to maintain stable finances without any significant debt. Since 2013, OMYC has not taken out any high-interest loans to sustain their timber and non-timber forest management activities. As a result, savings have been increasingly invested in community benefits such as education, enrichment of wild xate stocks, and the prevention of forest fires. An additional benefit of OMYC's recuperated finances has been increased enthusiasm among OMYC's members for sustainable natural resource management and the concession concept in general.

2) LAND-USE PLANNING FOR AGRICULTURE

The “Conservation Actions” component of the Conservation Agreement included a clause relating to land-use planning for agricultural areas. In order to proceed with this commitment, in 2010 partners undertook an assessment of the present agricultural land use patterns, and compared the results with the agricultural zone stipulated in the original General Management Plan for Uaxactún, developed shortly after the concession was signed in December, 1999.

The assessment revealed 22 areas used for agriculture by Uaxactún inhabitants that were located outside the agricultural zone permitted in the Management Plan and the concession zone map (**Figure 27**). These areas subsequently became known as “satellite areas”, with some located as far as 12 kilometers from the village, deep within the jungle. Concerns about these areas included the potential for creeping expansion of agriculture into areas zoned for sustainable timber and non-timber resource management, the potential for fire affecting intact forest areas, the difficulty of fire prevention support in remote areas, and the possible impacts on CONAP’s eventual evaluation regarding compliance with OMYC’s original concession contract.

Figure 27: Map depicting relocation of Uaxactún’s “satellite agricultural plots” within the permitted agricultural zone



With the help of technical personnel from OMYC, CONAP, WCS, all 22 satellite plots were voluntarily relocated within the agricultural zone, and OMYC developed an updated agricultural land-use map including a list of active farmers. Since the relocation, no new agricultural plots have since been detected outside the agricultural zone, and the abandoned satellite plots are recovering ecologically. Reinforcement for this new agreement has subsequently been provided by OMYC’s guards and agricultural/fire prevention support personnel supported in part through the Conservation Agreement.

3) INCENTIVES TO IMPROVE XATE SUSTAINABILITY

Another agreement “Conservation Action” consisted of the enhancement of wild xate populations through improved harvesting, and the planting of 20,000 xate plants annually into forest areas affected by over harvesting. Since the agreement’s inception, Uaxactún has fully achieved this objective every year, thereby helping to ensure the long-term

viability of one of Uaxactún's most important sources of household income. Xate harvesting in Uaxactún generates an estimated 1.3 million quetzals annually. The majority of this income (55%) is used to pay xate collectors, while the remainder is used to cover marketing costs such as packaging, materials and transport.

Since 2009, a total of 193,400 plants of three species have been transplanted into the forest, with 54% comprising xate "jade" (*Chamaedorea oblongata*), 44% Xate "hembra" (*Chamaedorea elegans*) and 2% Xate "cola de pescado" (*Chamaedorea ernesti-augustii*). Monitoring of the success rate of xate transplanted from OMYC's nursery into the forest has revealed that at least 85% of the transplanted stock survives long-term.



Xate "cola de pescado" in nursery areas / WCS

The agreement also provided a two-cent per frond financial incentive to the xate collectors to stimulate their selective harvest of only market-quality fronds. On average, 12 million fronds are collected each year that qualify for the incentive payment, helping to transform the Uaxactún's xate harvest from a quantity-based, to a quality-based payment system. This transformation has in turn helped reduce over harvesting of an economic resource essential for the village's forest-based economy, provided collectors (mainly men) with a 30% increase in their monthly income, and increased employment for village women "sorting" xate (i.e. evaluating each frond to ensure market quality) in OMYC's xate bodega. The incentive has also helped channel tangible benefits of the agreement directly to at least 100 harvesters annually. These individuals typically lack full time employment, and they often rank among the least wealthy inhabitants of the village.

Based on monitoring undertaken by WCS with the support of Rainforest Alliance and the U.S. Agency for International Development, harvested xate in OMYC's bodega has consistently exceeded the quality standard set by CONAP (at least 80% of harvested xate must be of market quality). This information has helped to improve the annual Uaxactún Management Unit performance evaluations conducted by CONAP.

4) INCREASED ACCESS TO SOLAR POWER

In 2014, Uaxactún experienced a considerable increase in access to solar panels, surging from 38% to 95% of the village's households. This was achieved through support from a project implemented by NRECA International and funded by the National Institute for Electrification (INDE) titled "Community Electrification through Photovoltaic Systems".

To obtain this benefit Uaxactún was required to comply with obligatory prerequisites to demonstrate that the proposal was legally and technically viable. Essential contributions were made by the village mayor, the village COCODE, and OMYC's financial manager, who was responsible for delivering all the required technical and legal documentation related to Uaxactún village and OMYC as the local institutional sponsor of the project.

Technical support was provided by WCS, the Rainforest Alliance, and OMYC's Forest Manager, who developed the environmental and technical review as part of the project proposal, which was presented to the Ministry for Environment and INDE.

NRECA personnel examined OMYC's financial management capacity, including a review of their financial status and debt to evaluate OMYC's ability to collect monthly maintenance fees from village residents provided with the panels. They concluded that OMYC was indeed a solvent and competently managed organization, allowing Uaxactún to become the first rural village in Guatemala to implement the project (**Figure 4**). The project demonstrates that the recuperation of OMYC's administrative capacity allowed the village of Uaxactún to leverage increased governmental investment on behalf of village residents, thereby propelling improved livelihoods and wellbeing among village residents.

Solar panels installed by INDE in the village of Uaxactún / Photo: WCS



5) IMPROVED EDUCATION

The principal social investment in the Uaxactún Conservation Agreement consisted of support for basic education within the village school. This particular project dates back to an informal agreement established between village leaders and WCS in 2003, when Uaxactún inhabitants requested improved educational opportunities for their children as their top development priority. As a result, in 2005 WCS assisted village leaders and OMYC to establish the first secondary school (*Básico*) in the Maya Biosphere Reserve. Since then, the secondary school has graduated eleven classes totaling 152 students, of which 43% have been female.

Through the Conservation Agreement as of 2010, \$6,757 has been provided annually to support the complete salary of one secondary teacher, the partial salary of a second teacher, and the provision of miscellaneous scholastic supplies. During that period, the secondary school has graduated 100 of the 152 students, with a majority receiving scholarships to

continue their studies (i.e. *diversificado*) in the central area of Petén. Some of these students have returned to Uaxactún to work as accountants and other related professions within OMYC.

Lessons learned during the six years of implementation of the Uaxactún Conservation Agreement include:

- Collaboration and technical support key to improving OMYC's financial solvency: The support of numerous individuals and institutions permitted the remarkable improvement in OMYC's financial solvency witnessed during the first four years of the implementation of the agreement in Uaxactún. First and foremost, the dedication of the members of OMYC and local leaders in Uaxactún was the essential factor that made it possible to sustain the recovery which began in earnest at the end of 2009, when the financial administrator was named by CONAP and supported by the agreement. Second, the sustained engagement by CONAP throughout the entire process made it clear to OMYC managers that it was imperative to implement the financial plans as developed, avoiding deviation for other objectives that could potentially derail the recovery. Finally, consistent support from all other CSO's engaged in Uaxactún, including the agreement witness of honor institutions, sent a consistent message that continued support for the concession would be forthcoming, if and only if OMYC labored seriously to ensure its economic viability in the future. These elements combined helped propel OMYC to a spectacular economic recovery that has been sustained throughout the subsequent years of the agreement's implementation. As of 2016, some six years into the agreement, the new challenge identified consists of transferring the technical knowledge and skills for solid financial administration from the OMYC financial administrator to Uaxactún residents – potentially to future university graduates as they graduate with degrees in business administration.
- Efficacy of xate incentives: Uaxactún xate incentive provided a unique model for a comparatively equitable distribution of agreement resources among the village's least financially secure inhabitants. These incentives eventually helped to eliminate independent xate middlemen that were effectively in competition with OMYC for access to the concession's natural xate stocks. This was of great relevance to the sustainability of the resource, since these middlemen continued to use the quantity-based payment system to remunerate harvesters, sustaining the traditional harvest system that resulted in the over harvesting xate palm fronds.
- Increased access to land and food security through agricultural land use planning: Though well-known as a “forest village”, many Uaxactún residents have always maintained agricultural areas for subsistence crops (corn, beans) as insurance when food costs rise, and in case other sources of employment become scarce. The consolidation of the original agricultural zoning plan in Uaxactún apparently provided farmers with security, as demonstrated by a notable increase in the reporting of agriculture as a main source of livelihoods in the concession. We presume that additional security was provided by the agricultural committees and fire prevention teams, which helped ensure that farmers reduce the risk of fire while burning their plots to prepare soils for planting. A similar, though less pronounced increase in the prevalence of agriculture was reported by Carmelita residents, also likely linked to the increased security of farmers once the agricultural zoning plan advanced. The key

message here is that despite the diversification of livelihoods from forest resources and tourism, agriculture remains an important source of rural livelihoods in the forest villages, and a key safety net that merits additional consideration in future agreements.

- Administrative capacity led to increased government investment: The example of the solar infrastructure installed by NRECA/INDE was just one example of the ability of OMYC and the Uaxactún COCODE to obtain governmental support for greater investments. Other notable investments obtained during the six-year period included improvements to the educational infrastructure, and the improvement of road access to Uaxactún.
- Education investments a top priority among inhabitants: Investments in education were the most recognized agreement benefit among Uaxactún inhabitants. Increased attendance and reduced scholastic desertion has led to a greater number of village youth continuing their studies in the central area of Peten, thereby contributing to the extremely low population growth rate in the village.

Testimonials by Community and Government Partners

“En Paso Caballos hemos logrado un Acuerdo de Conservación con un financiamiento para sacar a Paso Caballos adelante, una de las cuales la limpia de brecha de Paso Caballos, hemos logrado también para sacar adelante las quemas agrícolas, el COCODE ha estado saliendo a la central para hacer gestiones y también el COCODE a través del Acuerdo de Conservación ha estado recibiendo un pequeño incentivo para que el haga gestiones para nuestro desarrollo. A través del financiamiento hemos logrado algunas cosas para sacar adelante a nuestra unidad mínima, hay muchas cosas que hay que hablar del Acuerdo de Conservación y hemos logrado a sacar adelante lo que es la conservación de los recursos naturales, la cual todo mundo sabemos que conservar los recursos naturales es bueno, es mejor para que todo lo que tenemos todavía lo estamos conservando para nuestro futuro.”



Venancio Rax Icó
Líder Consejo Ancianos
Comunidad Maya Q'eqchi'
Paso Caballos

“Mi nombre es Aracely Ical. Fui Secretaria del COCODE en el año 2010 donde gestionamos y se implementó el Acuerdo de Conservación, hasta la fecha. Ahorita en este año soy Asistente Comunitario del proyecto, hemos estado trabajando gracias al apoyo del Acuerdo de Conservación nos hemos beneficiado bastante, tanto al apoyo del COCODE en gestiones y las buenas relaciones con el Consejo Nacional de Áreas Protegidas. También han implementado árboles frutales, construcción de dos escuelas allá en el Barrio La Pista y algunas aulas que ya tienen piso. Tanto en quemas agrícolas nos han apoyado bastante y en la limpieza de brechas limitantes.”



Aracely Ical
Asistente Comunitario

“Quiero contar que el Acuerdo de Conservación que tenemos aquí en Paso Caballos, nos está apoyando a la limpieza de brechas y quemas agrícolas, con injertos frutales y viáticos al COCODE y queremos que nos siga apoyando. Agradecemos también a WCS, estamos trabajando juntamente con el CONAP, WCS y otras instituciones y también tenemos una escuela en el Barrio La Pista.”



Presidente de CODODE y Alcalde Auxiliar 2015
Aldea Paso Caballos, San Andrés, Petén

“Mi nombre es Bayron Hernández soy Técnico Forestal de Cooperativa Carmelita, soy nacido y crecido aquí en Carmelita, mi trabajo consiste desde la planificación de un censo hasta que se vende el último pie de madera, es el control productivo que llevo. En el momento que se dio el Acuerdo de Conservación yo estuve presente. El Acuerdo se dio con Carmelita, PACUNAM, CONAP y Asociación Balam y también la Municipalidad. Tuvimos una gran ventaja en ese tema porque apoyó en educación, en salud, en control y vigilancia, en los planes de prevención y control de incendios, también en el ordenamiento territorial, en la plantación de xate y principalmente lo que nos viene un poquito avanzando aquí es la ganadería. Se reguló esos temas bastante amplios, por decir un número de 20 cabezas de ganado, ahora pues el que más tiene de todos los que se anexaron a ese tema tendrá 4 cabezas, aunque todavía estamos luchando con 2 familias por eso”.



**Bayron Hernández
Técnico Forestal
Cooperativa Carmelita**

“Mi nombre es Azucena Coc, soy vecina de la comunidad de Carmelita, crecida aquí, no pertenezco a ninguna asociación comunitaria, pero cuando se implementó el Acuerdo de Conservación entre Carmelita, CONAP, BALAM y PACUNAM apoyé en las acciones de salud. Cuando se dio el Acuerdo la Cooperativa realizaba consultas médicas en donde acudían las personas también se daba medicamento a quienes lo necesitaban y en algunos casos las personas recibieron ayuda económica para ir al área central con los médicos. En ese tiempo se apoyó la educación de los niños con útiles escolares para los niños y las niñas. Una de las limitaciones del Acuerdo fue que algunas veces las personas no se pusieron de acuerdo para recibir los beneficios, pero yo si recibí beneficios, estoy agradecida con la asociación.”



