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GUATEMALA

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Pre-Application Conference: January 6, 2017

Deadline for Questions: January 17, 2017

Closing Date: February 15, 2017

Closing Time: 10:00 hours (Guatemala time)

Subject: **Notice of Funding Opportunity (NOFO)**
Request for Applications (RFA) No. RFA-520-17-
000001

Program Title: **Fomenting Agriculture Incomes and Resilience Project (FAIR)**

Ladies and Gentlemen:

The United States Agency for International Development (USAID) is seeking applications for a Cooperative Agreement from qualified Guatemalan local organizations to fund a program entitled "Fomenting Agriculture Incomes and Resilience Project. Eligibility for this award is restricted to local organizations per Section C "Eligibility Information" of this Notice of Funding Opportunity (NOFO).

Subject to the availability of funds an award will be made to that (those) responsible applicant(s) whose application(s) best meets the objectives of this funding opportunity and the selection criteria contained herein. While single or multiple awards are anticipated as a result of this NOFO, USAID reserves the right to fund any or none of the applications submitted.

For the purposes of this NOFO the term "Grant" is synonymous with "Cooperative Agreement"; "Grantee" is synonymous with "Recipient"; and "Grant Officer" is synonymous with "Agreement Officer". Eligible organizations interested in submitting an application are encouraged to read this funding opportunity thoroughly to understand the type of program sought, application submission requirements and evaluation process.

To be eligible for award, the applicant must provide all information as required in this NOFO and meet eligibility standards in Section C of this NOFO. This funding opportunity is posted on www.grants.gov, and may be amended. Potential applicants should regularly check the website to ensure they have the latest information pertaining to this notice of funding opportunity. Applicants will need to have available or download Adobe program to their computers in order to view and save the Adobe forms properly. It is the responsibility of the applicant to ensure that the entire NOFO has been received from the internet in its entirety and USAID bears no responsibility for data errors resulting from transmission or conversion process. If you have difficulty registering

on www.grants.gov or accessing the NOFO, please contact the Grants.gov Helpdesk at 1-800-518-4726 or via email at support@grants.gov for technical assistance.

The successful Applicant will be responsible for ensuring the achievement of the program objectives. Please read each section of the NOFO.

Please send any questions to the point of contact identified in section D. The deadline for questions is shown above. Responses to questions received prior to the deadline will be furnished to all potential applicants through an amendment to this notice posted to www.grants.gov.

All prospective applicants are invited to attend a pre-application conference to be held on January 6, 2017 from 9 a.m to 12 noon; the place will be notified through an amendment to the RFA. The purpose of this meeting is to explain the objectives of the project and the expectations of USAID regarding the implementation of this activity. Please confirm your attendance to this meeting sending an email to guatemalaproposals@usaid.gov not later than January 3, 2017, providing the name of your organization and attendees. Due to limitation of space, attendance **will be strictly limited to two persons** per organization.

Issuance of this notice of funding opportunity does not constitute an award commitment on the part of the Government nor does it commit the Government to pay for any costs incurred in preparation or submission of comments/suggestions or an application. Applications are submitted at the risk of the applicant. All preparation and submission costs are at the applicant's expense.

Thank you for your interest in USAID programs.

Sincerely,

A handwritten signature in black ink, appearing to read "Dion Glisan". The signature is fluid and cursive, with a large initial "D" and a stylized "G".

Dion Glisan
Agreement Officer

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LIST OF ACRONYMS

A4P	Alliance for Prosperity
ADS	Automated Directives System
AGEXPORT	Guatemala Exporters Association
ANACAFE	National Coffee Association
AOR	Agreement Officer's Representative
APHIS	Animal and Plant Health Inspection Service
AO	Agreement Officer
B.A.	Bachelor of Arts
BEO	Bureau Environmental Officer
BIP	Branding Implementation Plan
CBOs	Community-based Organizations
CDCS	Country Development and Cooperation Strategy
CDIE	Center for Development Information and Evaluation
CFR	Code of Federal Regulations
COCOSAN	Comisión Comunitaria de Seguridad Alimentaria y Nutricional
CODESAN	Comisión Departamental de Seguridad Alimentaria y Nutricional
COMUSAN	Comisión Municipal de Seguridad Alimentaria y Nutricional
CPA	Certified Public Account
CV	Curriculum Vitae
DEC	Development Experience Clearinghouse
DO	Development Objective

CACIF	Coordinating Committee of Agricultural, Commercial, Industrial, and Financial Associations
ECR	Environmental Compliance Report
EEO	Equal Employment Opportunity
EMMP	Environmental Mitigation and Monitoring Plan
ENSMI	Encuesta Nacional de Salud Materno Infantil
ER	Environmental Review
ERF	Environmental Review Form
EXENIVA	Valued Added Tax Exemption Form
FAIR	Fomenting Agriculture Incomes and Resilience Project
FAO	Food and Agriculture Organization of the United Nations
FFP	Food for Peace
FANTA	Food and Nutritional Technical Assistance
FBRs	Food-based recommendations
FDA	Food and Drug Administration
FGDC	Federal Geographic Data Committee
FICA	Federal Insurance Contributions Act
FTF	Feed the Future Initiative
FSMA	Food Safety Mordernization Act
FUNDESA	Fundación para el Desarrollo de Guatemala
GAAS	Generally Accepted Auditing Standards
GCAP	Global Climate Adaptation Partnership
GCC	Global Climate Change
GDP	Gross Domestic Product

GIS	Geographic Information System
GOG	Government of Guatemala
IARNA	Instituto de Agricultura, Recursos Naturales y Ambiente
ICC	Institute for Climate Change
ICT	Information and communications technologies
IEE	Initial Environmental Examination
IICA	Inter-American Institute for Cooperation on Agriculture
IR	Intermediate Result
IVA	Value Added Tax
LAC	Latin America and the Caribbean
LGBTI	Lesbian, Gay, Bisexual, Transgender and Intersex
MAGA	Ministry of Agriculture
MEO	Mission Environmental Officer
MEP	Monitoring and Evaluation Plan
MP	Marking Plan
MSMEs	Micro, small, and medium enterprises
MYS	Multi-Year Strategy
M&E	Monitoring and Evaluation
M&M	Mitigation and Monitoring
NCBA/CLUSA	National Cooperative Business Association CLUSA
NGO	Non-Governmental Organization
NOFO	Notice of Funding Opportunity
OAA	Office of Acquisition and Assistance
OIRSA	Organismo Internacional Regional de Sanidad Agropecuaria

OMB	Office of Management and Budget
OP	Operational Plan
PIPAA	Programa Integral de Protección Agrícola y Ambiental
PESAN	Strategic Plan for Food and Nutritional Security
PPPs	Public Private Partnerships
RCE	Request for Categorical Exclusion
REA	Regional Environmental Advisor
RFA	Request for Application
RRF	Rapid Response Fund
RVCP	Rural Value Chains Project
SAM	System for Award Management
SAT	Simplified Acquisition Threshold
SBCC	Social and Behavior Change Communication
SESAN	Food Security and Nutrition Secretariat
SF	Standard Form
SPS	Sanitary and Phytosanitary
UAC	Unaccompanied Alien Children
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
USG	United States Government
WEAI	Women's Empowerment in Agriculture Index
WHIP	Western Highlands Integrated Program

SECTION A: PROGRAM DESCRIPTION

1. INTRODUCTION

Activity Title:	Fomenting Agriculture Incomes and Resilience Project (FAIR)
Development Objective:	DO 2: Improved levels of Economic Growth and Social Development in the Western Highlands DO 3: Improved Management of Natural Resources to Mitigate Impacts of Global Climate Change
Intermediate Result:	2.1 Broad Based Economic Growth and Food Security Improved 3.2: Vulnerability to the effects of global climate change reduced
Time Frame:	5 years
Resource Requirements:	\$60 million

Guatemala experiences high chronic malnutrition and poverty rates, especially in areas that are predominantly rural and indigenous. In 2010, the U.S. government initiated the Feed the Future Initiative (FTF) to improve food security in twenty priority countries. In line with FTF goals, USAID/Guatemala committed to working in the Western Highlands to support the following objectives: (1) increasing market-led agricultural development and (2) preventing and reducing chronic malnutrition. The Fomenting Agriculture Incomes and Resilience Project (FAIR) will build on the successes and lessons learned from the past five years of implementation of the FTF Initiative in Guatemala. FAIR will contribute to USAID/Guatemala's goal to reduce poverty and chronic malnutrition by increasing agricultural incomes and improving resilience of small farmers and their families in five departments of the Western Highlands.

2. BACKGROUND

During the last decade, the Guatemalan economy overall has reflected relatively stable macroeconomic growth, however not all Guatemalans participated equally in this growth. Guatemala reduced poverty from 56 to 51 percent between 2000 and 2006; however, poverty rose again to 59 percent in 2014.¹ Extreme poverty continues to be more severe in rural areas of the country, particularly in the Western Highlands region with a high concentration of indigenous people.

Further, since October 2013, the U.S. government has recorded a dramatic rise in the number of Unaccompanied Alien Children (UAC) arriving to the United States from El Salvador,

¹ Encuesta Nacional de Condiciones de Vida (ENCOVI) 2014.

Guatemala, and Honduras. According to the United Nations High Commissioner for Refugees' 2014 "Children on The Run" report,² there appears to be five primary factors driving the increase in migration of UAC from Guatemala: 1) lack of economic opportunity, 2) family reunification, 3) poverty and deprivation, 4) domestic violence, and 5) high violence and crime. The need to improve economic conditions is by far the predominant driving factor in Guatemala. Of children interviewed for the report, 51.7 percent indicated that the lack of economic opportunity was the main reason they decided to migrate.

Agriculture is the economic base for much of the country's employment and is critical for food security. With few exceptions, no country has alleviated poverty and hunger without developing its agriculture sector.³ Thus, investments in local capacity to provide for public and private development of the agriculture sector are urgent. However, evidence shows that improved income alone is insufficient to reduce malnutrition in Guatemala's rural poor communities. In response, USAID developed the Western Highlands Integrated Program (WHIP) to work with the Government of Guatemala (GOG), civil society, and the private sector in the Western Highlands to improve economic opportunities, as well as access to and utilization of quality health, nutrition, and education services. USAID hypothesizes that only parallel improvements in income, food utilization, nutrition, adaptation to climate change impacts, local governance, and equitable control over income in the Western Highlands will foster the sustainable rural development necessary for social and economic equity and reductions in chronic malnutrition. This project is a key component to the overall WHIP strategy which takes an integrated approach to contribute to the goal of the CDCS: "A more secure Guatemala that fosters greater socio-economic development in the Western Highlands and sustainably manages its natural resources."

Problem Statement

The largest source of employment in Guatemala is the agriculture sector, accounting for 31.2% of the workforce overall and 56.3% in rural areas. The average annual income from agriculture hovers above \$2,000.⁴ Farmers in the Western Highlands have small landholdings and limited ability for capital investment, combined with low agricultural productivity, a lack of market opportunities, and weak support from the government. Women in agriculture have less access than men to productive resources and opportunities.⁵ Also, not all households are ready or capable of immediately shifting from subsistence to high value cash crops. The extreme poor generally have less land, education, and ability or willingness to take risks. Poverty and chronic malnutrition are more acute for vulnerable groups—specifically indigenous peoples, women, and youth—and are further exacerbated by a history of economic and political inequality and social exclusion.

² United Nations High Commissioner on Refugees. "Children on the Run: Unaccompanied Children Leaving Central America and Mexico and the Need for International Protection." 2015. Available:

https://www.raicetexas.org/styles/raices_texas/defiles/1_UAC_Children%20On%20the%20Run_Executive%20Summary.pdf

³ World Bank, 2008. Agriculture for Development. World Development Report, The World Bank, Washington, DC.

⁴ ENCOVI 2014.

⁵ Food and Agriculture Organization of the United Nations (FAO), 2010-2011. The State of Food and Agriculture, Women in Agriculture, Closing the Gender Gap in Development, Rome, Italy 2011.

As for nutrition, Guatemala's prevalence of chronic malnutrition is the highest in the Western Hemisphere and the fourth highest in the world. In the 30 municipalities in the Western Highlands that comprise the FTF Zone of Influence, the chronic malnutrition rate for children under five is 67.4%, higher than the national average of 46.5%.⁶ In Guatemala, food insecurity is mainly caused by poor families' lack of access to food and unhealthy consumption and feeding practices. Guatemala is extremely vulnerable to natural disasters and climate change impacts, one of the 10 most vulnerable countries in the world, and experiences drought, frost, and flooding in the Western Highlands. Food security and incomes of smallholder farmers are vulnerable to climate variability, natural disasters, and market shocks.

Opportunities

Given that a high percentage of the Guatemalan population is involved in agriculture, this is a key sector in rural areas to expand economic development, increase incomes, and reduce poverty. The Western Highlands is still primarily an agricultural economy. It is estimated that approximately 500,000 people work in the agriculture sector in the Western Highlands, as producers and as laborers.⁷ Guatemala is recognized as a leader in the development of non-traditional agricultural exports in Central America. Coffee, cardamom, and horticulture are the products most exported by small farmers from Guatemala. Although coffee production has decreased since 2013 due to coffee rust, it remains a key crop for small farmers. Thousands of small coffee growers in the Western Highlands have production and marketing skills allowing them to participate in a global market niche for high-quality specialty coffees from Guatemala. Further diversification of agricultural crops can allow small farmers to access new markets, as well as be more resilient to market shocks and crop losses due to climate variability. Investment in small-scale infrastructure and technology allows farmers to increase their productivity and potentially access value-added markets.

Horticulture exports increased by 30% from 2006 to 2015 in Guatemala.⁸ Even though corn is the principal staple, horticulture offers a much higher potential to increase rural incomes, both in direct returns to the producer and increased agricultural wage employment. The combination of horticulture and limited basic grains production generates six times the revenue from just basic grains on the same plot of land, resulting in farmers earning a larger profit.⁹ Of rural employment, agriculture contributes with 45% of which 25% correspond to small rural producers. Employment in the rural area is generated from agriculture.¹⁰ Although incomes from horticulture are increasing, there is still room to improve investments in on-farm technologies and agriculture practices to improve quality and productivity and profit. Post-

⁶ Encuesta Nacional de Salud Materno Infantil (ENSMI) 2014-2015.

⁷ Universidad Rafael Landívar. "Distribución sectorial del crecimiento del empleo en el altiplano guatemalteco." 2006.

⁸ DevTech Systems, Inc. "Valoración del Proyecto de Cadenas de Valor (RVCP)." 2016.

⁹ Achieving Food Security in Guatemala: Opportunities and Challenges, Wingert, Stephen, Abt Associates, September 2010 from Hernandez, Ricardo, Thomas Riordan et al. —Analysis of Encuesta Nacional de Condiciones de Vida (ENCOVI), unpublished paper to be presented to the Agricultural and Applied Economics Association, 2010 Joint Meeting, July 2011.

¹⁰ Distribución Sectorial del Crecimiento del Empleo en el altiplano guatemalteco, IARNA, Universidad Rafael Landívar, septiembre 2006.

harvest loss of crops and rejections of horticulture products due to quality is an issue in Guatemala. Due to the distance from markets of many small farmers and the poor quality of rural roads, perishable horticulture crops can become damaged and rejections by packing centers/exporters result in lower incomes for small farmers. Also, inappropriate storage of basic grains can cause the spread of aflatoxins and fumonisins, which impact human health. There are opportunities to reduce crop damage and loss and improve human health.

The GOG supports policies and plans to reduce malnutrition and foment agricultural and economic growth. The Alliance for Prosperity (A4P) was announced in November 2014 outlining the Northern Triangle (El Salvador, Honduras, and Guatemala) governments' shared commitment to growing their economies, creating employment, and improving the life prospects of their poorest and most vulnerable citizens. The A4P plan targets four main lines of action: stimulate the productive sector, develop opportunities for their people, improve public safety and enhance access to the legal system, and strengthen institutions. For 2016, the governments of the Northern Triangle collectively identified more than \$2.6 billion for programs to address the needs in these areas.

President Morales' new administration has developed plans to support economic development, agriculture, and nutrition. The administration launched a plan for agricultural and rural development that emphasizes key topics such as irrigation, extension services, sanitary and phytosanitary measures, and value chains. The GOG also announced that one of its primary goals is to reduce malnutrition in Guatemala. In March of 2016, the GOG launched its "Strategy for Addressing Chronic Malnutrition 2016-2020," which aims to reduce chronic malnutrition by ten percentage points by 2020. The GOG's "Strategic Plan for Food and Nutritional Security (PESAN): 2016 – 2020," seeks to ameliorate the risk of food security and chronic malnutrition, focusing on the most vulnerable populations of priority municipalities. In addition, there currently exists political will to rebuild the healthcare system to provide access to health care in rural areas, which would help to provide some of the essential nutrition actions to rural areas. FAIR will need to be open to new activities or opportunities and be able to capitalize on GOG's efforts that link to USAID strategy and complements activities that will be carried out under this project.

Further, in August of 2014, the Planning and Programming Secretariat of the Presidency (Segeplán) released a national plan, *Nuestra Guatemala K'atun 2032* (K'atun: Our Guatemala 2032).¹¹ The plan focuses on improving access to education and health services, conditions for economic growth and poverty reduction, sustainable management of natural resources, human rights, and public management. During the Morales administration, it is envisioned that there will be opportunities to improve food security and expand rural development, as well as improve the capacity of the GOG to implement agricultural and food security policies. FAIR will align with the GOG's goals to improve food security and rural development in an integrated and sustainable way.

¹¹ The text can be found here: <http://www.katunguatemala2032.com/nportal/>

The private sector has also expressed a commitment to economic growth and social development in Guatemala. The formal private sector of Guatemala, represented by Fundación para el Desarrollo de Guatemala (FUNDESA), which was established in 1984 by Guatemalan entrepreneurs to generate and implement programs and projects that promote sustainable economic and social development in the country, and the Coordinating Committee of Agricultural, Commercial, Industrial, and Financial Associations (CACIF) started their own development plan in 2011 called *Mejoremos Guate* (Let's Make Guatemala Better).¹² *Mejoremos Guate* aims to stimulate a prosperous, secure Guatemala with more employment and investment, better health and education, and security and justice. The private sector has the potential to accelerate impacts through scalable market-led approaches, improved technology, and the development of new market opportunities. As such, FAIR could provide a catalyst to private-sector driven economic development and investment in the agriculture sector.

Linkage to USAID/Guatemala's Strategy

USAID/Guatemala's Country Development and Cooperation Strategy (CDCS) for FY 2012-2016¹³ marks a renewed commitment to poverty reduction, economic growth, and equitable social development. Development Objective (DO) 2 seeks to improve levels of economic growth and social development in the Western Highlands. This activity focuses on achieving DO 2, Intermediate Result (IR) 2.1 under the CDCS which aims for "broad based economic growth and food security improved." As articulated in the Results Framework, improving agricultural productivity and rural employment opportunities, expanding access of small-scale agricultural producers to larger and niche markets, increasing the economic resilience of poor rural households, and an improved enabling environment for agriculture will lead to economic growth and increased food security in the Western Highlands (IR 2.1). This activity will contribute to achieving IR 2.1 and directly connects to USAID's work on nutrition that is being done under the Global Health Initiative and Food for Peace (FFP), local governance activities for improved food security and rural development, and work to reduce vulnerability to climate change impacts on livelihoods under the Global Climate Change Initiative.

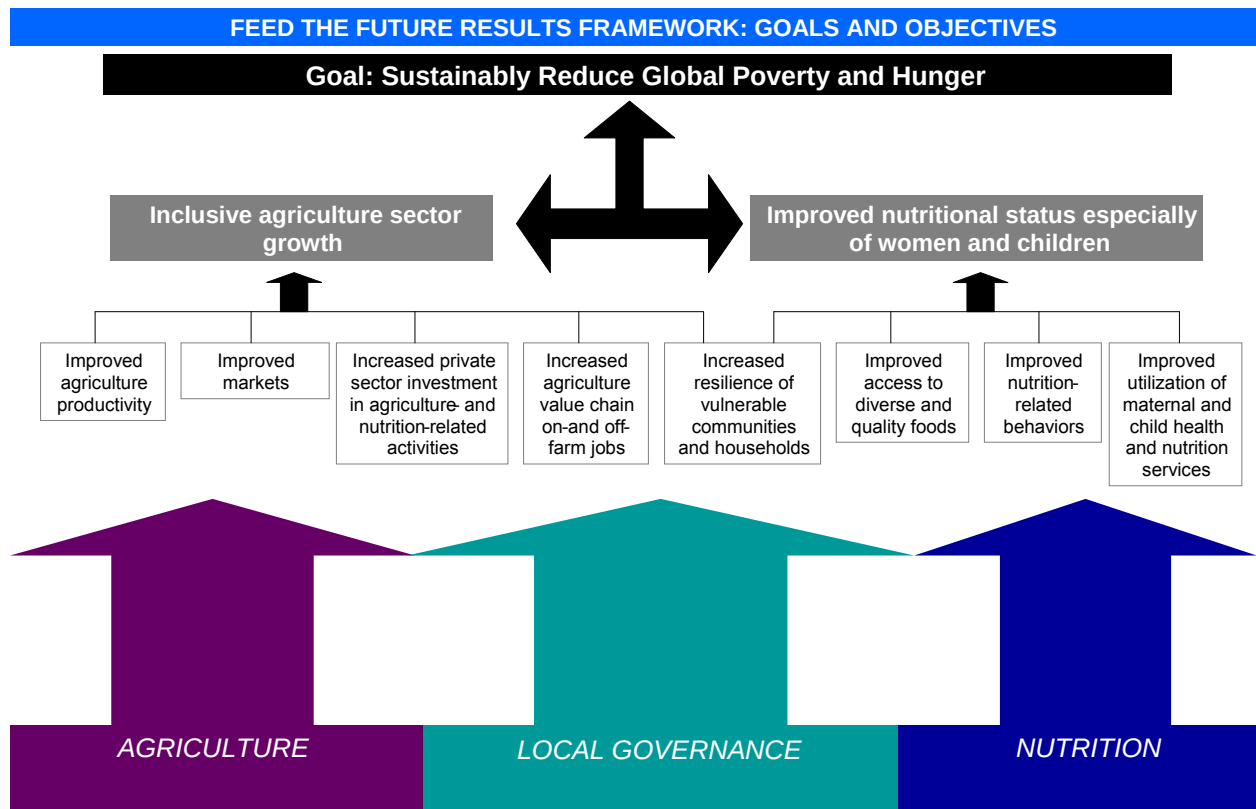
FAIR contributes to the goals of the whole-of-government FTF Initiative to reduce poverty, undernutrition, and hunger. FAIR will also contribute to USAID's Multi-Sectoral Nutrition Strategy 2014-2025¹⁴, which aims to achieve the goal of reducing chronic malnutrition by 20% from 2014 to 2025. In 2011, USAID/Guatemala developed its FTF Multi-Year Strategy (MYS)¹⁵ which outlines the USG implementation plan for food security and nutrition in Guatemala, the goal of which is to reduce rural poverty and malnutrition in Guatemala. The FTF MYS framework holds that reductions in poverty and chronic malnutrition will be achieved through improvements in agriculture, local governance, and nutrition.

¹² More information can be found here: <http://www.mejoremosguate.org/cms/>

¹³ Guatemala CDCS can be found here: <https://www.usaid.gov/guatemala/cdcs>

¹⁴ USAID's Multi-Sectoral Nutrition Strategy 2014-2025 can be found here: <https://www.usaid.gov/nutrition-strategy>

¹⁵ FTF Multi-Year Strategy can be found here: [FTF Multi-Year Strategy Strategy](#)



The FAIR project builds on the successes and lessons learned from five years of implementation of this strategy and will contribute to the achievement of reductions in poverty and chronic malnutrition. FAIR especially builds upon the successes and lessons learned from USAID/Guatemala’s Rural Value Chains Project (RVCP) 2012-2017. The objective of the RVCP is to improve household access to food by expanding and diversifying rural incomes and to contribute to improving the nutritional status of families. The strategy of the RVCP is to expand the participation of poor rural households in productive value chains in horticulture and coffee and linking those chains to local, regional, and international markets. Although the value chains model overall has experienced successes, FAIR will analyze the model and take into account lessons learned to increase impacts through the value chains model. One key catalyst of success in the RVCP has been its coordination with other USAID projects, which has led to a broader impact on small farm households in both poverty and chronic malnutrition.

Moreover, in response to increased migration from Central America to the U.S., the U.S. Government developed an inter-agency strategy, the U.S. Strategy for Engagement with Central America, to promote a more secure, democratic, and prosperous Central America. This strategy is complementary to the achievement of the goals of the Plan for the Alliance for Prosperity. FAIR will contribute to the achievement of the U.S. Strategy for Engagement with Central America by promoting increased agricultural incomes, private sector investment in the agricultural sector, and resilience of vulnerable populations. Leaders of the associations currently working with USAID/Guatemala’s Rural Value Chains Project reported that members

are unlikely to migrate for seasonal labor or to the U.S. since they have a secure market and source of income. FAIR will contribute to increasing economic opportunity in the agriculture sector in the Western Highlands, which is an area of high migration from Guatemala to the U.S.

The project will be implemented as part of the USAID/Guatemala CDCS which aims to reduce chronic malnutrition and improve economic conditions. Part of the conceptual and operational framework for the collaborative implementation of U.S. government-funded activities is WHIP. USAID, the U.S. Department of Agriculture (USDA), the Peace Corps, and their implementing partners all contribute to achieving the goals of the WHIP. However, this Project may align with other USAID initiatives outside of WHIP zone of influence as well. USAID collaborates with Guatemalan officials and leaders at the community, municipal, departmental and regional levels in order to achieve shared goals. USAID's implementing partners are expected to coordinate to achieve overall goals, and the project will actively participate in the departmental committees that spearhead integration through planning, implementation, and the monitoring and evaluation of activities.

