



**EXPERIENCES OF CARE GUATEMALA IN SUSTAINABLE
MANAGEMENT OF NATURAL RESOURCES AND
ADAPTATION TO CLIMATE CHANGE IN THE WESTERN HIGHLANDS**

Executive Summary



CARE Guatemala (2018)

Experiences of CARE Guatemala in Sustainable Management
of Natural Resources and Adaptation to Climate Change in
the Western Highlands.

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This document has been prepared with the purpose of demonstrating the best practices that help families and communities adapt to the adverse impacts of climate change. The most relevant of these are: Sustainable management of natural resources, strengthening of knowledge and local adaptive capacities, women's empowerment, and strengthening of alliances between different actors for decision making in agroforestry, water, forests and the environment. In regard to lessons learned, the study provides inputs that help to make official and strengthen new working approaches to promote a better adaptation to climate change.

Community Based Adaptation (CBA) and the Ecosystem-based Approach (EbA), constitute conceptual guidelines that model adaptation actions in the face of climate change impact, driven by CARE Guatemala in the western highlands through its projects: Integrated Forest Management, MIBOSQUE; Integrated Watershed Management, Micuenca; Water Links; and the Tropical Forest Conservation Fund, FCA, initiatives implemented in San Marcos, Quetzaltenango and Totonicapán.

From the CBA, adapting to climate change consists in the adjustment of natural or human systems, in response to current or expected impacts. This means strengthening adaptive capacity and reducing the exposure of people's risks or sensitivity to the impacts of climate change, improving their natural environment and social structure and not, inadvertently, worsening their vulnerability. Adaptation, in the case of EbA, consists of using biodiversity and the ecosystem services, as part of a broader adaptation strategy, to help people adapt to the adverse effects of climate change. Both approaches complement each other in an effort to increase adaptive capabilities and strengthen the resilience of the communities and those families most vulnerable to climate change.

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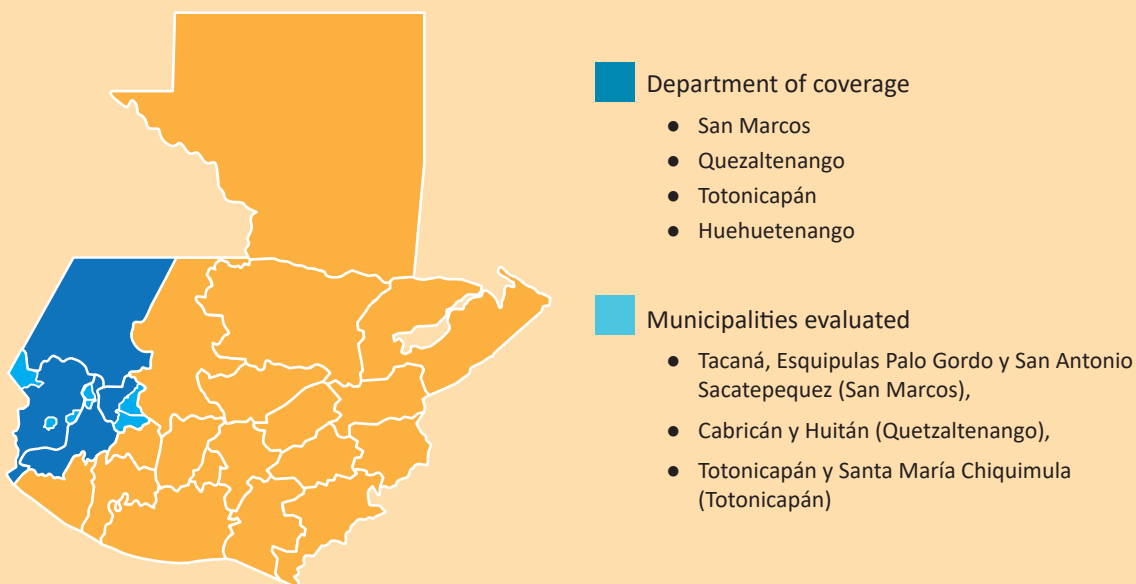
CARE's Working Approaches in Guatemala's Western Highlands

CARE is one of the oldest international cooperation and development organizations working in Guatemala. CARE's current working approach, in harmony with its strategy for Latin America, concentrates in fighting against poverty and achieving social justice. To this end, it has defined gender equality, working in partnerships, accountability and rights based approach as its working methodology. Its main strategic programs are related to the political and economic empowerment of women, the identity and rights of indigenous peoples, inclusive governance and community resilience in the face of climate change. Its main impact populations are women and girls, mainly those who suffer discrimination and racism, economic exclusion, labor inequality and damage caused by disasters.