**Azucena Coc
Colaboradora Comunitaria de Salud
Aldea Carmelita**

“Las ventajas del Acuerdo de Conservación es que directamente se implementó en las distintas áreas de la Cooperativa, directamente en control y vigilancia se hizo durante los dos años se tuvo la opción de contratar más personal para tener en control y vigilancia y prevención de incendio. En la parte administrativa legalmente nos fortaleció en lo que es la parte de gerencia, un 50% pagado el Gerente y en la parte de un sistema que se implementó aquí en la parte administrativa y en la parte de prevención pues igual siempre se contrata más personal. Y en el ordenamiento territorial legalmente se reubicó bastante gente que estaba afuera del área agrícola, se hicieron los límites del área agrícola y el área forestal, pues esa gente está reubicada en su área ahorita que ya es el área asignada agrícola, juntamente se miró esto con el CONAP para que esta gente no sea meneada, pues ya tienen su área donde pueden trabajar para no andar provocando incendios en distintas áreas.”



**Jesús Orlando Martínez Molina
Representante Legal
Cooperativa Carmelita 2013-2014**

“Estoy aquí como Alcalde Auxiliar hace 4 años, y en relación al Acuerdo que nos apoyó anteriormente, nosotros nos beneficiamos bastante porque nos dio el apoyo con salud, jornadas médicas apoyó con sacar a los enfermos también al área central conjuntamente con el apoyo de la Cooperativa. En otra área en control y prevención de incendios, comisión de vigilancia de no poder pasarnos más hacia adentro, patrullar más constantemente el área y en lo que es aquí en la escuela nos aportó con útiles escolares para los niños. Y en relación a los demás en lo que realmente si nos beneficia es patrullar toda el área y que no se hagan cosas ilícitas dentro del área y que en eso mismo la Cooperativa ha estado siempre dando su vigilancia que eso no suceda, pero ha venido a fortalecer eso el Acuerdo de Conservación un poco más para darle más seguimiento al mismo proceso.”



Manuel Alberto Osorio
Alcalde Auxiliar
Aldea Carmelita

“Tengo ya treinta años de ser recolector del producto xate, soy recolector desde muy niño y de eso he vivido, y espero en Dios seguir viviendo de ese producto, porque el bosque nos ha dado la facultad de vivir y de sostener a nuestra familia y gracias con los Acuerdos de Conservación, pues hemos estado recibiendo un incentivo para seguirnos ayudando, seguirnos manteniendo, seguir dándonos la prioridad de seguir trabajando, y gracias también a los Acuerdos que hemos venido conservando la naturaleza de nuestro bosque.”



Elder Humberto Samayoa
Recolector de Xate y Socio de la OMYC
Aldea Uaxactún

“Los Acuerdos de Conservación fomentan a re-alimentar financieramente las actividades que nosotros hacemos, permite financiar actividades de prevención y control de incendios en nuestra unidad de manejo y la ventaja es, que no solo financia la parte de protección, sino que incentiva el buen trabajo que se realiza aquí en la comunidad, los beneficios que hemos recibido se da directamente en el tema de educación, y directamente a los colectores de la palma de xate, ya que los incentivamos en el buen manejo del recurso. Los éxitos más relevantes, que hemos tenido del Acuerdo, acá en la comunidad se han firmado tres acuerdos de conservación (tres fases), también nos ha permitido reubicar a agricultores quienes estaban afuera directamente del área agrícola, ahora hemos tratado que ellos estén en una sola área, nos ha dado la oportunidad de enriquecer áreas afectadas o de reforestar esas áreas para que sean áreas de recuperación”

“Hay puntos marcados directamente como el tema financiero, nuestra organización cayó en un bache (deuda), pero con el Acuerdo de Conservación logramos contratar un gerente financiero que ordenara las finanzas y del 2010 al 2013 gracias a este proyecto se logró salir de esa deuda que nosotros acarreábamos como organización”



**Erwin Enrique Maas Pop
Presidente y Representante
Legal Periodo 2014-2015
Unidad de Manejo Uaxactún**

“Los Acuerdos de Conservación nos han apoyado para seguir conservando y protegiendo nuestros recursos naturales, desde nuestras aulas se le inculca a nuestros estudiantes el respeto por nuestra flora y nuestra fauna milenaria, tenemos que cuidar los recursos y tenemos que educar a nuestros jóvenes y a nuestros niños de que es muy importante la conservación porque nadie lo hará por nosotros, el bosque hay que respetarlo y hay que interactuar correctamente con los recursos naturales y culturales de esta comunidad, apoyamos actividades de reforestación comunitaria , apoyamos la siembra de arbolitos en lugares donde se necesita, también realizamos actividades de educación ambiental desde las aulas, manejamos una guía comunitaria que es elaborada por los propios maestros, y lo que queremos es educar y sembrar conciencia en nuestras juventudes de la importancia de cuidar el bosque.”

“El Acuerdo de Conservación es muy importante para nosotros, porque nos apoya a hacer actividades en beneficio propio de conservación, es muy importante porque nos apoya a conservar la flora y la fauna, los recursos naturales y culturales que posee esta comunidad legendaria y definitivamente esperamos que nos continúen apoyando, muy importante porque la gente va formando conciencia y está al pendiente de lo que hacemos con los apoyos recibidos”.



**Víctor Emilio Quixchán
Profesor de Telesecundaria
Unidad de Manejo Uaxactún**

“...los Acuerdos de Conservación han venido a fortalecer a nuestra comunidad en varios aspectos, porque la realidad es de que hoy en día los xateros tienen un incentivo a parte de su pago, las seleccionadoras también tienen un incentivo aparte de su pago, y nos ayuda para el aspecto conservación que nuestra concesión en total es conservacionista.”

...beneficios hemos obtenido a través del Acuerdo de Conservación como es para salarios de Control y vigilancia, como es para pagos de Maestros, también ha servido para incentivo de los xateros, entonces realmente hay varias cosas que nos ha funcionado bien.”

“...los éxitos más importantes, considero que es haber reunido a toda la gente en una sola área, porque anteriormente teníamos algunos lugares satélites muy retirados y esos logramos ubicarlos hacia adentro y ahora todos trabajamos en una misma área, otro éxito fue el tema administrativo, ya que logramos reducir la deuda que teníamos en los bancos.”

“...estoy seguro que los Acuerdos son una gran oportunidad para otras comunidades porque tenemos como espejo la nuestra y algunas otras más que han recibido Acuerdos de Conservación.”



José Elfidio Aldana
Alcalde Auxiliar y Presidente
del COCODE
Unidad de Manejo Uaxactún

“Los Acuerdos de Conservación son mecanismos financieros que han venido a contribuir con las comunidades a poder cumplir con los compromisos contractuales que tienen las mismas comunidades con el Estado de Guatemala”.

“Los Acuerdos de Conservación han traído beneficios a las comunidades, han traído beneficio a las organizaciones comunitarias que tienen administradas las Unidades de Manejo Concesionadas y uno de esos beneficios o resultados importantes que han tenido. En el caso de Carmelita son el tema de la disminución del ganado bovino que ha estado allí en Carmelita y que ha entrado de manera ilegal, también han habido otros logros importantes como el tema del ordenamiento territorial, el tema de control y vigilancia también que apoyado el Acuerdo de Conservación en Carmelita”.

“En Uaxactún también podemos mencionar grandes logros como es el tema del ordenamiento territorial que contribuyó a ordenar aquellas áreas agrícolas que estaban fuera del polígono agrícola, el tema de prevención de incendios también, ha venido a contribuir con todo esto los Acuerdos de Conservación”.

“Las comunidades han mejorado su calidad de vida de cada una de las familias a través y el apoyo del Acuerdo de Conservación, han mejorado su calidad de vida a través de los beneficios económicos que genera los bosques como lo es el empleo a través del xate, empleo a través de control y vigilancia y no podemos olvidar también que han mejorado también el apoyo en la educación escolar también en el caso de Uaxactún”.



Alan Gonzales
Director de la Zona de Usos
Múltiple de la RBM
CONAP Petén

“Los Acuerdos de Conservación para nosotros en CONAP han sido fundamentales, recuérdese que nosotros hemos tenido acuerdos de permanencia, ahora los Acuerdos de Conservación si nos han permitido en cuestiones de la organización comunitaria y también en la prevención y control de los incendios forestales.”

“En el caso de Paso Caballos tenemos una boleta con ellos y tenemos un control, ellos nos dicen que día van han quemar, pero también hay una responsabilidad por cada comunitario que está haciendo esto y hasta la fecha de hoy, allí no hemos tenido ningún problema de incendio forestal. Y es la zona Este de la Laguna del Tigre donde se encuentra esta comunidad, para nosotros es clave para ir tomando la gobernabilidad y gobernanza, que eso es lo que nosotros también perseguimos. Sabemos que los Convenios de Conservación es un medio con la finalidad, es un apoyo interinstitucional pero también con las ONG’s”.

“Tenemos el caso del Acuerdo de Conservación con Carmelita uno de los éxitos bastante grandes en Carmelita que tuvimos es el ordenamiento territorial”.

“En el caso de Corozal en el municipio de San José también, es una comunidad q’eqchi’ y ladinos, pues allí también con PROPETÉN se está trabajando el poder ordenarlos pero también ver las capacidades que ellos tienen, ver de qué manera viven del recurso del bosque que es muy importante”.

“El caso de Uaxactún es bastante exitoso que firmemos con ellos un Acuerdo de Conservación, son comunidades que desde la perspectiva de la explotación del bosque si lo han hecho de una manera racional. Estas comunidades si nos sirven a nosotros porque son barreras que no permite que las actividades ilegales se adentren más allá de las áreas, porque ellos empoderados no permiten que esta gente vaya a crear problemas serios”.

“Tenemos algunas cuestiones que fortalecer en la mayoría de estas comunidades por eso es que los Acuerdos de Conservación permiten ir evaluando también, porque no son Acuerdos de Conservación que no tengan un período de vencimiento sino que cada cierto tiempo, cada año se van evaluando los cumplimientos. Vamos dando prórroga nosotros o vamos firmando otros Acuerdos de Conservación”.

“Nosotros evaluamos pero lo hacemos en conjunto. Tanto la comunidad como nosotros hemos ido cumpliendo como son las corresponsabilidades y en esa medida vamos fortaleciendo. Lo que queremos también a corto plazo es que estas comunidades vivan del desarrollo sostenible, vivan de los recursos del bosque y sean menos agricultores y más gente que vive del bosque, en ese sentido hacia eso queremos apostar.”



Ervin Salvador López Aguilar
Director Regional
CONAP Petén

Error and Imprecision in Sampling Methods

Considerable effort was expended to ensure standardized sampling methods, with a particular focus on the social opinion and “plus” (+) surveys associated with the BNS+ methodology. In each evaluation project leaders undertook training sessions with surveyors to ensure their comprehension of the survey instrument. A number of different surveyors were engaged; for example, in Uaxactún four different teachers known to community members collected the data.

Nevertheless, data collected for the study were subject to modest levels of imprecision, with the results of the social opinion surveys as the most vulnerable to potential inaccuracies. In particular, partially incongruent data indicate that questions related to awareness of conservation agreements among community members may have been interpreted differently by individuals. When asked if they were “familiar with the agreement” some respondents apparently responded “no” if they had not personally seen or obtained a copy of the agreement. Surveyors also informed that some respondents initially reported not having received benefits from agreements, but did recognize, for example, some benefit from a specific agreement investment. This was the case in several examples in Uaxactún as related to the xate incentive paid to harvesters. Respondents later explained that they had not been aware the incentive was funded by the agreement. In these cases, we opted to maintain the data as reported by the surveys and avoid “corrections”. In regard to the educational levels, in the original baseline surveys we did not collect data on students within nursery school, unfortunately obviating the possibility of comparisons of change over time in this academic category. Overall however, we believe the data as presented are broadly reflective of the outcomes obtained and that they provide useful guidelines for future implementation of agreements in the MBR and beyond.

DISCUSSION

During the implementation of Conservation Agreements in the Maya Biosphere Reserve local communities registered simultaneous overall reductions in environmental degradation and tangible improvements in the wellbeing of rural participants. In this section, we review the results obtained, summarize some of the perceived strengths and weaknesses of agreements as implemented, and address the degree of causality between the agreements and changes detected.

Environmental Impacts of Agreements: Deforestation and Fire

The annual amount of forest loss registered during the implementation of agreements was notably lower in all cases when compared with baseline averages, yielding an average annual reduction of 49.9% among all sites. This included the most recent BioItzá-Corozal agreement implemented for only one year when data were compiled. Similarly, the annual number of active fires (i.e. hot points) detected within the agreement areas decreased among all sites by 34.9% compared with the baseline. Three of the four sites registered notable declines, with only Uaxactún registering an increase (from 3.5 to 6.0 hot points annually) due to increased agriculture in the legally sanctioned agricultural zone.

Were these improvements in the environmental indicators related to the implementation of agreements, or independent of them? To answer this question, we examine two sets of

information: the specific activities undertaken in each agreement area, and the background trends in deforestation and fire across the MBR during the same period.

All agreements contained activities specifically targeted at reducing deforestation. These included patrolling by “control and vigilance committees” (community guards) in the forest concessions of Carmelita and Uaxactún, patrols by community members in and around Paso Caballos, and multi-institutional patrols within the BioItzá Municipal Reserve and the El Zotz Biotope. In the latter case, patrols were undertaken by BioItzá members, personnel from CECON, and in some cases with the support of the army and the national police. In Paso Caballos, patrols of adjacent sections of Laguna del Tigre National Park were occasionally conducted with the support of CONAP, army, and police.