Theory of Change

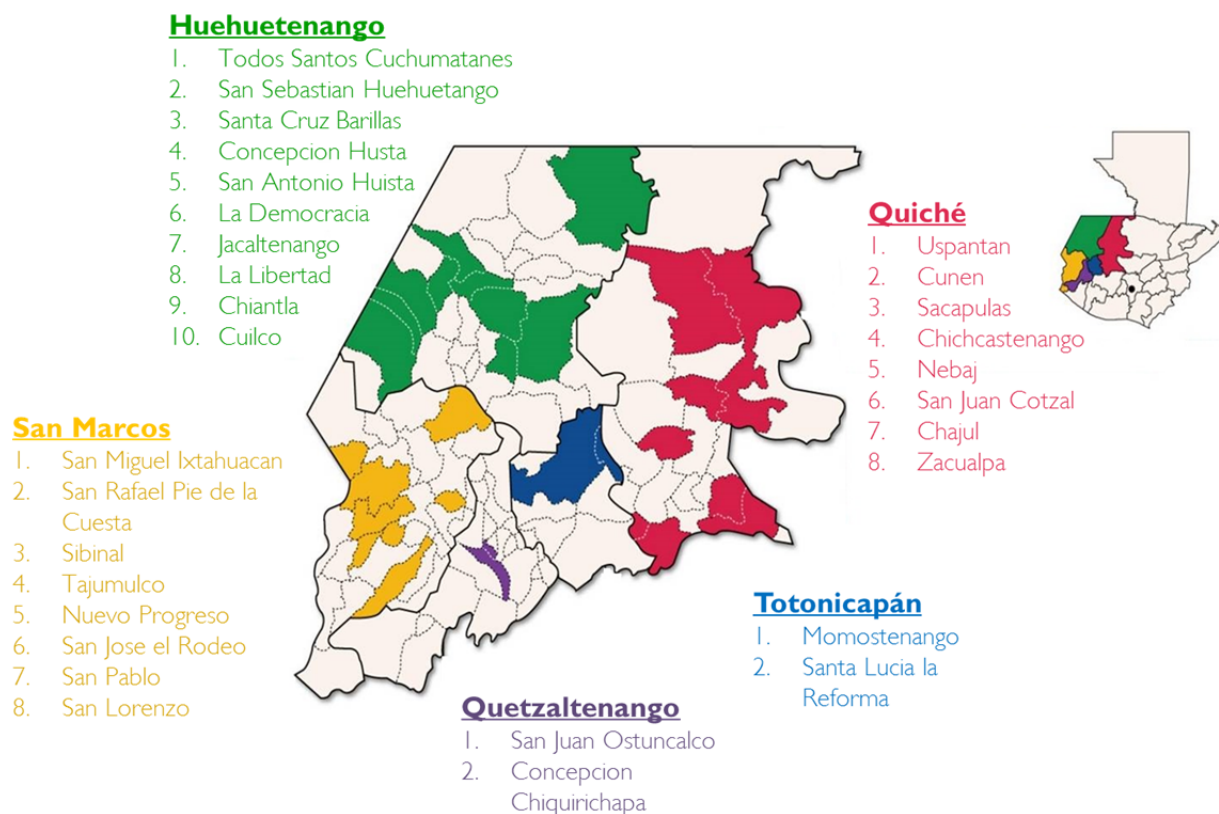
The activity is an integral part of USAID/Guatemala's FTF Strategy, which aims to reduce poverty and chronic malnutrition. The theory of change hypothesizes that by increasing rural household incomes and improving resilience¹⁶ for small farm households,¹⁷ poverty and chronic malnutrition will be reduced. If agricultural productivity is increased and market access is expanded, then small farmers will be able to increase incomes. Access to expanded markets will be achieved through value-added agricultural production, competitiveness, and public and private sector investment in the agricultural sector. If farmers diversify their cropping systems, then they will be able to access higher-value markets, consume a diversified diet, and be less vulnerable to climate variability, crop pests and diseases, and market shocks. When families implement climate-smart agriculture techniques, as well as nutrition-sensitive agriculture, they will improve their resilience and food security. Given the current political will to support food security and rural development, it is envisioned that this can be harnessed to make sustainable improvements in the enabling environment for agricultural growth and food security.

¹⁶ USAID defines resilience as "the ability of people, households, communities, countries, and systems to mitigate, adapt to, and recover from shocks and stresses in a manner that reduces chronic vulnerability and facilitates inclusive growth." For more information on the concept of resilience, please see "Building Resilience to Recurrent Crisis: USAID Policy and Program Guidance." https://pages.usaid.gov/system/files/policy_program_guidance_-_building_resilience_to_recurrent_crisis_dec_2012.pdf

¹⁷ According to USAID, small farm households are defined as having less than five hectares of land. However, small farm households in Guatemala often work far less than one hectare.

Geographic Focus

The geographic focus has been the Western Highlands predominantly in 30 municipalities within five departments (Huehuetenango, Quetzaltenango, Quiché, San Marcos, and Totonicapán). These municipalities were selected as they demonstrate high rates of poverty and chronic malnutrition yet have the potential to improve their levels of economic growth and social development, especially through agricultural development. These 30 municipalities are shown in the following map:



The main focus of FAIR will be to work in the 30 municipalities within the Western Highlands; however, FAIR can work outside the 30 remaining municipalities within the five departments, in the following instances: (1) where FAIR could form a strategy for territorial investment in agricultural development or a strategy for a geographic cluster of farmers producing a specific crop; (2) where members of producer organizations spill over into neighboring municipalities; (3) in municipalities that are part of the Alliance for Prosperity and (4) where there are opportunities for innovative and productive activities. In order to facilitate work with beneficiary communities and for economies of scale, FAIR may maintain branch office(s) in the Western Highlands. This will have to be included in the technical approach.

The GOG has named 51 municipalities that are part of the Alliance for Prosperity, 34 of which are in Huehuetenango, San Marcos, Totonicapán, and Quiché. Of these 34 municipalities, 16

are part of USAID's geographic area (see Map of Alliance for Prosperity municipalities in Annex 1). The Recipient may work in the following 18 municipalities which are also included in the Alliance for Prosperity, but are not part of the USAID's Zone of Influence:

Totonicapán	Totonicapán
San Marcos	San Marcos
	Concepción Tutuapa
	Tacaná
	Comitancillo
Huehuetenango	Huehuetenango
	Malacatancito
	Nentón
	San Pedro Necta
	Santa Bárbara
	San Idelfonso Ixtahuacán
	San Juan Atitán
	San Miguel Acatán
	San Sebastián Coatán
Quiché	Santa Cruz del Quiché
	Joyabaj
	San Andrés Sajcabajá
	San Bartolomé Jocotenango

3. PROGRAM DESCRIPTION

Objective

The objective of FAIR is to increase agricultural incomes and improve resilience for small farmers and their families in five departments of the Western Highlands, while improving nutrition outcomes. This will be achieved through the following four project results: (1) agricultural productivity improved and income generation alternatives diversified; (2) access to markets expanded; (3) resilience increased through implementation of climate-smart and nutrition sensitive agriculture; and (4) agriculture and food security enabling environment strengthened.

The project will measure success through reductions in poverty, including the change in the depth and prevalence of poverty for target households over five years of project implementation. The project will also measure the change in household income from the agriculture sector for target households over the course of the project. The overall required foreign assistance indicators¹⁸ to measure the achievement of the objective are:

¹⁸ Please see the Foreign Assistance Master Indicator List for more information: <http://www.state.gov/f/indicators/>

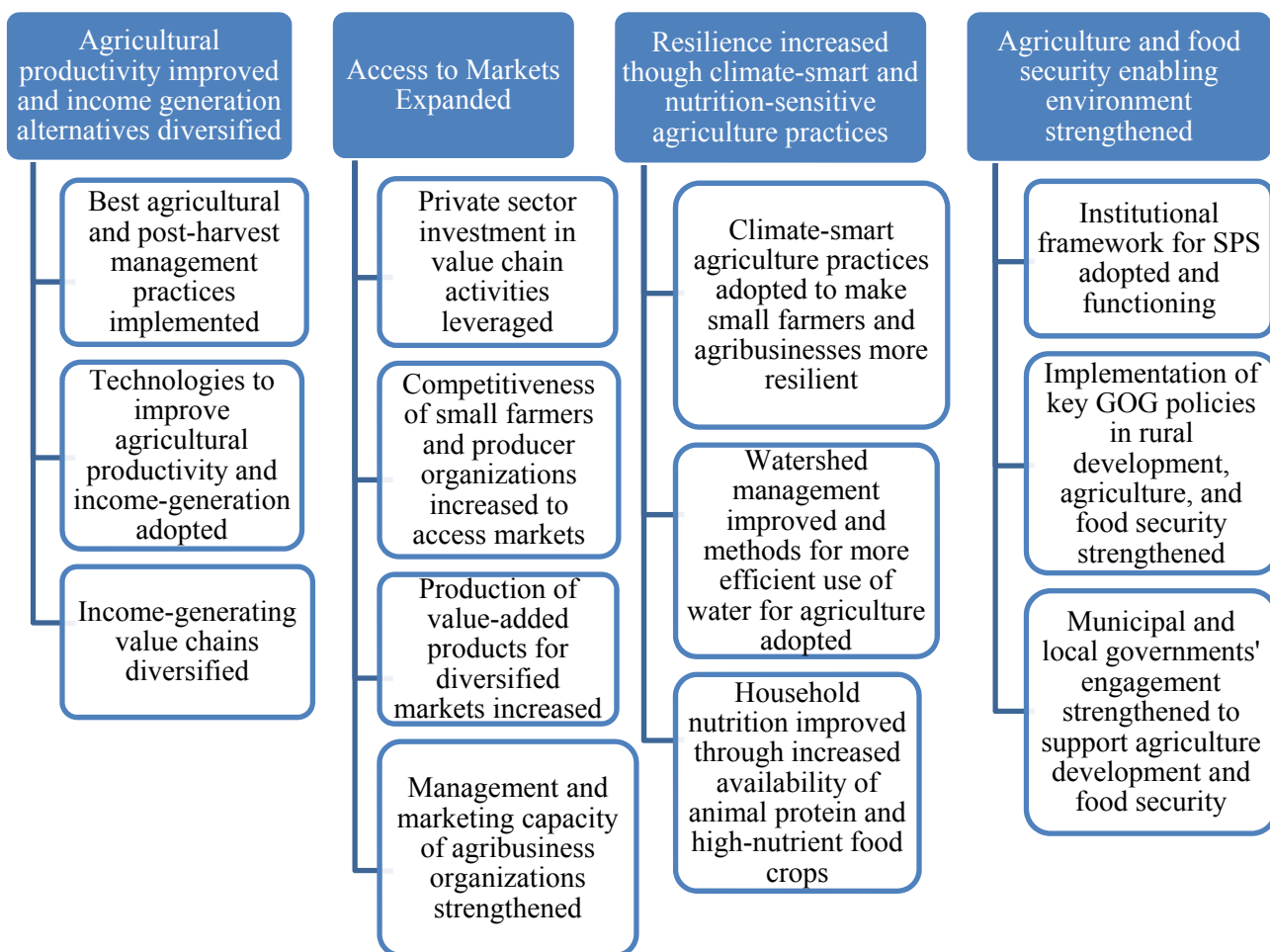
- 4.5-13 Prevalence of Poverty (extreme): Percent of people living on less than \$1.25/day
- 4.5-9 Per capita expenditures (as a proxy for income) in USG-assisted areas

The project will set ambitious targets for reductions in poverty and increases in household income to maximize impacts on a broad range of households and organizations. To measure the number of households and organizations impacted, the Applicant will measure the following required indicators:

- 4.5.2-13 Number of rural households benefiting directly from USG interventions
- 4.5.2-11 Number of food security private enterprises (for profit), producer organizations, water users' associations, women's groups, trade and business associations, and community-based organizations (CBOs) receiving USG assistance
- 4.5.2-27 Number of members of producer organizations and community based organizations receiving USG assistance

FAIR Results Framework

To achieve the objective, FAIR will achieve the following results and intermediate results:



Result One: Agricultural productivity improved and income generation alternatives diversified

To achieve Result One, the project will pursue the following Intermediate Results (IRs):

- 1.1 Best agricultural and post-harvest management practices implemented
- 1.2 Technologies to improve agricultural productivity and income-generation adopted
- 1.3 Income-generating value chains diversified

On-farm investments and improved management techniques can bring large gains in agricultural productivity and quality, leading to increased incomes. A diversified farming system includes a variety of nutritious crops and activities for income-generation, especially in order to maintain income and food security throughout the year.

Intermediate Result 1.1 Best agricultural and post-harvest management practices implemented

The project will implement activities to promote the adoption of best agricultural practices, increase yields per unit of land, and reduce post-harvest loss for target households where it would lead to increased net income generation. FAIR will support the construction of small-scale agricultural infrastructure to increase productivity and decrease post-harvest loss (e.g. drip irrigation, packing sheds, wet mills refurbishing, and cold-room storage). The Applicant must describe in its technical approach how this activity will be implemented including a description of the amount that they anticipate to invest with project funds for this type of activities and how the project will utilize these funds to leverage funds from private and public sector. Tying into IR 3.2, part of best agricultural practices are the improvement of communities' productive water management and efficient use of water for agriculture. One concern that arises in agriculture is the environmental effects of agricultural production, whether through agrochemical run-off, land and soil degradation, or inappropriate disposal of agricultural waste such as plastics used for hoop houses and plastic mulch. The implementation of best agricultural practices will reduce environmental impacts from agriculture.

Intermediate Result 1.2 Technologies to improve agricultural productivity and income-generation adopted

FAIR will promote the effective use and adoption of agricultural technologies to increase productivity and yields. This includes improved agricultural inputs, production methods, small-scale irrigation, integrated pest management (including the use of beneficial biological organisms), and post-harvest storage. FAIR will also promote information and communications technologies (ICT), such as traceability technologies, where applicable to improve production, support compliance with food safety and sanitary and phytosanitary (SPS) standards (such as the U.S. Food Safety Modernization Act), and advance agricultural income generation.

Intermediate Result 1.3 Income-generating value chains diversified

In order to broaden the base of farmers' agricultural incomes, FAIR will promote diversification of income-generating activities at the household level. It is critical to have a diversified source of income, especially as farmers can experience market shocks and variability in climate leading to potential crop loss. In promoting the diversification of farm incomes, FAIR will look at the demand-side of producing products for the market and help farmers analyze the relative returns of selected crops and on-farm economic activities. Where there is a demand for the product, crop diversification could open up potential markets, including local, regional, and international markets.

As women often do not have equal control of household resources, income, and decision-making, one component of this IR will be to analyze and promote income-generation opportunities specifically for women. Moreover, as women are more likely to control production of animals and animal products, handicrafts, and apiculture, these are potential

avenues for income generation.¹⁹ Promoting diversified cropping and farm systems that include the production of highly nutritious crops and animals/animal products for household and local consumption will also help to improve household nutrition (IR 3.3).

Required Indicators:

- 4.5-4 Gross margin per unit of land, kilogram, or animal of selected product
- 4.5.2-2 Number of hectares under improved technologies or management practices as a result of USG assistance
- 4.5.2-5 Number of farmers and others who have applied new technologies or management practices as a result of USG assistance

Result Two: Access to Markets Expanded

In order to expand access to markets, FAIR will achieve the following IRs:

- 2.1 Private sector investment in value chain activities leveraged
- 2.2 Competitiveness of small farmers and producer organizations increased to access markets
- 2.3 Production of value-added products for diversified markets increased
- 2.4 Management and marketing capacity of agribusiness organizations strengthened

Investments in crop production and agricultural infrastructure must respond to existing and potential market demands to produce income for small farmers. FAIR will conduct market research to analyze where there is the greatest potential and demand for target farmers to expand markets at the local, regional, and international levels. By focusing on market demand, growth will occur throughout the value chain and increase employment in agriculture-related jobs. Given that farmers in the Western Highlands have small plots for producing crops for both income-generation and household consumption, they do not have the volume to be able to access most markets. By organizing in producer associations and/or cooperatives, small farmers can reach the necessary scale to produce a larger volume and access services. Niche and value-added markets in particular can provide an opportunity for small farm agricultural production. FAIR will help link small farmers with local, regional, and international markets. The development of productive agriculture infrastructure and the adoption of innovative technologies can enable small farmers to successfully enter niche and value-added markets. FAIR will leverage both public and private investment to achieve these results.

In line with the project's social inclusion strategy, FAIR will expand participation of vulnerable populations, including women, youth, and indigenous persons, in the value chain and in agricultural enterprises to increase incomes and employment. As a result of improved competitiveness, private sector investment, value-added production, and agribusiness capacity, it is expected that employment opportunities in the agricultural sector, both from production and off-farm agriculture-related employment will increase.

¹⁹ See Annex 2 for a Rapid Gender Analysis of Income Generation Activities in the Western Highlands.

One key issue that hinders achieving this result is access to financing, credit, and seed capital to invest in small-scale infrastructure and technologies that would make farmers more competitive and help them access value-added markets. Thus, while resolving access to finance issues is not a principal focus of the project, it is recognized as a means to achieve the end result of expanding access to markets. FAIR will therefore include in its strategy effective ways to catalyze investments that would help farmers expand and access diversified markets.

Intermediate Result 2.1 Private sector investment in value chain activities leveraged

FAIR will leverage the private sector technical, managerial, and financial support to invest in agriculture-related activities and fuel innovation and job creation. Project activities will stimulate private investment and financing across value chains. This includes investment in productivity-enhancing technologies, small-scale infrastructure,²⁰ and/or value-added processing for value chain and agribusiness development.

FAIR's strategy to foment private sector investment in agricultural development will be key to supporting and achieving FAIR results and IRs. FAIR may encourage and facilitate business alliances, joint commercial ventures, public private partnerships (PPPs), and innovative approaches to expand market access and increase productivity and competitiveness of small farmers.²¹ FAIR will also seek equitable partnerships that link small producers with larger companies in different value chains. Special attention should be paid to building systems and mechanisms to attract financing and investment of remittances into agricultural value chains, enhancing the multiplier effects in the local and regional economy.²² In line with FAIR's proposed strategy, a portion of FAIR funds (10%) will be used to leverage funds from the private sector to develop public private partnerships and mechanisms in which to foment agricultural growth and small agribusiness development across the value chain.

Intermediate Result 2.2 Competitiveness of small farmers and producer organizations increased to access markets

In this project, competitiveness can be measured by the capacity of the farmer and producer organization to produce goods and services for the market, and at the same time, to create value and obtain profit. FAIR may look at competitiveness both at the individual farm and producer organization levels, as well as the territorial level. The territorial level would include areas of production with similar social and economic considerations, institutions, natural resources, and/or infrastructure. An integrated strategy at the territorial level could increase the

²⁰ Examples of small-scale infrastructure include, but are not limited to, packing sheds, cold storage, machines/implements for value-added processing, small-scale irrigation systems, bio-composting centers, etc. Small-scale infrastructure does not include roads or large-scale irrigation.

²¹ For an in-depth discussion of partnership considerations and models to leverage the private sector to improve small farm livelihoods, see Feed the Future Partnering for Innovation's "From Smallholders to Shareholders: A Guide to Optimizing Partnerships with the Private Sector for Smallholder Impact." 2014. Available: http://www.partneringforinnovation.org/docs/Fintrac_PIModels_Toolkit_14Oct14_fin_web.pdf

²² FAIR will coordinate with USAID/Guatemala's Opportunities for My Community Project to utilize remittances and financing opportunities to stimulate agricultural investment and growth.

competitiveness of small farmers in that area. A territorial strategy to increase competitiveness could also be a key to fomenting increased public and private investment in agriculture in the region (IR 2.1), as well as active engagement of municipal and local governments (IR 4.3).

While small farms often cannot compete with larger farms in terms of costs of production and transportation per unit, they can compete in specific niche markets and in certain more labor intensive crops. To become more competitive in niche markets, FAIR will help farmers improve product quality, add-value to products, reduce costs of production and post-harvest loss, and ensure that farmers can access and utilize market information. FAIR will also train farmers to analyze and keep track of their agricultural expenditures and income so that farmers can make informed decisions to maintain their competitiveness and maximize profit. FAIR may build upon research and extension linkages to increase competitiveness and adjust to local resources and conditions. A high percentage of agricultural crops are rejected by agricultural distributor and export companies due to distributor/export quotas, failure to meet quality/size standards, and damage to crops during transportation. FAIR will implement activities to help agribusiness organizations and farmers meet quality standards, including Good Agriculture Practices and compliance with sanitary and phytosanitary (SPS) and food safety standards, such as the Food Safety Modernization Act. This will help farmers reduce rejection rates and access higher-value markets with specific certifications and requirements. For crops that meet food safety standards but are or would be rejected by distributor and export companies, FAIR will develop opportunities for income generation looking at alternative markets and/or value-added processing for these crops.

Intermediate Result 2.3 Production of value-added products for diversified markets increased

FAIR will conduct market research on opportunities to enter new markets and to enhance value chains. FAIR will transfer cutting edge scientific, technological, and other innovations to allow producers and agribusiness enterprises to capture higher value-added opportunities in domestic and/or international markets. Value-added processing can also lead to jobs in the agricultural value chain. One challenge that FAIR will address is how to bring value-added activities like processing to communities to increase incomes and employment. Where processing centers have been built, they have brought jobs to communities, notably bringing local employment opportunities for women and youth.

Intermediate Result 2.4 Management and marketing capacity of agribusiness organizations increased

FAIR will implement activities to build the operational and organizational capacity, management, marketing, and efficiency of agribusiness organizations participating in the value chain. Improved management and administrative capacity of producer associations will aim to create sustainable organizations that expand market access, obtain financing, provide effective services to its members, and increase the negotiating capacity of its members. Improvements in the capacity of cooperatives and producer organizations includes management and operational capabilities focusing on private input supply, equipment sales, processing, storage, transport,

traceability, and information and communications technology (ICT) services. FAIR will also increase the capacity of agribusinesses to market their products and successfully access local, regional, and international markets. The development of marketing capacity may include developing capacity to participate in and organize trade shows.

Producer organizations assisted by FAIR will vary in their initial capacities and resources, with some producer organizations being recently, loosely formed with producers with few resources and very small plots of land, while other organizations might have a longer history and more access to land and capital. FAIR's strategy will address how it will choose, work with, and measure advances in groups of varying initial capacities and resources. FAIR's social inclusion strategy should include how it will increase participation of women, youth, and indigenous people in organizations, especially in positions of leadership and decision-making.

Required Indicators:

- 4.5.2-23 Value of incremental sales (collected at farm-level) attributed to USG assistance
- 4.5.2-12 Number of public-private partnerships formed as a result of USG assistance
- 4.5.2-38 Value of new private sector investment in the agriculture sector or food chain leveraged by USG assistance

Result Three: Resilience increased through climate-smart and nutrition-sensitive agriculture practices

The following intermediate results will contribute to the achievement of Result Three:

- 3.1 Climate-smart agriculture practices adopted to make small farmers and agribusinesses more resilient
- 3.2 Watershed management improved and methods for more efficient use of water for agriculture adopted
- 3.3 Household nutrition improved through increased availability of animal protein and high-nutrient food crops

This result aims to assist farmers to become more resilient to climate variability and market shocks through climate-smart and nutrition-sensitive agriculture practices. Within the framework of resilience, FAIR will focus on increasing the adaptive capacity of individuals and families involved in the agricultural sector. FAIR will provide technical assistance to small farm households to improve food security and diversify farming systems to make farms more resilient to climate and market shocks.

In Guatemala, analyses of climate trends reveal historic changes in climatic variables, such as an increasing trend in average temperature and decreasing rainfall patterns. Changes in temperature may result in unusually warm and cold spells like more intense mid-summer drought periods. Guatemala's sensitivity to climate change is evidenced through losses caused

by extreme hydro-meteorological events, which have caused economic losses equal to 4% of the country's GDP. These climate trends would mainly affect human health, forest and water resources, the agricultural sector, and biodiversity.²³ The Western Highlands has high vulnerability to climate change and climate variability. Landslides, forest fires, and frosts are common to the region. Due to the socio-economic conditions of the Western Highlands, the main areas of focus for climate change adaptation to strengthen resilience are agriculture and water resource management. Climate stressors, such as changes in seasonality, intense or prolonged rainfall, droughts and floods, can negatively affect the agricultural sector. The impact on the agricultural sector would directly affect food security in the country.

Nutrition-sensitive agriculture can also help increase the availability of key nutrient-dense foods, especially for pregnant and nursing mothers and children in the 1,000-day window (from conception through 24 months). Through USAID's Food and Nutrition Technical Assistance III (FANTA) project, Food-Based Recommendations (FBRs) were developed based on the nutritional needs of pregnant and nursing mothers and children in the 1,000-day window, taking into account food availability in the Western Highlands.²⁴ The study cited challenges of household availability of certain key foods such as animal protein, especially of eggs, and fresh vegetables. FANTA's FBR study also recommended the exploration of options for improved home or commercial production, processing, storage, and preservation of nutrient rich foods to make them more available to households. While essential nutrition actions are critical for improved nutrition, FAIR's value-added in improving nutrition in the Western Highlands will be to implement nutrition-sensitive agriculture practices and ensure greater availability of appropriate nutrient dense foods for small farm families so that they can make improved dietary decisions to reduce rates of chronic malnutrition.

Intermediate Result 3.1 Climate-smart agriculture practices adopted to make small farmers and agribusinesses more resilient

According to the USAID study "Recommendations on Climate Change Adaptation responses for Guatemala," the main climate vulnerability impacts identified for agriculture and livestock are: 1) loss of crops due to frosts, 2) loss of crops due to excess rainfall and high humidity, 3) increase in pests, 4) (agricultural) drought, 5) soil loss and degradation, and 6) loss of diversity in the gene pool for crops. On the other hand, a low impact is expected through loss of crops due to floods.

FAIR will train farmers on climate-smart agriculture practices, including education on adapting to climate change. Activities implemented will aim to make small farms and agribusinesses

²³ USAID. "Recommendations on Climate Change Adaptation responses for Guatemala." Private Institute for Climate Change Research (ICC); Global Climate Adaptation Partnership (GCAP); Grupo Laera. 2012. Please see attached Annex 3 and Análisis de la Vulnerabilidad ante el Cambio Climático en el Altiplano Occidental de Guatemala, please see it in the following link: <http://www.usaid-cncg.org/analisis-de-la-vulnerabilidad-ante-el-cambio-climatico-en-el-altiplano-occidental-de-guatemala/>

²⁴ For more detail, see the following report:

FANTA. 2014. Development of Evidence-Based Dietary Recommendations for Children, Pregnant Women, and Lactating Women Living in the Western Highlands in Guatemala. Washington, DC: FHI 360/ FANTA. Available: <http://www.fantaproject.org/sites/default/files/resources/Guatemala-Optifood-June2014.pdf>

more resilient to climate change and climate variations, such as drought, frost, and flooding. Where appropriate, FAIR will coordinate with other USAID projects working on climate change adaptation to improve implementation of this result.²⁵

Intermediate Result 3.2 Watershed management improved and methods for more efficient use of water for agriculture adopted

Watersheds and availability of water for agricultural production are affected by climate variations. Climate change-related effects on watershed services (i.e. water quantity and quality) can be gradually observed. For instance, water quality used in agriculture could be affected by increasing sedimentation in the rainy season, especially due to soil erosion and surface run-off. During the dry season, growing concentrations of pollutants (such as E. coli) could be found in rivers due to smaller water flows and lesser dilution. Water quality of water used in agriculture can also be an issue, especially as new Food and Drug Administration (FDA) Food Safety Modernization Act of 2010 (FSMA) regulations are implemented which would require potable water to be used for irrigation of crops for export. According to a study by Universidad Rafael Landívar/Instituto de Agricultura, Recursos Naturales y Ambiente (IARNA-URL), 74% of the Western Highlands lacks adequate watershed management and will experience an estimated average decrease in water availability of 44% by 2080.²⁶ Furthermore, IARNA-URL estimated that 80% of the municipalities in the Western Highlands would experience problems with water scarcity and variability in water availability.²⁷ Land degradation and deforestation also impact watersheds and water quality.

Thus, FAIR will improve watershed management and the efficient-use of water for agriculture which is integral to adaptation to climate change and climate-smart agriculture. FAIR will work to improve watershed management at the community level in the target geographic area. FAIR will also support the adoption of methods by small farmers and producer organizations to improve the efficient-use and quality of water for agriculture. Municipal level engagement will be critical to support watershed management and improved water use.