CARE's MIBOSQUE Project (2001-2010) is the organization's main reference in the field of natural resources, promoting agroforestry systems, soil conservation, collective management of communal forests and conservation of biodiversity, in the departments of San Marcos, Quetzaltenango and Totonicapán. The project promoted the first studies of carbon stock in communal forests and promoted the development of



Coverage of Evaluated Projects



the institutional capabilities of municipal governments through the constitution of the Municipal Forestry Offices (OFM). Since 2010, in those same departments, three cycles of three year projects supported by the **FCA Program** (Fund for the Conservation of Tropical Forests), have been carried out, with emphasis on the implementation of planning and participatory management of micro watersheds for the protection of environmental goods and services generated by forests and to contribute to the restoration of biodiversity and forest connectivity.

The **Micuenca (2007 – 2012)** project has been CARE's work reference in favor of promoting the right to water, improving access to and management of potable water services, and strengthening community and municipal capabilities. To address the impacts of climate change related to water, such as droughts, floods, landslides and socio - environmental conflicts, this project also impelled improvements in policies, public investment and customary standards for integrated management of water resources. In the same area, the Water Links project (2012-2016), continued to improve the quality and access to water, the organization of water committees and municipal capabilities through the creation of the Municipal Water and Sanitation Office (OMAS for its Spanish acronym).



Synthesis of the evolution of the approaches implemented by CARE projects

PROJECT	APPROACHES AND RELEVANT EXPERIENCE			
	ENERGETIC	ECONOMIC	ADAPTATION	RIGHTS
Agroforestry Project	Reforestation for firewood production	Income for the sanitation of forests damaged by insects and fungus infestations		
MIBOSQUE	Agroforestry Systems	Forestry incentives management Christmas fir tree production for sale	Forest replanting Restoration of natural ecosystems	Communal and municipal forest management Inclusion of women in forest management Configuration of the OFM - UGAM
MICUENCA		Regulation of water service tariffs Payment for environmental services	Water source protection	Creation of Micro-Watershed Councils Water Governance
FCA	Endorsement of wood saving stoves	Payment for environmental services Productive Diversification	Protection of water sources Recuperation of traditional knowledge Vulnerability analysis and adaptation capabilities	Support for nursery and forest committees
Water Links		Tariffs for water services Sustainability	Rainwater harvesting systems Watershed protection	Configuration and strengthening of OMAS and water regulations

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Case Studies on Relevant Practices of Adaptation to Climate Change

To highlight the CARE Guatemala efforts that are most closely aligned with the new working approaches to face the challenges presented by the impacts of climate change in the most vulnerable communities, the experiences related to the Community Based Adaptation (CBA) and Ecosystem-based Adaptation (AbE) are presented in this study. For a better understanding, these experiences are organized into four main themes:

- 1) Sustainable Management of Natural Resources,
- 2) Improvement in Livelihoods,
- 3) Development of Official Municipal Capabilities, and
- 4) Community Governance

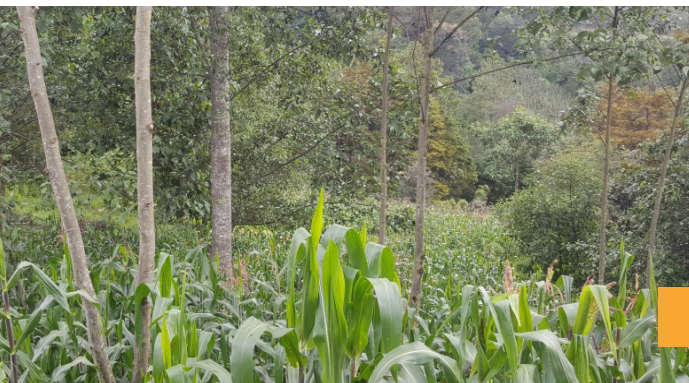
2.1 Sustainable Management of Natural Resources