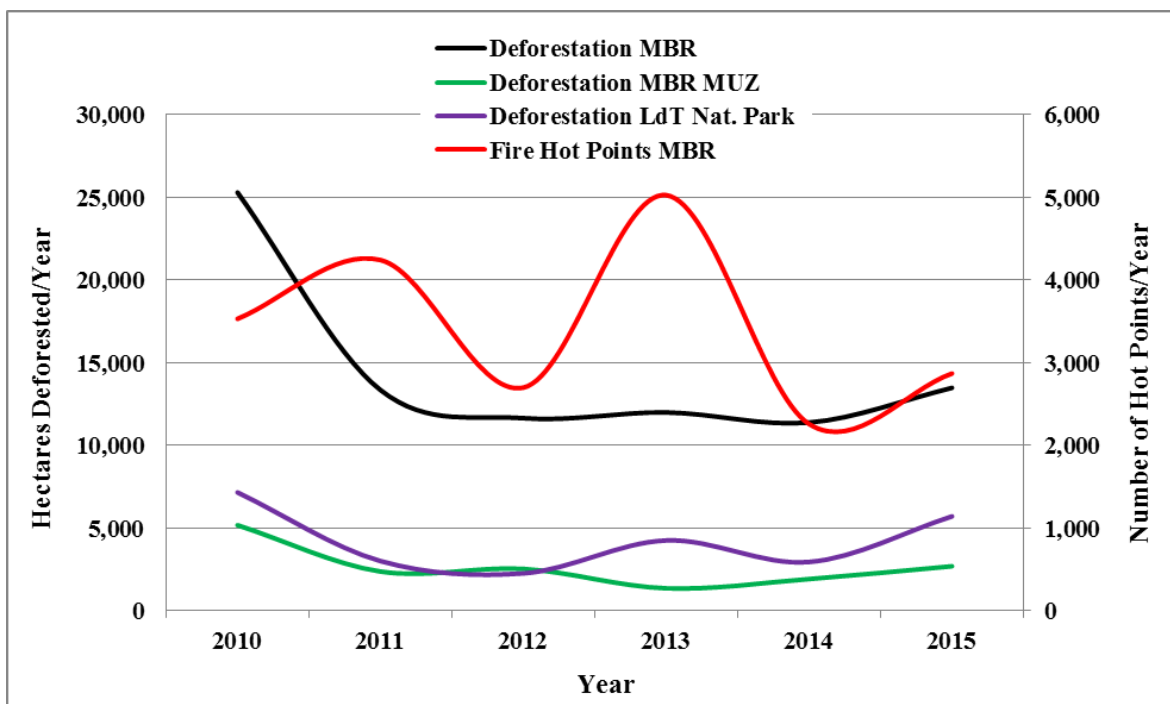
Fire prevention activities included the implementation of an Early Warning System for fire in all agreement areas. This consists of an alert managed by village authorities using a set of prominently displayed green, yellow, and red flags indicating local conditions for the use of fire by farmers³⁰. Agreements also supported the operational capacities of fire prevention teams sanctioned by CONAP in Carmelita, Uaxactún, and Paso Caballos, providing them with basic resources (supplies, salaries, and equipment). Project staff helped to coordinate their activities with the regional fire prevention program (*Sistema de Prevención de Incendios Forestales/SIPECIF*), as well as providing information generated daily by CEMEC, CONAP’s monitoring laboratory, regarding trends in fire across the MBR.

Agreements also included specific language approved by the general assemblies of rural participants regarding their commitments to reduce deforestation and fire. Local inhabitants reported considerable awareness of these responsibilities in community surveys conducted³¹. In Uaxactún, annual “parades” by school children were undertaken each year to raise awareness about the threat of fire mismanagement.

Figure 28: Deforestation (ha/year) Registered in the Maya Biosphere Reserve, Laguna del Tigre National Park and the MBR Multiple Use Zone, and Active Fires (“hot points”) across the MBR during Agreement Implementation

³⁰ Green: fire is permitted due to safe conditions; Yellow: fire is permitted with accompaniment by fire prevention personnel once a permit has been issued; and Red: fire is completely prohibited due to high temperatures and/or drought.

³¹ For example, in Uaxactún fire prevention was the most common commitment recognized by inhabitants (16%); in Paso Caballos only 1% of the respondents reported fire control as a commitment, but 86% recognized the broader commitment to comply with the agreement – which specifically included control of fire as an obligation; in Carmelita 55% of the respondents recognized their commitment to protect forests, and 42% identified the need to prevent fire.



Comparison of the results in agreement areas with the trends in deforestation and fire across the MBR during agreement implementation (**Figure 28**) reveal a mixed picture. Annual deforestation across the 2.1 million hectare MBR decreased by 47% over the six years spanned by agreement implementation in Uaxactún, going from 25,289 hectares in 2010 to 13,479 hectares in 2015. However, the deforestation rate increased by 15.7% between 2012 and 2015, providing a background of a moderate uptick in deforestation in 2015 when all four agreements were being implemented. In Laguna del Tigre, after a large drop between 2010-2012, by 2015 the rate of annual deforestation more than doubled between 2012 and 2015. A more modest increase in deforestation within the Multiple Use Zone also contributed to the recent upswing in the reserve’s overall deforestation rate.

Overall, three of the four agreements were implemented in two MBR management zones (Laguna del Tigre, MUZ) that initially registered large drops in annual deforestation rates but which have subsequently climbed upwards again. In comparison, the 49.9% decrease in forest loss registered among the agreement areas was 2.9% greater than the background rate during the same period across the entire MBR (47% decrease); it was also 2.2% greater than the Multiple Use Zone’s decrease (47.9%), and 29.6% greater than Laguna del Tigre’s decrease (20.3%).

As expected, the annual number of hot points across the reserve varied considerably over the six year period between 2010 and 2015, ranging from a low of 2,258 hot points in 2014 (the lowest year on record), to 5,025 hot points in 2013. The number of active fires across the MBR was 43% lower in 2015 than in 2010, the first full year of agreement implementation. By comparison, agreement areas reported only a 34.9% decrease during the same period.

In summary, reductions in deforestation and fire in agreement areas mirrored similar reductions across the greater MBR, with the exception of the recent uptick in MBR’s

deforestation rate (largely driven by Laguna del Tigre). It is important to note however, that during the same period CONAP and diverse partners expended significant effort and resources to reduce deforestation in vulnerable sections of the MBR, presumably propelling improvements in both indicators reserve-wide. With the exception of the areas adjacent to Carmelita, CONAP's interventions were not specifically focused on the agreement areas.

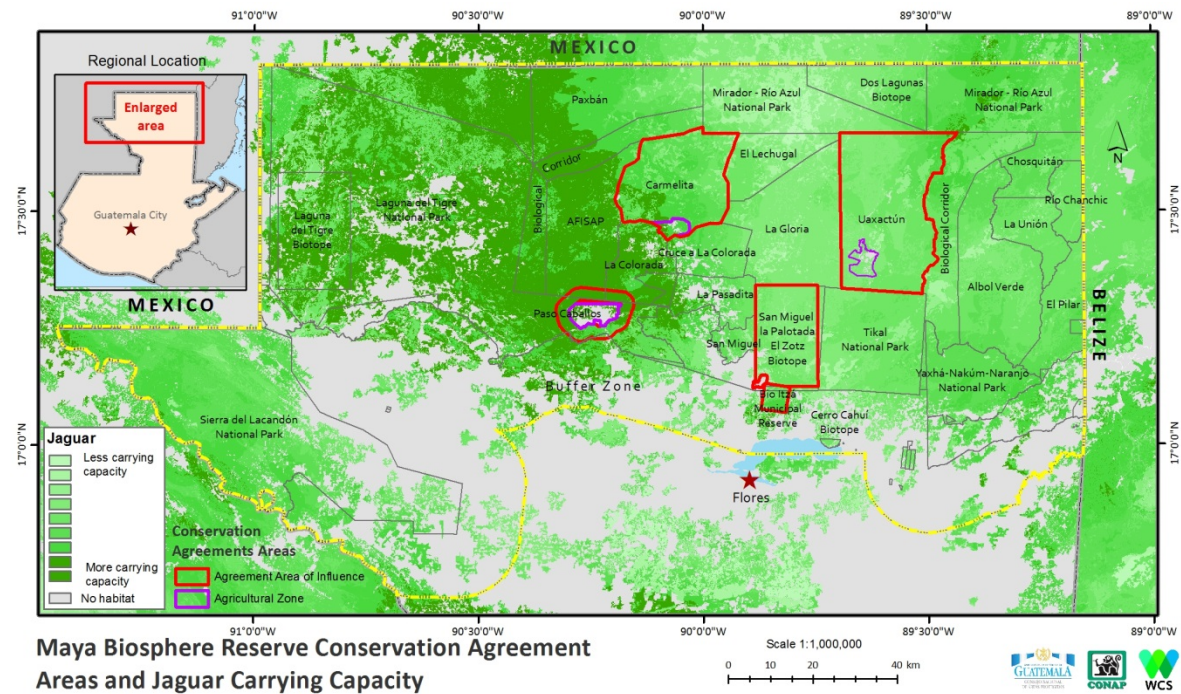
Thus, the improvements in both indicators suggest that agreements made a significant contribution to reduce rates of deforestation and fire, in turn helping to improve trends across the reserve. Patrolling activities, agreements with farmers, collaboration with CONAP, and internal sanctions all contributed towards these improved results. It is also important to note that in the case of fire, improved performance was undoubtedly influenced by the lack of a severe climatic or El Niño event during the six-year period, which benefitted all areas of the reserve through the lack of extreme drought and spikes in the number and intensity of forest fires.

Environmental Impacts of Agreements: Wildlife

Between 2004-2009 the Wildlife Conservation Society (Ramos et al. 2009) estimated and mapped habitat for key landscape species across the MBR, including jaguar (*Panthera onca*), white-lipped peccary (*Tayassu pecarî*), Baird's tapir (*Tapirus bairdii*), scarlet macaw (*Ara macao*), and Central American river turtle (*Dermatemys mawii*). Based on these results, Conservation Agreements played an important role in reducing deforestation and degradation through fire in key habitats for the aforementioned species. As an example, **Figure 29** provides a graphic representation of the distribution of high to low quality jaguar habitat across the reserve, with the location of each Conservation Agreement's area of influence.

The Maya Biosphere Reserve is Guatemala's largest Jaguar Conservation Unit (Zeller 2007), home to perhaps as many as 90% of the jaguars remaining in the country. Agreement areas of influence spanned 11.1% of the remaining jaguar habitat in the MBR; reduced rates of fire and deforestation in these areas undoubtedly provided a tangible contribution towards ensuring jaguars have a safe home, and in turn helping to keep jaguar populations stable.

Figure 29: Map of Conservation Agreements and their Contribution to the Maintenance of Jaguar Habitat in the MBR (Note: darker shades of green indicate higher quality habitat for jaguars)



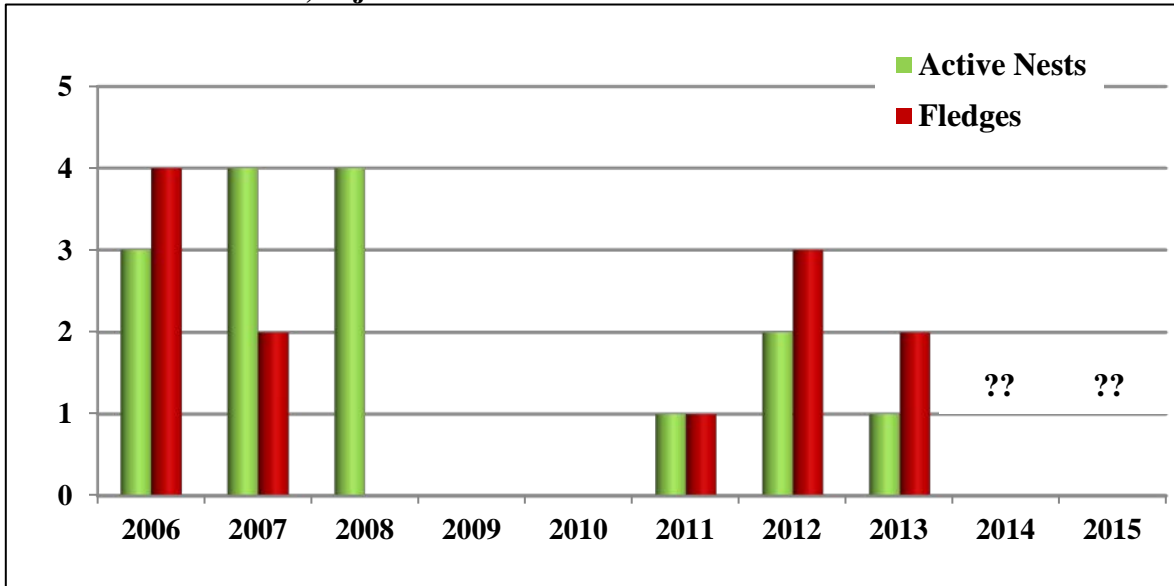
Agreement areas also spanned 11% of remaining Baird’s tapir habitat across the MBR. Similar to jaguars, Baird’s tapir is predominately solitary, largely nocturnal, and thus occasionally able to survive in partially fragmented landscapes with modest levels of hunting, including protected areas in southern Peten, and the Departments of Izabal and Alta Verapaz. In many sites of the MBR, tapirs are not a preferred game species, which also provides them with an advantage compared to more heavily hunted species.

In comparison, in addition to being heavily impacted by habitat loss, white-lipped peccaries are under severe threat from hunting across the MBR due to their biological and habitat use characteristics, including olfactory markers (pungent smell) that tips off hunters as to their presence in an area, their large group sizes – which make them easier to find and harvest in large quantities, and their dependence on surface water during the dry months. In Guatemala, as of 2003, white-lipped peccaries were found in only 16% of their historic range (Altrichter et al. 2012), with the only known remaining habitat for the species lying within the MBR. Agreement areas of influence spanned 11.9% of the remaining habitat for this species in the entire country of Guatemala, providing a notable contribution to the conservation of this extremely threatened ungulate species.