Intermediate Result 3.3 Household nutrition improved through increased availability of animal protein and high-nutrient food crops

FAIR will promote improved nutrition through the implementation of nutrition-sensitive agriculture practices. FAIR will support increased household production and improve all food storage, particularly of nutrient dense foods, such as beans and vegetables, promoting varieties that are well-suited to the variety of agroecologies in the Western Highlands. This IR links closely with IR 1.3 to diversify agricultural production, in this case with the objective being availability of nutrient-rich foods for improved nutrition.

²⁵ USAID projects currently working on climate change adaptation include: Climate, Nature, and Communities in Guatemala, Low Emission Development Strategy, and Nexos Locales.

²⁶ IARNA-URL. “Estudio que identifica y justifica inversiones estratégicas para adaptación al cambio climático relacionadas con el agua.” 2013. Please see Annex 4 for this study.

²⁷ IARNA-URL. “Estudio que identifica prácticas de manejo del agua para adaptación al cambio climático.” 2013. Note: Please see Annex 5 for this document.

FAIR will also implement activities to promote sustainable small animal husbandry. USAID/Guatemala has worked with successful models of small animal husbandry to advance both nutrition and income generation through FFP projects and the Cooperative Development Project III. Although FAIR shall implement a model for small animal husbandry that is best suited to the project's geographic area, FAIR may scale-up the impact of these USAID projects and models.

Where demand exists, FAIR will implement activities to stimulate the sale of nutrient-rich food produced by target small farmers and producer organizations to local markets so that nutrient-rich food availability will increase, as well as incomes for farmers. Nutrient-rich foods promoted for sale should also be set aside for home consumption to diversify the household diet and improve nutrition for the family. This could include value-added processing and the sale of nutrient-rich foods that make consumption easier and faster for mothers and children under the age of two. A linkage between FFP beneficiaries and small farmers working with FAIR could be explored, especially in selling nutrient-rich foods and value-added products to FFP beneficiaries receiving food vouchers through the FFP program.

Required Indicators:

- 4.8.2-8 Number of climate mitigation and/or adaptation tools, technologies, and methodologies developed, tested and/or adopted as a result of USG assistance
- 4.8.2-26 Number of stakeholders with increased capacity to adapt to the impacts of climate change as a result of USG assistance
- 3.1.9-1 Number of people trained in child health and nutrition through USG-supported programs

Result Four: Agriculture and Food Security Enabling Environment Strengthened

A more transparent and efficient agriculture and food security enabling environment will contribute to equitable economic growth, facilitate access to technologies and inputs that increase productivity, expand access to markets, and encourage private investment. As the agriculture and food security enabling environment has a broad scope, the Applicant will focus on addressing issues that directly impact the achievement of the overall objective of the project and Results 1-3. The Applicant will work with the Ministry of Agriculture to strengthen their capacities to work in those strategic areas that are key to foster sustainable rural development. The Applicant will also coordinate with USAID's Sustainable Economic Observatory Project to achieve this result and stimulate dialogue on prioritized issues. For regional issues, FAIR will coordinate with USAID's Central America Mission based in El Salvador.

Within this framework, FAIR will aim to achieve the following intermediate results:

- 4.1 Institutional framework for sanitary and phytosanitary (SPS) adopted and functioning
- 4.2 Implementation of key GOG policies in rural development, agriculture, and food security strengthened
- 4.3 Municipal and local governments' engagement strengthened to support agriculture development and food security

Intermediate Result 4.1 Institutional framework for SPS adopted and functioning

Compliance with SPS is critical to maintaining food safety and export markets for small farmers. Currently, *el Programa Integral de Protección Agrícola y Ambiental* (PIPAA) is supported by the private sector and is accredited by the Ministry of Agriculture to issue export permits for a small number of specific fresh commodities, but does not have independently recognized official standing as a regulatory body. The GOG is assisted for specific tasks in this area by USDA/Animal and Plant Health Inspection Service (APHIS) and by the regional organizations Inter-American Institute for Cooperation on Agriculture (IICA) and *Organismo Internacional Regional de Sanidad Agropecuaria* (OIRSA). There is increasing concern among trading partners about Guatemala's ability to meet strict international SPS standards. If a significant problem were discovered, it could undermine Guatemala's reputation as a reliable supplier, which would have devastating consequences for large numbers of smallholders who export their perishable products. Guatemalan exports to the U.S. will be required to meet the stringent requirements of the FSMA regulations that come into effect over the next few years. The implementation of FSMA will require stringent food safety practices and traceability of export crops to the farm level.

FAIR will provide technical support on sanitary and phytosanitary (SPS) issues, which are vital to maintain the competitiveness of Guatemalan exports. This includes working with the GOG, the U.S. Department of Agriculture (USDA), and the private sector to promote a sustainable model for SPS. In coordination with USDA/APHIS and partners in the public and private sectors, FAIR will strengthen an institutional framework for a national inspection and certification system for SPS and food safety that will meet the requirements of FSMA as well as the standards set by the European Union and other potential markets for Guatemalan produce.

Intermediate Result 4.2 Implementation of key GOG policies in rural development, agriculture, and food security strengthened

FAIR will support the implementation of the Strategic Plan for Food Security and Nutrition (PESAN 216-2020), the National Strategy Chronic Malnutrition Prevention 2016-2020, and the National Strategy to Improve Agricultural Development 2016-2020. In coordination with USAID's Sustainable Economic Observatory Project, FAIR will stimulate dialogue on key food security and rural development topics with the GOG, civil society, universities, the private sector, and other donors to promote action and transparency on these issues. FAIR will provide

technical capacity building to key GOG ministries to improve implementation of food security, rural development, and agriculture policies. This includes technical assistance to the Ministry of Agriculture (MAGA) and Food Security and Nutrition Secretariat (SESAN) to plan and execute their budget based on the concept of “management for results.”

FAIR will also work with private sector associations and programs to build a business climate that favors private investments in small-holder agriculture and the entry of small-scale entrepreneurs in the agricultural sector.

While FAIR may focus on a diversity of policy implementation issues and technical capacity building that assists with the achievement of FAIR’s overall objective and results, there are specific issues that merit attention:

1. Career civil service system: FAIR shall support the establishment of a working career civil service system within MAGA in order to strengthen the professionalism and continuity of the civil service. Additionally, given the need to strengthen both the rural extension service and build the career civil service, FAIR will assist MAGA to pilot the implementation of civil service reform in MAGA’s rural extension service if there is political will.
2. Irrigation Policy: FAIR will provide technical support for the implementation of the Irrigation Policy that has been adopted by MAGA.
3. Water and watershed management: As water availability will only increase as an issue in the Western Highlands, FAIR will work to improve regulations and procedures for effective water and watershed management.
4. Connectivity of rural roads: To increase market access for small producers, FAIR may focus on increasing public investment in rural roads, taking into account the environmental, economic, social, and institutional aspects of rural roads.²⁸
5. Micro, small, and medium enterprises (MSMEs): FAIR will support implementation of policy for MSME development in the agriculture sector.
6. Financial mechanisms for agriculture sector investment: It is difficult for small farmers, especially women, to gain access to financing for agriculture. In order to stimulate agricultural development, FAIR will support the implementation of mechanisms that provide financing to small farmers, agribusiness, and producer organizations and that reduce the associated risks.
7. A more effective agriculture extension system.

Intermediate Result 4.3 Municipal and local governments’ engagement strengthened to support agriculture development and food security

The planning and implementation structure for food security and nutrition set up by SESAN includes decentralized food security and nutrition committees at community (COCOSANs), municipal (COMUSANs), and departmental (CODESANs) levels. Joint management structures

²⁸ IARNA-URL. “Manual para la planificación, diseño, construcción y mantenimiento de caminos rurales con enfoque de gestión y adaptación a la variabilidad y al cambio climático.” 2013

called *mancomunidades* have been set up by a few adjoining municipalities to support local development and address specific issues of common interest. Engagement from municipal and local governments is critical in order to advance food security and agricultural development.

To achieve results one through four and promote sustainability of agricultural growth and food security gains, FAIR will strengthen engagement of municipal and local governments in local agricultural development and food security. To stimulate agricultural growth, FAIR will promote public private partnerships to strengthen entrepreneurship in the agriculture sector and foment investment in productive infrastructure for agriculture. USAID's Nexos Locales project is working on developing local economic development plans with municipal governments, FAIR will examine potential synergies to work with municipalities to implement local economic development plans and strengthen agricultural development and food security.

Required Indicators:

- Number of institutions/organizations that strengthened their capacity as a result of USG assistance
- Number of Policies, Regulations, and Administrative Procedures in development, passed, or being implemented as a result of USG assistance

4. CROSS-CUTTING PRINCIPLES

FAIR will integrate the following cross-cutting principles throughout the project's strategy and implementation:

1. Social inclusion (gender, youth, and indigenous populations)
2. Sustainability
3. Engagement of Key Stakeholders for Agricultural Development and Food Security
4. Coordination
5. Social and Behavior Change Communication
6. Integrated Conflict-Sensitive Approach

Social Inclusion

Social inclusion is a process and an objective to improve the terms on which people take part in society. Inclusion is about achieving balance, fairness, representation, a voice in decision-making, and diversity. This requires changes in social and economic opportunity structures that have privileged some individuals and groups to the exclusion and marginalization of others. Equal opportunity (regardless of social identity) needs to be pursued by improving capacity within the local and national governments, organizations, and individuals for social inclusion.

Poverty and chronic malnutrition in the Western Highlands are more acute for vulnerable groups—specifically indigenous peoples, women, and youth—and are further exacerbated by a history of economic and political inequality and social exclusion. FAIR will develop and

implement a social inclusion strategy as part of the project to increase participation of and opportunities for vulnerable and marginalized groups.

Gender

USAID is committed to the advancement of gender equality and the pursuit of gender as a key development principle, and USAID/Guatemala seeks to ensure that appropriate gender considerations are incorporated into all aspects of its portfolio. In the Western Highlands, the culture of the region is also highly patriarchal, although the degree of male dominance varies across communities. On measures of education, literacy, and Spanish fluency, women are disadvantaged compared to men, and the deficit in girls' schooling is the highest in Latin America. Gender inequality and lack of women's empowerment are reflected in women's low levels, both absolute and as compared to men, of participation in public and private organizations, absence in leadership and decision-making positions in the community, and deficits in access to information and to productive resources like land and credit. A study by USAID's Rural Value Chains Project indicates that only 26% of women influence decisions pertaining to the use of household income, compared to 90% of men.

In a 2013 survey for the Women's Empowerment in Agriculture Index (WEAI) in Guatemala, 57.5% of women were below the threshold for empowerment. The domains that contribute most to women's empowerment are: leadership in the community, control over the use of income, and control of productive resources. Indigenous men in the Western Highlands also score relatively low in terms of empowerment, agency, and inclusion; however, they have more power than the women in the household. USAID also completed a Rapid Gender Analysis of Income Generation Activities in the Western Highlands (see Annex 2) that discusses potential opportunities and issues related to women's income generation.

Specific issues that may need to be addressed in a social inclusion strategy were identified in USAID/Guatemala's Gender Analysis²⁹:

- The analysis identified significant gaps in schooling, literacy, and fluency in Spanish, which affect access to information about farming and markets. These characteristics need to be taken into account in training and educational materials and social behavior change messaging if women are to benefit from the assistance.
- Patterns of time use differ for men and women. Men spend more of their day in paid labor, while women predominate in unpaid labor in the home and in agriculture. Men have more free time. Women's work in the field takes away from their time for housework and childcare (which may be transferred to older daughters who then have to drop out of school) and from time spent in their own money-making activities, such as creation of items to sell in the local market or of handicrafts. It also precludes paid employment.
- Men control household decisions related to agriculture (including women's unpaid and paid labor), and household income from agriculture. Women control decisions about

²⁹ Análisis de Género de USAID/Guatemala: AGRICULTURA. Please see Annex 6 for this document.

income from handicrafts and, often, the sale of small farm animals or their by-products (e.g., eggs, wool, and milk). In general, the men in the household also dominate in decisions about the purchase of food and household items. How to build and promote value-chains and economic activities that are under women's control should be considered.

- A gap also was identified between the participation of men and women, not only in the associations and cooperatives but also in community organizations and committees. Except in rare cases, even when women attend meetings they tend to be less active and less involved than men in decisions.
- Although both men and women in the target population have problems in accessing credit, women have less access than men to finance (and other productive resources like land).

The social inclusion strategy will consider the issues raised in order to develop a meaningful approach to address identified gender issues and promote the inclusion of women and women's empowerment throughout the project. In FAIR's social inclusion strategy, women's participation in agriculture production and marketing and development of appropriate financial and leadership skills will be emphasized, including assisting women to take on and expand leadership positions within agricultural organizations and businesses. In addition, all monitoring and evaluation activities will include sex disaggregated indicators to measure project results for women and men.

Youth

One of the primary reasons for youth migration is a lack of economic opportunities. When interviewed, many youths in the Western Highlands reported that they are less interested in being farmers like their parents, but are more interested in the use of modern technology and methods in the agricultural sector. Youths also expressed interest in innovation and entrepreneurship. Some youths reported an interest in having opportunities to be agriculture extensionists in their communities where they know the culture and language. However, education in many communities of the Western Highlands is weak and the youth do not always have access to secondary and post-secondary school. This is especially acute for female youths who often do not complete as many years of school as males and have less opportunities for education and participation in income generating activities.

The youth have a strong potential to be innovative in participating in value chains and this should be harnessed in the FAIR project. There are opportunities to harness youths' entrepreneurial spirit and interest in technology and modern methods of agriculture to achieve the FAIR project results. FAIR's social inclusion strategy should include a strategy as to how to integrate youth into project activities in order to increase youth opportunities in value chains, as well as their ability to generate income and build resilience.

Indigenous and Other Marginalized Populations

Approximately forty percent of Guatemala's population self-identifies as indigenous. Social conditions for the indigenous population have been slow to improve. Income inequality remains high, and two-thirds of the indigenous rural population remains poor. As a result, Guatemala ranked near the bottom of an index measuring opportunity inequality in Latin America published by the World Bank in 2010. The inequality that exists between indigenous and non-indigenous populations in Guatemala manifests as limited access for indigenous peoples to health and educational services, jobs and markets, which contributes to higher levels of poverty, poorer health and nutrition statistics, and lower levels of education among indigenous populations compared to non-indigenous populations. Nationally, education and wage levels are low within the general population. USAID/Guatemala mandates supporting active participation of indigenous groups in the design and implementation of FAIR initiatives, as well as in policy-making processes.

Other marginalized groups which may be included in the social inclusion strategy are individuals with disabilities and/or lesbian, gay, bisexual, transgender, and intersex (LGBTI) individuals. At present, there is little research completed in the Western Highlands to gauge impacts of exclusion on these groups in the agriculture sector.

USAID is committed to achieving and maintaining a diverse and representative workplace free of discrimination. USAID prohibits discrimination in its own workplace on the basis of race, color, religion, sex (including pregnancy and gender identity), national origin, disability, veteran's status, sexual orientation, genetic information, marital status, parental status, political affiliation, and any other conduct that does not adversely affect the performance of the employee. We strongly encourage all Applicants to establish comprehensive nondiscrimination policies for their workplaces and take this into account when formulating a plan for submitting a proposal.

Sustainability

USAID/Guatemala identified three specific areas of emphasis to ensure sustainability of agriculture project goals: 1) work closely with the GOG to strengthen government plans and institutions; 2) increase market-led growth and household incomes; and 3) improve crop productivity and storage. The sustainability of all interventions related to agriculture, food security, and nutrition depend on the support and capacity of local institutions in the public and private sector as well as civil society. They in turn need to be linked effectively with policies, programs, and budget sources at the national level. USAID will help strengthen the producer associations' management and financial systems so that they become sustainable entities by project end. The project will engage local systems and institutions, producer organizations, and municipalities to ensure that the project follows the principle of inclusive development and improves the sustainability of the results beyond the life of the project.

Another key aspect of sustainability in the context of the FAIR project is the scalability of project activities and impacts. Scalability reflects how the project's approach can be scaled or replicated in a manner that would provide broader impacts at the local, regional, or national level. One opportunity for scalability is the application of agricultural research within the value chain to improve production, quality, technology, market opportunities, processing, etc. FAIR will develop a plan to scale-up the activities and impacts of the project and to ensure the sustainability of project results and investments in organizations and productive infrastructure.

Engagement of Key Stakeholders for Agricultural Development and Food Security

a. Private Sector

Private sector investment in the agriculture sector is critical for growth, increased employment, and expanded markets and is key to the success of this project. The project will leverage the private sector technical, managerial and financial support to invest in agriculture-related growth and opportunities. The Applicant will have a strategy to stimulate private sector investment in the agricultural sector and reduce risks for private sector investment in the target areas and will identify specific expected results from this strategy.

b. Government of Guatemala

GOG institutions and actors at the national and sub-national levels are important partners in agriculture development and food security in the Western Highlands. Partnerships with the GOG will build upon existing relationships between USAID and the Ministry of Agriculture and the Secretariat for Food and Nutrition Security, among others. It will be critical that close dialogue is maintained between USAID and appropriate GOG entities throughout the life of the project to ensure that there is sustained high-level commitment to public investment in agriculture and implementation of policies that reduce poverty and chronic malnutrition.

c. Local Government

Local coordination and support will be vital for the achievement of FAIR's purpose. Specifically, local governments (municipalities COMUDES, COCODES) hold significant potential to coordinate and deliver sustainable civil society engagement on issues related to local development. Public private investment can be honed for agriculture development. USAID has had positive experiences with local engagement of governments through PPPs to support agriculture development.

d. Other Donors

There are many multilateral and bilateral donors currently supporting various types of agriculture, health, nutrition, education, governance, climate change, biodiversity and sustainable natural resources projects in Guatemala. The project will coordinate work with

other donors in the Western Highlands to leverage complementary donor activities and maximize results.

e. Universities and Research Institutions

Universities and research institutions can be a key stakeholder to engage to achieve the objectives of FAIR. Application of current research on technology, markets, agriculture inputs, and innovative practices in agriculture production and processing could benefit small holder farmers through increased productivity, quality, and ability to access markets. Education, especially of youth, in agriculture extension allows them to access new job opportunities and bring back their knowledge to their community and region.

Coordination

USAID's definition of coordination and integration is found in Annex 7 of this Request for Application (RFA).

The Applicant will ensure close collaboration and coordination with other actors including: other USG agency-funded programs/projects; the Government of Guatemala; local and international universities and other training institutions; the technical ministries of the Government of Guatemala; NGOs and community groups; private firms and associations; and other donor partners and agencies. The Applicant will primarily need to coordinate activities with the USAID/Guatemala Economic Growth Office, as well as, the implementing partners of the Health and Education Office, and the Democracy and Governance Office.

As noted, USAID/Guatemala has embarked upon an ambitious program to reduce poverty and chronic malnutrition in selected municipalities of five Western Highlands departments (Quetzaltenango, Huehuetenango, San Marcos, Totonicapán and Quiché). Partners are expected to coordinate to achieve overall goals, and the project will actively participate in activities that spearhead integration through planning, implementation, and monitoring and evaluation. The resulting Recipient will actively participate in joint activities to achieve CDCS's aims and will coordinate with other USAID and U.S. Government-funded partners' approaches such as social and behavior change communications (SBCC), among others.

USAID implementing partners currently working in the Western Highlands include the following:

- Climate, Nature and Communities in Guatemala (Rainforest Alliance)
- USAID Leer y Aprender (Juarez Associates)
- Rural Value Chains Quetzaltenango, Totonicapán and Quiché (Guatemala Exporters Association-AGEXPORT)
- Rural Value Chains San Marcos and Huehuetenango (National Coffee Association-ANACAFE)

- Cooperative & Food Security Development in Guatemala (National Cooperative Business Association-NCBA/Cooperative League USA-CLUSA)
- MASFRIJOL – (Michigan State University)
- Buena Milpa (International Maize and Wheat Improvement Center)
- Monitoring and Evaluation Program (DevTech Systems Inc.)
- Food and Nutrition Technical Assistance III (FANTA-III) (FHI Development 360 LLC)
- PLANFAM (PSI)
- Community Nutrition and Health Care Project (University Research Corporation (LLC))
- Health and Education Policy Project (Futures Group)
- Food Security Focused on the First Thousand Days / Seguridad Alimentaria en los Primeros Mil Días – SEGAMIL (Catholic Relief Services)
- Western Highlands Program of Integrated Actions for Food Security and Nutrition/Programa de Acciones Integrales de Seguridad Alimentaria y Nutricional de Occidente (PAISANO) (Save the Children Federation, Inc.)
- Nexos Locales (Development Alternatives Inc.)
- Partnering for Innovation (Fintrac)
- Low Emission Development Strategy (Engility-IRG)
- MASRIEGO, California Davis University
- Global Food Security, Peace Corps
- Promoting Food Security and Trade Integration through SPS and Other Agriculture-Related Capacity Building, US Department of Agriculture
- Opportunities for my Community, Inter-American Dialogue
- Health Communication Capacity Collaborative (HC3), Johns Hopkins University
- Sustainable Improvement of Water Quality of the Population of Metrópoli de los Altos, Mancomunidad Metrópoli de los Altos

Social and Behavior Change Communication

USAID seeks to include SBCC/Social Marketing as a strategy to generate and enhance the generalized support needed for empowerment and sustainable change. USAID considers social and behavior change to be a product of multiple overlapping levels of influence, including individual, interpersonal, community, and organizational, as well as political and environmental factors. As such, social and behavior change communication is a best practice in development organizations; an essential basis for effective programming that deepens and expands the impact and sustainability of development programs. FAIR shall incorporate SBCC in project implementation and coordinate with other USAID/Guatemala SBCC efforts.

USAID defines SBCC as the systematic application of interactive, theory-based, and research-driven communication processes and strategies to create/enhance ‘tipping points’ and social support/mobilization for change at the levels of individual, community, and society (enabling environment). SBCC employs communications strategies in three areas of action: Interpersonal, Social Mobilization, and Advocacy.

High-quality SBCC is characterized by grounding in behavior change theory; use of a proven programmatic process; attention to both individual behaviors and interpersonal and social influences; and bi-directional, interactive communication.

SBCC is based on formative research among audiences to develop and distribute coordinated messages, materials, and activities through a range of different communication channels, including but not limited to traditional mass media and social media; community-level activities; interpersonal communication; and non-traditional media. (Refer to Annex 8 for general guidance and more information and Annex 9 for Audience Research Findings.)

Integrated Conflict-Sensitive Approach

USAID/Guatemala takes into account social conflict dynamics in all projects in order to support the overarching goal of a more secure Guatemala that fosters greater socio-economic development and sustainably manages its natural resources. Conflict sensitivity encourages organizations to understand and track the conflict dynamics in the contexts in which they are working. As these changes arise, organizations must adapt their projects to minimize their potential negative effects on conflict and build upon their positive effects. The application of conflict sensitivity usually does not require a major restructuring of a project or an explicit focus on peacebuilding; adjusting small project details can have significant impacts on FAIR's interaction with the conflict context.

In an effort to ensure interventions are conflict-sensitive, USAID/Guatemala requires that: a) they do not inadvertently create or exacerbate social conflict; b) they factor in the possible impact of existing or potential conflict on staff, implementing partners, and the activities themselves; and c) they seek appropriate opportunities to mitigate tensions and sources of conflict.

In an effort to ensure interventions are conflict-sensitive, projects' design and implementation must ensure that: a) they do not inadvertently create or exacerbate social conflict; b) they factor in the possible impact of existing or potential conflict on staff, implementing partners, beneficiaries, and the activities themselves, c) they seek appropriate opportunities to mitigate tensions and sources of conflict; and d) they support constructive collaboration between communities in conflict when possible. To better understand conflict dynamics in the Western Highlands, the recipient can refer to USAID/Guatemala's conflict vulnerability assessment titled Legacies of Exclusion: Social Conflict and Violence in Communities and Homes in Guatemala's Western Highlands (2015).³⁰

--End of Section A – PROGRAM DESCRIPTION --

³⁰ U.S. Agency for International Development. (October 2015). Legacies of Exclusion: Social Conflict and Violence in Communities and Homes in Guatemala's Western Highlands. Available: https://www.usaid.gov/sites/default/files/documents/1862/Guatemala_Conflict_Vulnerability_Assessment.pdf

SECTION B: FEDERAL AWARD INFORMATION

1. Estimate of Funds Available and Number of Awards Contemplated

Subject to funding availability, USAID intends to provide \$60 million in total USAID funding over a five (5) year period. The ceiling for this program is \$60 million. Actual funding amounts are subject to availability of funds.

USAID intends to award one or more Cooperative Agreements pursuant to this notice of funding opportunity.

USAID reserves the right to fund any or none of the applications submitted.

2. Start Date and Period of Performance for Federal Awards

The period of performance anticipated herein is five (5) years. The estimated start date will be upon the signature of the award.

3. Substantial Involvement

USAID/Guatemala will be substantially involved with the Recipient(s) during the performance of the Cooperative Agreement to ensure that implementation proceeds as planned and is consistent with the Mission's Strategic Objectives. To help the Recipient(s) achieve the agreement objectives, USAID will be substantially involved in the following manner:

- a. The Agreement Officer's Representative (AOR) will review and approve the annual work plans.
- b. The AOR will review and approve the monitoring and evaluation plan, including the Performance Monitoring Plan.
- c. The Agreements Officer will approve key personnel.
- d. Agency and Recipient Collaboration or Joint Participation:
 1. The Rapid Response Fund Activities require AOR concurrence, in accordance with the requirements contained in the approved Rapid Response Fund Manual;
 2. The AOR will review and approve the Monitoring and Evaluation Plan;
 3. The AOR will be substantially involved in establishing selection factors and must provide technical concurrence of all sub-grant recipients. The AOR is hereby delegated the authority to approve sub-grants below the federal government's Simplified acquisition Threshold (SAT) which is currently \$150,000. However, the Agreement Officer must approve the sub-awards above the SAT.
 4. In accordance with 2 Code of Federal Regulations (CFR) 200.308, the Agreement Officer will approve any sub-award above the simplified acquisition threshold (sub awards identified in the application do not require additional USAID approval);
 5. The AOR will review the communication materials produced by the project and provide approval at key points of concept, design, development and reproduction.

6. Agreement Officer approval is required for the Grants Manual, for the Rapid Response Fund Manual and for all sub awards above the SAT.
 7. The AOR may provide direction or redirection because of interrelationships with other U.S. government projects, USAID/Guatemala programs and offices, and U.S. government agencies.
 8. The Agreement Officer will provide approval to any construction activities for small-scale infrastructure (including specifications and materials) once they are identified.
- e. Agency Authority to Immediately Halt a Construction
 - f. Activity: The Agreement Officer may immediately halt a construction activity if identified specifications are not met.

4. Title to Property

Property title under the resultant agreement shall vest with the recipient in accordance with the Requirements of Standard Provision entitled “Title to and Use of Property” because 2 CFR 200 applies to U.S. Orgs and the Mandatory SP for Non U.S. Orgs would apply to the resulting award regarding use, accountability, and disposition of such property.

5. Authorized Geographic Code

The geographic code for procurement of goods and services for this program is 937.