Agroforestry Systems for the Restoration of Natural Ecosystems

Cabricán, a municipality in the department of Quetzaltenango, has been traditionally known as one of the important lime production centers at a regional level. This activity has

degraded the neighboring forests, since the process requires great volumes of firewood from recently cut trees, causing a high level of deforestation and consequently a high deterioration of its soil. With the purpose of overcoming this condition, during the 2001 – 2010 period, CARE’s MIBOSQUE project provided support for the communities in natural ecosystem restoration, utilizing



Ecological restoration with agroforestry systems.

agroforestry systems, combining technical and ancestral knowledge. It is interesting to observe that eight years after the project ended, the communal groups continue to be organized and are very active in maintaining the community nurseries and the agroforestry systems that currently provide firewood and protect the soil against erosion. The

agroforestry systems are CBA based practices, which, via traditional knowledge and the use of native plants, contribute to restore natural ecosystems and biological diversity, and the soil is protected against erosion and loss of humidity.

Rainwater Harvest and Improved Firewood Stoves as Adaptation Strategies

Santa María Chiquimula is an ancestral Maya K'iché municipality in the department of Totonicapán. It is also one of the poorest and most vulnerable to the effects of climate change in the country. With support from the Tropical Forests Conservation Fund, FCA, CARE Guatemala is promoting adaptation technologies among which, the following are prominent: Use of improved firewood stoves, soil conservation and rainwater harvest, all of which have been well received by the rural families due to effects they have, that is increasing their adaptation capabilities. Improved stoves have reduced up to a 50% the use of firewood, which represent savings in the money assigned to purchase

firewood or in the time investing collecting it. Additionally, it represents a reduction in health risks due to their exposure to smoke. These savings are currently invested in food for the family and education for their children. Rainwater harvest provides opportunities for food security, since it is used for domestic orchards and forest nurseries. Low cost and easy to build technological options which are also easy to manage and accessible to the residents' economic conditions, are fundamental to increase their adaptive capabilities facing climate change.



Rain water harvest structure.



Firewood saving stoves.

2.2 Improved Livelihoods in Rural Communities



Income Generation Based on the Guatemalan Fir Production (Pinabete)

By the end of the 90's decade, several families from the Quiquibaj, Cabricán, community living in extreme poverty, worked extracting forest product and subsistence farming, facing, at the same time, a strong deterioration of their natural ecosystems. In 2002, with support from CARE's MIBOSQUE and the Municipal Forestry Office, they received

forestry incentives to produce Pinabete (*Abies guatemalensis*), a Guatemalan fir that is in danger of extinction and additionally, with a high demand as a Christmas ornament. Local families developed their skills to collect the seeds and managing the nurseries, which are the hardest steps in reproducing this specie. Fir production, related to nursery seedlings as well as Christmas trees, provide job opportunities and income for community residents. This is consistent with the CBA and AbE approaches, in terms of improving their level of life and therefore their community's resilience.



Agroforagroforestal con pinabete.

Productive Chains Based on Forest Incentives for Women

Esquipulas Palo Gordo is a municipality of San Marcos with a longstanding tradition of taking care of its forests, habitat to the Quetzal, Guatemala's symbolic bird. This experience refers to the honey productive chain developed by a communal group, made up mainly of women, from Esquipulas Palo Gordo, San Marcos. The women observed that restored natural ecosystems, as a result of the reforestation supported by forestry incentives, and has had a direct effect in beekeeping.

To encourage bee production, the group has requested government forestry technicians a selective management of the underbrush to ensure the growth of plants that benefit beekeeping. This experience is related to CBA and AbE because it reduces the vulnerability of rural women, providing them instead, with opportunities to face climate change. Traditionally, rural women have been relegated from income producing activities, that is why their participation as beneficiaries of the reforestation projects, supported by

the forestry incentives, can motivate them to search other productive entrepreneurship, that besides increasing their adaptation capabilities, contribute to their empowerment and economic independence.

Edible plant harvest in the undergrowth of replanted areas, supported by forest incentives.



Ecotourism in Communal Forests

The Partiality of Chuamazán, a community of Totonicapán, has implemented in its communal forest an Ecoturistic Park, named Chajil Siwan (Momotus momota) which generates income and jobs for the members of the community and at the same time, supports the protection of its natural ecosystem. Chuamazán is an ancestral Maya K'iché indigenous community, organized as a Partiality, based on a large family group that has inherited the land rights of their ancestors and maintains them as a collective property, indivisible and inalienable, as a strategy to ensure the control and the projection of their collective patrimony. CARE provided support to carry out their Communal Participatory Diagnosis, which pointed to the idea of an ecological park and later contributed to its organization, design and implementation.