In addition to improving habitat conservation for the three mammal species, the Paso Caballos agreement played an important role in stabilizing scarlet macaw nesting habitat. Scarlet macaws are extremely threatened in Guatemala, with an estimated 250 individuals remaining in the wild. Following the signing of the Paso Caballos agreement and after two years of absence in the area (2009, 2010), scarlet macaws returned to the nesting site of *Peñon de Buena Vista*, adjacent to the Paso Caballos agreement area of influence (**Figure**

30). Active nests were reported in 2011-2013, yielding six successful fledglings, a significant contribution to the threatened population. In 2014 and 2015, macaws were sighted repeatedly in the area, but WCS personnel were not able to undertake regular monitoring of nests during those years.

Figure 30: Number of Active Nests and Successful Scarlet Macaw Fledges in the Peñon de Buena Vista, adjacent to Paso Caballos



Additional benefits accrued to Central American river turtles, ranked as one of the 25 most threatened species of fresh water turtles (Turtle Conservation Coalition 2011). Improved conservation of this species resulted from protection of riparian areas, principally as a result of the Paso Caballos agreement due to its location within the Laguna del Tigre wetland ecosystem. Community members also pledged to reduce turtle harvesting in river, lagoons, and swamps that surround the community polygon, although we were not able to monitor specific compliance with this commitment.

Finally, also of note was that respondents to BNS+ surveys reported that consumption of wild game animals reduced considerably in Uaxactún (-36.1%) and Paso Caballos (-12.0%), with only Carmelita registering an increase (+2.6%), propelling wild game consumption to the indicator with the third largest decrease among the 31 utilized in the survey. It is possible that this was to some degree compensated by the uniform increase in the presence of pigs within households of the three villages (13.9%), while fowl on average remained stable (0.2%). However, other drivers of decreased wild game consumption should not be discounted, including reduced availability due to employment of hunters in economic alternatives and/or rarity of wild game, which in turn can increase cost and decrease consumption.

Improved Wellbeing & Reduction of Poverty

The improvements in wellbeing registered with the Basic Necessities Surveys in the three agreement areas evaluated (Carmelita, +5.4%; Paso Caballos, +5.6%; Uaxactún +6.2%) provided a notable contrast with national trends. According to the 2015 national report using standardized indicators to evaluate advances in meeting Millennium Development

Goals³² (SEGEPLAN 2015), the percentage of rural Guatemalan households living in poverty and extreme poverty increased by nearly 5 percent (71.4% to 76.1%) between 2011 and 2014. In the Department of Peten, during the same period (2011-2014) the percent of households living in extreme poverty increased by 5 percent (15% to 20%). In regard to education, the percent of inhabitants with access to primary education in Peten decreased by more than 7 percent (79% to 63.4%).

Given these unfortunate trends, improved wellbeing detected among communities partnering in agreements is particularly notable. Also of interest is that improved wellbeing was detected in the agricultural village of Paso Caballos, not only among inhabitants of the two forest villages of Carmelita and Uaxactún. This suggests that improvements cannot be uniquely explained by the existence of forest-based economies such as those in Carmelita and Uaxactún. Nevertheless, Carmelita and Uaxactún did demonstrate comparatively higher scores on the BNS Index of Wellbeing, indicating that despite the gains obtained, Paso Caballos remained the least affluent community among the three. This is likely explained by the considerable economic income associated with sustainable forest management, which for communities such as Carmelita and Uaxactún can generate a total annual income of half a million dollars or more.

In all three communities, investments in social projects and the strengthening of local capacity undoubtedly had a direct impact on the social indicators evaluated. Through seed funding and increased capacity among communities for “demand side governance”, community partners were able to leverage significant governmental and project-based investment in their villages. Examples of large-scale leveraged investments included the improvements in the roads to Paso Caballos and Uaxactún, improvement in the internal road network of Paso Caballos, the installation of a community-wide solar panel system in a majority of community households in Uaxactún, and the initiation of an integrated family planning and reproductive health component in Paso Caballos. In total, we estimate that community leaders were able to leverage at least \$992,561 of additional investments to improve wellbeing.

The degree to which these investments were indirectly leveraged by the investments of Conservation Agreements is difficult to ascertain; however, two examples help to demonstrate the linkages. First, in the case of the Paso Caballos road and infrastructure improvements, the COCODE of Paso Caballos received direct support from the agreement to increase their capacity to demand improved governmental investment from Municipal and Federal governments. Second, Uaxactún was selected as the first rural village in Guatemala to implement a pilot solar panel project supported by the Inter-American Development Bank. During project scoping, one of the key criteria for the project was the presence of an established, and financially solvent local organization to manage the maintenance costs (monthly payments) to be paid by beneficiaries. The elimination of OMYC’s debt and their recuperated financial solvency as a direct result of agreement implementation allowed OMYC to qualify for the program.

³²The 66 indicators include 24 with set goals, and 44 lacking goals. Among these indicators 44% demonstrated improvements, and 41% demonstrated deterioration. Poverty was defined as people having an income below one dollar per day. Extreme poverty was defined as a total annual income of Q5,750 (\$767) or less.

The greatest improvements registered among the 31 BNS+ indicators of wellbeing directly linked to the agreements consisted of those where the Community Development Councils were able to leverage complementary investment from governmental agencies. Specific examples included the top four indicators: advances in piped water to local houses (led by Carmelita), access to a doctor, installation of solar panels (both led by Uaxactún), and improved road access to all three communities. In Paso Caballos, investments in fruit trees propelled an increase in the number of households that reported access to an orchard. One incongruous result consisted of the reported decrease in access to agricultural land in Uaxactún (where the agreement helped ensure all farmers in satellite areas were relocated within the agricultural polygon). This was particularly confounding since between 2009 and 2015, Uaxactún registered a 14% increase in the number of households reporting income from agriculture, suggesting that the agreement had at the very least not negatively impacted the access to arable land.

Trends in livelihoods revealed distinct livelihood strategies among the five participating community groups. Two communities (Carmelita and Uaxactún) retained forest-based economies shaped by decades of sustainable extraction predicated on extensive forest tracts. Some slight distinctions did emerge amongst the two, primarily the strong increase in activities related to tourism in Carmelita, where data suggest that the socioeconomic foundation of Carmelita village may be undergoing a fundamental expansion from reliance on natural resource harvesting and timber management to include tourism-based economies focused on the MBR's natural and cultural patrimony.

Despite similar decreases in the reliance on xate, one clear difference between the “forest villages” of Carmelita and Uaxactún was the continued importance of xate in Uaxactún, with 23% of the households reporting xate as their main source of income in 2015 (compared to 7% in Carmelita). The Uaxactún agreement provided xate harvesters with a modest incentive to reduce waste (i.e. the collection of unmarketable fronds); this payment was initiated when OMYC began paying xate harvesters only for market quality fronds³³, thereby helping harvesters sustain and even increase their income during a key intervention to increase the sustainability of the resource.

Another important difference between the forest villages was Uaxactún's notable success in obtaining employment from government sources, the most important source of household income in the village. This is likely due to the proximity of Tikal National Park, located only 23 kilometers away.

Two more communities (Paso Caballos and Corozal) demonstrated major dependence on agriculture (both), and in the case of Corozal daily wages likely correlated with a lack of arable land and employment on large ranches (adjacent to the community). In contrast, by virtue of their central location near the municipal capital of San José, the members of Asociación BioItzá retained by far most advanced indicators in regard to educational levels (35% with diversified or university education), while also registering governmental employment (50%) and commerce (36%) as their main livelihood options.

³³ Greater detail is provided in Case Study No. 4, summarizing the xate sustainability component of the Uaxactún agreement.

Although Corozal was not re-evaluated with the BNS survey, initial BNS data reported herein suggest that communities with a high dependence on agriculture may correlate with the lower scoring on the Index of Wellbeing. In 2015 tourism finally registered as an economic activity (1%) in Paso Caballos; nonetheless, important questions remain about the sustainability of the agricultural yields in Paso Caballos, and what types of viable economic alternatives may exist in view of current educational levels. For this reason, the Paso Caballos agreement focused on boosting investments in education, but additional sources of support need to be identified to work with farmers to ensure the long term viability of crop yields, particularly in the face of climatic variation.

In all villages surveyed at least twice, education levels varied considerably while also highlighting some positive trends given the rural contexts. Possible explanations for the variations included demographic changes among the households surveyed as cohorts moved on through schooling, as well as ex-migration in search of employment in the central area, as in the case of the slight reduction in the number of university graduates in Carmelita and Uaxactún. Overall however, positive patterns included the strong attendance of primary schooling, the availability of secondary schooling, and an upward trend in the number of students with post-secondary (diversified) schooling. Given that education was by far the most recognized investment by local communities (Figure 15), these upwards trends suggest that agreements were able to reinforce a sincere development imperative of the reserve's rural inhabitants.

In summary, the most conservative potential interpretation regarding the role of agreements is that as a whole they did not negatively impact local opportunities for social advancement. A more propitious interpretation is that agreements helped spur some specific advances in wellbeing (i.e. increased income for xateros in Uaxactún, a new school and more teachers in Paso Caballos) while fostering conditions that helped participating communities increase the benefits of their natural resource and land use systems permitted by CONAP. In other words, agreements helped catalyze increased socioeconomic benefits derived from legally sanctioned economic activities in the reserve. These included those associated with certified forest concessions (Carmelita and Uaxactún) and subsistence/household income agricultural activities (mainly Paso Caballos, but also Carmelita and Uaxactún). As described above, agreements also played a role in helping communities obtain increased social investment from governmental institutions. In conjunction, these advances indicate that the three MBR Conservation Agreements contributed to the improvement of wellbeing in communities evaluated, while also helping local communities and CONAP deliver reduced environmental impacts in their areas of influence.

Social Awareness and Support

As implemented in the Maya Biosphere Reserve, Conservation Agreements obtained significant support among both community members and implementing civil society and governmental partners. Knowledge of agreements varied considerably among the five community groups surveyed, while remaining high on average (67.2%, SD=18.2%). We considered that awareness of 50% or more among surveyed participants was “high” given that the experience of project partners is that often local inhabitants not in leadership positions are unaware of social development and conservation initiatives, particularly their

details and specific commitments. And, as noted in **Table 11**, agreements also led to sanctions imposed on specific individuals; in some cases the engagement of CONAP was also required to resolve violations and support challenging interventions such as the relocation of agricultural plots or the removal of cattle from the community management unit.

Within the survey, the comparatively low levels of awareness in Corozal and BioItzá (43% and 57%, respectively) were likely correlated with the far shorter period of implementation as compared to the other agreements. A notable result, however, was that community members surveyed in Uaxactún, with the longest period of agreement implementation, reported lower awareness (67%) than those in both Paso Caballos (90%) and Carmelita (79%).

In regard to support for agreements, on average 59.1% (SD=15.8%) of community respondents considered agreements to be “good” or “regular”. These figures include surveyed individuals not familiar with agreements; if we restrict analysis to the opinions of those aware of agreements, on average 88.6% (SD=12.5%) of respondents considered agreements to be “good” or “regular”. In only Carmelita did any respondents consider the agreement to be “bad” (5%), most likely due to the resistance by a small minority of the families to the agreement’s efforts to strengthen the Carmelita Cooperative and reduce cattle ranching.

Once again, project implementers consider that these results overall demonstrate a notable level of endorsement from local community members. At the same time, specific data obtained from the survey also provided an opportunity to improve agreement outreach activities. For example, in Corozal, the 43% of the respondents that were aware of the agreement corresponded perfectly with the 43% that considered the agreement to be “good” or “regular”. This suggests that greater awareness about the agreement among Corozal residents would increase social support for its goals and activities.

In Uaxactún, 45% of the respondents considered the agreement “good” or “regular”, whereas none considered the agreement to be “bad”; however, another 21% were unable to provide an opinion. Perhaps most interesting was that a greater percentage of respondents in Uaxactún reported direct benefits from the agreement (49%) than those who were aware of the agreement (45%). Once again, these data suggest that increased outreach in Uaxactún about the agreement’s goals and activities would increase both local awareness and appreciation for the mechanism, and reinforce its social viability over the long-term.

In Carmelita, 71% of respondents considered their agreement to be either “good” or “regular”, once again ranking Carmelita as the community group with the second highest level of support for the agreements, behind only Paso Caballos. These results indicate that Asociación Balam, CONAP, and the Carmelita Cooperative were successful in maintaining support for agreement commitments among community participants. This finding also provided an indication that the failure to maintain full implementation of a Conservation Agreement after an initial two-year period does not necessarily relegate the approach unviable, or spur perverse incentives where community members would cease to act on commitments in the absence of (full) funding.

The degree of support for agreements among non-community partners and implementers, including CONAP, revealed even greater support than that reported in most communities. Ninety-one percent (91%) considered agreements to promote positive environmental impacts, while 74% responded that agreements helped to propel improved quality of life for rural inhabitants. Perhaps most notable was that all non-community partners participating in the survey considered that Conservation Agreements hold potential as a useful conservation and development approach.

Land Tenure

Increased security of access to land and usufruct rights was one of the signature outcomes of the agreements. While the advances do not guarantee permanent standing and natural resource use rights for these communities in their respective areas, the results and feedback from diverse partners suggest that land tenure security was boosted in two ways: first, through substantially improved relationships and positive engagement with CONAP; secondly, in the cases of Carmelita, Paso Caballos, and Uaxactún, through improved compliance of pre-established requirements detailed in formal, binding agreements with the State (forest concession contracts of Carmelita and Uaxactún, and the “Agreement of intent” in the case of Paso Caballos). This was particularly true in regard to environmental performance as one of the principal concerns of the State (i.e. CONAP), but it also included aspects such as the improved financial solvency of the Uaxactún concession, and documented social investments by OMYC and the Carmelita Cooperative.