6. Purpose of the Award

The principal purpose of the relationship with the Recipient and under the subject program is to transfer funds to accomplish a public purpose of support or stimulation of the FAIR Project which is authorized by Federal statute. The successful Recipient will be responsible for ensuring the achievement of the program objectives and the efficient and effective administration of the award through the application of sound management practices. The Recipient will assume responsibility for administering Federal funds in a manner consistent with underlying agreements, program objectives, and the terms and conditions of the Federal award. The Recipient using its own unique combination of staff, facilities, and experience, has the primary responsibility for employing whatever form of sound organization and management techniques may be necessary in order to assure proper and efficient administration of the resulting award.

END OF SECTION B - FEDERAL AWARD INFORMATION

SECTION C: ELIGIBILITY INFORMATION

1. Eligible Applicants

Only local organizations may participate as the primary recipient of this RFA. According to ADS 303.3.6.5 (b) (2) Other Exceptions to Restrict Eligibility allows Washington Bureaus and Missions to restrict eligibility to local or regional (indigenous) entities, when the local or regional entities meet the following definition in the Automated Directives System (ADS):

"For purposes of consistency and reporting, the definition of "local entity" means an individual, a Corporation, a nonprofit organization, or another body of persons that: (1) Is legally organized under the laws of; (2) Has as its principal place of business or operations in; (3) Is majority owned by individuals who are citizens or lawful permanent residents of; and (4) Is managed by a governing body the majority of who are citizens or lawful permanent residents of the country receiving assistance.

For purposes of this section, 'majority owned' and 'managed by' include, without limitation, beneficiary interests and the power, either directly or indirectly, whether exercised or exercisable, to control the election, appointment, or tenure of the organization's managers or a majority of the organization's governing body by any means."

Both U.S. and non-U.S. organizations may be sub-recipients of the award under a local primary recipient. The local primary recipient must receive at least 60% of the project funds, sub-recipients may receive up to 40% of the project funds. USAID welcomes applications from organizations which have not previously received financial assistance from USAID.

Applicants must have established financial management, monitoring and evaluation processes, internal control systems, and policies and procedures that comply with established U.S. Government standards, laws, and regulations. The successful Applicant will be subject to a Pre-Award Risk Assessment by the Agreement Officer (AO).

The Recipient must be a responsible entity. The AO may determine a pre-award survey is required to conduct an examination that will determine whether the prospective recipient has the necessary organization, experience, accounting and operational controls, and technical skills – or ability to obtain them – in order to achieve the objectives of the program and comply with the terms and conditions of the award.

For-profit Applicants must note that USAID policy prohibits the payment of fee/profit for recipients under assistance instruments. Forgone profit does not qualify as cost-share or leverage.

2. Cost Sharing and Leverage

USAID has established a suggested cost share of 15% for the recipient of the award. Such funds may be mobilized from the recipient; other multilateral, bilateral, and foundation donors; host governments; and local organizations, communities and private businesses that contribute

financially and in-kind to implementation of activities at the country level. For guidance on cost sharing in grants and cooperative agreements refer to ADS 303 and 2 CFR 200.306.

Applicants should treat USAID/Guatemala funding as an incentive to leverage funds from alliance and private sector partners which in combination can be used to build the foundation for sustained rural economic growth. As mentioned in IR 2.1, 10% of FAIR funds will be used to leverage funds from the private sector to develop public private partnerships and mechanisms in which to foment agricultural growth and small agribusiness development across the value chain. Leverage, defined as financial and in-kind contributions/investments which enable the achievement of substantial results, could include resources from joint ventures and commercial partnerships among others. However, it should not include sales, sales contracts, or purchase agreements. Within these parameters, Applicants are expected to quantify the leverage which will be provided in terms of cash and in-kind contributions.

3. Number of Applications

USAID reserves its right to make a single or multiple awards as a result of this Request for Application. Depending on the content of the selected application(s), the range of each individual award will vary but the total of all awards will likely be no more than \$60.0 million.

An Applicant may submit only one application per organization; no individual investigator/program director application will be accepted.

4. Partner Vetting Pre-Award Requirements

In the event that the Pilot Partner's Vetting Program continues to apply to Guatemala, the following will apply:

- (a) USAID has determined that any award resulting from this assistance solicitation is subject to vetting. An Applicant that has not passed vetting is ineligible for award.
- (b) The following are the vetting procedures for this solicitation:
 - (1) Prospective Applicants review the USAID Partner Information Form, USAID form 500-13 is being attached to this RFA as Attachment 1. Submit any questions about the USAID Partner Information Form or these procedures to the agreement officer by the deadline in the solicitation.
 - (2) The agreement officer notifies the Applicant when to submit the USAID Partner Information Form. For this solicitation, USAID will vet the apparently successful Applicant. Within the timeframe set by the agreement officer in the notification, the Applicant must complete and submit the USAID Partner Information Form to the vetting official.
 - (3) The Applicants must notify proposed sub-recipients and subcontractors of this requirement when the sub-recipients or subcontractors are subject to vetting. Note: Applicants who submit the required information using non-secure methods of transmission do so at their own risk.

(c) Selection proceeds separately from vetting. Vetting is conducted independently from any discussions the agreement officer may have with an Applicant. The Applicant and any proposed sub-recipient or contractor subject to vetting must not provide vetting information to anyone other than the vetting official. The Applicant and any proposed sub-recipient or contractor subject to vetting will communicate only with the vetting official regarding their vetting submission(s) and not with any other USAID or USG personnel, including the agreement officer or the agreement officer's representatives. The agreement officer designates the vetting official as the only individual authorized to clarify the Applicant's and proposed sub-recipient's and contractor's vetting information.

(d)(1) The vetting official notifies the Applicant that it: (i) Is eligible based on the vetting results, (ii) is ineligible based on the vetting results, or (iii) must provide additional information, and resubmit the USAID Partner Information Form with the additional information within the number of days the vetting official specified in the notification.

(2) The vetting official will coordinate with the agency that provided the data being used for vetting prior to notifying the Applicant or releasing any information. In any determination for release of information, the classification and sensitivity of the information, the need to protect sources and methods, and the status of ongoing law enforcement and intelligence community investigations or operations will be taken into consideration.

(e) Reconsideration: (1) Within 7 calendar days after the date of the vetting official's notification, an Applicant that vetting has determined to be ineligible may request in writing to the vetting official that the Agency reconsider the vetting determination. The request should include any written explanation, legal documentation and any other relevant written material for reconsideration.

(2) Within 7 calendar days after the vetting official receives the request for reconsideration, the Agency will determine whether the Applicant's additional information merits a revised decision.

(3) The Agency's determination of whether reconsideration is warranted is final.

(f) Revisions to vetting information: (1) Applicants who change key individuals, whether the Applicant has previously been determined eligible or not, must submit a revised USAID Partner Information Form to the vetting official. This includes changes to key personnel resulting from revisions to the technical portion of the application.

(2) The vetting official will follow the vetting process of this provision for any revision of the Applicant's Form.

(g) Award. At the time of award, the agreement officer will confirm with the vetting official that the apparently successful Applicant is eligible after vetting. The agreement officer may award only to an apparently successful Applicant that is eligible after vetting.

END OF SECTION C - ELIGIBILITY INFORMATION

SECTION D: APPLICATION AND SUBMISSION INFORMATION

1. Point of Contact

Mrs. Patricia Sigui
Acquisition and Assistance Specialist
USAID/Guatemala
guatemalaproposals@usaid.gov

All questions regarding this Notice of Funding Opportunity (NOFO) should be submitted in writing to the e-mail address above not later than the time indicated on the cover letter. Any information given to a prospective Applicant concerning this NOFO will be furnished promptly to all other prospective Applicants as an amendment to this NOFO, if that information is necessary in submitting applications or if the lack of it would be prejudicial to any other prospective Applicant.

2. Content and Form of Application Submission

Applicants shall furnish the information required by this NOFO. Applications shall be submitted in two separate parts: (a) Technical Application and (b) Cost/Business Application. Applicants are expected to review, understand, and comply with all aspects of the NOFO. Any erasures or other changes to the application must be initiated by the person signing the application. Applications signed by an agent on behalf of the Applicant shall be accompanied by evidence of that agent's authority, unless that evidence has been previously furnished to the issuing office.

Applicants who include data that they do not want disclosed to the public for any purpose or used by the U.S. Government except for evaluation purpose, should mark the title page with the following legend:

“This application includes data that shall not be disclosed outside the U.S. Government and shall not be duplicated, used, or disclosed – in whole or in part – for any purpose other than to evaluate this application. If, however, a grant is awarded to this Applicant as a result of – or in connection with – the submission of this data, the U.S. Government shall have the right to duplicate, use, or disclose the data to the extent provided in the resulting grant. This restriction does not limit the U.S. Government's right to use information contained in this data if it is obtained from another source without restriction. The data subject to this restriction are contained in sheets {insert sheet numbers} and, mark each sheet of data it wished to restrict with the following legend:

Use or disclosure of data contained on this sheet is subject to the restriction on the title page of this application.”

Applicants should retain for their records one (1) copy of the application and all enclosures which accompany it.

3. Application Submission Procedures

Applications must be submitted BOTH electronic and hard copy format (original and three copies). Applications are due to USAID/Guatemala by the date included in the cover page of this NOFO. It is the Applicant's responsibility to ensure that all necessary documentation is complete and received on time.

Submission of Hard Copy Applications: Hard copy applications must be submitted to the following address:

Patricia Sigui
USAID/Guatemala
Office of Acquisition & Assistance (OAA)
Km 6.5 Final Blvd. Los Próceres
Santa Catarina Pinula, Guatemala

Hard copies should be clearly marked with “**RFA-520-17-000001**”. Hard copies shall be submitted in sealed envelopes or packages and indicate whether the contents contain technical or cost application noted on the outside of the envelopes/packages.

The hard copy technical application shall consist of **one (1) original and three (3) copies**. The cost or business application shall consist of **one (1) original and one (1) copy**.

Submission of Electronic Applications: Electronic applications should be submitted to the following address: guatemalaproposals@usaid.gov .

Applicants may upload applications to <http://www.grants.gov> . USAID bears no responsibility for data errors resulting from transmission or conversion processes associated with electronic submissions.

Electronic applications should be submitted in .pdf format. In addition, applications are required to send their budgets in Microsoft Excel format.

For an application sent by multiple emails, please indicate in the subject line of the email whether the email relates to the technical or cost application, and the desired sequence of multiple emails (if more than one is sent) and of attachments (e.g. "No. 1 of 4", etc.). For example, if your cost application is being sent in two emails, the first email should have a subject line which says: "RFA-520-17-000001, [organization name], Cost Application, Part 1 of 2". Each email should not exceed 20 MB.

Our preference is that the technical application and the cost application be submitted as single email attachments, e.g. that you consolidate the various parts of a technical application into a single document before sending them. If this is not possible, please provide instructions on how to collate the attachments. USAID will not be responsible for errors in compiling electronic applications if no instructions are provided or are unclear. All applications received by the submission deadline will be reviewed for responsiveness to the NOFO and the application format. No addition or modifications will be accepted after the submission date.

After you have sent your applications electronically, immediately check your own email to confirm that the attachments you intended to send were indeed sent. If you discover an error in your transmission, please send the material again and note in the subject line of the email or indicate in the file name if submitted via www.grants.gov that it is a "corrected" submission. Do not send the same email more than once unless there has been a change, and if so, please note that it is a "corrected" email.

4. Technical Application Format

Technical applications must describe an implementation plan and programming approach that achieves the results stated in this RFA and demonstrate the Applicant's capabilities and expertise with respect to achieving the goals of this project. Technical applications must take into account requirements of the project and evaluation criteria found in this RFA. The Technical Application is the most important factor for consideration for the resulting Cooperative Agreement.

Application must be written in English and typed on standard 8 1/2" x 11" paper, single spaced, Times New Roman size 12 font, one inch margins on all sides. The hard copy must be printed double-sided. The Technical application must **not exceed 30 pages**, excluding cover page, acronyms list, table of contents and annexes. The annexes must not exceed a total of 40 additional pages. An application that exceeds this page limit will only be evaluated through page 30 (plus annexes) and the remaining pages will not be evaluated.

A page in the technical application that contains a table, chart, graph, etc., not otherwise excluded below, is subject to the 30 page limitation. Not included in this page limitation are the following: Table of Contents; Dividers; Appendix attachments which contain biographical information (i.e., resumes (CVs) and other supporting documentation provided by the Applicant) for proposed candidates; and Charts, such as Management Structure Organizational Chart(s). All critical information from appendices should be summarized in the technical application.

The application must be organized as follows:

- I. Executive Summary**
- II. Technical Approach**
- III. Management and Staffing Strategy**

IV. Implementation Work Plan and Schedule

V. Annexes

The application should include the following sections and information:

I. Executive Summary

The Executive Summary will summarize the technical approach, the qualifications and experience of key personnel, the management approach, and relevant past performance. This summary is part of the 30 page limit.

II. Technical Approach

At a minimum, the Applicant must describe its capability and approach to achieve the project results to increase incomes from agriculture and improve resilience of rural communities including strengthening management capacity of agribusiness organizations. The Applicant must show a clear link how achieving the results of increased income and resilience will lead to reductions in poverty and contribute to USAID/Guatemala's broader strategy to reduce chronic malnutrition for target rural households. The Applicant will describe a clear, effective, and innovative approach to achieve the project objective. The approach will incorporate the cross-cutting principles discussed in Section A.

- a. The Applicant shall clearly describe the context in which the project will be implemented and demonstrate an understanding of the challenges, needs, and opportunities related to implementing the project as described in **Section A**.
- b. The Applicant must provide a clear conceptual framework, theory of change underpinning the proposed approach, and rationale to achieve the project objective and results.
- c. The Applicant will propose targets, quantified, to be achieved based on the cost of the program and the Expected Results and Indicators in this RFA.
- d. The Applicant will also describe the following:
 - o Geographic area in which the Applicant intends to work and rationale
 - o How the Applicant will identify and work with target beneficiaries of small farmers and producer organizations
 - o How the Applicant will work with beneficiaries, civil society, the GOG, the private sector, academia, and any other stakeholders, including in any partnerships, to:
 - Improve agricultural productivity and diversify income generation

- alternatives;
 - Expand access to markets;
 - Increase resilience through implementation of climate-smart and nutrition sensitive agriculture; and
 - Strengthen the agriculture and food security enabling environment.
 - How the Applicant will encourage the participation of a broad-base of community members, including women, indigenous persons, youth, those who work in informal economies, and other traditionally marginalized groups
 - How the activities and results can be replicated and scaled-up to increase impacts over the life of the project and beyond
 - How construction will be implemented including a description of the amount that they anticipate investing, with project funds, for this type of activities and how the project will utilize these funds to leverage funds from private and public sector.
 - Methods for promoting and mechanisms for leveraging private and public sector investment in the agriculture sector
- e. Applicants should clearly and explicitly address the cross-cutting principles of social inclusion, sustainability, engagement of key stakeholders, social and behavior change communication and integrated conflict/sensitive approach.

III. Management and Staffing Strategy

USAID expects that the Applicant will maintain open, timely and effective communications with USAID, resulting in an implementation partnership that proactively addresses potential problems with flexible, workable solutions.

The Applicant should be sensitive to the need for cultural and ethnic awareness and appreciation in its skill mix when proposing personnel. The Applicant shall provide a biographical sketch and position description for the proposed staff. The biographical sketch and position description, combined, must not exceed one page for each proposed professional staff. The position descriptions shall reflect a clear understanding of the technical skills necessary to achieve the results specified in the Application. Resumes/curriculum vitae may not exceed two pages in length per individual; this information should be included as an attachment to the technical application.

If the Applicant proposes a partnership, a series of partnerships or a consortium of local and/or international partners, a signed letter agreeing to the relationship shall be submitted as annex to the Technical Application. Additionally, Guatemalan Non-Governmental organizations, must submit a written evidence of the partner's legal registration as a Guatemalan non-governmental organization (NGO).

If the Applicant intends to develop broad institutional partnerships, alliances, sub-contracts, or sub-agreements as part of implementing the Agreement Program Description, the application should clearly identify and describe the roles and responsibilities of each entity. The Applicant must discuss the nature of organizational linkages between the prime awardee and any sub-contractor, partner, and joint venture entity. This will include a discussion of roles and responsibilities, relationships, lines of authority and accountability and mechanisms for utilizing and sharing resources to achieve results.

The Applicant will submit a high quality management strategy that highlights the Applicant's management plan and staffing/recruitment. The following elements will be considered:

- Extent to which the Applicant, and the Applicant's selection and proposed use of implementing partners, demonstrates that the proposed organizational and operational structure and staffing incorporates the mix of requisite skills and relevant experience to achieve project results;
- The clarity and strength of the staffing and organization plan to achieve results, including specific arrangements for interacting with agribusiness enterprises, farmer associations and cooperatives, small and medium service enterprises, private sector, NGOs, the GOG and other donors.

Management Plan – The Applicant shall explain the proposed management structure, providing a clear description of the roles and responsibilities of staff, an organizational chart, and the approach and timeframe for mobilization. The proposed management structure should emphasize synergies and complementarities among the project's components and describe the roles and responsibilities of proposed sub-contractors/sub-grantees.

Staffing Plan – The Applicant shall provide a staffing plan, identifying proposed individuals to fill key personnel positions, their qualifications, the stages of the project at which they will be expected to be working, and what they are expected to contribute. The same information should be provided for other proposed staff.

Note: On qualification and experience of proposed personnel, the Applicant is required to present resumes for proposed staff and ensure that the proposed personnel will in fact be available to staff the project should the Applicant be selected for award. Failure to provide such assurances and letters of commitment may disqualify the Applicant from being considered for award. Failure of the Applicant selected for award to provide the proposed personnel may result in disqualifying the winner from receiving an award.

USAID reserves the right to request the apparent winner(s) to make their proposed key personnel candidates and other representatives available for interviews and oral discussions in Guatemala City. Interviews may be by phone since USAID will not pay for costs associated with these interviews.

The Applicant shall propose an appropriate mix of local talent and expertise to implement the Cooperative Agreement and utilize non-Guatemalan expertise only when skills or experience in specific project areas are lacking in Guatemala.

Key Personnel - The Applicant shall discuss appropriateness of academic backgrounds of the proposed key personnel, their work experience related to the RFA components and experience in the national or international arenas. Specific requirements to be taken into consideration for key staff include:

Chief of Party

The Chief of Party must have no less than eight years of experience in a managerial position in Guatemala or in Latin America, with five years of experience in the agricultural sector. Especially pertinent experience includes work in value chain competitiveness, agribusiness management and private sector development. S/he must have a B.A. in Business Administration, Marketing, Agriculture, or related fields, although a master's degree in agriculture is desired. S/he should also have demonstrated experience as a manager management of large interdisciplinary teams. The Chief of Party must demonstrate skills on problem solving, collaboration, creativity and willingness to innovate, management skills and history of productive involvement with a wide range and levels of organizations (government, private sector, NGOs, research institutions). S/he must be proficient in Spanish and English.

Rural Development Specialist

The Rural Development Specialist must have no less than five years of experience in the agriculture sector. A B.A. in Agriculture, Rural Development, or related field is required. S/he should have demonstrated technical expertise, ample field of experience and relevant technical background in rural development and agriculture. The Rural Development Specialist must demonstrate the ability to rapidly develop and consolidate excellent and independent relationships with private sector and other technical partners. S/he must be proficient in English and Spanish.

Monitoring and Evaluation Specialist

The Monitoring and Evaluation Specialist must have a minimum of five years working in similar activities. S/he must have demonstrated abilities and experience in monitoring and evaluation analysis and reporting with international organizations. A university degree is required. S/he must possess excellent written and speaking English and Spanish skills.

Financial Manager/Administrator

The Financial Manager/Administrator must have demonstrated ability in budget formulation and financial reporting, according to USG and USAID regulations and Guatemalan law. High level technical skills in staff, office and program management, budget management, operational

planning and financial performance reporting are key elements for this position. Must have no less than five years of experience in management of projects with international organizations. A B.A. (or equivalent) is required.

Policy Specialist

The Policy Specialist must have demonstrated experience in working with senior government officials and private sector to support a program's objectives. Relevant technical background and working experience in the areas of agriculture and rural development. Capacity to facilitate coordination amongst diverse sectors is required. Full professional proficiency in Spanish and English. A B.A. in Public Policy is required.

IV. Implementation Work Plan and Schedule

The application must provide a draft annual work plan for the first year, including a detailed Implementation Schedule for achieving expected project results. The Applicant is encouraged to propose innovative implementation mechanisms to reach the desired results and an aggressive but realistic schedule of performance milestones as steps toward achieving proposed results. The implementation plan should clearly outline links between the proposed results, conceptual approach, and performance milestones, and should include a realistic timeline for achieving the quarterly, annual, and end-of-project results.

V. Annexes

The Applicant must provide the following in the Annex:

- a. Results Framework and Logical Framework
- b. Draft Monitoring and Evaluation Plan (MEP)

The Applicant will submit an illustrative MEP. This includes a draft Performance and Monitoring Plan that includes required indicators and any proposed indicators to objectively measure progress towards achieving each of the results. This includes annual and anticipated life-of-project targets for these indicators and a strategy for monitoring these indicators during implementation. The Applicant should provide ambitious, realistic targets for the project.

The Applicant must also address the data collection process to ensure that quality data is collected and available to inform management decisions. The key criteria for assessing the quality of performance data is: validity, reliability, timeliness, precision, and integrity. The Applicant must be familiar with the standard indicators that USAID is obliged to measure for various agency frameworks, such as the FTF, Global Climate Change. The links are hereby provided: <https://feedthefuture.gov/resource/feed-future-handbook-indicator-definitions> and <https://www.climatelinks.org/resources/gcc-standard-indicator-handbook>.

Since the MEP must monitor selected indicators on an ongoing basis, the – Adaptation, and

Foreign Assistance Standard Indicators.

Applicant will be expected to select those indicators that best relate to outputs and outcomes. With the MEP, the Applicant shall provide: (a) criteria to determine at what level of investment or coverage a baseline and end-line survey will be established to measure results in a quantifiable manner; and (b) criteria to measure impact through qualitative research.

c. Branding Implementation (BIP) and Marking Plans (MP)

The BIP and MP shall be requested only to the apparent winner as part of the Applicant's response to the revised application. Visual examples of markings must be provided and may be included as an annex to the Marking Plan. The MP is also the vehicle for the Applicant to request exceptions, if necessary, to the marking requirement. The Applicant shall define in the proposed MP when the exceptions should apply and when the USAID Identity will be used. USAID requests that the Applicant prepare a list of examples of how the activities and materials will likely be acknowledged. Please include illustrations of the proposed brand. The Applicant may propose a project name as part of the Marking Plan. The name must be appropriate in both English and Spanish. Acronyms that read as words are discouraged.

The Applicant is responsible for including branding and marking requirements for grants in its BIP and MP (see Attachment 2), as part of its overall responsibility for managing grants under its award.

d. Institutional Capacity and Past Performance

The Applicant must include demonstrated recent, relevant technical and field experience and quality of performance in programs or projects of similar technical content and scope in developing countries, including a description of experience and representative accomplishments of the organization in conducting activities of the type required under this RFA.

The Applicant information on past performance must be provided in accordance with the table below. USAID may use performance information obtained from other than the sources identified by the Applicant/subcontractor. USAID will utilize existing databases of contractor performance information and solicit additional information from the references provided herein and contact the individual(s) indicated as well as others.

Program Description Summary	Primary location of work	Term of performance	Dollar Value	Award Type & Number	Organization/Contracting Entity/Technical Officer	e-mail address and Tel.

NOTE: USAID relies on the prime organization's review of partner/subcontractor institutions. However, if deemed necessary to ensure prudent use of USG funds, USAID may conduct its own past performance review of proposed partners/subcontractor institutions. In cases where the Applicant lacks relevant performance history and information on performance is not available

then the Applicant will not be evaluated favorably or unfavorably on performance. USAID reserves the right to contact references other than the ones provided by the Applicant in its application and use this information in the pre-award risk assessment.

e. Social Inclusion Strategy

The Social Inclusion Strategy will provide a plan of action through which to increase participation of and opportunities for vulnerable and marginalized groups identified in the cross-cutting principles in Section A. The effectiveness of this strategy is key to the success of the project and its objectives. As applicable, the social inclusion strategy may reference the integrated conflict-sensitive approach.

f. Coordination Plan

The coordination plan details how the Applicant will engage with other USAID programs, other donors and programs, and key stakeholders in order to strengthen the results and impact of the project. See Annex 7 for discussion of principles of coordination and integration.

g. Sustainability Plan

The Sustainability Plan will discuss how FAIR will ensure the sustainability of project results and investments in organizations and productive infrastructure after the life of the project.

h. Security Plan

Since this Project is expected to be implemented in high-risk regions, the proposal must include a section outlining the Offeror's security plan in accordance with the operational security supplement to ADS 303 which indicates that "when implementing any USAID award, the implementing partner bears the ultimate responsibility for ensuring adequate steps are taken to safeguard the security and safety of its personnel and any USAID funded equipment/property/vehicles." (See Attachment 3) The supplement also states that to achieve an adequate level of security, USAID implementing partners must see security as a top priority. It must be an integral component of project design and project management.

i. Resumes/Curriculum Vitae

The Applicant will provide the resumes/CV of Key Personnel, the position description for proposed technical and administrative staff managing the project (no more than 1 page per position), letters of commitment for key personnel, and English Fluency information for key personnel (non-native English speakers)

j. Project Organizational Chart (1 page).

5. Cost Application Format

The Cost/Business Application must be submitted separately from the Technical Application. Certain documents are required to be submitted by an Applicant in order for the Agreement Officer to make a determination of responsibility.

The Cost/Business application must contain the following sections:

- a) Cover page
- b) Signed SF 424 Forms
- c) Budget
- d) Budget Narrative
- e) Dun and Bradstreet and SAM.gov Registration
- f) Funding Restrictions
- g) Certifications, Assurances and Other Statements of the Applicant
- h) Additional Requirements

The following sections describe the documentation that Applicants for Assistance award must submit to USAID prior to award. While there is no page limit for this portion, Applicants are encouraged to be as concise as possible, but still provide the necessary detail to address the following:

- a. **Cover Page:** The Cost/Business Application cover page must contain the same information as the Technical application Cover Page.
- b. **SF 424 Forms:** The Applicant shall submit the application using the SF-424 series:
 - SF-424 Application for Federal Assistance
http://apply07.grants.gov/apply/forms/sample/SF424_2_1-V2.1.pdf
Instructions: <http://www.grants.gov/web/grants/form-instructions/sf-424-instructions.html>
 - SF-424A Budget Information – Non-construction Programs
<http://apply07.grants.gov/apply/forms/sample/SF424A-V1.0.pdf>
Instructions: <http://www.grants.gov/web/grants/form-instructions/sf-424a-instructions.html>
 - SF-424B Assurances – Non-construction Programs
<http://apply07.grants.gov/apply/forms/sample/SF424B-V1.1.pdf>
Instructions: <http://www.grants.gov/web/grants/form-instructions/sf-424b-instructions.html>

- c. **Budget:** The electronic copy of the Budget must be submitted as an unprotected Excel file (MS Office 2000 or later versions) with visible formulas and references and shall be broken out by project year. .