Currently, the recreational park generates twelve permanent jobs and 25 seasonal ones for local workers. A notable improvement in its forest ecological conditions can be observed and the guided visits contribute in the promotion of environmental awareness among visitors. The community has proved that forests can host sustainable activities that ensure the vitality of the natural environment and at the same time, can improve livelihoods for its residents. Ecotourism in communal forests has proven to be a productive activity that generates sustainable, inclusive jobs and income, coherent with the CBA and AbE goals. It contributes to the increase of resilient capabilities and in reducing the vulnerability, related to the diversification of income sources and jobs for the members of the communities.



Ecotourism center of the Chuamazán community, Totonicapán.

2.3 Official Municipal Capabilities for Climate Change Adaptation



Municipal Agencies for Natural Resource Governance

This experience reveals that efforts of municipal governments to foster the participatory decentralization of governance and management of natural resources fundamentally depends on the authorities' political will, on the orientation that the cooperation has and also on the communities' and local actors' capability to advocate for it. This coincides with CBA and EbA approaches, which include strengthening public functions to support individuals, households and communities more effectively in the face of climate change adaptation. Most municipalities have implemented the Municipal Forestry Office, OFM, some have a Department of Environment and Protected Areas, DAPMA, and others have an Environmental Management Unit, UGAM. The performance capabilities of these offices to respond to the populations' needs and to incentivize their participation in protected areas, forest and environmental

governance, have been strengthened with support from CARE and other entities. The capacities of local governments to respond in a better manner to the challenges of adaptation require strengthening municipal entities and their coordination skills with the communities. The municipal governments must assume a greater political will and assign their own resources, complemented with a good management of aid, to develop a greater aptitude for adaptation in the face of climate change.

Communal reforestation work with technical support from the OFM.



Municipal Forestry Office Support for Communal Management of Natural Resources

This experience is related to the support provided by the Tacaná, San Marcos, Municipal Forestry Office, to rural communities, for the protection and maintenance of their communal forests, water sources and environmental services. This area is located in high altitude ecosystems, ecologically very fragile, due to its steep slopes and marked climatic seasonality. Hence, efforts to maintain the vitality of these ecosystems are essential in adapting to climate change.

Community governance mechanisms have ensured a relatively good preservation of forests because their water sources are located in them. The Tacaná OFM provides technical support, supplies and equipment to 53 communal nurseries, has managed forestry incentives for 400 hectares of communal forests in six communities and 560 additional hectares for 185 private forests. With CARE support, the OFM reinforces the work that the communities have been doing for a long time with their own resources and governance schemes, which proves the importance of matching the municipal and communal agendas, in their efforts to face the impact of climate change.



Joint work of the Water and Nursery Commissions Toninchincalaj, Tacaná, San Marcos.

Providing Official Status to the Municipal Water Management

The development of installed capacities in the Municipality of Tacaná, San Marcos, for the administration and provision of potable water for its residents, through the Municipal Water and Sanitation Office, OMAS, was supported by CARE through the Water Links project. Tacaná, is a municipality of 370 km² with 90 thousand residents distributed among its urban center and in 167 rural communities, the management of the right to water and sanitation has been a challenge, since there are still many communities that lack

a domiciliary potable water service. Water sources are scarce and hotly contested, and there is reluctance among neighbors to pay for the service. Additionally, the municipal budget is insufficient to meet the scale of the demand. Since the creation of the OMAS in 2012, water management was improved in the village, based on the following activities: A survey of the networks' water system distribution, improvement of user registration, installation of water meters and 20 hydrological studies.

The communities have strengthened their Water Commissions and work in conjunction with the Nursery and Forestry Commissions and other instances of local organization. Water regulations establish standards and sanctions related to water access and use as well as the application of micrometers and tariffs. These charges function as a type of compensation for environmental services, since these proceeds are reinvested in protecting water sources and maintaining water systems. Additionally, each family invests up to ten annual wages in nursery, reforestation and forest tending jobs. Experience shows that efforts to strengthen water and sanitation management are

manifestations of the CBA approach, since they encourage commitment from the municipal government and the involvement of civil society to help people reduce their vulnerability and increase their adaptive capacity and communal resilience.