As a result of the advances to date, Carmelita and Uaxactún have increased their chances of obtaining a renewal of their 25-year concession lease agreements providing usufruct rights. For example, CONAP’s Alan Gonzales, stated “*Conservation Agreements are financial mechanisms that have contributed to the ability of communities to comply with their contractual commitments with the Guatemalan State*”³⁴. Similarly, in the case of Paso Caballos, the village’s improved working relationship with CONAP and their abandonment of intentions (i.e. circa 2008) to colonize, or support colonization of adjacent areas of Laguna del Tigre National Park, have decreased the probability of Paso Caballos being evicted from their agricultural polygon for the foreseeable future.

Improved security of access to land and natural resources among participating communities is also reinforced by the independent final assessment of project impact undertaken during the last semester of the project (**Appendix 6**). According to the review, project outcomes included: (1) Improvement of Inter-institutional Cooperation³⁵; (2) Consolidation of Community-based Forest Management³⁶; and (3) Support of the Existing Legal Framework³⁷.

³⁴ Translation from the testimonial provided in this document by Alan Gonzales, CONAP’s Director of the MBR multiple use zone.

³⁵ This point highlighted “*development of very productive cooperative relationships among the different governmental institutions and local communities represented by their COCODE and concession leaders*”...”which demonstrated that they can work hand in hand with CONAP” (Point 2; Page 11).

³⁶ In reference to the Carmelita and Uaxactún forest concessions; Point 16; Page 16.

³⁷ The report stated “*it was evident that the Conservation Agreements supported the legal framework established by CONAP, and concession contracts and Agreements of Intention, particularly in activities lacking financing*” (Point 68; Page 29).

Key Factors Influencing Reported Outcomes

In the opinion of the authors, community enterprise was undeniably the most important factor in influencing the diverse outcomes reported during this study. For example, the commitment of community members and their organizations to respect management norms established by CONAP explain the notable reductions obtained in deforestation and fire indicators during the agreements. At the same time, income generation resulting from the daily activities of community members related to forest management, tourism, agriculture, or other types of employment, played the most significant role in improving the wellbeing of local residents. Also of significance was the ability of local leaders to leverage increased investment in their communities.

A second relevant factor included accompaniment by partner organizations, led by CONAP. Witness of honor organizations also undertook targeted investments (i.e. supporting community-based tourism) and supported select interventions (i.e. continued technical support for Carmelita's administrative management after the initial two-year phase of the agreement with Balam; technical support to open new markets for xate and other non-timber forest products such as breadnut). And in the case of CONAP, their accompaniment throughout strengthened resolve among community members and leaders to address some of the most complex issues, including the rezoning of land use, the removal of cattle from community areas, and the improvement of financial administration by forest concession administrators.

As detailed by the vast majority of the testimonials provided by community, CSO, and governmental partners, Conservation Agreements provided a significant boost to the capabilities of rural communities and their ability to deliver improved conservation and development outcomes. The most explicit causal link was the transparent determination of unified conservation and development goals, established in partnership with local communities through an extensive process of consultation. We believe that this explicit linkage between clear conservation goals and improved social investment increased motivation for many community members to act in partnership to deliver positive results. In summary, the alignment of community, CSO, and governmental priorities within Conservation Agreements served as a crucial catalyst for the outcomes obtained.

Strengths and Limitations of Conservation Agreements

As implemented in the Maya Biosphere Reserve, Conservation Agreements helped resolve fourteen of the twenty-two weaknesses identified in the literature on ICDP, CBNRM, and PES models. Three of the weaknesses were only partially addressed through project activities, and another five either did not apply or were not addressed at all. The results of this analysis are detailed in **Table 12**.

A notable tradeoff detected during the implementation of Conservation Agreements in the MBR consisted of the effort required to ensure participation by CONAP as the main representative of the Government of Guatemala³⁸. This tradeoff was accentuated due to the need to engage two CONAP offices: (1) the regional headquarters of CONAP as the main partner in the implementation and evaluation of the agreements; and (2) the national CONAP office. As a result of CONAP's limited personnel, the engagement of the regional

³⁸ See Text Box 2 for a description of the key role played by CONAP within the MBR landscape.

office typically required project partners to plan far in advance, and occasionally postpone meetings and other relevant events when personnel were otherwise occupied. And because the authority to sign agreements required legal permission from the CONAP national headquarters located in Guatemala City, the process of formalizing agreements often lasted as much as three months or more, sometimes delaying implementation plans and/or requiring adaptive management of budgets to retain impact.

But despite these tradeoffs, the consensus of project partners was that the engagement of CONAP was a crucial element of the agreements, well worth the minor delays. Engagement of CONAP provided access to their monitoring institute (CEMEC) as an independent arbiter of the environmental impacts accrued during agreements. It also provided the State with an opportunity to accompany, and where necessary leverage, compliance to commitments by community-based organizations and CSOs, no matter how challenging. Finally, a key benefit of CONAP's engagement was the validation of improved community management in the eyes of the State. This in turn led to greater tenure security among participating communities, and contributed significantly to increased community enthusiasm for attaining the conservation and development goals outlined.

Some additional limitations to the viability of Conservation Agreements as implemented in Guatemala include:

- Lack of community interest: We do not recommend signing Conservation Agreements with communities lacking interest in ecological stability or conservation goals. The challenge in this regard is the definition of a minimal threshold of community “support” for conservation goals. In the current methodology we partially addressed this challenge through majority approval of agreements in community general assemblies. Another indicator for a minimal threshold consists of the results of the social awareness surveys, which revealed the lowest level of support consisted of 43% of the interviewed population considering agreements to be “good” or “regular”, including those who were not familiar with agreements. At any rate, potential implementers of future agreements should consider the minimal degree of social support required to ensure viable agreements. It should also be noted that in different cultural contexts the level of support required may vary somewhat based on the social structures and local hierarchies of communities; this study does not portend to define these levels in areas other than the MBR.
- Communities lacking standing: Given the complex context of illegal land colonization in Guatemala, we believe that Conservation Agreement incentives are not appropriate in the case of communities that lack formal standing and governmental recognition in the protected area (i.e. in this case the Maya Biosphere Reserve). Closer scrutiny of this precept, however, raises interesting questions. For example, what about cases of communities that are recognized by Municipal governments, but not by CONAP? What about communities that have received investment from the Ministry of Education (i.e. Federal government), with teachers assigned to their village school, but yet are not officially recognized by CONAP? In the current approach these communities did not qualify for Conservation Agreements, since one of the objectives of agreements as implemented was to increase cooperation between community groups and CONAP (i.e.

environmental authorities), and ensure community compliance with pre-existing environmental commitments.

- Short-term projects: Short-term projects and/or those lacking funding to correlate socioeconomic investments with conservation investments may not be appropriate for the Conservation Agreement model. The model in and of itself requires considerable investment in partnerships and, as noted previously, flexibility to ensure engagement by State agencies. That said, in the case of these particular MBR agreements, we believe that a two-year period was enough to merit the additional “costs” of developing a formal agreement.
- Inflexible project investments: Projects lacking flexibility to negotiate investment targets with local communities may not be viable due to the possibility of encountering competing community (and governmental) priorities prior to initiation. In this regard, if funding is requested for agreement implementation, proposal writers would do well to emphasize the need for flexibility in the definition of the specific investments and outputs, listing instead some *possible options* as opposed to concrete results expected. This simple suggestion, though initially sensible, may also imply the need for considerable reflection by most donor organizations, which typically prefer to have outputs identified before they commit funding. However, the upsides for donors could also be considerable. For example, once attained, agreements provide extremely clear contracts detailing specific ecological and socioeconomic outputs, while ensuring that donor investments conform to principles of free, prior and informed consent. In addition, many donors may agree that enabling significant community/partner input in planning investments will ultimately result in a more impactful project.
- Governmental bureaucracy: Engagement of government delayed somewhat the negotiations and final approval of MBR agreements; but as detailed above, governmental support also provided considerable dividends. In this regard we recommend that where governmental engagement is an option, CSO partners work continuously to ensure that government remain fully engaged and aware of advances and setbacks in agreements. This in turn will help minimize delays as projects advance through the stages of approval, implementation, and renovation. That said, if in the future the number of agreements were to be increased significantly (i.e. perhaps as much as an order of magnitude), governmental partners would require additional support and streamlining of official procedures to ensure that agreements could be evaluated, approved, and renewed efficiently.
- Countering severe threats and personal security challenges: Agreements and their associated incentives and technical support are unlikely to resolve severe governance issues affecting local communities, particularly in the case of external and asymmetrical threats (i.e. illegal colonization and deforestation linked to narco-trafficking, etc.), or personal security issues (violence, crime, etc.). If however there is tolerance for longer timeframes among donors and implementers, the results of this study (particularly in Paso Caballos, and to a lesser degree in Carmelita) provide some evidence that agreements can help initiate traction for conservation in contexts with considerable challenges. In cases of agreements developed in the face of severe internal threats, we recommend that initial two-year phases of agreements focus more on social investments and more easily attainable conservation goals, while minimizing goals that could increase the vulnerability of community leaders and conservation partners.

- Financial sustainability: As detailed below in **Table 12**, agreements are not a panacea for the lack of steady funding required to address wicked conservation and social development challenges. However, many if not most sustainable development initiatives to this day remain plagued by the short-term nature of conservation and development investments. When engaging in agreements it is important to immediately plan for long-term fundraising, and to diversify support for each agreement wherever possible.
- Consistent awareness though implementation: Consistent and transparent implementation and delivery of incentives in the MBR did not guarantee complete awareness of agreements, nor did it ensure full support for agreements by the vast all participants. We therefore recommend continued outreach, and, if possible, house to house dissemination of information to ensure that households are and/or remain informed about the status of agreements, their benefits and impacts, associated local commitments, the roles of project partners and challenges over time. Maximizing both local awareness and appreciation for the mechanism are important to reinforce the social viability of agreements over the long-term.

Table 12: Critiques of Community-based Initiatives addressed (or otherwise) by Conservation Agreements in the MBR

Critique	Field	Addressed?	Notes
1) Failure to deliver environmental impacts / Lack of evidence on ability to reduce deforestation or conserve the environment	ICDPs / PES	Yes	Results demonstrate reduced impacts of deforestation and fire. Agreements provided a substantial and direct contribution through targeted activities focused on these threats. Agreements also directly propelled additional environmental impacts including the enrichment of wild xate populations in Uaxactún, and the elimination/reduction of the herds of cattle in Paso Caballos and Carmelita, respectively.
2) Failure to deliver socioeconomic impacts / Lack of evidence on poverty reduction	ICDPs / PES	Yes	Results demonstrate clear improvements in the Index of Wellbeing within the three communities with established baselines. Additional socioeconomic improvements directly linked to Agreements included improved education (all villages), health projects (Carmelita, Paso Caballos), and improved governmental investment (Carmelita, Paso Caballos, Uaxactún).
3) Unproven links between improved socioeconomic status and conservation	ICDPs	Yes	Dual goals of improved environmental performance and improved social welfare were demonstrably advanced among participating communities. Despite a 1.4% increase in the families with chainsaws (which we ranked as “stable”), no evidence was available that improved socioeconomic status led to increased ecological deterioration.
4) Over simplification of threats, and failure to account for powerful external actors	ICDPs	Yes	Projects benefitted from decades of collective experience within the MBR among staff members; this was enriched by threats analyses previously led by WCS for the entire MBR. Partners also engaged CONAP as a key actor, and where appropriate collaborated with army and police to undertake patrols/interventions required to deter powerful actors (land usurpation by actors linked to powerful ranchers and organized crime).
5) Lack of baselines and comprehensive tracking of outcomes	ICDPs	Yes	Detailed baselines were established, tracked, and are reported herein covering ecological, socioeconomic, and social awareness indicators
6) Over dependence on "outside" consultants	ICDPs	Yes	Long term staff, community leaders, and CONAP personnel designed projects; an independent consultant was contracted to evaluate the project after implementation.
7) Absence of protection components (patrolling & enforcement)	ICDPs	Yes	All agreements included patrolling and coordination with governmental agencies responsible for enforcement, as well as clear procedures for sanctions upon detection of violations of the agreement commitments.
8) Internal and external conflicts	CBNRM	Yes	Negotiations and approval by community assemblies from the beginning helped to reduce the potential for conflicts; Establishment of clear mechanisms for conflict resolution and the use of internal sanctions helped avoid conflicts once implementation initiated. No conflicts derailed agreements during the 6 years of implementation.

Critique	Field	Addressed?	Notes
9) Financial mismanagement	CBNRM	Yes	CSO partner financial obligations were detailed in writing, allowing constant monitoring by both community and governmental partners to ensure compliance with commitments. Agreements including community businesses (concessions) obligated improved financial transparency. In Uaxactún this propelled the elimination of a significant debt that was threatening to default the concession. In Carmelita, the agreement helped initiate improved financial management; this activity was continued by CONAP and a witness of honor (ACOFOP) after agreement funding declined.
10) Mismanagement of natural resources	CBNRM	Yes	Agreements contributed to reduced rates of deforestation and fire. In Uaxactún the agreement supported the enrichment of wild xate stocks in the jungle (a key economic resource for village inhabitants), and the xate incentive paid to harvesters improved the sustainability of xate harvests by reducing the number of fronds coppiced from wild plants.
11) High turnover of leaders	CBNRM	Yes	Agreements were approved by community assemblies and ratified by CONAP, helping to buffer them from community leadership changes. Leadership turnover was substantial, with no impacts, changing 4 times in Uaxactún, 5 times in Paso Caballos, and 2 times in Carmelita.
12) Weak conditionality	PES	Yes	Payments of incentives were conditioned upon adequate completion of activities, and reinforced by quarterly reviews by the accompanying organization, and annual and biennial CONAP evaluations.
13) Lack of additionality	PES	Yes	When compared with baseline trends prior to agreement implementation, results reveal notable reductions in deforestation and fire. However, all agreements also generated numerous additional results that clearly would not have accrued without the incentives provided; for example: a) Uaxactún: xate enrichment and reduction of OMYC's debt; b) Paso Caballos: construction of a new school and the removal of all cattle in the community polygon; c) Carmelita: removal of 50% of the cattle in the community polygon, and improved education; and d) BioItzá-Corozal: patrolling of the BioItzá Municipal Reserve and El Zotz Biotope.
14) Elite capture of incentives and benefits	PES	Yes	The number of direct beneficiaries was monitored to evaluate distribution. In Uaxactún, Paso Caballos, and Carmelita social incentives were distributed via education and health projects, helping to increase dispersion. In Uaxactún, the xate incentive was paid to a minimum of 100 harvesters/year, who are among the neediest inhabitants of Uaxactún.