The budget must include a breakdown of all costs associated with the program according to the costs of, if applicable, headquarters, regional and/or country offices.

Individual subcontractors/sub-awardees must include the same cost element breakdowns in their budgets as applicable.

Pursuant to 2 CFR 200 Contract means a legal instrument by which the Applicant purchases property or services needed to carry out the project or program under a resulting award. The term does not include a legal instrument when the substance of the transaction meets the definition of a Federal award or sub-award (see § 200.92 Sub-award), even if the Applicant considers it a contract. The Applicant must describe the work to be performed, the risk borne by the contractor, the contractor's investment, the amount of subcontracting proposed by the contractor, and the quality of its record of past performance for similar work. For-profit contract organizations that work under the award and do not meet the above definition of a sub-awardee are eligible for profit/fee.

The budget should include costs to ensure an appropriate coordination, collaboration and information sharing with other USAID, U.S. Government Agencies, other international donors, the GOG, including municipal governments and private sector stakeholders and civil society organizations.

Applicants must submit a summary and a detailed budget as follows:

Summary Budget						
Cost Elements	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1. Salaries and Wages						
2. Fringe Benefits						
3. Consultants						
4. Travel, Transportation, and Per Diem						
5. Equipment and Supplies						
6. Sub-contracts						
7. Sub-grants						
8. Rapid Response Fund	\$500K	\$500K	\$500K	\$500K	\$500K	\$2.5 M
9. Other Direct Costs						
10. Construction						
11. Indirect Costs						
Estimated Cost (sum 1 to 11)						
12. Cost Share						
TOTAL AWARD BUDGET						

Note: Individual sub-awards proposed as part of application must include the same cost element breakdowns in their budget as applicable

Illustrative description of the cost elements are provided below:

1. Salary and Wages – must be proposed in accordance with the Applicant’s personnel policies and must include as much as possible information about the personnel’s name, position, salary rate, level of effort and salary escalation factors. Explain assumptions in the Budget Narrative.
2. Fringe Benefits – If the Applicant has a fringe benefit rate approved by an agency of the U.S. Government, the Applicant must use such rate and provide evidence of its approval. If an Applicant does not have a fringe benefit rate approved, the application must propose a rate and explain how the Applicant determined the rate; in this case, the narrative must include a detailed breakdown comprised of all items of fringe benefits (e.g., unemployment insurance, workers compensation, health and life insurance, retirement, FICA, etc.) and the costs of each, expressed in U.S. dollars and as a percentage of salaries.
3. Consultants – If Applicant proposes for short-term expert services rendered by persons who are members of a particular profession or possess a special skill and who are not officers or employees of the Awardee/Recipient. Costs of consultants must be broken down by person months or days.
4. Travel, Transportation and Per Diem – The Applicant must indicate the number of trips, domestic and international, estimated as necessary to carry out the proposed activities, and their estimated costs. Applicants must specify the origin and destination for each proposed trip, the duration of travel, and number of individuals who would be traveling. Per Diem must be based on the Applicant’s normal and current travel policies that do not exceed the published U.S. Government per diem rates for the localities concerned.
5. Equipment and Supplies – must include information on estimated types of equipment, models, supplies, and the cost per unit and quantity. The Budget Narrative must include the purpose of the equipment and supplies and the basis for the estimates.
6. Sub-Contracts – Any goods and services being procured through a sub contract mechanism.
7. Sub-grants – The Applicant should identify the activities to be implemented through sub grants. The Applicant shall describe its approach to, and how it will manage, the competition and award of sub-awards in line with USAID best practices and the Guatemalan context.
8. Rapid Response Fund (RRF) – Per instructions in Section F.6 the Applicant is required to reserve \$500K annually or \$2.5 million during the period of performance of the Cooperative Agreement for implementation of the RRF mechanism.

9. Other Direct Costs – Applicants must detail any other direct costs, including the costs of communications, report preparation, passport issuance, visas, medical exams and inoculations, insurance (other than insurance included in the Applicant’s fringe benefits), equipment, office rent, communication component, etc.
10. Construction– Construction is anticipated under this NOFO. Per Mandatory Reference for ADS 303 entitled “USAID Implementation of Construction Activities”, the construction activities under this project are only a portion of all award activities and :1) The estimated cost of construction activities at a single project site is less than \$500,000; and 2) The aggregate estimated cost of construction activities under the resulting award is less than \$10,000,000.
11. Indirect Costs – The Applicant must support the proposed indirect cost rate with a letter from a cognizant, U.S. Government audit agency, a Negotiated Indirect Cost Agreement (NICRA). The Budget Narrative should clearly explain the base and the calculation for the indirect costs.

If no NICRA the Applicant should submit the following:

Reviewed Financial Statements Report: a report issued by a Certified Public Account (CPA) documenting the review of the financial statements was performed in accordance with Statements on Standards for Accounting and Review Services; that management is responsible for the preparation and fair presentation of the financial statements in accordance with the applicable financial reporting framework and for designing, implementing and maintaining internal control relevant to the preparation. The account must also state the he or she is not aware of any material modifications that should be made to the financial statements; or

Audited Financial Statements Report: An auditor issues a report documenting the audit was conducted in accordance with Generally Accepted Auditing Standards (GAAS), the financial statements are the responsibility of management, provides an opinion that the financial statements present fairly in all material respects the financial position of the company and the results of operations are in conformity with the applicable financial reporting framework (or issues a qualified opinion if the financial statements are not in conformity with the applicable financial reporting framework).

If the apparently successful Applicant has never received a negotiated indirect cost rate, the apparently successful Applicant may choose to charge the administrative/management costs as direct costs or to charge a de minimis rate of 10% of modified total direct costs (see 2 CFR 200.414(f)). If the prospective Applicant chooses the de minimis rate, the AO must incorporate the 10% indirect cost rate in the award budget and the Recipient must follow the requirements in 2 CFR 200.414(f).

12. Cost Share – USAID has established a suggested cost share of 15% of the Award’s projected value for the recipient of the award. Cost sharing must be verifiable from the recipient’s records, is subject to the requirements of Standard Provision entitled “Cost Share” and can be audited.

d. Budget Narrative:

The budget must have an accompanying detailed budget narrative and justification that provides in detail the total program amount for implementation of the program your organization is proposing. The budget narrative should provide information regarding the basis of estimate for each line item, including reference to sources used to substantiate the cost estimate (e.g. organization's policy, payroll document, and vendor quotes, etc.).

The budget narrative should be organized using the same structure of the budget.

e. Dun and Bradstreet and SAM.gov Registration

USAID may not award to an Applicant until the Applicant has complied with all applicable unique entity identifier and SAM requirements. Each Applicant is required to:

1. Be registered in SAM before submitting its Application. SAM is streamlining processes, eliminating the need to enter the same data multiple times, and consolidating hosting to make the process of doing business with the government more efficient;
2. Provide a valid unique entity identifier in its application; and
3. Continue to maintain an active SAM registration with current information at all times during which it has an active Federal award or an application or plan under consideration by a Federal awarding agency.

f. Funding Restrictions

USAID policy is not to award profit under assistance instruments. However, all reasonable, allocable and allowable expenses, both direct and indirect, which are related to the agreement program and are in accordance with applicable cost principle under 2 CFR 200 Subpart E. of the Uniform Administrative Requirements may be paid under the anticipated award.

g. Certifications, Assurances and Other Statements of the Applicant

The business section of the cost/business application should include:

1. Applicants must complete and sign the Certifications, Assurances, and Representations included in the following link:
<https://www.usaid.gov/sites/default/files/documents/1868/303mav.pdf>
2. The cost/business application should also include evidence of responsibility that the Agreement Officer can use to determine that the Applicant:
 - a. Has adequate financial resources or the ability to obtain such resources as require during the performance of the award;
 - b. Has the ability to comply with the award conditions, taking into account all existing and currently prospective commitments of the Applicant;
 - c. Has a satisfactory record of performance. Past relevant unsatisfactory performance is ordinarily sufficient to justify a finding of non-responsibility, unless there is clear evidence of subsequent satisfactory performance;
 - d. Has a satisfactory record of integrity and business ethics; and
 - e. Is otherwise qualified and eligible to receive a Cooperative Agreement under applicable laws and regulations (e.g., EEO).
3. Certificate of Compliance: Please submit a copy of your Certificate of Compliance if your organization's systems have been certified by USAID/Washington's Office of Acquisition and Assistance (M/OAA).
4. Potential Request for Additional Documentation: Upon consideration of award or during the negotiations leading to an award, Applicants may be required to submit additional documentation deemed necessary for the Agreement Officer to make an affirmative determination of responsibility. Applicants should not submit the information below with their applications. The information in this section is provided so that Applicants may become familiar with additional documentation that may be requested by the Agreement Officer:

The information submitted should substantiate:

- a. Bylaws, constitution, and articles of incorporation, if applicable.
- b. Whether the organizational travel, procurement, financial management, accounting manual and personnel policies and procedures, especially regarding salary, promotion, leave, differentials, etc., submitted under this section have been reviewed and approved by any agency of the Federal Government, and if so, provide the name, address, and phone number of the cognizant reviewing official. The Applicant should provide copies of the same.

h. Additional Requirements

If the Applicant has established a consortium or another legal relationship among its partners, the Cost/Business application must include a copy of the legal relationship between the parties. The agreement should include a full discussion of the relationship between the Applicant and Sub-Applicant(s) including identification of the Applicant with whom USAID will work with for purposes of Agreement administration, identity of the Applicant which will have accounting responsibility, how Agreement effort will be allocated and the express agreement of the principals thereto to be held jointly and severally liable for the acts or omissions of the other.

Additionally, if the Applicant is selected for award, it is a requirement that the organization is legally registered in the country of Guatemala. If the Applicant is a U.S. Organization and it is not registered in the country at the time of the award, the registration process should be completed during the first year of project implementation or sooner. Costs associated with this registration process should be included as part of the Applicant's overhead costs since these are considered cost of doing business.

END OF SECTION D - APPLICATION AND SUBMISSION INFORMATION

SECTION E – APPLICATION REVIEW INFORMATION

1. EVALUATION CRITERIA

The criteria presented below have been tailored to the requirements of this particular RFA. Applicants should note that these criteria serve to: (a) identify the significant matters which Applicants should address in their applications, and (b) set the standard against which all applications will be evaluated.

The technical applications will be evaluated in accordance with the Technical Evaluation Criteria set forth below. Thereafter, the cost application of all Applicants submitting a technically acceptable application will be evaluated for general reasonableness, allowability, and allocability. To the extent that they are necessary (if award is made based on initial applications), negotiations may then be conducted with all Applicants whose application, after discussion and negotiation, have the best chance of being selected for award. Awards will be made to responsible Applicants whose applications offer the greatest value, cost and other factors considered. The government reserves the right to make award without discussions.

A review panel established under the direction of the Agreement Officer will evaluate applications. The review panel and the Agreement Officer will use “Best Value” criteria to determine the application most advantageous to the U.S. Government. Award will be made based on the ranking of proposals according to the evaluation criteria. For overall evaluation purposes, technical factors, when combined, are considered more important than cost factors. The award shall be made to the responsive and responsible Applicant whose combined technical and cost factor offer the best value to the U.S. Government.

All Applicants who meet the eligibility and program requirements and conform to the application preparation and submission instructions will be reviewed and scored by a panel of USAID reviewers in strict conformity with the evaluation criteria set forth in this section.

Technical applications will be evaluated on the basis of the following criteria.

2. REVIEW AND SELECTION PROCESS

A. Technical Evaluation

1. Technical Approach (60 points)

The Applicant’s technical approach shall be evaluated based on its capability to reduce poverty by increasing agricultural incomes and improving resilience of small farmers and their families in targeted geographic areas of the Western Highlands. This includes the Applicant’s capability to improve agricultural productivity and diversify income generation alternatives; expand access to markets; increase resilience through implementation of climate-smart and nutrition sensitive

agriculture; and strengthen the agriculture and food security enabling environment. The Applicant must show a clear link how the project's approach contributes to USAID/Guatemala's broader strategy to reduce chronic malnutrition for target rural households.

The technical approach will be rated on the following criteria:

- a. The realism, appropriateness, and innovation of the proposed approach and implementation schedule to achieve the project results, with a demonstrated understanding of the challenges, needs, and opportunities within the Guatemalan context. This includes the effectiveness of the approach to improve value chain competitiveness, strengthen management and marketing capacity of organizations, expand participation in the value chain (including groups identified in the social inclusion strategy), scale-up and replicate proposed activities and impacts, link agriculture development to improved nutrition and diet diversity, and leverage and create partnerships with the private and public sectors. The rationale for selecting the geographic focus will be evaluated.
- b. Clarity of conceptual framework and theory of change underpinning the proposed approach, draft annual work plan and rationale to achieve the project objective and results. This includes the scope, ambitiousness, and realism of results, targets (quantified), and indicators to be achieved with a clear link to the proposed Monitoring and Evaluation Plan.
- c. Effectiveness of the proposed approach and activities to integrate cross-cutting principles, including the social inclusion strategy, communication strategy, sustainability of interventions and integration of a conflict-sensitive approach.
- d. Successfully coordinate with other USAID and USG interventions, other donors and programs, and key stakeholders as well as have a clear link to USAID CDCS and Government of Guatemala initiatives to effectively address the components as described in the Technical Approach.
- e. Proposed approach for including construction activities and leveraging public and private sector funds for this purpose.

2. Management and Staffing Plan (40 points)

- a. Management Strategy: Extent to which the Applicant, and the Applicant's selection and proposed use of implementing partners, demonstrates that the proposed organizational and operational structure and staffing incorporates the mix of requisite skills and relevant experience to achieve project results.
- b. Extent to which the Applicant, in the Management Plan, provides a clear description of staffing roles and responsibilities and appropriate skill sets for personnel proposed

and sub-contractors/sub-awardees proposed with defined lines of management, supervisory authority, and technical responsibilities and the extent to which the Applicant has experience in managing sub awards.

- c. Adequacy of Staffing Plan, key personnel and staff strengths (i.e., skills, education, and experience) *vis-à-vis* their roles and responsibilities in the proposal. Key personnel must convincingly demonstrate the ability to successfully and effectively implement the proposed program and describe how the proposed personnel will contribute holistically to both the technical and administrative needs of a project of this description, size and proposed results. USAID will also evaluate whether proposed personnel composition achieves gender equity and inclusion of indigenous participation in the staffing plan.

B. Cost Evaluation

Cost is not a weighted factor. All evaluation factors other than cost or price, when combined, are significantly more important than cost. However, estimated cost is an important factor and the estimated cost to the Government increases in importance as competing applications approach equivalence and may become the deciding factor when technical applications are approximately equivalent in merit. The application with the lowest estimated cost may not be selected if award to a higher priced technical application offers a greater overall benefit for the program.

Only the cost application(s) of the apparently successful applicant(s) will be evaluated for cost effectiveness including the level of proposed leverage. Other considerations are the completeness of the application, adequacy of budget detail and consistency with elements of the technical application. In addition, the organization must demonstrate adequate financial management capability, to be measures for a responsibility determination.

Cost estimates will be analyzed as part of the application evaluation process. Proposed costs may be adjusted, for purposes of evaluation, based on results of the cost analysis and its assessment of reasonableness, completeness, and credibility.

Cost Sharing

USAID has established a suggested cost share of 15% of the Award's projected value. Leveraged non-USAID resources from private firms and institutions (such as equipment, training, level of effort and any in-kind contributions) may be considered part of cost share. Cost sharing may be also demonstrated either through direct funding, beneficiary contributions, in-kind assistance, or a combination thereof. USAID shall make the final determination and assess whether or not the Applicants cost share contributions (e.g. categories or items) meet the standards set in Standard Provision entitled "Cost Share".

END OF SECTION E: APPLICATION REVIEW INFORMATION

SECTION F: FEDERAL AWARD ADMINISTRATION INFORMATION

1. Federal Award Notices

Award of the agreement contemplated by this NOFO cannot be made until funds have been appropriated, allocated and committed through internal USAID procedures. While USAID anticipates that these procedures will be successfully completed, potential Applicants are hereby notified of these requirements and conditions for the award. The Agreement Officer is the only individual who may legally commit the Government to the expenditure of public funds. No costs chargeable to the proposed Agreement may be incurred before receipt of either a fully executed Agreement or a specific, written authorization from the Agreement Officer.

Following the selection for award and successful negotiations, the successful Applicant will receive an electronic copy of the notice of the award signed by the Agreement Officer which serves as the authorizing document. The Agreement Officer will only do so after making a positive responsibility determination that the Applicant possesses, or has the ability to obtain, the necessary management competence in planning and carrying out assistance programs and that it will practice mutually agreed upon methods of accountability for funds and other assets provided by USAID.

The award will be issued to the contact as specified in the application as the Authorized Individual in accordance with the requirements in the Representations and Certifications.

USAID will follow the guidelines of ADS 303.3.7.2 to provide additional information for unsuccessful Applicants.

2. Administrative & National Policy Requirements

The resulting award from this NOFO will be administered in accordance with the following policies and regulations.

- **U.S. organizations (for sub-awards only if any)**
 - 2 CFR 700: <http://www.ecfr.gov/cgi-bin/text-idx?SID=531ffcc47b660d86ca8bbc5a64eed128&mc=true&node=pt2.1.700&rgn=div5>
 - 2 CFR 200: <http://www.gpo.gov/fdsys/pkg/FR-2013-12-26/pdf/2013-30465.pdf>
 - ADS 303: <https://www.usaid.gov/sites/default/files/documents/1868/303.pdf>
 - Standard Provisions for U.S. Non-governmental Organizations: <https://www.usaid.gov/sites/default/files/documents/1868/303maa.pdf>

- **Non-U.S. organizations**

- ADS 303: <https://www.usaid.gov/sites/default/files/documents/1868/303.pdf>
- Standard Provisions for Non-U.S. Non-governmental Organizations: <https://www.usaid.gov/sites/default/files/documents/1868/303mab.pdf>

3. Participant Training

For all training activities financed under this cooperative agreement the Recipient must comply with Automated Directives system (ADS) Chapter 253 and other USAID/Guatemala specific policies and procedures (i.e., Mission Order 253) governing the effective, efficient planning, design, and implementation of such training programs. The Recipient will also be responsible for entering training information into the TrainNet database on a quarterly basis. Each quarterly report will include a confirmation that this requirement has been met.

For all project-funded trips to the United States, the Recipient must follow the guidelines included in ADS 252

4. Management of Sub-awards

USAID/Guatemala's intent is that the Recipient will award grants and contracts in order to implement the FAIR Project. The USAID/Guatemala Agreement Officer must approve the recipient's grants manual, the actual selection of grant recipients with US and Non- US organizations, including any decisions to award grants based on exclusive or predominant capability. All sub-grants must comply in all material respects with USAID's Automated Directives System (ADS) Chapter 303 (including mandatory and supplementary references) in awarding and administering grants, as well as 2 CFR 200 and 2 CFR 700.

The Applicant shall describe its approach to, and how it will manage, the competition and award of grants in line with USAID best practices and the Guatemalan context. The Applicant will design ***an approach to grant-making*** that is cost effective and designed to be responsive to the needs of FAIR's activities; and ***procedures for identifying and approving applications*** that are not onerous and ensure flexibility. The Applicant will establish a cost-effective system for awarding and managing grants. The Applicant will emphasize the application of alliance principles to leverage private investment, and financing, and encourage public-private implementation partnerships. The Applicant should propose a reasonable amount assigned to sub-awards based on the proposed technical approach and the working business environment in Guatemala. If Applicant is considering providing small grants to beneficiary organizations either in cash or in kind; it needs to be clearly described in the proposal and in the budget.

5. Earmarks and Funding Sources

This project will directly support USAID/Guatemala's CDCS DO 2 "Improved levels of economic growth and social development in the Western Highlands," focusing on IR 2.1 "Broad based economic growth and food security improved." This project will also focus on achieving DO 3, "Improved management of natural resources to mitigate impacts of global climate change" focusing on IR 3.2, "Vulnerability to the effects of global climate change reduced."

As the primary focus of the project is to achieve IR 2.1, the majority of funds for the project will be Feed the Future Agriculture funds. A small amount of Climate Change Adaptation funds to achieve IR 3.2 and Private Sector funds to achieve IR 2.1 may be used in the project. Please see Attachment 4 for the parameters for the use of Climate Change Adaptation funds.

Given the uncertainties of funding from year to year, the selected Recipient should have a degree of flexibility in order to absorb funding from other sources, as available, without changing the total estimated amount of the resulting Award.

The Recipient shall follow agency guidance on the use of USAID funds for these earmarks and it will be required:

- To track and report on the results obtained from these funds, including per their earmarks, and separately from other funds obligated under this Cooperative Agreement; and,
- To attach to the financial report detail of the funding available and utilized according to each specific earmark.

6. Rapid Response Fund

The Rapid Response Fund (RRF) is a flexible mechanism that will allow the project to respond to opportunities and/or crises that may emerge during the implementation of the technical components of this Program Description that have not been foreseen or anticipated but that offer high pay off. The proposed funding level for the RRF is \$2.5 million during the period of performance of the Cooperative Agreement. USAID may adjust these figures depending on the number of requests and their amount.

A Manual for the use of the RRF shall be developed by the Recipient and approved by the USAID/Guatemala Agreement Officer (AO). The fund will be managed by the Recipient in a separate line item. The use of these funds requires AOR prior written approval, and shall be reported in a Quarterly and Annual Performance Reports. The RRF manual should be sent for approval within 60 days of the signature of the Cooperative Agreement. In the event that an activity under the RRF is implemented under a sub-award, an additional approval from the AO will be required.

7. Value Added Tax

Adherence to IVA program is a requirement for the prime recipient and for any sub-awardees; exemption procedures will be provided to the Recipient soon after award. Use of EXENIVA form is authorized only for official project related procurement.

Use of IVA exemption form is authorized for project related procurement. USAID will support the customs clearance of official project vehicles. These vehicles will be cleared free of duty and IVA and will be titled to USAID/Guatemala with MI license plates.

8. Use of Project Vehicles

In accordance with USAID policy, all vehicles must be used only for the purpose of work concerning project objectives. Use of vehicles acquired under this cooperative agreement for private use is not authorized. At no time will a project vehicle be used for home-office transportation and all project vehicles must be parked in a secure area overnight, preferably at field office sites.

Recipient agrees that, in the event any vehicle financed by USAID for use by Recipient in conducting activities under this instrument is registered in the name of the U.S. Government, it will be the responsibility of Recipient to indemnify and hold the U.S. Government harmless from any damages or liability assessed against it because of the negligence of Recipient or its agents or employees.

The Recipient must be responsible to follow USAID/Guatemala requirements to return MI plates of project vehicles as part of the closeout process.

9. Recipient's Staff Support, Administrative and Logistics Arrangements and Legal Registration in the Cooperating Country

In accordance with Standard Provision entitled "Regulations Governing Employees", the Recipient will be responsible for all administrative support and logistics required to fulfill the requirements of this Agreement. These include all travel arrangements, appointment scheduling, secretarial services, report preparations services, printing, and duplicating.

In addition, the Recipient is responsible to comply with all applicable local laws regarding fringe benefits for its local employees, local business operations, including but not limited to the registration of its offices in the local country, etc.

10. Geospatial Information

Geospatial information technologies provide particularly powerful tools for visualizing and understanding the complex interactions between people and the environment. They are especially important in identifying where USAID activities are taking place. USAID is required

to make non-proprietary geospatial data available to the public. Therefore, where appropriate, the Recipient that creates geospatial data under this award will be required to electronically submit data layers to the AOR. USAID/Guatemala, under the M&E Project implemented by DevTech, is developing a mission-wide GIS system and the Recipient will be required to input geospatial data into this new system.

Data must be consistent with U.S. Federal Geographic Data Committee (FGDC) level 1 metadata standards. USAID is in the process of developing standards and protocols for geospatial related activities. The Recipient will be provided a copy of these once they are developed, and will be required to abide by them. All spatial and geographic information system (GIS) activities financed by USG federal funds must comply with:

- 1) OMB Circular A-16, Executive Order 12906;
- 2) Automated Directives System (ADS) 507 (Freedom of Information Act);
- 3) ADS 551 (Data Administration); and
- 4) ADS 557 (Public Information).

All geospatial data must be submitted to the AOR, complete with metadata, as well as applicable maps.

11. Monitoring, Evaluation, and Learning

Monitoring, evaluation, and learning will be utilized in order to assess the impact of project interventions, whether or not objectives are being achieved, and if the interventions should be adjusted. The FAIR Project may be required to coordinate with USAID/Guatemala's Monitoring and Evaluation instrument in order to monitor and set targets for FTF and Operational Plan indicators.

Processes to monitor progress and project performance must be utilized in order to assess the on-going results of project interventions and determine whether or not objectives are being achieved and if interventions should be adjusted. The Applicant will provide a proposed **Monitoring and Evaluation Plan (MEP)** as part of the response to this RFA. The MEP will be reviewed as part of the selection process.

The MEP also includes conflict sensitivity considerations and proposed strategies, such as context monitoring, to understand and track conflict dynamics related to the project. Measurements of conflict should be incorporated into project plans as early as possible. Incorporating conflict analysis into templates for baseline assessments allows the building of a roadmap to implement conflict-sensitive development projects. This up-front work also lays the groundwork for monitoring and evaluating conflict impacts of project activities.

1) Monitoring

The Recipient will provide a proposed Monitoring and Evaluation Plan (MEP) as part of a

response to this RFA. The MEP will be reviewed as part of the selection process. The Performance Monitoring Plan specifies indicators, targets, and methodologies that will be used to monitor the progress of project activities towards achieving key milestones and results related to project objectives, expected outcomes, impacts, and measures of accountability. The MEP also gives USAID a tool for gauging performance and understanding any unforeseen changes in strategy needed to achieve intended results. Since the MEP must monitor selected indicators on an ongoing basis, implementers will be expected to select those indicators that best relate to outputs and outcomes. The MEP will need to incorporate FTF and GCC indicators that will need to be monitored during project implementation. Each indicator (except for those for which the answer is yes/no) must have a Data Quality Assessment conducted. The key criteria for assessing the quality of performance data are: validity, reliability, timeliness, precision, and integrity.

The MEP will present indicators that could objectively measure progress towards achieving each of the results included in the proposal. The Applicant is expected to develop specific indicator baselines and targets. It is expected that the Applicant will conduct surveys at the beginning of the project to establish the baseline and at the end of the project to measure the impact of the program.

For each indicator, a brief narrative must include at the minimum the following:

- The Recipient's data collection method (e.g. how often data is collected, who collects the data, who analyzes the data collected, controls in place to safeguard data);
- Data quality information for all relevant indicators (USAID proposed/Recipient proposed indicators). Data quality includes: a precise definition of the indicator, unit of measure, and disaggregation information to include women, youth, members of vulnerable populations and people with disabilities;
- Indicator validity (i.e., the relationship between the indicator and the desired output or result)
- Life of activity targets for each relevant indicator for each fiscal year of this program; and
- The Recipients procedures for ensuring data quality of sub-recipients' reported data.