Water Committee users, Chemealón, Sujchaj, Tacaná, San Marcos.

2.4 Communal Governance as an Adaptation Practice Based on the Community



Community Governance of Communal Forests

This experience demonstrates the manner in which the indigenous community of Chuigurabal, Totonicapán, mobilizes its structures of ancestral organization for their communal forest governance, allowing its conservation, restoration and orderly use, based on the K'axk'ol volunteer modality enforced among its members. A total of 45 families manage a 360 ha territory. Since 2001, with support from CARE Guatemala

and from other entities, its residents have replanted the area with several species, following the pattern of ecological succession. These activities are also in accordance with the CBA approach; it is also an example of social mobility and the vindication of the right to have greater control and access to natural resources. The strength of communal organization, governance, community service systems and accountability, are factors that

contribute to the sustainable management of their forest. Without knowing it, community members have applied the CBA and AbE principles, building their own development based on good management of their natural ecosystem.

Community authorities verifying reforestation and protection of their communal forest.



Empowering Indigenous Women in Communal Forest Governance

This case is related to the empowerment of indigenous women in the governance of their collective forests, as part of the efforts to adapt to climate change, which is being built between community-based organizations and the Municipality of Huitán, Quetzaltenango. This process began during the MIBOSQUE project, which supported the installation of the Municipal Forestry Office and as a second step, trained and promoted the integration of women as forest and water committee members. Eight years after the finalization of MIBOSQUE, these women still replicate their knowledge. Additionally, the group has made an impact on the municipal government and the designation of the first Maya Mam* woman responsible for the OFM since 2008.

The above has facilitated an adequate communication between the OFM and women, and has also expedited its inclusion in forestry incentive programs. The Forest Committees have nurseries that generate income from the sale of saplings. One such committee sells about 10,000 trees per year. The experience of Mayan Mam residents of Huitán responsible of their forests is undoubtedly a CBA and AbE model that values the knowledge of indigenous women in the use of native plants, for example alder, pine and cypress, using seeds of native species. After ten years of this work, they have explained that the number of wild animals in their forests has increased and that their water sources are in a better condition. Women have achieved greater empowerment in decision-making in themes related to forest care and have also a greater impact on municipal public policies. With these actions, they have reduced their vulnerability and improved their adaptive capacity in the face of climate change.

* The Mam, an indigenous ethnic group living in the western highlands, in the departments of Huehuetenango, San Marcos, and Quetzaltenango, who speak the Mam language.



Women working in reforestation.

Communal Participation in the Decentralization of Adaptation to Climate Change Processes

This experience documents the alliance between communities and municipalities to consolidate their efforts in participatory forest decentralization, very important for climate change adaptation. In Santa María Chiquimula, Totonicapán, the municipality, through the OFM, acknowledges and values the role of the nursery committees and respects the decisions made by the communities. The OFM was created through an agreement between the community and the 36 communal nursery committees that exist among 18 communities, most of them members of the Santa María Agroforestry Development Association, (ADAFORSA, for its Spanish acronym). This entity was established in 1984 and was previously known as the Central Forest Committee. ADAFORSA has received support from various entities, including CARE Guatemala's, to strengthen the communal nurseries, forest restoration and adaptation to climate change. Additionally, Santa María's OFM has managed nursery projects to produce and distribute plants among participants of the forest incentive programs, emphasizing women's

groups that work with family orchards, forest nurseries, soil conservation and firewood saving stoves.

Residents prefer using wood from the alder, a local, fast growing tree that helps to protect and restore soils when used in agroforestry systems or in soil conservation structures. Based on CBA and AbE, this experience points out that even the poorest communities struggle to maintain the prevalence of their organizational forms and continue to put into practice their local knowledge to work jointly and face poverty as well as the impact of climate change.

Santa María Chiquimula's OFM coordinating work with communities.



Local Climate Change Adaptation Plans

Given the evidence of the impacts that climate change is already causing on the livelihoods of rural families, CARE Guatemala has been promoting a series of activities to reduce vulnerability, improve adaptation and increase community resilience. To this end, it has implemented the CBA approach, using the Climate Vulnerability and Capacity Analysis (CVCA) and Local Adaptation Plans (LAP), in which traditional knowledge is valued in the design of actions to strengthen their adaptive capacities. The LAPs are carried out with community participation, including women and youth, in which, actions are prioritized to face their exposure to the main climatic threats, such as frosts, droughts, floods, landslides and forest fires. In the short term, the actions seek to improve livelihoods, increase agricultural yields and ensure the protection of water sources in order to reduce the levels of food and nutrition insecurity. In the medium term, it is intended to address precarious employment, reduce illiteracy in women, and enhance access to health services and other actions that improve their ability to adapt.