Critique	Field	Addressed?	Notes
15) Uncertain financial sustainability	ICDPs / PES	Partially	The inability to sustain the Carmelita agreement in full during the last two years (2014, 2015) provides an interesting case study. On the one hand, the \$42,500 incentive payment was not fully raised by WCS or by project partners, suggesting that an incentive of this magnitude might be too difficult to sustain over time. However, after the agreement failed to be formally extended for a second two-year period, Asociación Balam was able to obtain and invest approximately half the previous incentive, and the community continued to work with Balam on shared conservation goals. Specific Carmelita community commitments were maintained, such as the reduction in the standing herd of cattle. Deforestation and fire indicators remained lower than before the agreement initiated. Additional investments provided to Carmelita by ACOFOP, also helped sustain the commitment to improve financial management of the Carmelita Cooperative. This suggests that the agreement helped to propel a set of commonly shared goals which were sustained over time among community members and partners.
16) Lack of equity among community stakeholders	ICDPs	Partially	Agreements worked with pre-existing community structures and with diverse sectors within each community, helping address the complex dynamics related to the internal equity. All actors were consulted in community general assemblies, and the dispersion of incentive benefits was prioritized through mechanisms that provided direct benefits to the greatest number of participants when possible. Some steps forward were also taken to increase gender equity; for example, by supporting the xate project, which created income for women working sorting the product in the bodega in Uaxactún; the xate incentive paid to harvesters (mainly men) subsequently leveraged an increase in the wages paid to women sorters. This increase was provided by OMYC. Women were also engaged through their participation in leadership positions in Carmelita, Uaxactún, and Corozal village; but not in Paso Caballos where women's leadership continues to lag. However, in Paso Caballos, women's leadership of, and participation in, health assistance and education projects helped to promote increased women's participation and investment in equitable opportunities for development. Nevertheless, significant inroads must continue to be made in all rural Guatemalan communities before we can report that aspects of equity across socioeconomic, gender, and racial lines have been resolved.
17) Political/economic instability	CBNRM	Partially	Project implementation in Uaxactún spanned three national administrations, and was able to engage positively with all three. Projects in Paso Caballos and Carmelita have spanned two administrations, and retained full support of Guatemalan authorities. That said, major political and economic instability did not occur during the project lifetime.

Critique	Field	Addressed?	Notes
18) Changes in markets	CBNRM	N/A	No major currency or inflation variations occurred during the project lifespan. The project was also not focused on promoting one single economic strategy or product as a livelihood base. We recognize that conservation programs are unlikely to ensure rural community resilience to all potential vagaries of national and global markets, especially when evidence abounds that international multilateral institutions and developed nations have repeatedly failed to do so. That said, improved natural resource management should help rural communities by ensuring their natural “capital” is conserved, in turn providing greater adaptability as economic conditions change.
19) Interference from large scale projects	CBNRM	N/A	No significant large scale projects with the potential to disrupt Conservation Agreements existed in the participating communities during the implementation period.
20) Lack of controls in sites without interventions	PES	No	Project scope and resources did not allow for detailed comparisons with other communities without Conservation Agreement incentives. Nevertheless, comparisons with background trends across Guatemala and within the MBR were undertaken as illustrative comparisons, with important caveats since sites with complete sets of comparable characteristics were not available in the MBR. Carmelita and Uaxactún are the only two traditional forest villages in the reserve. Paso Caballos is the only Q’eqch’í community with a legally recognized agricultural polygon within Laguna del Tigre National Park.
21) Displacement of environmental problems to other areas	PES	No	Displacement or "leakage" was not addressed directly by the project; however WCS did continue to monitor deforestation and fire rates across the entire MBR, and we noted that there was no major increase in deforestation or fire across the reserve at the same time.
22) Payments supplant local conservation ethics	PES	N/A	This could not be adequately evaluated; yet as demonstrated by the continued commitment to conservation in Carmelita after the agreement was only partially funded after the first phase, there is no evidence the suspension of agreements will spur local inhabitants to revolt against conservation. Based on testimonials and experience from six years of engaging rural MBR inhabitants, we believe that the agreements were more likely to reinforce the conservation ethics of forest communities of Carmelita and Uaxactún by helping them to return their forest management enterprises to profitability. In Paso Caballos, increased support for conservation may also be a legacy of the agreements as the result of greater security in their access to land, through improved compliance with their obligations under their “Agreement of Intention” with CONAP.

CONCLUSION

Conservation Agreements in the Maya Biosphere Reserve helped local communities, civil society organizations, and governmental institutions propel notable improvements in environmental and socioeconomic indicators by strengthening existing legal frameworks and working in partnerships. Agreements were based on the principles of free, prior and informed consent and established transparent blueprints for collaborations based on clear roles for each participating institution, while also identifying goals and indicators to evaluate progress over time.

Positive impacts of agreements were increased by harnessing the potential of State institutions and civil society organizations (CSOs) to work together with rural communities to pursue common goals. Agreements were also improved through the leadership of CSOs having years of experience with the partnering communities, and by utilizing pre-existing indicators for environmental performance with considerable baselines and that were comparatively inexpensive to monitor (deforestation and fire).

The ability of the Government of Guatemala to meet international obligations was improved by Conservation Agreement investments, particularly Aichi targets 2,5,7,14,15, and 19³⁹ as well as all five Strategic Goals of the Convention on Biological Diversity. It is also notable that while the 2015 Millennium Development Goals report registered increases in poverty and extreme poverty across Guatemala, the three communities with established socioeconomic baselines participating in agreements obtained significant improvements in wellbeing despite their extremely rural locations.

Conservation Agreements also provided considerable leveraging, multiplying investments by supporting persistent, demand-side development requests by community leaders. None of the participating groups had access to land titles in the agreement areas; rather, all agreements were focused in areas where the State had provided usufruct rights to local communities with the intent of reinforcing established conservation (and social development) paradigms. Agreements were also undertaken in areas where conservation organizations had previously engaged with local communities. In this regard, the additionality of these particular agreements could potentially be called into question. But the results obtained during implementation demonstrate that agreements helped catalyze improved delivery of both environmental and social development goals, suggesting that future investments in similar communities might make a difference between successful implementation of established conservation models, or failure.

Considerable value for money was also obtained through the implementation of agreements. Annual costs of Conservation Agreement investments spanned between \$0.62 and \$4.47 per hectare; on a per capita basis, annual agreement investments ranged from \$28.81 to \$181.40. In both cases these ranges include protection benefits and social investments, as well as technical assistance and additional funding provided by partnering institutions. However, value for money was also delivered through the long-term nature of agreements and the strengthening of local partners to enhance the staying power of

³⁹ <https://www.cbd.int/sp/targets/>

agreement interventions. Investments responded to local needs, thereby helping to promote community “ownership” of the approaches developed, as demonstrated by the broad endorsement of agreements within participating communities. It is also important to note the positioning of agreements among State institutions such as CONAP, and the adoption of the Carmelita agreement as the first community-based pre-investment of the GuateCarbon REDD+ project.

The results obtained provide cause for reflection on the potential roles for environmental organizations working in extremely rural conservation areas. According to Redford et al. (2007) “*there is a broadly developing understanding that protected areas must be integrated into the surrounding land and with the neighboring human populations*”, in no small measure due to the heightened expectation that they deliver direct benefits to those living adjacent to and within the protected areas themselves.

Yet priority conservation areas contain relatively few (< 0.5%) of the world’s poorest people, rendering most of these areas less attractive for the delivery of assistance from development organizations (Redford et al. 2008). At the same time, authors have recommended that conservation organizations avoid the slippery slopes of mediocrity (Robinson et al. 2004) and mission drift (Redford et al. 2008) should conservation organizations begin working directly to reduce poverty on the conservation frontier. Instead, since conservation organizations typically have established relationships with remote communities, authors recommend that they are well positioned to partner with development institutions to promote poverty reduction goals.

Conservation Agreement outcomes in the MBR, reinforced by nearly a century of collective conservation experiences of the authors of this White Paper, lead us to believe that there may be a third way. Conservation organizations need not choose between simply partnering with other institutions to address poverty and forfeiting their conservation mandates. If judicious and disciplined, conservation organizations working on the frontier can indeed engage in the intertwined goals of conservation and social development to great effect, maximizing previously considered benefits. These often include the ability to build upon established social relationships and an intimate knowledge of the landscape and environmental variables. They also include some aspects of value for money, by building on existing infrastructure and to some degree personnel. It is also important to point out that, as mentioned by the authors above, development organizations are rarely present within priority conservation frontiers. Their recruitment and engagement can be slow, lead to failures, and still tarnish conservation organizations enmeshed in partnerships.

But from a conservationist’s point of view, perhaps one of the most relevant additional benefits of addressing social development issues directly is that conservation messages can be more faithfully linked to tangible demonstrations of concern for the future of people (too), thereby helping conservationists win rural hearts and minds. If conservation organizations can hire local biologists to monitor threatened species, and protection experts to support government patrols, why can they not also add local agronomists and development specialists to promote socially viable and ecologically benign development models? Results obtained through Conservation Agreements implemented in the MBR suggest that they can, while retaining impact vis-à-vis the conservation outcomes desired.

Recommendations

Based on the lessons learned while implementing Conservation Agreements in the MBR we offer the following recommendations to any actors interested in applying agreements to the dual effect of promoting improved conservation and social development in rural areas:

For communities:

- Negotiate: It is important that communities negotiate realistic commitments and ensure to the greatest degree possible that benefits of agreements are channeled towards community priorities. Community leaders should ensure that agreements commitments are socially and economically viable, and do not endanger the social fabric or local cohesion.
- Independent advocates for communities: The incorporation of witness of honor institutions in Conservation Agreements facilitates additional consultation and advice to communities engaged in agreements negotiations. Communities may also want to consider engaging independent advisors or researchers who can advocate on their behalf.
- Awareness of limitations: Communities should recognize that no single project can be a panacea, addressing all the shortfalls affecting a community. They should also remain aware of limitations of government institutions, since agreements are unlikely to facilitate the elimination of legally binding prescriptions for presence in protected areas and/or access to natural resources. In some cases as well, the prescriptions of donors may provide some limitations in regard to how funding may be used, and in these cases it is essential that communities be informed from the outset to avoid false expectations.

For conservation civil society organizations (CSOs):

- Establish baselines and undertake periodic monitoring: The tracking and reporting of socioeconomic and environmental baselines helps indicate whether projects are delivering the expected outcomes, report advances to project partners, and motivate all engaged to implement agreements faithfully throughout implementation. Data generated also increase possibilities for identifying and obtaining additional and more diversified funding sources.
- Utilize periods of two years for agreement phases: In most cases, one year would be unlikely to yield significant returns when compared to the effort required to identify and engage partners and negotiate agreements. Two years are ideal, since this provides an opportunity for revision and improvement. Additional two-year phases are preferable, but a minimal period of two years should be adequate in most circumstances to generate positive results.
- Be aware of limitations of agreements: Agreements are not a panacea for the serial lack of attention provided to most rural communities on conservation frontiers; they also require a strong commitment by all parties involved, particularly when addressing structural challenges related to social development. Agreements should also not be expected to resolve serious threats stemming from severe governance challenges, particularly in areas where State presence is minimal or ineffective. If communities residing in such areas are interested in conservation and social development projects, the activities and outputs should be commensurate with the local conditions, and not require that communities resolve governance vacuums.

- Undertake constant outreach: Despite an inclusive approach, many community members do not participate regularly in community and organizational assemblies. More consistent, systematic outreach about the activities, benefits, and results of conservation agreements, particularly among community members, would help increase the degree of social awareness of, and support for agreements. This outreach could include simple fliers/trifolds, house to house visits, and targeted presentations at community events undertaken every six months or as deemed locally appropriate.
- Engagement of government, community, and CSO partners in evaluations: Engagement of governmental and CSO partners, including witness of honor organizations in the periodic evaluations helps ensure buy-in and institutional support for agreements, while ensuring timely feedback to make corrections if required. This in turn facilitates the continuity of agreements should financing be available for subsequent phases.
- Persistent accompaniment: A strong field presence by CSO technical support staff is of great importance, as it allows for the early detection of potential problems, and consistent engagement with community partners, particularly local leaders. For CSOs considering entering into an agreement without having a pre-established working relationship with a village, the presence of a field technician that focuses full time on agreement implementation will increase confidence among community partners and efficiency in delivering project outcomes.
- Linkage of new opportunities: New and unexpected investments that become available to communities can be linked into pre-existing agreements, ensuring that agreements are reinforced and benefit a greater portion of the community participants.
- Long term commitment: A willingness to raise funds consistently and/or establish long term funding streams is essential due to the complex nature of rural poverty and conservation in frontier areas. We urge CSOs to consider a place-based approach that has at its core a long term commitment (i.e. of at least a decade) to local communities to increase the likelihood of consolidating conservation and development gains.
- Basic education investments: As detailed in **Figure 15**, investments in basic education were by far the most commonly recognized benefit of Conservation Agreements among community respondents. Far too often, environmental organizations have focused on raising awareness about nature among the people most closely linked to natural resources, while simultaneously ignoring the state of basic education in rural communities. Project partners recommend that, when prioritized by local communities, investments in basic education not only win local hearts and minds, but provide a notable win-win for conservation and nature alike, constituting one of the most impactful conservation investments available.
- Bi-lateral or CSO agreements: In special cases, CSOs may want to consider developing bilateral agreements (CSO – Community) in areas where conservation imperatives are urgent, but no legal framework exists permitting the incorporation of State actors. Care should be taken however to ensure that such agreements do not legitimize activities considered illegal by the State (i.e. a community considered “invader”, or believed to be usurping protected areas), for the fear of creating perverse incentives or undermining State authority. Bilateral agreements should also be viable in the case of traditional indigenous communities with indisputable standing within wildland areas.