To ensure conflict sensitivity (and that different population sub-segments are benefiting appropriately from the project), when possible indicators must be disaggregated based on age, disability, religion, ethnicity, gender, or along any other lines of division that may be relevant to the context.

Applicants should also be familiar with the standard indicators that USAID is obliged to measure for various agency frameworks, such as the FTF results framework and the Operational Plan (OP). They will be encouraged to propose additional indicators in addition to the required indicators provided in this document if they better capture the proposal's ability to measure impact. Indicators should be gender disaggregated where appropriate.

Applicants will submit an illustrative MEP that includes notional indicators, anticipated Life of Project and annual targets for these indicators, and a strategy for monitoring these indicators during implementation. The MEP will be finalized after project start-up and submitted with the first Annual Work Plan for USAID approval. Any subsequent changes in the MEP will require concurrence from USAID.

Data collection efforts will be necessary at the beginning of the project to verify or establish baseline information for many of the project's indicators. Indicators will be reported on quarterly and annual reports.

The Recipient will implement and manage a process of assessing and reporting that supports reaching the program outcomes while strengthening impact. Two field evaluation/impact study shall be conducted, one mid evaluation after two years of project implementation and a final impact evaluation at the end of the project. The results will allow for learning-based adjustments to be made in the program and/or for the purpose of adjusting future programming. The timing of the studies shall be decided in accordance with USAID/Guatemala, while taking into account the policy environment. It will be important to ensure that evaluation results, if possible and appropriate, are made available in time for important policy-related decisions.

2) Evaluation

USAID has committed to evaluating programs and projects using credible impact and performance evaluation methodologies. See USAID's Evaluation Policy for specific information:

<http://www.usaid.gov/sites/default/files/documents/1868/USAIDEvaluationPolicy.pdf>. In the spirit of increasing the rigor of all USAID project evaluations, the FAIR Project will require evaluations that will be solicited by USAID and conducted by objective third parties—external evaluations—and final results may be made public. The Recipient will consult with USAID before conducting any sub-contracted evaluations to ensure that planned evaluation efforts will not be duplicated. Moreover, the Recipient must cooperate with any external evaluation indicated by USAID and provide input to external evaluation team when requested by USAID. FAIR will also benefit from engaging in and cooperating with evaluation activities that allow project managers and field staff to gauge whether the behavior change they are attempting to foster is indeed happening and be ready to redirect investments or activities when needed.

3) Learning

Experimentation is essential to innovation and effectiveness. FAIR will utilize a knowledge/learning methodology that builds in continuous learning and evaluating about “what works” and “what does not.” Activities to expand poor rural household participation in value chains will be unavoidably experimental given the challenges of incorporating these households while maintaining value chain competitiveness, transforming them from subsistence to commercial orientation, and improving food security. Ongoing monitoring and outcome-related evaluations will allow FAIR to learn from these experiments, obtain timely feedback on their

success, and make adjustments in intervention design, as needed.

12. Knowledge Management and Communications

Experimentation is essential to innovation and effectiveness. FAIR must utilize a knowledge management methodology that facilitates continuous learning and adapting. Ongoing learning will allow the project to obtain timely information on successes and allow for adjustments in design and management, as needed.

FAIR's communications activities will be guided by a Strategic Communication Plan designed to reach segmented audiences with a wide range of messages to motivate engagement and sustained behavior change that is in line with the USAID Guatemala CDCS Communication Strategy, USAID/Guatemala Strategic Communications Results Framework (Attachment 5 to this RFA) and the program description of FAIR. The Strategic Communication Plan will be a combination of Institutional Communications and Development Communications, utilizing SBCC to complement and support the project's overall strategy and implementation activities. Development communications has been shown to deepen and expand the impact of development initiatives by generating additional behavior change above and beyond the activities of information dissemination, education, and awareness-raising alone.

USAID/Guatemala anticipates significant interest in the implementation of FAIR. The Applicant will be responsible for preparing materials for high-level visitors to project activities that include but are not limited to: scene setters, trip itineraries, photographs, event agendas, press releases, reports, and video presentations of the project, as well as, content developed for distribution on social media. Therefore a robust communications strategy and appropriate staffing and resources to ensure strong development communications are particularly important to the success of the project.

All communications materials must be submitted to the USAID Agreement Officer's Representative (AOR) for review and approval at key points during concept, design, development and pre-production. AOR approval will focus on the technical content of the material, presentation, and compliance with the Branding Strategy and Marking Plan. The Applicant must ensure that all branding and marking specifications laid out in the Branding Strategy and Marking Plan have been followed prior to submitting the material for AOR approval.

All camera-ready art, final production files, production master videotapes and other final versions of all program and communications products shall be submitted to USAID upon agreement termination, unless submitted previously. The AOR must receive a minimum of three copies of all program and communications final products as they are produced.

13. Reporting Requirements

The Recipient shall submit reports, as further described below, to the AOR. All reports and other deliverables shall be in the language and in the format specified in the **Reporting Requirements Summary** table. AOR approval of reports will be provided within 15 calendar days. The Recipient will then have 15 calendar days to incorporate the modifications and resubmit the reports for AOR approval. AOR approval of the revised submission will be within 15 calendar days.

A. Annual Work Plan

Within 90 days of award of the agreement, the Recipient will submit for AOR approval its first Annual Work Plan that covers from the period of award date through September 30, 2017. The second Annual Work Plan covering the period October 1, 2017 – September 30, 2018 shall be submitted on August 30, 2017. Each subsequent year the Annual Work Plan covering the fiscal year period October 1 to September 30 shall be submitted on August 30 of each calendar year until project completion. Annual Work Plans will be submitted in English and Spanish.

Presentation of the Annual Work Plan: In addition to the submission of a hard copy and electronic copy, the Recipient must present the Annual Work Plan to the AOR and other interested USAID staff on an annual basis. The presentation is usually held in October of each year and organized in collaboration with the AOR.

The Annual Work Plans submitted must include:

- a. Introduction;
- b. Background including a Problem Statement and Analysis;
- c. Project approach including the Development Hypothesis, Results Framework, Implementation Strategy, and any possible obstacles hindering achievement of objectives;
- d. The Project Approach should highlight plans to engage: marginalized groups (women, LGBTI, indigenous, poor, youth, others), private sector entities, civil society, and local institutions.
- e. Implementation Plan Matrix organized according to project objectives/results that identify proposed accomplishments for the fiscal year, tasks, activities, timeframe, expected outputs or progress toward achieving cooperative agreement results, indicators, and targets linked to the Monitoring and Evaluation Plan;
- f. Detailed Budget by principal activities, funding source, and also by line item, broken down by quarters. The Annual Work Plan must show planned expenditures and actual expenditures to date;
- g. Western Highlands Integrated Program and Coordination with Other USAID Partners describing the approach that the Recipient will use to ensure coordination, collaboration,

and information sharing with other USAID partners working in the Western Highlands and in other sectors;

- h. Conflict-Sensitivity Approach explaining the manner in which conflict sensitivity is addressed in programming and monitoring and evaluation activities, and how the project interacts within the conflict context. For example, the project should consider how community development plans interact with various community dynamics including socio-economic and ethnic divides.
- i. Work with Other Stakeholders describing the approach the Recipient will use to ensure coordination, collaboration, and information sharing with other USG Agencies, other international donors, GOG institutions, private sector stakeholders, and civil society organizations;
- j. Training Plan describing all planned local and international training events and expected results (a format for the preparation of this plan will be provided by USAID upon signature of the award);
- k. Environmental Monitoring Plans to ensure compliance with USAID Environmental Procedures, Reg. 216;
- l. Project Fact Sheet or Project Profile, in Spanish and English and camera-ready, that summarizes pertinent information regarding the award that can be used for preparing media kits and disseminating to broad audiences;
- m. A description of any planned communications materials (including training and education materials). These materials will be submitted for approval by the AOR at the design stage prior to printing, reproducing, disseminating, or airing. AOR approval will focus on the materials' technical content, presentation, and compliance with the Branding Strategy and Marking Plan. The Recipient must ensure that all branding and marking specifications laid out in the Branding Strategy and Marking Plan have been followed prior to submitting the material for AOR approval;
- n. Procurement Plan;
- o. Social Inclusion Strategy;
- p. List of all anticipated international travel; and
- q. A detailed Annual Security Plan.

Annual Work Plans must be consulted with relevant stakeholders. Following the AOR's approval of the plan, USAID will submit a copy to the stakeholders and other GOG principals. Annual Work Plans may be modified by the Recipient to accommodate the changing policy environment, to formalize activities in response to GOG requests, or for modified or unanticipated activities for the use of the rapid response funds. Modified implementation plans require the approval of the AOR. The Recipient shall provide management necessary to fulfill all the requirements of this agreement. This includes cost and quality control.

B. Monitoring and Evaluation Plan

The MEP will be completed within 90 calendar days after the signature of award, covering the complete agreement period, and be submitted with the first Annual Work Plan for USAID approval following instructions provided in Section F.11.1 “Monitoring”. Any subsequent changes in the MEP will require technical concurrence from the AOR.

C. Quarterly and Annual Performance Reports

Quarterly Reports: Fifteen (15) days after the end of each quarter, on January 15, April 15, and July 15, the Recipient will provide quarterly performance reports to describe activities undertaken, report on progress made toward achieving results, and make necessary adjustments for activities that will be undertaken in the next quarter including status of construction activities if applicable. The fourth quarterly report shall also serve as the Annual Performance Report and shall be submitted on October 15 of each year. Any implementation problems should be discussed in the reports as well as proposed corrective actions and the costs associated with the delay.

These reports must include sections on: compliance with USAID Environmental Procedures, Reg. 216, including environmental mitigation measures monitoring, use of flexible rapid response funds, social inclusion considerations in implementation and performance during the quarter and reports on security incidents.

For all training activities financed under this award and conducted in-country, in the U.S., or in a third country, the Recipient must comply with Automated Directives System (ADS) Chapter 253 and other USAID/Guatemala specific policies and procedures (i.e., Mission Order 253) governing the effective, efficient planning, design, and implementation of such training programs. The Recipient will also be responsible for entering training information into the TraiNet database on a quarterly basis. Each quarterly report will include a confirmation that this requirement has been met.

For all project-funded trips to the United States, the Recipient shall follow the guidelines included in ADS 252.

Annual Performance Reports: The fourth quarterly report shall be subsumed into the annual performance report and shall be submitted on October 15 of each year. The annual performance report shall follow the same format as the quarterly reports, but additionally focus on:

- a. The extent to which objectives and targets contained in the Annual Work Plan have been achieved;
- b. Highlights of major achievements during the year;
- c. Significant implementation problems encountered during the year and progress toward achievement of results;
- d. Actions taken to resolve problems;

- e. Accomplishments, progress and problems toward achievement of results, performance measures, indicators and benchmarks, tied to the Annual Work Plan and Monitoring and Evaluation Plan targets, for the quarter and for the entire previous fiscal year;
- f. Include a summary of lessons learned, observations, and recommendations that might be relevant to programming, design, and implementation of similar or follow-on activities;
- g. Environmental compliance required as indicated in the USAID Environmental Threshold Decision;
- h. Activities or steps that have been taken during the year to effectively coordinate, collaborate, and share information with other USG implementation partners;
- i. Social inclusion considerations in implementation and performance during the year;
- j. Cost Share report (both cash and in-kind) by contributing partner; and
- k. Success stories for publication.

The annual performance report should also consolidate data from the previous quarterly reports in order to present annual totals for the numerical targets. Annual performance reports are not to exceed 50 pages in length, including an Executive Summary not to exceed five pages in length. Additional supporting information may be included in annexes.

One copy of all reports shall be submitted to USAID's Development Experience Clearinghouse (DEC) which describe, communicate, or organize project development assistance activities, methods, technologies, management, research, results, and experience as outlined in the Agency's ADS Chapter 540. Information may be obtained from the AOR. These reports include: assessments, evaluations, studies, development experience documents, technical and consultant reports, quarterly reports, and annual reports. The Recipient shall also submit copies of information products including training materials, publications, databases, geo-coded data or other GIS related data (i.e. shape files and mapping files), computer software programs, videos and other intellectual deliverable materials required under the Agreement Schedule. The reports, in English, shall be sent to USAID's DEC either in electronic (preferred) or paper form to one of the following: (a) via E-mail: docsubmit@dec.cdie.org; (b) via U.S. Postal Service: Development Experience Clearinghouse, 8403 Colesville Road, Suite 210, Silver Spring, MD 20910, USA; (c) via Fax: (301) 588-7787; or (d) Online: <http://www.dec.org/index.cfm?fuseaction=docSubmit.home>.

The Recipient shall also include in the progress reports a list of all documents submitted during the reporting period to the Center for Development Information and Evaluation (CDIE) and a list of all in-country training events performed during the reporting period, if any. This report shall include at a minimum: name of the training program, field of study, relationship to the objectives of the project, start and end dates, estimated cost (USAID's cost and partner's cost disaggregated by instruction, trainee, and travel) and number of male and female participants.

The Recipient shall submit a Procurement Plan along with Annual Work Plans. The Procurement

Plan shall contain the following:

- Specifications and the estimated cost of all non-expendable supplies and equipment expected to be purchased in the coming fiscal year
- An explanation of the intended use of each item
- The source of the commodities to be purchased

D. Final Performance Report

The fourth quarter/annual performance report for the fifth year will also be the final report. The draft report is due 30 days prior to completion of the award and a final version and electronic version (two print copies in each language and on a CD), within 90 days of the expiration of the award. The Recipient should also submit the report to the DEC online: <http://dec.usaid.gov>.

The report will include the information required in the annual performance report in the paragraph above, as well as: (1) basic agreement information; (2) a description of the activity, the accomplishments and successes achieved during the agreement period in terms of the expectations of activity design and changes in the activity environment, as well as any shortcomings and/or difficulties encountered; (3) an assessment of the progress towards achievement of the objectives or results, including social inclusion aspects; (4) a summary of performance indicators used and an assessment of their relative usefulness; (5) a summary of lessons learned and recommendations that might be relevant to programming, design and implementation of similar or follow-on activities. Also, it must (6) list all publications, evaluations, and media products that were sent to the DEC during the life of the agreement.

E. Strategic Communications Plan

The Recipient must submit a Strategic Communication Plan that describes the communication strategy that will be used to inform project participating communities, GOG, USG, and other key audiences over the life of implementation. At minimum, the Strategic Communication Plan will outline the following basic elements: a problem statement, desired change(s), measurable goals, segmented audiences, project positioning, main message and supporting information, framework for of media plan; and, propose communication tactic(s) to be used. The Recipient may develop the Plan using existing primary and/or secondary research and other reliable evidence, including audience research and other forms of stakeholder consultation.

The Strategic Communication Plan should be designed to reach segmented audiences with a wide range messages to motivate community engagement and sustained behavior change that is in line with the USAID Guatemala CDCS Communication Strategy and USAID Guatemala Strategic Communications Results Framework (See Attachment 5), and the program description of the project. The Strategic Communication Plan will be a combination of Institutional Communications and Development Communications, specifically S&BC Communication to complement and support the project's overall strategy and implementation activities. The Strategic Communication Plan will be developed with USAID and other key stakeholders in

coordination with the First Annual Work Plan and M&E Plan and will be due 45 days after the approval of the First Work Plan.

F. Financial Reports

The Recipient must submit the Federal Financial Form (SF-425) on a quarterly basis via electronic format to the Agreement Officer's Representative (AOR) and the Agreement Officer. Electronic copies of the SF-425 can be found at:

https://www.whitehouse.gov/sites/default/files/omb/grants/standard_forms/ff_report.pdf. Line item instructions for completing the SF-425 can be found at:

https://www.whitehouse.gov/sites/default/files/omb/grants/standard_forms/ffr_instructions.pdf

Financial reports will show the total amount of cost share (cash and in-kind). The Recipient is solely responsible for not exceeding obligated amounts. The Recipient shall report according to earmarks, as required.

G. Accrual Reports

The Recipient shall submit an estimated accrual report including the following information: (i) agreement number; (ii) recipient's name; (iii) total amount obligated; (iv) total amount invoiced for; (v) total amount expended but not yet invoiced for; (vi) remaining unexpended funds; (vii) estimated completion date; (viii) any pertinent information, such as analysis, projections for the next quarter, and an explanation of costs increases or underestimation of original costs. The accruals report shall be presented in English to the AOR and other designated administrative staff, on a quarterly basis (15 days previous to the close of each fiscal year quarter) in the format to be provided to the Recipient upon award signature.

H. Closeout/Demobilization Plan

Ninety days prior to the completion date of the Cooperative Agreement, a closeout/demobilization plan including the proposed disposition of equipment, including vehicles, will be submitted to the USAID Agreement Officer for approval with copy to the AOR. The close-out plan shall include a list of actions that are typically required for close-out activities such as to ensure that all program activities are completed; conduct an analysis of progress to date and, if necessary, expedite timelines to ensure completion; conduct a thorough pipeline analysis to ensure that there are sufficient funds available to finalize activities and complete all requirements; ensure that all reports are submitted in accordance with the terms and conditions of the agreement. All subcontracts and/or sub-awards are completed and payments settled, if applicable. Submission of a final inventory of all residual non-expendable property that was acquired or furnished by the Government under the Cooperative Agreement and request disposition instructions for any property acquired or furnished by the Government under the program. Particular care should be taken regarding vehicles, since their legal transfer may require a special procedure that would need to be completed before the completion date of the award. Ensure that all staff members are provided with severance and other payments, if

applicable, in accordance with local labor law. Ensure that all audit requirements are addressed, if applicable. For U.S. organizations, demobilization plans need to include: closing of offices (remember to cancel phone, electricity, subscriptions, etc.), disposition of all equipment (including vehicles), disposition of residual supplies, repatriation of expatriate staff, household and POV shipments, etc. In particular, USAID requests submission of all electronic and hard copies of reports, documents, studies, photographs, video, and all other published and not published intellectual property.

I. Other Reports

During the life of the agreement, the Recipient may be required to prepare and submit to USAID other special reports concerning specific activities and/or analyses. These requests will be in writing and will specify the due date. The substance of this reporting may include special agreement activities, coordination with other USAID projects, USG agencies, or coordination with other donors. USAID may also request the attendance and participation of project staff in implementing partners' meetings and portfolio reviews.

Reporting Requirements Summary		
Report	Due Date	Format
Annual Work Plans	The first plan is due 90 days after award. The second and subsequent year Annual Work Plans are due on August 30 of each calendar year.	Electronic and print copies. Recipient will be requested to present this orally as well. English and Spanish.
Monitoring and Evaluation Plan (MEP)	90 days after award date.	Electronic and print copies. English.
Quarterly Progress Reports	15 days after the end of each quarter. Due dates shall be: Qtr 1 = January 15; Qtr 2= April 15; Qtr 3= July 15.	Electronic and print copies. English and Spanish.
Quarterly Accruals Report	15 days before the end of each quarter. Due dates shall be: Qtr 1 = December 15; Qtr 2= March 15; Qtr 3= June 15; Qtr 4 = September 15.	Electronic. English.
Quarterly Financial Reports	30 days after each quarter. Due dates shall be: Qtr 1 = January 30; Qtr 2= April 30; Qtr 3= July 30; Qtr 4 = October 30.	Electronic. English.
Planned Expenditures Reports	The first plan is due 90 days after award. The second and	Electronic. English.

	subsequent year Annual Work Plans are due on August 30 of each calendar year.	
Annual Performance Reports	Annual performance reports are due on October 15 of each calendar year.	Electronic and print copies. Recipient will present orally as well. English and Spanish.
Final Report	Draft final report is due no later than 90 days prior to end of the award and final report due no later than 30 days after the award end date.	Electronic and print copies. English and Spanish.
Success Stories	In quarterly reports (minimum of 8 per year).	Format will be provided, and must include high quality photos, two color print copies. English and Spanish.
Strategic Communications Plan	45 days after first Annual Work Plan is approved	Electronic and print copies. English.
Miscellaneous Reporting	Briefings, Ambassadorial and other field visits, talking points, scene setters, press releases, donor coordination. On demand.	Format to be specified. English or Spanish.
Closeout/Demobilization Plan	90 days before the end of the agreement	Electronic and print copies. English.
Equipment Inventory	Annually (as part of the annual performance report).	English.

14. Program Income

Applicants are requested to mention in the application whether program income is anticipated under the resulting award. If an activity under the award generates a profit, in accordance with Required as Applicable Standard Provision entitled “Program Income”, income earned during the project period must be added to the total program amount and used to further eligible project or program objectives, unless this award Schedule specifies otherwise.

15. Branding & Marking

Only the apparently successful Applicant will be required to submit a Branding Strategy and Marking Plan to be evaluated and approved by the Agreement Officer prior to award of the Cooperative Agreement. These plans shall be prepared in accordance with the guidance in ADS 320 “Branding and Marking” <https://www.usaid.gov/sites/default/files/documents/1868/320.pdf> and the Graphic Standard Manual <https://www.usaid.gov/branding>. The apparently successful Applicant should use the template included in Attachment 2 of this RFA.

16. Environmental Compliance

The Foreign Assistance Act of 1961, as amended, Section 117 requires that the impact of USAID's activities on the environment be considered and that USAID include environmental sustainability as a central consideration in designing and carrying out its development programs. This mandate is codified in Federal Regulations (22 CFR 216) and in USAID's Automated Directives System (ADS) Parts 201.5.10g and 204 (<http://www.usaid.gov/who-we-are/agency-policy/series-200>), which, in part, require that the potential environmental impacts of USAID-financed activities are identified prior to a final decision to proceed and that appropriate environmental safeguards are adopted for all activities. Applicant environmental compliance obligations under these regulations and procedures are specified in the following paragraphs of this RFA.

In addition, the recipient must comply with host country environmental regulations unless otherwise directed in writing by USAID. In case of conflict between host country and USAID regulations, the latter shall govern.

No activity funded under this cooperative agreement will be implemented unless an environmental threshold determination, as defined by 22 CFR 216, has been reached for that activity, as documented in a Request for Categorical Exclusion (RCE), Initial Environmental Examination (IEE) duly signed by the Bureau Environmental Officer (BEO). (Hereinafter, such documents are described as "approved Regulation 216 environmental documentation.").

An Initial Environmental Examination (IEE) [LAC-IEE-12-55](#), and its amendment currently under approval process, [LAC-IEE-12-41](#), [LAC-IEE-15-05](#) and [LAC-EA-16-03](#) have been approved for DO2: Improved Levels of Economic Growth and Social Development in the Western Highlands, IR 2.1 Broad based economic growth and food security improved, funding this RFA. The IEE covers activities expected to be implemented under this cooperative agreement. USAID has determined that a Negative Determination with Conditions applies to one or more of the proposed activities. This indicates that if these activities are implemented subject to the specified conditions, they are expected to have no significant adverse effect on the environment. The Applicant shall be responsible for implementing all IEE conditions pertaining to activities to be funded under the resulting award.

As part of its initial Work Plan, and all Annual Work Plans thereafter, the recipient, in collaboration with the USAID AOR and MEO, REA or BEO, as appropriate, shall review all ongoing and planned activities under this cooperative agreement to determine if they are within the scope of the approved Regulation 216 environmental documentation.

If the recipient plans any new activities outside the scope of the approved Regulation 216 environmental documentation, if the life of activity funding ceiling will be eclipsed, or if a time extension is required, it shall prepare an amendment to the documentation for USAID review and approval. No such new activities shall be undertaken prior to receiving written USAID approval of environmental documentation amendments.

Any ongoing activities found to be outside the scope of the approved Regulation 216 environmental documentation shall be halted until an amendment to the documentation is submitted and written approval is received from USAID.

When the approved Regulation 216 documentation is an IEE that contains one or more

Negative Determinations with Conditions, the recipient shall:

- Unless the approved Regulation 216 documentation contains a complete environmental mitigation and monitoring plan (EMMP) or a project mitigation and monitoring (M&M plan), the recipient shall prepare an EMMP describing how the recipient will, in specific terms, implement all IEE conditions that apply to proposed project activities within the scope of the award. The EMMP format is attached. The EMMP shall include monitoring the implementation of the conditions and their effectiveness.
- Integrate a completed EMMP into the initial work plan.
- Prepare an Environmental Compliance Report (ECR) at the end of the year or as per reporting requirements of the award. The ECR shall be based on the monitoring of mitigation measures using Table 3 of the EMMP.
- A revised EMMP must be completed and approved in subsequent Annual Work Plans, making any necessary adjustments to activity implementation in order to minimize adverse impacts to the environment.

A provision for sub-awards is included under this award. Therefore, the recipient will be required to use an Environmental Review Form (ERF), an EMMP form (in LAC) or Environmental Review (ER) checklist (Table 1 of the EMMP for LAC) to screen grant proposals to ensure the funded proposals will result in no adverse environmental impact, to develop mitigation measures, as necessary, and to specify monitoring and reporting. Use of the ERF or ER checklist is called for when the nature of the grant proposals to be funded is not well enough known to make an informed decision about their potential environmental impacts, yet due to the type and extent of activities to be funded, any adverse impacts are expected to be easily mitigated. Implementation of sub-grant activities cannot go forward until the ERF or ER checklist is completed and approved by USAID. The recipient is responsible for ensuring that mitigation measures specified by the ERF or ER checklist process are implemented. The recipient will also be responsible for periodic reporting to the USAID AOR, as specified in the Schedule/Program Description of this solicitation/award.

USAID anticipates that environmental compliance and achieving optimal development outcomes for the proposed activities will require environmental management expertise. Respondents to the RFA shall include as part of their application their approach to achieving environmental compliance and management, to include:

- The respondent's approach to developing and implementing an EMMP.
- The respondent's approach to providing necessary environmental management expertise, including examples of past experience of environmental management of similar activities.

- The respondent's illustrative budget for implementing the environmental compliance activities. For the purposes of this solicitation, Applicants should reflect illustrative costs for developing the EMMP and environmental compliance implementation and monitoring in their cost proposal.

Climate Risk Management

All USAID projects and activities approved after October 1, 2016 are required to be assessed for climate risks, and the results of that analysis will be documented in the Activity's Initial Environmental Examination (IEE) (see Climate Risk Management for USAID Projects and Activities, a Mandatory Reference for ADS Chapter 201). This process of assessing, addressing, and adaptively managing climate risks is known as climate risk management (CRM). For USAID's purposes, climate risks are potential negative consequences on projects or activities due to changing climatic conditions. The goal of CRM is to both render USAID's work more climate resilient (i.e., better able to anticipate, prepare for and adapt to changing climate conditions and withstand, respond to and recover rapidly from disruptions) and to avoid maladaptation (i.e., development efforts that inadvertently increase climate risks). By using climate risk assessments to inform decision-making at the strategy, project and activity levels, USAID is better able to manage climate risks and more effectively pursue its mission to end extreme poverty and to promote resilient, democratic societies while advancing our security and prosperity.

The goal of climate risk assessment at the activity level is to identify ways in which to integrate measures to address climate risks into activity design and/or to provide instructions to implementers to ensure that they adequately assess and address climate risks throughout implementation. To comply with this requirement, the IEE must include a summary of the approach to activity-level CRM and major results, as well as a completed Climate Risk Management Summary Table. For FAIR, USAID/Guatemala has conducted the climate risk assessment, and the Climate Risk Management Summary Table can be found in Attachment 6. The assessment indicated moderate climate risk for two results, and these must be addressed by integrating risk management measures into activity implementation. This will be done through an environmental mitigation and monitoring plan (EMMP), where the Awardee will describe specifically how it will implement all IEE conditions and mitigation measures that result from the CRM that apply to proposed activities within the scope of the award, including identified climate risks."