The Local Adaptation Plan of Chuacorrall III, a community in Santa María Chiquimula, for example, identifies the climatic impacts on agriculture, natural resources and living conditions of the population. Its' crosscutting issues of action for adaptation include improvements in integral health, diversification of agricultural crops, infrastructure and the environment. The idea is to provide guidelines for actions that reduce the risks of the effects of climate change and adopt appropriate strategies to improve the livelihoods of the most vulnerable families. This experience shows that communities have become aware of their vulnerability to climate change and also of the impacts on their livelihoods, but also of their own capacities to face climate change

Communal nursery supported by the OFM of Santa María Chiquimula, Totonicapan.



3

Lessons Learned and Recommendations to Replicate Experiences

CARE Guatemala's work related to the CBA and EbA approaches, emphasize the construction of official capacities, social inclusion and recognition of rights - empowerment of women, community governance, value of traditional knowledge and improvement in living conditions for its residents-. The experiences analyzed in this document point to evidence of practices that are consistent with the Community Based Adaptation and Adaptation-based Ecosystems approaches.



Which can be replicated based the following suggestions:

- a) Recognize that families and communities have lived through constant adaption experiences as a result of political, economic and environmental changes, which is why adaptation to climate change is not alien to them and more than one action has been taken previously.
- b) Start a process of reflection as a self-diagnosis, to discuss the vulnerability conditions and the potential, in assets and knowledge, that families and communities posses, in order to face climate change, and later continue to identify and plan the most pertinent actions.
- c) Support strengthening the capabilities of the municipal governments, ensuring they can count with adequate personnel, administrative agencies, instruments and their own budgets, that ensure an adequate work with the most vulnerable families and communities.
- d) Put special emphasis on the conditions and proposals made by women, since the immediate impacts of climate change fall on them. It is necessary to transform the conditions of gender inequality that discriminate and relegate women from the decision-making processes in their family and their community.
- e) Consider and contribute to the transformation of the underlying causes of vulnerability, such as poverty, discrimination, inequality and racism, so that efforts to strengthen their adaptive capacity are not hindered by these situations.
- f) Recognize and strengthen traditional knowledge held by families and communities, since they usually have a long history of permanence in their territories and therefore have developed knowledge that shows their ability to adapt to changes that have affected their lives.
- g) Strengthen administrative capacities, planning, accountability and equitable distribution of benefits in cases that involve projects that generate income at the community level.

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Great leaders find ways to connect with their people and help them fulfill their potential.

Steven J. Stowell

Acronyms

AbE	Ecosystem-based Adaptation
ADAFORSA	Agroforestry and Environmental Development Association
APs	Protected Areas
BPA	Best Agricultural Practices
CBA	Community Based Analysis
CBD	Biological Diversity Agreement
CMNUCC	United Nations Framework Convention on Climate Change
COCODE	Community Development Council
CONAP	National Protected Areas Council
COP	Conference of the Parties, UN Framework Convention on Climate Change
CRS	Catholic Relief Services
CSA	Climate Smart Agriculture
CUNOC	Western Region University Center – a branch of San Carlos University
CVCA	Climate Vulnerability and Capacity Analysis
DAPMA	Protected Areas and Environment Department
DMP	Municipal Planning Directorate
FAO	Food and Agriculture Organization of the United Nations
FCA	Tropical Forest Conservation Fund
GWI	Global Water Initiative
INAB	National Forestry Institute
MAGA	Ministry of Agriculture, Livestock and Food
MARN	Ministry of Environment and Natural Resources
MIBOSQUE	Comprehensive Management of Forests Project
Micuenca	Comprehensive Management of Watersheds Project
OFM	Municipal Forestry Office
OMAS	Municipal Water and Sanitation Office
PINFOR	Forestry Incentive Program
PINPEP	Forestry Incentive Program for Small Landholders
REDD+	Reducing the Emission from Deforestation and Forest Degradation
UGAM	Municipal Environmental Management Unit
UICN	International Union for Conservation of Nature
UVG	Del Valle University of Guatemala



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