For government:

- Maximize potential of partnerships: Governments can maximize advantage of the tripartite agreement model, harnessing the benefits of CSO assistance and community willingness to engage to resolve problems since their staff and resources are often limited. However, government must also establish the rules of engagement in conservation areas under their mandate; accordingly, CSOs should respect governmental leadership and reinforce existing norms while serving as intermediaries to assist in the identification of viable solutions when local development aspirations contrast with the existing legal frameworks in conservation areas.
- Efficient review and approval: In cases where government is engaged as a direct partner in agreements, governmental review is essential (at a minimum) at the end of each two-year phase, prior to the initiation of a following phase. Lapses in review can delay continued investments, dealing setbacks to established programs which also decrease local enthusiasm for tackling challenging problems. Establishing a procedural framework for evaluations and continuation can help reduce the time for agreement renewal, and ensure that momentum is maintained.
- Sanctions: Government must set the pace when sanctions are required, including those for community and CSO non-compliance. Failure to do so or abdication of this responsibility to CSO partners undermines governmental authority and creates a slippery slope where non-compliance with commitments becomes ever more frequent, weakening agreements and the principles upon which they are based.

For donors:

- Flexibility: Greater flexibility during granting by donors can permit CSOs and community partners to reach agreements about the specific types and amounts of investments, as opposed to having these set in stone prior to agreement negotiation. For donors interested in funding agreements, we would recommend implementation of a two-tiered approval system that would initially commit funding, which would be confirmed pending the submission of a detailed agreement with the community and appropriate stakeholders.
- Long-term commitment: Properly addressing the thorny, intertwined challenges of poverty reduction and environmental conservation in remote frontier areas requires a long-term commitment if gains are to be sufficient (i.e. affecting a big enough percentage of the population, so as to make a real difference) or sustained over time. Conservation agreements provide a simple, accessible framework by which long-term support can be channeled, ensuring clarity of inputs, methodological approaches, and outputs, as well as evidence of indicators.
- Investment in committed CSOs: Significant value for money is provided when investing in CSOs established at the conservation/rural front lines that also have a long-term commitment to these areas.
- Investment in monitoring: Modest and/or periodic investments in social and environmental monitoring are essential when working in integrated environmental and poverty alleviation projects, and help donors evaluate whether their investments are reaching the goals outlined and providing value for money.

LITERATURE CITED

- Altrichter, M., A. Taber, H. Beck, R. Reyna-Hurtado, L. Lizarraga, A. Keuroghlian, and E.W. Sanderson. 2012. Range-wide declines of a key Neotropical ecosystem architect, the Near Threatened white-lipped peccary. *Oryx*, 46(1), 87–98
doi:10.1017/S0030605311000421
- Baur, E.H., McNab, R.B., Williams, L.E., Ramos, V.H., Radachowsky, J., Guariguata, M.R. 2012. Multiple forest use through commercial sport hunting: lessons from a community-based model from the Peten, Guatemala. *Forest Ecol. Manag.* 268, 112–120.
- Blackman, A. 2014. Strict versus mixed use protected areas: Guatemala's Maya Biosphere Reserve. Resources for the Future discussion paper, Washington, D.C.
- Bray, D. B., E. Duran, V. H. Ramos, J.-F. Mas, A. Velazquez, R. B. McNab, D. Barry, and J. Radachowsky. 2008. Tropical deforestation, community forests, and protected areas in the Maya Forest. *Ecology and Society* 13(2): 56. URL:
<http://www.ecologyandsociety.org/vol13/iss2/art56/>
- CEMEC/WCS. 2015. Monitoreo de la Gobernabilidad en la Reserva de la Biosfera Maya. Centro de Monitoreo y Evaluación del Consejo Nacional de Áreas Protegidas y Wildlife Conservation Society. 47 pp.
- CONAP/WCS. 2013. Estimación indirecta de la tasa de crecimiento y tamaño actual de la población y encuesta socioeconómica de la RBM. Consejo Nacional de Áreas Protegidas y Wildlife Conservation Society. 58 pp.
- CONAP/WCS. 2015. Monitoreo de la cobertura forestal en la Reserva de Biosfera Maya para el periodo 2014-2015. Consejo Nacional de Áreas Protegidas, Wildlife Conservation Society. 19 pp.
- CSP. 2007. Conservation Agreements: Model, Design, and Implementation. Technical Paper by Conservation Stewards Program and Conservation Economics Program, Conservation International. http://www.conservation.org/publications/Documents/Conservation_Agreement_Model.pdf
- Fabricius, C. and S. Collins. 2007. Community-based natural resource management: governing the commons. *Water Policy* 9 Supplement 2 (2007) 83–97.
- Fisher, M., Riemer, J. J. and E. R. Carr. 2010. Who should be interviewed in Surveys of Household Income? International Food Policy Research Institute Discussion Paper 00949, Consultative Group on International Agricultural Research (CGIAR). January, 2010.

- Garnett, S. T., J. Sayer, and J. Du Toit. 2007. Improving the effectiveness of interventions to balance conservation and development: a conceptual framework. *Ecology and Society* 12(1): 2. [online] URL: <http://www.ecologyandsociety.org/vol12/iss1/art2/>
- Grandia, L. (2009). *Tz'aptz'ooqeb'*: El despojo recurrente al pueblo q'eqchi'. Autores Limitados, No. 20. Asociación para el Avance de las Ciencias Sociales en Guatemala (AVANSCO). Editores Siglo Veintiuno, Ciudad Guatemala. 454 pp. ISBN: 978-99922-68-65-0.
- Grandin, G. (2011). *The Last Colonial Massacre: Latin America in the Cold War (Updated Edition)*. University of Chicago Press, Chicago, Ill. 318 pp. ISBN-13: 978-0-30690-2.
- Hansen, M. C., Potapov, P. V., Moore, R., Hancher, M., Turubanova, S.A., Tyukavina, A., Thau, D., Stehman, S. V., Goetz, S. J., Loveland, T. R., Kommareddy, A., Egorov, A., Chini, L., Justice, C. O., and J. R. G. Townshend (2013). High-Resolution Global Maps of 21st-Century Forest Cover Change. *Science* 342, 850; DOI: 10.1126/science.1244693
- Hodgdon, B.D., Hughell, D., Ramos, V.H. and R.B. McNab. 2015. *Deforestation Trends in the Maya Biosphere Reserve: 2000-2013*. Rainforest Alliance.
- Hughes, R. and Flintan, F. (2001) *Integrating Conservation and Development Experience: A Review and Bibliography of the ICDP Literature*. London: International Institute for Environment and Development.
- IFAD, 2006. *Community-based natural resource management: How knowledge is managed, disseminated and used*. <http://www.ifad.org/pub/other/cbnrm.pdf>
- Ingram, J.C., Wilkie, D., Clements, T., McNab, R.B., Nelson, F., Baur, E.H., Sachedina, H.T., Peterson D.D., and C.A.H. Foley. (2014). Evidence of Payments for Ecosystem Services as a mechanism for supporting biodiversity conservation and rural livelihoods. *Ecosystem Services* 7, 10-21.
- Leach, M., Mearns, R. and I. Scoones. 1999. Environmental Entitlements: Dynamics and Institutions in Community-Based Natural Resource Management. *World Development* Vol. 27, No. 2, pp. 225±247, 1999. PII: S0305-750X(98)00141-7
- McNab, R. B. 1998. *Comparative Impacts of Chicle and Xate Harvests on Wildlife of the Maya Biosphere Reserve, Guatemala*. Master's Thesis presented to the University of Florida. Department of Latin American Studies, 199 pp.
- McSweeney, K., Nielsen, E.A., Taylor, M.J. Wrathall, D.J., Pearson, Z., Wang, Ophelia, and S.T. Plumb, 2014. Drug Policy as Conservation Policy: Narco-Deforestation. *Science*, 343: 489-490; DOI: 10.1126/science.1244082

- MFEWS, 2009. Sistema Mesoamericano de Alerta Temprana para Seguridad Alimentaria (MFEWS). Perfiles de Medios de Vida. Guatemala.
- MSPAS, 2015. Ministerio de Salud Pública y Asistencia Social (MSPAS), Instituto Nacional de Estadística (INE), ICF Internacional, 2015. Encuesta Nacional de Salud Materno Infantil 2014-2015. Ciudad de Guatemala, Guatemala.
- Naeem, S., J. C. Ingram, A. Varga, T. Agardy, P. Barten, G. Bennett, E. Bloomgarden, L. L. Bremer, P. Burkill, M. Cattau, C. Ching, M. Colby, † D. C. Cook, R. Costanza, F. DeClerck, C. Freund, T. Gartner, R. Goldman-Benner, J. Gunderson, D. Jarrett, A. P. Kinzig, A. Kiss, A. Koontz, P. Kumar, J. R. Lasky, M. Masozera, D. Meyers, F. Milano, L. Naughton-Treves, E. Nichols, L. Olander, P. Olmsted, E. Perge, C. Perrings, S. Polasky, J. Potent, C. Prager, F. Quétier, K. Redford, K. Saterson†, G. Thoumi, M. T. Vargas, S. Vickerman, W. Weisser, D. Wilkie, and S. Wunder. (2015) Get the science right when paying for nature's services. *Science* 347: 1206-1207; DOI: 10.1126/science.aaa1403
- Norbu, U.P. 2012. Benefit-sharing for Ecosystem Services with Emphasis on Poverty Reduction. Consolidated Report on Review, Project Proposal, and Programmatic Framework, presented to the Watershed Management Division, Department of Forests and Parks Services, Ministry of Agriculture and Forests, Government of Bhutan. Norbu Samyul Consulting, Thimphu, Bhutan. 57 pp.
- Pattanayak, S.K., Wunder, S. and Ferraro, P. J. (2010) Show Me the Money: Do Payments Supply Environmental Services in Developing Countries? Symposium: Environmental Quality and Economic Development. *Review of Environmental Economics and Policy*, 4(2) summer 2010: 254-274.
- Pham, T.T., Brockhaus, M., Wong, G., Dung, L.N., Tjajadi, J.S., Loft, L., Luttrell C. and Assembe Mvondo, S. (2013) Approaches to benefit sharing: A preliminary comparative analysis of 13 REDD+ countries. Working Paper 108. CIFOR, Bogor, Indonesia.
- PNUD, 2011: Índice de Desarrollo Humano para el Petén: Informe Nacional de Desarrollo Humano. ISBN: 978-9929-8097-5-8
- Radachowsky, J., Ramos, V.H., McNab, R., and R. Garcia. 2005. Landscape Species in the Maya Forest: A landscape conservation strategy based on wide-ranging species. WCS Living Landscape Program Technical Paper. Unpublished document.
- Radachowsky, J., Ramos, V.H., McNab, R., Baur, E.H., and N. Kazakov. (2011). Forest concessions in the Maya Biosphere Reserve, Guatemala: A decade later. *Forest Ecol. Management*, DOI:10.1016/j.foreco.2011.08.043
- Ramos, V.H. 2005. The Human Footprint of Mesoamerica. Wildlife Conservation Society and Centro de Monitoreo y Evaluación del CONAP (CEMEC). Unpublished document.

- Ramos V.H., García-Anleu, R. y McNab, R. 2009. Paisajes de Conservación de la Reserva de la Biosfera Maya: 2009. Wildlife Conservation Society – USAID-EGAT GCPII. Guatemala.
- Redford, K.H., Wilkie, D. and E. Fearn. 2007. Protected Areas and Human Livelihoods: Experiences from the Wildlife Conservation Society. Introduction to “Protected Areas and Human Livelihoods”; WCS Working Paper No. 32 [K.H. Redford and E. Fearn, Eds]. Wildlife Conservation Society Institute; December, 2007; pp. 2-5.
- Redford, K.H., Marc A. Levy, Eric W. Sanderson and Alex de Sherbinin. (2008). What is the role for conservation organizations in poverty alleviation in the world's wild places?. *Oryx*, 42, pp 516-528. doi:10.1017/S0030605308001889.
- Robinson, J. G., and K. H. Redford. 2004. Jack of all trades, master of none: inherent contradictions among ICD approaches. Pages 10-34 in T. O. McShane and M. P. Wells, editors. *Getting biodiversity projects to work: towards better conservation and development*. Columbia University Press, New York, New York, USA.
- Sanders, C. 2006. Household Income. Chapter in *The Encyclopedia of World Poverty*, Volume 1: A-G, General Editor M. Odekon. Sage Publications, London, UK. ISBN 1-1429-1807-3, pp. 507-508.
- Schwartz, N.B. 1990. *Forest Society: A Social History of Peten, Guatemala*. University of Pennsylvania Press, Philadelphia, Pennsylvania. 367 pp.
- SEGEPLAN. 2015. Informe Final de Cumplimiento con los Objetivos de Desarrollo del Milenio, Guatemala 2015. Secretaria de Planificación y Programación, 499 pp. www.segeplan.gob.gt/odm
- Sundberg, J. 1998. NGO Landscapes in the Maya Biosphere Reserve, Guatemala. *Geographical Review*, Vol. 88, No. 3 (Jul., 1998), pp. 388-412
- Terborgh, J. (1999) *Requiem for Nature*. Washington, DC: Island Press/Shearwater Books.
- The Economist (2015). ViewsWire. The Economist Intelligence Unit. http://viewswire.eiu.com/site_info.asp?info_name=social_unrest_table
- Turtle Conservation Coalition. [Rhodin, A.G.J., Walde, A.D., Horne, B.D., Van Dijk, P.P., Blank, T., and R. Hudson (Eds.)]. 2011. *Turtles in Trouble: The World's 25 Most Endangered Tortoises and Freshwater Turtles—2011*. Lunenburg, MA: IUCN/SSC Tortoise and Freshwater Turtle Specialist Group, Turtle Conservation Fund, Turtle Survival Alliance, Turtle Conservancy, Chelonian Research Foundation, Conservation International, Wildlife Conservation Society, and San Diego Zoo Global, 54 pp.
- UNEP (2015) *World Population Prospects: 2015 Revision, Key Findings and Advance*

Tables. The United Nations, Department of Economic and Social Affairs,
Population Division Working Paper No. ESA/P/WP.241.