17. Construction activities

USAID anticipates implementing construction activities under this project. Construction activities will consist of small-scale agricultural infrastructure to increase productivity and decrease post-harvest loss (e.g. drip irrigation, packing sheds, wet mills refurbishing, and cold-room storage). Construction activities are subject to the limitations specified in Automated Directives System (ADS) 303.3.30 "Limitation on Construction under Assistance." The selected Recipient must comply with the USAID environmental requirements. Small scale construction

refers to construction or repair of facilities where the total surface area of the disturbed environment is under 1,000 square meters and less than \$200,000 total cost.

The Agreements officer will provide approval to the construction activities (including specifications and materials) once they are identified.

END OF SECTION F: FEDERAL AWARD ADMINISTRATION INFORMATION

SECTION G: FEDERAL AWARDING AGENCY CONTACT(S)

The Agreement Officer for this Award is:

Ms. Dion L. Glisan
Agreement Officer
USAID/Guatemala

The A&A Specialist for this Award is:

Mrs. Patricia Sigui
Acquisition and Assistance Specialist
USAID/Guatemala
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SECTION H: OTHER INFORMATION

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Annex 2	Rapid Gender Analysis of Income Generation Activities in the Western Highlands
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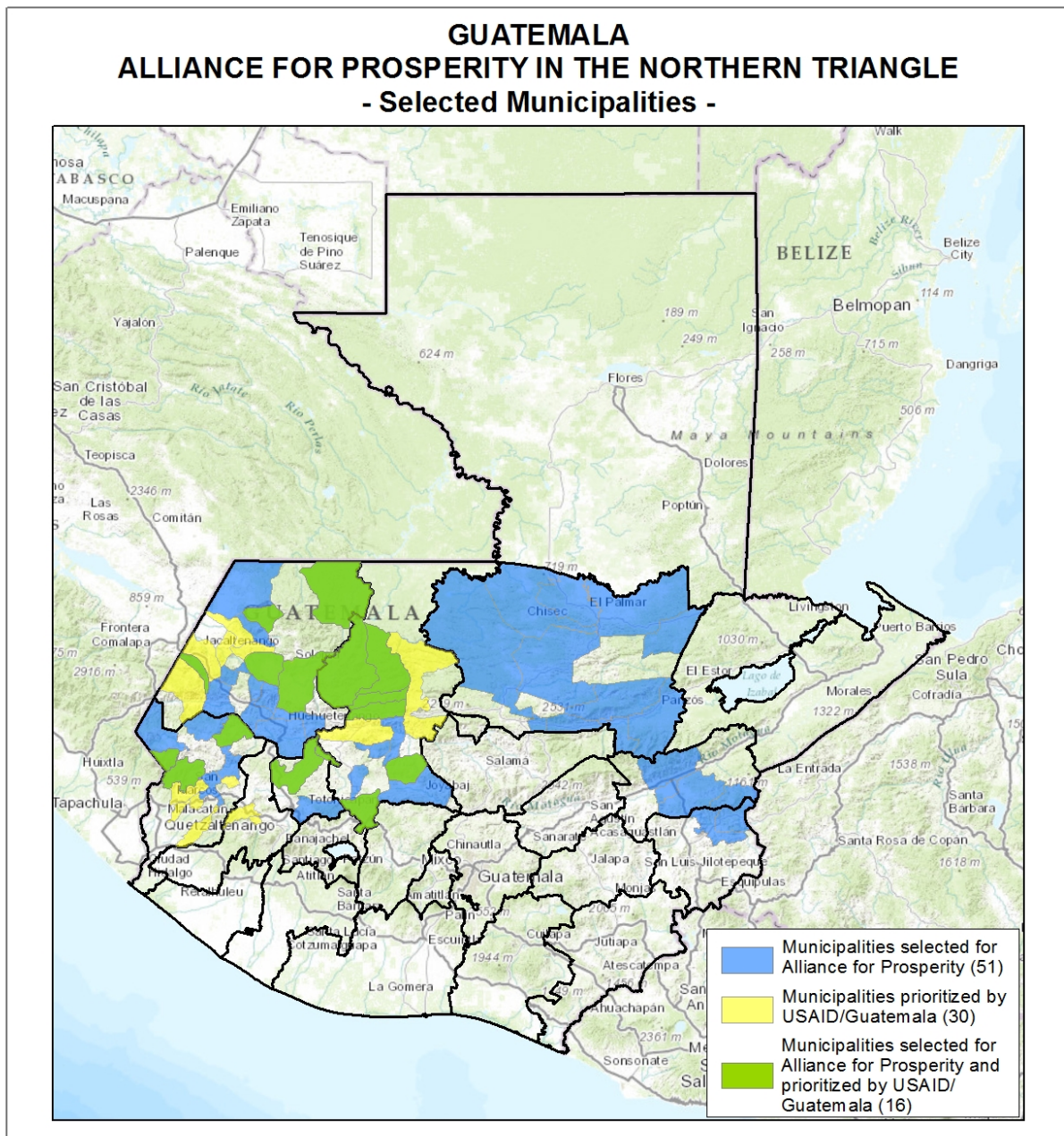
List of Attachments to the RFA

Attachment 1	USAID Partners Vetting Information Form
Attachment 2	Branding and Marking Template
Attachment 3	Operational Security – General Information
Attachment 4	Global Climate Change - Adaptation (GCC-AD) Funding Requirements
Attachment 5	USAID Guatemala Strategic Communications Results Framework
Attachment 6	Climate Risk Management Summary Table

Other Reference Documents

1. Guatemala Feed the Future Zone of Influence Baseline Report
2. Guatemala Conflict Vulnerability Assessment
3. Nutrition-Sensitive Agriculture: Nutrient-Rich Value Chains: Technical Guidance Brief Improving Nutrition for Women and Young Children
4. Growing Prosperity for a Food-Secure Future
5. Multi-Sectoral Nutrition Strategy 2014-2025 - Nutrition Sensitive Agriculture
6. SPRING Technical Assistance Reports
7. HC3 Behavior Change Communication:
 - 1) Shining a Light on Untapped Resources for Behavior Change Communication in Guatemala.
 - 2) Overarching Communication Strategy for Programs in Family Planning, Maternal Child Health, Nutrition, HIV/AIDS & Education in Guatemalan Western Highlands;
 - 3) Materiales de Comunicación de la Región WHIP de Guatemala
8. Prácticas de adaptación de la agricultura al cambio climático que ya están siendo adoptadas por los pequeños agricultores del Altiplano Occidental de Guatemala
9. Diagnóstico sobre la eficiencia de las operaciones de importación y exportación en puertos con énfasis en productos hortícolas, café e insumos para la industria alimentaria.
10. Plan de Acción para Modernizar el Servicio Civil de Guatemala.
11. Tipología Nacional de productores agrícolas, con especial referencia al Altiplano Occidental de Guatemala.
12. Diagnóstico Nacional de Riego de Guatemala.
13. Política de Promoción del Riego 2013-2023.
14. Política Nacional de Seguridad Alimentaria y Nutricional y Ley del Sistema Nacional de Seguridad Alimentaria y Nutricional.
15. Sistematización de Prácticas de Post-Cosecha y Recuperación de Valor de Mercado en la Cadena Productiva de Hortalizas del Area de Cobertura de la Iniciativa FTF.
16. Análisis Económico-Financiero y Presupuestario del Modelo de Gestión de la Infraestructura Vial Rural en Guatemala, y recomendaciones para su modernización (2006-2011).

Annex 1 Map of Alliance for Prosperity Municipalities



Annex 2 Rapid Gender Analysis of Income Generation Activities in the Western Highlands

Introduction

The purpose of the rapid gender assessment of the Rural Value Chain Program (RVCP)/Feed the Future Initiative (FtF) activities in the Western Highlands is to update the analysis underlying the 2012 Guatemala Country Development Cooperation Strategy (CDCS) and the RVCP design, utilizing the indicators and results reported to date and cursory field observations and key informant interviews. Because of the short timeframe for this assessment, the findings are presented as tentative and proposed as hypotheses for further investigation in the new project design.

The focus of attention to gender in the CDCS and the RVCP is increased gender equality and empowerment among poor rural, primarily indigenous, women in the departments and municipalities where the RVCP is being implemented. Gender has been identified as a cross-cutting component to be implemented as part of each of the six central components of the program (improved value chain competitiveness; increased participation in the value chains; improved agricultural productivity; expanded markets and sales; improved productivity of crops for household consumption; and, improved competitiveness of the handicraft value chain.) Targets are set for indicators of women members of the associations, and of women in organizational leadership positions. All person-level indicators are disaggregated by sex.

A second aspect of the RVCP concerned with gender and women's roles is food security and nutrition (SAN). The FtF Initiative and the RVCP identify women as the target for the SAN activities because of their role in childcare and household management and because the focus is on

improved nutritional status of women and children. The SAN activities are limited to households in the value chain associations/cooperatives with children under age five and/or with pregnant or lactating mothers. Training and technical assistance are directed to household decisions about diet, health, and sanitation, and include tools and methods to change behavior such as water filters, house gardens, housing improvements, and food preparation guidance. Women's empowerment in terms of their capacity and autonomy to make decisions about use of household income is a central variable in successful behavior change and improved nutrition.

The questions posed in the Scope of Work for the rapid gender assessment are focused on income generation activities and empowerment in the western highlands, namely:

- What would most effectively empower women to increase income generation in rural areas? and,
- What kinds of businesses are most effective to empower women to become economically sustainable (e.g., handicrafts, small animals, aquaculture, other)?

The RVCP and FtF target population of the Western Highlands is characterized by high levels of poverty and chronic malnutrition, as well as low levels of educational achievement and literacy. It is 76% indigenous and in most areas, Spanish is a second language. The region is 97% rural, and primarily dependent on subsistence agriculture.

In this environment, health and health care issues are significant for both men and women. Women's health and access to services are of particular concern. Maternal and infant mortality rates, which are exceptionally high, in absolute terms and in

comparison to urban areas, have been a focus of attention and have improved somewhat in recent years. Anemia and malnutrition in young women pose a risk for the women and their children. Continuing high birth rates reflect low rates of usage of family planning, and magnify the extremes of poverty and lack of food.

In broad terms, the culture of the region is also highly patriarchal, although the degree of male dominance and machismo varies across communities. On measures of education, literacy, and Spanish fluency, women are disadvantaged compared to men, and the deficit in girls' schooling is the highest in Latin America. Gender-based and intra-familial violence is endemic. Gender inequality and lack of women's empowerment are reflected in women's low levels, both absolutely and compared to men, of participation in public and private organizations, absence in leadership and decision-making positions in the community, and deficits in access to information and to productive resources like land and credit.¹

Women and Income Generation

The RVCP seeks increased empowerment and income generation for rural women through attention to gender equality and empowerment in all activities, but first through the primary objective of the RVCP, which is increased rural household income derived from market-led growth of rural value chains in export agriculture (horticulture and coffee), and in handicrafts. Second, the RVCP activities to promote food security also include avenues for women's empowerment and income generation through home-based production and microenterprise. Third, the RVCP may

enhance income generation and empowerment for rural women through increased opportunities for paid employment and entrepreneurship in the communities and municipalities where the target associations and cooperatives are located.

The following sections explore the relative effectiveness of each of these avenues to income generation and empowerment for women through the RVCP.

Export agriculture as a source of income and empowerment for women

Empowerment of women is a core component of the global FtF Initiative. It is measured by the Women's Empowerment in Agriculture Index (WEAI), which is included in the FtF impact evaluation baseline and final surveys. The WEAI has two components: the first index measures five domains of empowerment (input and autonomy in production, access to and control of resources, control over income, leadership, and time allocation); and, the second, the gender parity index, measures women's empowerment relative to men's empowerment in the same household. The WEAI and the component parts measure empowerment on a scale of 0 to 1. A value of .80 is considered to show empowerment. It is an aggregate index reported at the regional level and is based on individual-level data from men and women in the same household, as well as data from women living in households with no adult male.

The 2013 baseline survey for the RVCP (and WHIP) showed an average WEAI score of 0.77 for the Western Highlands but more than half (57.5%) of the women scored below the threshold on the empowerment sub-index, and the average inadequacy score for women who were not empowered was 40.75. The average score on the gender parity sub-index was 0.83 although two-thirds of the women (64.6) had not achieved parity, and the average gap

¹ For background information see the 2012 USAID Guatemala Country Development and Cooperation Strategy, and Annex E of the 2011 Feed the Future Guatemala Multi-Year Strategy.

between men and women was 26.4 points. It is important to note that the average for the empowerment component was calculated for the entire sample, while the gender parity part was only measured for women in male/female households.²

Age and education are important correlates of inadequacy, as young women and those who have little or no schooling are the most vulnerable. Empowerment does not vary in terms of wealth/poverty. Empowerment (or inadequacy) in agriculture is associated with lack of power and autonomy in other domains such as household expenditures, daily tasks, and health and family planning. The domains that contribute most to women's inadequacy are lack of: leadership in the community, control over the use of income, and control of productive resources. Rural men face deficits in these same domains but in all cases, they have more power than the women in their households. The forthcoming follow-up survey will be useful in measuring change in these indicators and potentially, the effect the RVCP on empowerment in the participants' households.³

The **2013 USAID/Guatemala Gender Analysis** associated with the RVCP also was directed to commercial agriculture. It identified gaps between men and women that may affect RVCP implementation and results, and proposed ways in which

implementers could eliminate or mitigate the effects of these gaps

- The analysis identified significant gaps in schooling, literacy, and fluency in Spanish, which affect access to information about farming and markets. These characteristics need to be taken into account in training and educational materials if women are to benefit from the assistance.
- Patterns of time use also differ for men and women. Men spend more of their day in paid labor, while women predominate in unpaid labor in the home and in agriculture. Men have more free time. Women's work in the fields takes away from their time for housework and childcare (which may be transferred to older daughters who then have to drop out of school) and from time spent in their own money-making activities, such as creation of items to sell in the local market or of handicrafts. It also precludes paid employment.
- Men control household decisions related to agriculture (including women's unpaid and paid labor), and household income from agriculture. Women control decisions about and income from handicrafts and, often, the sale of small farm animals or their by-products (e.g., eggs, wool, milk). In general, the men in the household also dominate in decisions about purchase of food and household/family items.
- A gap also was identified between the participation of men and women, not only in the associations and cooperatives of the RVCP but also in community organizations and committees (e.g., COCODES/COMUDES), and except in rare cases, even when women attend meetings they tend to be less active and less involved than men in decisions.
- Although both men and women in the target population have problems in accessing credit, women have less access than men to finance (and to other productive resources like land and

² In a very broad sense this implies that women heads of households are more empowered than women in a household with an adult male present, and that although rural women are less empowered than men, the indigenous men in the Western Highlands also score relatively low in terms of empowerment, agency, and inclusion.

³ See the WEAI Guatemala pilot and case study, *Women's Empowerment in Agriculture Index*, Feed the Future, 2012, and the *Guatemala Feed the Future Baseline Study*, July 2014.

technology), even in the associations and cooperatives

Based on the key informant interviews and site visits in the current rapid assessment, the 2013 analysis of the status and opportunities for women in agriculture has not changed significantly in the municipalities and organizations included in the RVCP.

- The goal and purpose level indicators for the RVCP (prevalence of poverty and income, measured by daily per capita expenditures, respectively) are measured at the household level, and therefore no comparisons can be made between men and women on these items.
- The gender cross-cutting component is monitored by the proportion of female and male participants in the RVCP-supported organizations; Number of farmers who have applied improved technology or management practices; number of people who have received technical assistance or training in production and in SAN; head of beneficiary household;
- Other indicators that are disaggregated for women and men include: the number of jobs (full-time equivalent positions) attributed to FTF implementation;

These indicators are important because they focus attention on gender gaps and inequality in the RVCP communities and organizations, and ensure that these topics are addressed in quarterly and annual reports. At the same time, few direct actions have been taken to increase gender equity and empowerment. Implementers report that the targets for women's participation have been achieved automatically as a part of overall program implementation. A woman may join an association because of her spouse's death

or migration, or because she inherited a piece of land and is farming it separately from her husband.⁴

- In AGEXPORT the proportion of women among participants has not changed from the baseline (30%) despite the increase in total participants. No new handicraft associations were added and membership within the existing organizations changed little.
- For ANACAFE, the proportion of women participants increased from 23% in 2013 to 28% in 2014, largely as a result of the entry of new handicraft associations.
- Neither consortium has invested in targeted recruitment to increase the participation of women in the value chains for agriculture.⁵ Associations are encouraged/directed to include women in the *juntas directivas* of the associations and cooperatives, although interviews suggest that women are rarely in key decision-making positions, and, for a variety of reasons, are usually ineffective as leaders (e.g., cultural tendency to subservience and reluctance to speak in public, low self-image, and lack of Spanish language, literacy, and numeracy).⁶

⁴ Agriculture is a difficult source of income for women who are heading households because of male bias and also the demands of the work given all her other responsibilities.

⁵ ANACAFE reported the formation of a small women's GAT in San Marcos, *Mujeres con Esencia de Café*, with 19 members.

⁶ The annual reports of the consortia do not provide consistent reporting for women's participation in the *juntas directivas* of the agriculture associations and cooperatives and the handicraft associations, which are more likely to include women. For example, ANACAFE reports (2015) that in Huehuetenango, "760 mujeres son socias de las organizaciones y algunas de ellas son miembros de juntas directivas y consejos de administracion." They also note that "en las 28

- The organizations responsible for implementation of the cross-cutting gender component (Voces Vitales Guatemala for the AGEXPORT consortium, and FUNCAFE for the ANACAFE consortium) were limited in their implementation to training of field personnel and some members of *juntas directivas* on the meaning and importance of gender integration and empowerment.⁷ Both observed the need for more direct activities to effect change in traditional patterns of interaction.

The analysis of the midterm impact evaluation survey will provide quantitative evidence of the extent of change in women's empowerment and of the impact of the program activities on poverty, food security, and nutrition. The preliminary analysis of these results suggests that the change has been minimal at least in terms of poverty reduction and nutritional status, both of which were linked hypothetically to women's empowerment.

In general terms, subject to additional analysis of the results: although some women (especially widows and wives of men who have migrated) participate in and benefit from the increased income accruing to the cooperatives and associations associated with RVCP, overall, commercial and export agriculture in the RVCP has not been a viable source of income generation

organizaciones con las que el FEDECOCAGUA trabaja participantan 517 mujeres y 46 de ellas participan en cuadros directivos (Consejos de Administracion, Comisiones de Vigilancia y Comisiones de Educacion.” AGEXPORT reports (2015) that 38 women occupy leadership positions in Type A associations and 59 are leaders in handicraft associations. Without further information, it is difficult to interpret these numbers.

⁷ As noted below, Voces Vitales also had a small supplemental grant from HIVOS for pilot work directly with women members of *directivas*.

or empowerment for rural women. Women in male-headed households have only indirect access to this source of income or the decisions about how the income is to be spent or invested. Further, women contribute significant unpaid labor, which constrains their time available for other tasks and potential sources of income. (See the following section for further discussion of this point.) The interviews also suggest that women's integration into the *juntas directivas* has not been effective as a tool for increased input into decisions or empowerment. Given the context of male dominance in the household and in the organizations, the traditional gender roles and dependence remain intact as women, even in the *juntas* are marginalized in secondary and social (as opposed to business) roles.

An alternative model

The formation of women-only agricultural cooperatives and associations is an alternative model to involve women in export agriculture. Several examples of women-only organizations exist, the most prominent of which is the Cuatro Pinos Cooperativa de Mujeres, which started in September 2010 and presently has about 450 members in two departments.⁸ In discussing their experience working in export agriculture, the women cite both indicators of success as producers (volume of production and sales, earnings, jobs created, and achievement of Global GAP certification) as well as the impact the business has had on their personal well-being and that of their families (such as improved living conditions, personal achievements and experiences, and their children's schooling). They speak with a

⁸ This information is based on a brief visit with members of the Junta Directiva at the Cuatro Pinos offices on 9 March 2016.

clear sense of pride in their achievements and plans for the future, as well as the problems they have encountered.

In the interview the women also discussed the process of empowerment. Initially, when some of them sought to enter the Cuatro Pinos cooperative, the men did not take them seriously and rejected them as members. Now, as a result of their success as a separate cooperative, they sit in the same meetings with the men's cooperatives, and their contributions and ideas are respected. The women's conversation about the changes in their lives also reflected a more collaborative and equal relationship with their husbands in their homes in terms of discussion and decisions about their farm, family, and investments.

The Cuatro Pinos experience is not unique but elements of this experience may be instructive concerning the process of women's empowerment in commercial agriculture. First, the cooperative emerged from the initiative of a few women in the community but, as the women themselves emphasize, it was brought to fruition through the continued and long-term support of the Cuatro Pinos social director, who provided guidance in the organizational and empowerment processes, and the technical assistance and training in horticulture provided through Cuatro Pinos. Second, in this case, and in an ONU Mujeres enterprise development project in Chiquimula,⁹ the technical training and assistance was accompanied by gender-specific training to raise awareness of women's rights and relationships, whereby

⁹ The ONU Mujeres project for *Mujeres Emprendedoras* is a joint activity with FIDA in El Salvador, Mexico and Nicaragua, as well as Jalapa and Chiquimula in Guatemala. It is a small two-year activity to support enterprise development and empowerment, which is finishing this year.

empowerment was enhanced both through business development and generation of income, and through training with direct application in the activities. Third, the commitment for the women and for Cuatro Pinos is long-term and interactive, building a clear sense of ownership and direction among the members.

Handicraft production for income

The RVCP handicraft value chain for production, marketing, and export of artesanía reflects a history of success for export-oriented handicraft associations and cooperatives in Guatemala,¹⁰ which generate a significant source of income for some rural women, drawing on traditional skills and patterns in textile production. As a part of the RVCP, the handicraft value chain is cited explicitly as a vehicle to strengthen gender equality and women's empowerment.

- Previous experience with handicraft associations and cooperatives in Guatemala and elsewhere has demonstrated positive impacts on empowerment, leadership, and investment in the well-being of their families and education of their children. This same empowerment was observed in a focus group discussion with representatives of two AGEXPORT handicraft associations during the current rapid assessment, expressed in terms of gaining independence from the men, making their own choices, and improving the care and education of their children. In this discussion, the women also pointed directly to the importance of the associations and the income for widows and others who are single heads of households.

¹⁰ The AGEXPORT Comisión de Artesanías began operating 34 years ago and has 90 affiliate associations and cooperatives.

- In most cases, the associations are women-only providing a platform for interaction and leadership development among women who are often isolated, and constrained by their domestic roles in the patriarchal environment. The association also provides women with their own source of income, a strong element in creating independence and control.
- The production of handicrafts builds on, values, and preserves the traditional skills of indigenous Guatemalan women.

While handicrafts have been and continue to be an important source of income and empowerment for some rural women several important caveats should be noted.

- Handicraft production does not replace or override women's traditional roles in the rural household and in agriculture. Handicrafts provide supplementary rather than the primary source of household income.
- Not all women are skilled artisans. Artesania is not a panacea and it should not be treated as the only or primary route to women's income generation and empowerment. For example, women work on handicrafts intermittently in their free time. Because young women with young children and struggling families are overburdened, handicraft production is a less viable option for young women than for mature women.
- The handicraft market, especially for export, is limited and is constantly shifting in response to style and preference. The handicraft value chain for export, like the agricultural value chains, depends on outside designers and sourcing of inputs, which limit the spread effects in the local community. As in the case of the agricultural value

chains, the women are often simply following instructions provided from the exporters.¹¹

- AGEXPORT has recommended consideration of expansion of the scope of this value chain to include the production of other items not necessarily destined to international markets such as footwear.
- The data on membership (cited above) and interviews suggest that the handicraft value chain within the RVCP has added little to on-going activities in terms of opportunities or increased income for women. In the case of AGEXPORT, the activities are a continuation of ongoing collaboration with pre-existing associations. In the case of the ANACAFE consortium, ARTEXCO previously had supported only one cooperative in the RVCP area, and had to create entirely new organizations for the RVCP, which to date, given the timeframe of only three years for such a complex task, are not active in export markets and in many cases have not survived.

An additional observation is that, except for gender training for technical personnel and members of some juntas directivas by Vital Voices, there is no evidence or discussion of actions by the RVCP implementers to expand gender awareness or empowerment among the association members. This may be an opportunity to explore in future programming since most of

¹¹ In some cases, the cooperatives have shifted away from traditional products, designs, materials, and colors in response to the guidance of external experts. This type of situation is likely not sustainable without external assistance (e.g., AGEXPORT). The women themselves do not have access to the materials, the market intelligence, or the marketing channels to carry forward independently.

these cooperatives and associations are women-only and could be an ideal arena for advancing issues and programs directly related to empowerment such as literacy training or education, leadership development, or exposure to/training on women's rights or advocacy.

Home-based production for sale or microenterprises

Rural women in Guatemala and around the world traditionally have generated income for themselves and their families through home production of items for sale in their communities and local markets. These items include the by-products from the animals they raise as a source of food and as assets to tap for special occasions or emergencies (such as eggs, milk, cheese, yarn), preparation and sale of food (like pastries, jams, pickles, or juices), or services like sewing, or small local shops, among others.

The effect of the RVCP on this source of income and empowerment for rural women deserves more attention and research. The RVCP components for food security and improved nutrition, include increased productivity of crops grown for home consumption and subsistence (primarily corn and beans), and support for house gardens and patio animals, are linked to women's role in household management, and women's use of time.

In the RVCP implementation of the components for increased productivity of crops for home consumption, and for improved nutrition have been secondary to export production in terms of personnel and financial resources. Previous research hypotheses also suggest that the household management activities often become secondary to export production for the

participating households in terms of the allocation of women's time.¹²

- One hypothesis posits a negative effect of household involvement in export production of vegetables on women's income and power. Because of the high demands of horticulture for unpaid family labor, and the resulting constraints on women's time, women cut back on these home-production activities, which generate income that they control for their own use. Further, the vegetables produced for export are not local food crops. Even excess production or production rejected by exporters (which is usually not available locally) is not considered or used as a resource for processing into some other product that can be sold.
- A second hypothesis is that for households involved in an export association or cooperative, wives and daughters may secure paid employment (usually seasonal) in post-harvest processing, which takes time but also may replace the income lost in home production. In some cases, these earnings may be considered as part of the income from agricultural production and therefore will be turned over to the husbands/fathers. In other cases, women may be able to use this income to purchase food and other items that they previously had to produce themselves. The corollary is the apparent effect that the replacement of home production has had on family nutrition, whereby less nutritious and more prestigious purchased food items replace the traditional diet.

¹² An interesting observation in the conversation with women leaders from the *Cuatro Pinos Cooperativa de Mujeres* is that as successful farmers, they now employ other women to assist them in their household tasks.