UNESCO, 2015: <http://www.unesco.org/new/en/natural-sciences/environment/ecological-sciences/man-and-biosphere-programme/>

UNWFP, 2015. United Nations World Food Programme Guatemala Country
Overview. <https://www.wfp.org/countries/guatemala/overview>

USAID, 2013. What is Community-based Natural Resource Management? Southern Africa
CBNRM Policy Brief No. 1. http://pdf.usaid.gov/pdf_docs/PA00JRV1.pdf

WCS-CONAP. 2009. Paisajes de Conservación en la Reserva de Biosfera Maya:
Actualización a 2009. Wildlife Conservation Society - Programa Guatemala.
Reporte Interno. 21 pp.

Wilshusen, Peter R. , Brechin, Steven R. , Fortwangler, Crystal L. and West, Patrick
C.(2002) 'Reinventing a Square Wheel: Critique of a Resurgent Protection Paradigm
in International Biodiversity Conservation', *Society & Natural Resources*, 15: 1, 17-
40.

Worah, S. (2000) International History of ICDPs. In: UNDP (2000) Proceedings of
Integrated Conservation and Development Projects Lessons Learned Workshop,
June 12-13, 2000. Hanoi: UNDP/World Bank/WWF.

World Bank (2014). World Development Indicators database, World Bank, 1 July 2015.
<http://data.worldbank.org/data-catalog/world-development-indicators>

Zeller K. A. 2007. Jaguars in the New Millennium Data Set Update: The State of the Jaguar
in 2006. Wildlife Conservation Society, Bronx, New York. 77 pp.

APPENDICES

APPENDIX 1

[Final Environmental Performance Report \(PDF 3.1 mb, Spanish\)](#)

APPENDIX 2

[Final Socioeconomic Report Carmelita \(PDF 754 kb, Spanish\)](#)

[Final Socioeconomic Report Paso Caballos \(PDF 1.1 mb, Spanish\)](#)

[Final Socioeconomic Report Uaxactún \(PDF 915 kb, Spanish\)](#)

APPENDIX 3

Results of Paired t-test Comparing Differences in the Basic Necessities Index of Wellbeing between Baseline and 2015 Samples among All Households (178), and Households in Carmelita (38), Paso Caballos (79), and Uaxactún (61)

	All Households	Carmelita	Paso Caballos	Uaxactun
Average difference:	0.059134115	0.0540615	0.0612986	0.05949
N:	178	38	79	61
Degrees of freedom:	177	37	78	60
t-value:	7.458496	2.817013	7.114933	3.592082
P-value:	3.77E-12	0.007732	4.76E-10	0.000662

Descriptive statistics	All Households		Carmelita		Paso Caballos		Uaxactun	
	Baseline	2015	2011	2015	2009	2015	2009	2015
count	178	178	38	38	79	79	61	61
mean	0.390691	0.449825	0.408433	0.462494	0.330746	0.392045	0.457271	0.516762
sample variance	0.015734	0.015019	0.013374	0.015387	0.008894	0.009592	0.017168	0.013296
sample standard deviation	0.125436	0.122553	0.115646	0.124044	0.094310	0.097939	0.131027	0.115307
minimum	0.107368372	0.14202342	0.17642477	0.21100242	0.10736837	0.14202342	0.20974433	0.25805874
maximum	0.735522557	0.81836884	0.69767863	0.72437017	0.50105958	0.66954103	0.73552256	0.81836884
range	0.628154185	0.67634542	0.52125385	0.51336775	0.3936912	0.52751761	0.52577823	0.5603101
standard error of the mean	0.009402	0.009186	0.018760	0.020123	0.010611	0.011019	0.016776	0.014764
1st quartile	0.310433	0.363142	0.337515	0.381760	0.267583	0.327587	0.378304	0.448035
median	0.383719	0.433278	0.387947	0.432333	0.337884	0.381391	0.443909	0.499524
3rd quartile	0.457101	0.525584	0.490518	0.561571	0.397895	0.456451	0.530356	0.593186
interquartile range	0.146667	0.162442	0.153003	0.179811	0.130312	0.128864	0.152051	0.145152
mode	0.247457	0.301316	#N/A	#N/A	0.247457	0.301316	#N/A	0.574880
low extremes	0	0	0	0	0	0	0	0
low outliers	0	0	0	0	0	0	0	0
high outliers	7	1	0	0	0	1	0	1
high extremes	0	0	0	0	0	0	0	0

Statistical test: T-Pared Test

APPENDIX 4

PARTICIPACION DE LA MUJER EN LOS ACUERDOS DE CONSERVACIÓN

1) ACUERDO DE CONSERVACIÓN DE UAXACTÚN:

La participación de la mujer ha sido muy importante en el desarrollo de las actividades de la comunidad de Uaxactún, ya que según los registros las mujeres han ocupado el 30% de las plazas en las comisiones formales establecidas en la comunidad, incluyendo la Junta Directiva de la Organización Manejo y Conservación (OMYC), y el Consejo Comunitario de Desarrollo (COCODE), entre otras.

Actividad	No. de Individuos	
	Mujeres	Hombres
Control y Vigilancia		
Directos (salario, equipo, suministros)	0	4
Indirectos (toda población: seguridad en la concesión forestal)	343	436
Educación		
Directos (salarios, infraestructura, material didáctico, artículos)	41	74
Indirectos (total familiares de personas beneficiadas)	136	172
Incentivo y Enriquecimiento de Xate		
Directos (pago del jornal, incentivo por hoja de xate)	53	230
Indirectos (total familiares de beneficiarios directos)	106	134
Áreas Agrícolas		
Directos (acompañamiento de C&V y CIF en la roza agrícola)		74
Indirectos (toda población: protección contra incendios)	130	166
Sub-Totales de Beneficiarios Directos por Actividad	94	382
Beneficios por Género		
Total beneficiarios directos depurando por individuo	78	230
Porcentaje de beneficiarias/os directas/os	34%	66%

El Acuerdo de Conservación impulsó el incentivo por recolecta de xate con calidad que fue pagado a los recolectores de xate. Como resultado, la OMYC también aumentó el pago de las mujeres que laboraban en la bodega de xate seleccionando las hojas para mantener la calidad del producto, yendo de Q0.10 a Q0.20 por cada manojo seleccionado; equivalente a Q3.00 adicional por cada paquete. Este “apalancamiento” del incentivo resultó en un aumento de 100% más en relación al precio base del pago recibido por las mujeres. En total durante los seis años se estima que las mujeres han ganado un total de Q480,000 (\$63,160), del cual la mitad (\$31,580) se debe al aumento obtenido. Los beneficios tangibles obtenidos por las mujeres a través del Acuerdo se basan en la selección de xate y las mejoras percibidas por estudiantes en la Telesecundaria. Se estima que las mujeres representaron el 34% de las personas beneficiadas directamente por el Acuerdo. Actualmente se está evaluando la participación de la mujer, para que en el diseño y negociación se incorpore un componente que beneficie directamente a los grupos de mujeres organizadas partir de la Fase 4 del acuerdo en Uaxactún.



Figura 1: Selección de Xate en la Bodega de Uaxactún - Crédito: J. Morales/WCS

2) ACUERDO DE CONSERVACIÓN CARMELITA

Los beneficios sociales proporcionados por el Acuerdo de Conservación de Carmelita se centraron básicamente a: 1) fortalecimiento o apoyo a la salud, y 2) fortalecimiento o apoyo a la educación en la comunidad, ya que ambas potenciaban llegar a gran porcentaje de las familias de la comunidad.

En cuanto a la salud, las mejoras a la infraestructura y equipamiento dentro del centro de salud comunitario fue un beneficio compartido para toda la comunidad. El acceso a la medicina proporcionada por el “*Botiquín Comunitario*” fue gestionado por medio del COCODE. Un total de 169 personas recibieron las medicinas del botiquín en emergencias o accidentes, del cual el 55% fueron mujeres y el 45% hombres.

También se hicieron jornadas médicas, entre ellos dos pediátricas, en las que se atendió un promedio de 66 niños y niñas durante cada jornada, atendiendo al 100% de las familias con hijos/hijas menores a los 8 años. Se realizó una jornada ginecológica con apoyo de APROFAM, en la que asistieron 16 mujeres, representando el 10.5% de las mujeres adultas de la comunidad. También se realizaron dos jornadas médicas generales, con una participación de 118 personas, en beneficio de 97% de las familias.



Figura 2: Jornada Médica en Carmelita - Crédito: D. Trujillo/Asociación Balam

Los beneficios de la educación llegaron al 100% de los estudiantes. Para dar un ejemplo del impacto en cuanto a género, en el año escolar del 2012 había un total de 66 estudiantes, del cual 35 eran femenino (53%). Todas beneficiaron directamente de las mejoras de la infraestructura educativa la provisión de insumos educativos. Estas inversiones fueron repetidas durante dos años escolares (2102, 2013), mientras que el acuerdo estaba en fuerza.

3) ACUERDO DE CONSERVACIÓN PASO CABALLOS

La participación de la mujer en la implementación del Acuerdo de Conservación ha sido distinta a los demás acuerdos debido a la naturaleza de la estructura social de Paso Caballos, lo cual consiste en dos grupos (COCODE y Consejo de Ancianos) que mayormente son liderados por los hombres de la comunidad.

Según el censo de CONAP del 2014, del total de población de Paso Caballos, 652 son mujeres. De los beneficios económicos, consistiendo del pago por jornales y/o empleos, solamente una mujer recibió un pago directo, siendo la quien ocupó el puesto de Asistente Comunitaria asignada por el COCODE.

En cuanto a los beneficios de educación, toda la población escolar y comunitaria tuvo acceso independientemente de su género. Como un ejemplo, 232 niñas recibieron beneficios en un año, tomando como base el censo escolar del 2012. Estas niñas fueron

beneficiadas con materiales educativos y mejoras en las instalaciones de la escuela comunitaria.



*Figura 3: Enfermera Auxiliar atendiendo en la Unidad Mínima de Salud –
Crédito. J.C. Rodas/PNLT CONAP Petén*

En diciembre del 2015, a raíz del apalancamiento del acuerdo, los beneficios directos para las mujeres aumentaron considerablemente a través de la instalación de un proyecto de salud familiar y reproductiva en Paso Caballos. En este componente, una enfermera de la comunidad fue seleccionada para el cargo de Enfermera Auxiliar, permitiéndole iniciar visitas domiciliarias para compartir información sobre la salud reproductiva con las mujeres y adolescentes de la comunidad, así como apoyo a la capacitación a 2 comadronas comunitarias que son reconocidas por el Ministerio de Salud Pública y Asistencia Social.

En los primeros dos meses de implementación se han registrado 61 mujeres y adolescentes que han recibido atención directa en el tema. Este proyecto representa un paso importante para las mujeres de la comunidad, particularmente en cuanto a sus capacidades de planificar el tamaño de sus familias e incidir sobre su forma de vida.

4) ACUERDO DE CONSERVACIÓN BIOITZÁ-COROZAL-ZOTZ

El beneficio social acordado en el Acuerdo de Conservación de BioItzá-Corozal-Zotz fue el fortalecimiento de la educación en la escuela de Corozal.

Las mejoras a la escuela han beneficiado a toda la comunidad escolar, conformada por 109 niños y 89 niñas del nivel preprimaria, primario y telesecundaria. En específico, la instalación de pizarrones y la provisión de insumos escolares han apoyado el quehacer de 7 maestras y maestros responsables de cada salón de estudios. Además, las charlas de educación ambiental impartidas y actividades complementarias como los trenes de aseo y reforestación fueron dirigidas al 100% de la escuela primaria.



Figura 4: Participación de estudiantes Crédito: ProPetén

Aparte, el proyecto patrocinó charlas de educación sexual y reproductiva destinada a estudiantes de quinto primaria, sexto primaria, y la telesecundaria. En la Telesecundaria 75% de las estudiantes son mujeres, y 25% hombres. En turno, estos estudiantes apoyaron el Acuerdo a través del diseño y la pintura de rótulos alusivos a la conservación de los recursos naturales.

La Comisión para la Prevención a Incendios Forestales Comunitaria del Caserío El Corozal está conformada por 6 hombres y 3 mujeres, quienes a su vez participaron en la gira de intercambio de experiencias con participantes en el Acuerdo de Conservación en Uaxactún.



Figura 4: Reactivación Comisión para la Prevención a Incendios Forestales Comunitaria en el Caserío El Corozal / Crédito: Fundación ProPetén

APPENDIX 5

[External Evaluation of Support by Other Institutions \(PDF 833 kb, Spanish\)](#)

APPENDIX 6

[External Evaluation of Project Impact \(PDF 691 kb, English\)](#)

[External Evaluation of Project Impact \(PDF 637 kb, Spanish\)](#)