Traditionally, women have raised small animals as a part of the household patio, as a source of women's income (through sale of animal by-products or of the animals themselves) and of food for the family, and as an asset available to sale or consumption in emergencies and in celebrations. Small animal husbandry was cited in the program descriptions for both FtF and RVCP. According to the annual reports of the implementers, these activities were not a significant part of components for increased productivity of crops for home consumption or for food security and nutrition. Inputs in this area were limited to isolated training sessions, primarily with women in the affiliated households.¹³

This potential source of income generation for women deserves further investigation and analysis. A bibliographic search indicates that various non-governmental organizations (NGOs), both national and international, have supported women in husbandry on a relatively small scale. ONU Mujeres also has supported some small business development by rural women in the production and sale of honey. A systematic review of these experiences would be instructive. The potential for income generation on a larger scale is not clear. One factor to be examined is the costs of animal husbandry and the source of funding (credit) and technical assistance for women to support the start-up and maintenance of animal husbandry as a small business. A second consideration is the constraints on women's time, given the conflicting demands for agricultural work and household maintenance. A third factor, given the cultural context, may be the difficulty for women to maintain control of

the income from an agriculturally-related business.¹⁴

Other sources of income among rural women

Three other potential income sources deserve mention although they are not directly linked to the RVCP strategy or program in the short-term.

A core concern in Central America at present is the generation of employment and opportunities for young people to stem the flow of young migrants to the US and to improve security. While these issues usually are discussed in the context of young men, the arguments apply equally to young rural women. With the proper incentives and educational opportunities, young women may be employed in formal sector service jobs in the region, primarily in traditional fields like education, health, and commercial services. Improved education opportunities, particularly technical education, with attention to access and recruitment is as important for young women as for young men.¹⁵ Even within the RVCP, opportunities exist for young women in the region as they do for young men in working as promotoras or field technical personnel.

A second area for income generation that has been promoted by some donors and NGOs (e.g., ONU Mujeres) is support for women entrepreneurs. Support for small business development in rural communities

¹³ Animal husbandry was cited as a successful component of the Save the Children Title II program.

¹⁴ In a personal interview, the tendency for men to intervene when the business reaches commercial scale was mentioned as a factor to be investigated.

¹⁵ Local access to schooling, especially secondary and tertiary education, is particularly important for young women to counter cultural restrictions on girls' leaving the community to study as well as the constraints of home responsibilities.

for women as well as for men is a logical extension of the RVCP strategy to have the value chains provide the base and initiative for regional development.

A third source of income for rural women in the western highlands is remittances from family members (husbands) who have migrated to the US. This topic was not discussed during the rapid assessment except for occasional anecdotal references to the fact that some women participate in the agricultural associations while their husbands are in the US. The extent of the external migration and remittances among farmers in the RVCP municipalities and the effect on factors like investment in agriculture (or business development), household nutrition and well-being, and women's economic roles in the region may be considered in future planning.

Gender Equality and Women's Empowerment

The questions guiding the rapid assessment focus on the relationship between income generation for women and empowerment. This relationship is not straightforward or unidimensional. Income generation and empowerment among rural women do not have a single or even a best "solution" for all women. While it is possible to identify a broad set of constraints and gaps that bind women's options, confronting or mitigating these constraints is intended to open opportunities and expand agency, not to provide a ready-made solution.

- Income generation without control of that income does not change the position of women in the household or in the community. Empowerment involves making decisions and choices. Activities to enhance the income and empowerment of women in the Western Highlands should focus on opening opportunities and supporting women in making choices, through support for education and skills development, health services, access to information and

credit, personal and leadership development, and organizational skills. Knowledge of rights and support to counter personal threats of gender-based violence also are important. This process of support is especially important and effective when it is directed to girls and young women.

- A point emphasized in interviews and discussions is the diversity not only among women but also among communities. This point focuses on the need to adapt programs and training materials to the setting (e.g., the degree of isolation, organization, leadership, and cultural norms), and on the value of an interactive process with the community and its leaders.
- A central factor in working with rural women in the Western Highlands (and elsewhere) is the time constraints they face and the trade-offs that are made between the traditional tasks of household management and care of children, elderly, and sick, and productive tasks for income generation. Young women with young children, living in poverty are particularly burdened. The freedom to make choices about time allocation is an element of empowerment.

An unanswered question posed during the rapid assessment is the relative degree of empowerment for women through more active participation in mixed organizations or through separate women's organizations. The experience of the handicraft associations and of the Cuatro Pinos Cooperativa de Mujeres seems to affirm the value of separate organizations for leadership development, independent decision-making and action, and building support structures among women to counter the isolation and constraints imposed by male dominance. At the same time, separate organizations may also imply subordinate organizations, whereby the women's activities are seen as secondary

and less important by both the implementers and the community. The development of these organizations also implies a commitment of resources and technical skills that have not been available to the RVCP implementers. The process of integration and empowerment of women into mixed organizations might be made more effective by moving beyond training on gender integration, and acting to recruit additional women members (perhaps by having both husbands and wives as voting members, for example) to build a “critical mass” of women members, or working directly with women members to support them in developing and expressing their interests and priorities.¹⁶

A final aspect of income generation by women within the poverty and food security objectives of the RVCP and the FtF is sustainability. To what extent will the activities be managed and grow under local leadership, without continued outside resources and support? Although all income generation activities are vulnerable to exogenous changes, the observations during the rapid assessment suggest that sustainability will increase with empowerment and a sense of local ownership and decision-making, derived from an extended interactive process of support and learning.

¹⁶ Vital Voices has had a small activity of this type with women association members with supplemental funds from HIVOS. Additional documentation and analysis of this experience could be instructive.

Annex 3 Recommendations on Climate Change Adaptation responses for Guatemala



**Project: Climate Change, Vulnerability and Adaptation Assessment for
USAID/Guatemala**

USAID: United States Agency for International Development

**Deliverable 4 (Final Report). Recommendations on
Climate Change Adaptation responses for Guatemala**

**Consultants: Private Institute for Climate Change Research (ICC), part of the
Guatemalan Sugar Association (Asociación de Azucareros de Guatemala); Global
Climate Adaptation Partnership (GCAP); Grupo Laera**

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Abbreviations and acronyms

AGAAI: Guatemalan Association of Indigenous Mayors and Authorities

ANACAFÉ: National Coffee Association

ANAM: National Association of Municipalities of Guatemala

ARNPG: Private Nature Reserves Association

ASOCUCH: Association of Organizations in the Cuchumatanes region

ASOREMA: National Association of Natural Resource and Environmental Non-governmental Organizations

CEMAT: Centre for Alternative Technology

CIV: Ministry of Communications, Infrastructure and Housing

COCODE: Community Development Council

CODEDE: Departmental Development Council

COE: Center of Emergency Operations

COMUDE: Municipal Development Council

CONAP: National Council of Protected Areas (by its Spanish acronym)

CONRED: National Coordinating Office for Disaster Reduction

COOPI: Italian Cooperation

DIPECHO: European Union Program for Disaster Preparedness

GCAP: Global Climate Adaptation Partnership

GHG: Greenhouse Gases

IAM: Impact-Action Matrix

ICC: Private Institute for Climate Change Research

ICTA: Agriculture Science and Technology Institute

INAB: National Forests Institute

INDE: National Electricity Institute

INFOM: Municipal Development Institute

INSIVUMEH: National Institute for Seismology, Volcanology, Meteorology and Hydrology

MAGA: Ministry of Agriculture, Livestock and Food (by its Spanish acronym)

MARN: Ministry of the Environment and Natural Resources (by its Spanish acronym)

MCD: Ministry of Culture and Sports

MEM: Energy and Mines Ministry

MINECO: Ministry of Economy (by its Spanish acronym)

MINEDUC: Ministry of Education

MSPAS: Ministry of Public Health and Social Assistance

UN: United Nations Organization

PDO: Pacific Decadal Oscillation

PES: Payments for ecosystem services

PINFOR: Forest Incentive Program

PINPEP: Program of Incentives for Small Owners of land with Forest and Agro-forestry Capacity

PFN: National Forestry Program

PRS/USAID: USAID Policy Regulation Support Project

PWS: Payments for watershed services

RA: Rainforest Alliance

REDD: Reduction of Emissions from Deforestation and Forest Degradation

SCAEI: Integrated Environment and Economics Accounting System

SEGEPLAN: Presidential Planning and Programming Office

SICA: Central American Integration System

SIGAP: Guatemalan System of Protected Areas

SIPECIF: National System of Forest Fire Prevention and Control

UNFCCC: United Nations Framework Convention on Climate Change

USAID: United States Agency for International Development

USAID/PRS: Policy Regulatory Support USAID project

WWF: World Wildlife Fund

ITCZ: Inter-Tropical Convergence Zone

1. Introduction

This report contains the final results of the study called Climate Change Vulnerability and Adaptation Assessment in Guatemala. It includes two of the three main objectives which involved developing a list of potential measures on climate change adaptation and recommendations to USAID/Guatemala regarding actions that should continue in order to support climate change adaptation in prioritized geographical areas. Its importance lies in the fact that Guatemala has been identified as one of the most vulnerable countries of the region and it needs to take measures to reduce impacts derived from current and future climate events and variability.

The report provides a brief theoretical framework that should allow the reader to obtain an overall picture on climate change adaptation in order to better understand what is presented throughout the document. The third section shows the list of potential adaptation measures that came out from the different project stages. This part includes one of the requirements of the purchase order, which consists in the assessment of adaptation measures in a final workshop with different stakeholders from Government, USAID/Guatemala partners and the geographical areas of interest (section 3.1). Among the numerous measures that emerged, several may not be considered as climate change adaptation measures but it is definitely advisable to take them into account to diminish climate derived impacts.

The fourth section addresses two subjects that were explicitly requested in the purchase order and that are essential to tackle climate change adaptation. These are local governance and gender equity. Both subjects highlight aspects that need to be considered and they also provide recommendations that emerged from both workshops and consultations, as well as from the consultants responsible for the study.

In the fifth section one of the most important elements of the report is presented: key messages and recommendations to USAID/Guatemala. Ten messages and recommendations derived from the whole study, and particularly from a discussion carried out by the foreign and national consultants after the final workshop, are provided.

Although the report as such is a tool that will support USAID/Guatemala, it is recommended to take into consideration information contained in the first three documents produced during the study. Even though the identified measures in the different stages of the study are summarized in this document, the other reports contain additional information that could be useful.

2. Adaptation to Climate Change: important theoretical aspects

The term adaptation has been used as the process to establish changes in a system's behavior and characteristics to increase its ability to withstand external pressures (Brooks, 2003). In terms of climate change, adaptation has been defined as the implementation of adjustments in the ecological, social or economic systems in response to expected or observed changes in climate and their effects to reduce adverse impact of such changes, or to take advantage of new opportunities (IPCC, 2007; Adger et al., 2005).

For two decades, towards the end of the 20th century, the adaptation issue was widely neglected because there were concerns that focusing on it would imply reducing attention to climate change mitigation (Pielke et al., 2007). However, climate change adaptation has gained importance and it is considered an alternative or complementary strategy to mitigation (Pielke et al., 2007; Smit et al., 2000). It is important to be aware of this because it explains, to some extent, the greater progress in the climate change mitigation agenda compared to the adaptation one. For the latter, there are no well-defined protocols or financial mechanisms that support the implementation of actions. The Adaptation Fund that emerged from negotiations of the United Nations Framework Convention on Climate Change (UNFCCC) is the first step, but its definition and structure have been developed in recent years and it has been functioning for two. The (relative) underdevelopment in climate change adaptation is not only reflected in international negotiations but also in theory, methodologies and mechanisms to guide actions nationally and locally. Nevertheless, considerable importance is given to the subject at all levels, which will facilitate without a doubt moving forward.

The definitions of adaptation have in common that they refer to changes in a system in response to climatic stimuli, though they also present differences. These are particularly related to application and context. Some refer to climate *change* while others focus on climate *variability*. There are variations related to who and what has to adapt as they could be social and economic sectors, ecological systems with or without management, or practices, processes or structures. The impacts of changes in climate are different according to sectors or systems. For instance, increases in heat waves have a deep effect on the elderly, and thus, adaptation measures must focus on that part of society. The implementation timing of adaptation measures also influence approaches that can be used, thus, there is preventive and reactive adaptation. Although adaptation measures are usually assumed to be or should be preventive, in reality it is common to take measures in a reactive way (Smit et al., 2000). Another factor to consider is the participation level of the country or the sector that must adapt and the assistance that will be provided by other stakeholders, that is adaptation can be passive or active.

Many societies, institutions and individuals have changed their behavior in response to climatic changes that have occurred in the past and others are considering adapting to future climatic alterations. A part of this adaptation is reactive because it responds to past or current events, but also preventive because it is based on assessments of future conditions. Adaptation is composed of individual, group and governmental actions. Among the factors that can drive adaptation are economic well-being protection and improvement of both individual and community security (Adger et al., 2005).

Authors like Adger et. al (2003) argue that populations in developing countries are not passive victims, but in the past they have shown stronger resilience to droughts, floods and other catastrophes. In that sense adaptation options may not be necessarily new to a place. The

analogous approach is to consider case studies of past responses to climate variability and extremes (temporary analogies). Current behavior in regions with similar climatic conditions to those that may develop in the region of interest (spatial analogies) can also be investigated (Adger et al., 2003). Most adaptation in developing countries will depend on past experiences on how to cope with climate related risks. So, a great part of the adaptation of farmers, fishermen, coast inhabitants and residents of great metropolis will be autonomous and facilitated by their own resources and social capital (Adger et al., 2003).

There are many approaches and types of adaptation measures. Some adaptation measures can be purely technological as in the adoption of water storage and irrigation technologies that would be recommended in order to decrease impacts of greater variability in water availability for some crops. Other adaptation measures can have an institutional nature like the creation of entities whose work contributes to the reduction of impacts from changes in climate. There are adaptation measures that are more related to behavioral changes. If, for example, food security is threatened by climate change due to the fact that it is fundamentally based on two vulnerable crops, a possible adaptation measure could be for people to change their diet, to be based on a greater variety of crops or on those less vulnerable to climate change. In many cases, although adaptation measures are identified, recommended actions entail tasks already carried out in a planned, effective and efficient way.

In the analyses of potential adaptation measures conducted, some of the resulting actions may not be seen as direct adaptation measures, but as conditions that help reduce climate change impacts. Still it is very important to identify how climate change and variability will affect specific sectors (biodiversity, agriculture, hazards, health etc). Deforestation for example, has multiple causes related more closely to social and economic processes than to climate. For adaptation, addressing deforestation is a key component because it will lead to more resilient ecosystems, reducing the loss of species and providing environmental goods and services for the population. Additionally, protecting forested areas and working on conservation, will reduce overall greenhouse gas emissions, thus linking adaptation to mitigation. One of the main causes driving deforestation is the increase in cropland demand, which is affected by the lack of land planning and lack of logging law enforcement. Measures considered, among others, that were discussed during this project to reduce deforestation include: 1) Promotion of sustainable uses of forests 2) Strengthening of authorities that are in charge of forests, 3) Dissemination of fire management, 4) Land planning, etc. These measures, however, would appear not to be directly climate change adaptation measures, but are in fact related to reducing current vulnerability, increasing resilience (both at forest level and within institutions) and increasing capacity to respond to environmental changes, including climate change and, would also reduce the extent of biodiversity loss. Additionally, it is important to note that deforestation can also lead to landslides, as hill slopes that are left without vegetation are much more likely to erode or form landslides during rain events, which may increase due to climate change. This is one of the reasons why adaptation measures should not be seen separately from project formulation or planning but they should be mainstreamed in them.

3. Climate change adaptation options identified for Guatemala

The project intended to provide an initial list of adaptation options that would then be analyzed through consultations with various stakeholders in order to produce a shorter list of most

recommended options per sectors and geographical areas. However, while some adaptation actions were identified as (overall) more feasible, each stage of the project added adaptation options to the initial list. Therefore, the project yielded a rather long list of adaptation options or measures that can help reduce climate impacts. A discussion of the most recommended options, based on the different analysis and assessments and on the climate potential impacts in the different geographical areas, is included first. Then we included those options that were analyzed at the final workshop with numerous stakeholders (see section 3.2), including a rank of the main options for each of the sectors studied. The complete list of adaptation options that resulted from the project is then presented (see Table 3).

3.1. Focus of the adaptation options in the geographical areas of interest for USAID/Guatemala

According to the Impact Action Matrix (IAM) carried out during the first workshop, impacts and potential adaptation responses were identified for forests, biodiversity, agriculture and the water sector, in the different regions of interest.

3.1.1. The Sierra de las Minas Biosphere Reserve

The Sierra de la Minas Biosphere Reserve has an exceptional value in terms of biodiversity. Adaptation options in that region should be prioritized around protecting that diversity. Furthermore, its adequate conservation and management is also crucial to sustain the livelihoods of hundreds of human settlements in its surroundings, particularly because most sources of water are found in it. Forest fires are a threat at present and its risk is very likely going to increase as a result of higher temperatures and reduced rainfall, as most future climate projections suggest. Fire could speed up the changes in those ecosystems as indicated by a recent study by IARNA (2011), where the most threatened ecosystem is the cloud forest, which could even disappear. Therefore, fire risk management, and particularly the prevention element, should be a priority. The results shown in the IAM indicated that an increase in forest fires is the factor that could have a high impact on forests and biodiversity.

In the case of the agricultural sector, the main impacts were pointed out as 1) loss of crops due to drought (in the southern part), as well as loss and degradation of soils; 2) a medium impact is expected through the loss of crops due to excess rainfall, and high humidity, as well as an increase in pests; 3) a low impact was believed in loss of crops due to floods, frosts, and (scarce) water availability.

The water sector expects a high impact through poorer water quality and water-related conflicts, due the reduced availability of water. Water quality becomes a growing concern as water availability reduces because there is less available water for the dilution of contaminants. A medium impact is expected through damage in infrastructure and variability in water availability for human settlements.

Actions aiming to reduce, prevent, and manage forest fires would be advisable in the Reserve, followed by ecosystem conservation initiatives. Soil management strategies and watershed management initiatives would reduce current and future agriculture vulnerability to climate change at the Reserve. For the water sector actions aiming to improve water quality, reduce

conflicts arising from the use of water and ensuring the resource could increase the sector's resilience to Climate Change.

3.1.2. The Maya Biosphere Reserve

The discussion on the Maya Biosphere Reserve generated several conclusions. Direct impacts of Climate Change on the Reserve's biodiversity can be linked to the plant and animal capacity to respond and adapt to changes in temperature and precipitation patterns. As ecosystems are formed by communities of species, the alteration of abundance and distribution of such species will definitively impact ecosystems structure, resilience and composition. If environmental conditions change, species and ecosystems can adapt to new conditions or migrate to areas with more suitable conditions. However, if there are geographical barriers, or the exact environmental conditions required for their reproduction and development are nonexistent, then the evolutionary process will prevail and species might disappear, other species will occupy their niches and it is possible that ecosystems change, as well as the services they provide. Overall there is very little scientific knowledge on species and ecosystems thresholds to the impacts of climate change. For example, basic knowledge on amphibians leads to the conclusion that drier conditions will add stress to the animals; there has also been laboratory research of their physiology and relation to humidity and temperature, but these are for few species and under controlled environments. It is possible that some of these species are in the limit of their thresholds and we do not know them, also conditions might be changing too fast for those species to adapt. Furthermore, most ecological models involving climate change impacts are still very simplistic and do not incorporate the other many environmental, ecological, and evolutionary variables that could be driving change on ecosystems, such as relief, waterways, prey-predator behavior, competition, or human pressures, to name a few.

Understanding all the ecological and evolutionary processes occurring at the Maya Biosphere and how species and ecosystems at this particular site could be impacted by increased temperature and reduced water availability would be ideal. However, the reality is that it is not possible and reducing the other stressors might be the best alternative for species and ecosystems to adapt to climate variability and the changing conditions set by climate change.

David F. Whitacre in 1997 produced a report for USAID and CONAP in which he already identified potential variables that could affect the Reserve including climate and global change: atmospheric changes, potential increase in UV, increased concentration of CO₂, acid rain and set a medium to high priority for monitoring such variables. The report states that there is a need of indicators at the habitat level to monitor the consequences of such processes. In particular the report states that trees and Anura (frogs) could be used as indicator species to detect and monitor atmospheric and climatic changes.

Local climate data, forest phenology, and tree growth and survival are suggested as indicators of climate change, but low and medium priority was given to them in the report mentioned above. Atmospheric changes are suggested to be monitored assessing amphibian population trends and trees growth and survival. High priority was given for amphibian population trends.

It is not possible within this project to assess the repercussion of such a report in CONAP and USAID projects in Guatemala, however, if the proposed monitoring system is in place it could be possible to use the data and assess changes over the past 15 years. The Team of this project was not aware of this report when doing the respective interviews. A scientific literature search

aiming to find more detailed information on climate change impacts on the Biodiversity of the Maya Biosphere Reserve resulted in no resources.

This project has identified the following direct impacts of climate change on forests and biodiversity: 1) biodiversity loss, including genetic material in crop and forest species, 2) Potential increase in forest fires, and 3) a potential decrease in ecosystem resilience. Deforestation, particularly due to land use change and illegal logging are further stressors that could increase the vulnerability of forests and ecosystems to climate change. It is thought that these two combined could have potentially more damaging consequences than the direct impacts themselves.

Further consideration is related to impacts of climate change on communities' livelihoods, agriculture, and water quality and availability, as well as other pressures on the systems outside the Reserve. If these conditions become worse, in close areas that are not protected or in areas within the region, it is possible that higher pressure on the Reserve resources might occur.

The experts who were consulted and who participated in the first workshop also agreed that medium and low impact was expected in the agriculture and water sectors. These included increase in pests, soil loss and degradation, poorer water quality (because of decreasing flow), and, possibly the start of water-related conflicts. Low impacts were expected in damage to infrastructure and water scarcity in human settlements, according to the informants.

3.1.3. The Western Highlands

Extremely high levels of poverty and food insecurity are found in the Western Highlands. Although the flood and drought maps by MAGA (2000) indicate that these hazards do not occur largely in the Western Highlands (except for some small localities), landslides, forest fires, and frosts are common to the region (DesInventar, 2012). The region's disaster vulnerability is high and any increase in climate-related hazards is bound to have a strong impact on the population. Because of the socio-economic conditions, the main areas of focus for climate adaptation should then be agriculture and water resources. However, the Western Highlands are home to numerous ecosystems due to their rugged topography and diverse microclimates, as described by Holdridge in his life zones system (MAGA, 2001). Protection and sustainable management of biological diversity should, then, be also encouraged and supported.

The IAM assessment identified the following direct impacts of climate change on forests and biodiversity in the region: 1) loss of diversity in the gene pool both for crops and forest species, 2) decrease in ecosystem resilience; and 3) Potential increase in forest fires. Forest degradation due to extraction of firewood and in a lesser degree deforestation, are further stressors that could increase the vulnerability of forests and ecosystems to climate change.

The main impacts identified for agriculture and livestock are: 1) loss of crops due to frosts, 2) loss of crops due to excess rainfall and high humidity, 3) Increase in pests, 4) (agricultural) drought, and 5) soil loss and degradation. On the other hand, a low impact is expected through loss of crops due to floods.

In the water sector the main impacts identified were: 1) damage to (public) infrastructure, 2) water scarcity in human settlements, 3) poorer water quality due to decreasing water flow, and 4) increase in water-related conflicts.

3.1.4. The Verapaces

Alta and Baja Verapaz show varying climatic conditions. Alta Verapaz and part of Baja Verapaz are some of the most humid areas in the country. Rainfall occurs all year round, intensifying from May to October. Some municipalities in the region also show some of the highest levels of poverty and food insecurity. According to the IAM, adaptation options, then, should give slightly more importance to the agricultural and the water sectors.

Part of Baja Verapaz lies in the dry corridor area. Given that dry conditions are likely to increase and cover a wider territory in that department (IARNA/URL, 2011), climate hazards related to dry conditions should then be analyzed to determine the appropriate adaption actions. They should take into account water resources, especially in their relation to provision to homes, and its use in agriculture.

The IAM showed that the highest impacts on forests and biodiversity were not directly related to the impacts of climate change but to other processes such as degradation due to extraction of firewood and to a lesser degree, illegal logging, which in turn could exacerbate system's climate change vulnerability.

Direct impacts identified included: biodiversity loss for crops, forests and other natural ecosystems, increase in forest fires (particularly in Baja Verapaz), and loss of ecosystem resilience.

The results for the agricultural sector were as follows, the highest impacts were expected through: 1) loss of crops due to excess rainfall and high humidity in the more humid regions, particularly during tropical storms, 2) increase in pests, and 3) soil loss and degradation. Medium impacts are expected through loss of crops due to floods and droughts, and variability in available water for crops. Impacts of frosts on crops were considered low.

High impacts are expected in the water sector through damages in infrastructure, deterioration of water quality due to decreasing water flow and a rise in water-related conflicts. Medium impacts are thought to happen through water scarcity in human settlements.

Table 1 summarizes the lines of actions identified during the IAM assessment to reduce the impacts of climate change in each of the regions of interest. Several other actions were discussed and this table is only presenting those that directly relate to climate change impacts.

Table 1. Recommended actions for climate change adaptation in the regions of interest

Region	Proposed lines of action
Sierra de las Minas Reserve	Biodiversity protection and management
	Increase forest fire prevention, control and management
	Soil conservation and management
	Watershed management
	Efficient water management and harvesting to reduce conflicts among users

Maya Biosphere Reserve	Biodiversity conservation initiatives, including seed banks
	Increase fire prevention, control and management
	Soil conservation and management
	Pest management strategies
	Efficient water management and harvesting to reduce conflicts among users
The Western Highlands	Biodiversity conservation initiatives, including seed banks
	Increase fire prevention, control and management
	Crops management and diversification
	Soil conservation and management
	Pest management strategies
	Irrigation water management
	Infrastructure climate proofing
	Efficient water management and harvesting to reduce conflicts among users
The Verapaces	Detailed hazard assessment
	Biodiversity protection and management
	Increase fire prevention, control and management
	Pest management strategies
	Soil conservation and management
	Efficient water management and harvesting to reduce conflicts among users

3.2. Most recommended adaptation options according to the workshop with different stakeholders

The final list of adaptation options and the level of priority designated to them resulted from a workshop with various stakeholders (see the list of participants in annexes), though inputs from all stages of the project were taken into account. During the workshop the outcomes from the consultations, the initial workshop and interviews were presented to the attendants. They were split into groups according to three topics: forests and biodiversity, water resources and agriculture. They were asked to discuss the list of adaptation actions and consider including more according to their knowledge and experience. The instruction was to choose around 8

adaptation actions according to their effectiveness and feasibility. These actions were then used for a pair-wise exercise that would help further explore the most recommended actions.

The pair-wise exercise required the groups to compare each adaptation option against each of the other options and try to decide, in pairs of options, which was more feasible. They were asked to consider effectiveness, economic feasibility, technical feasibility, social/cultural feasibility, and institutional feasibility when deciding which of the two to select. In a matrix a letter that represented the chosen adaptation option was placed in a box intercepting the two options (see Annex 7.2). At the end this gave each adaptation option a frequency that helped build the rank of most recommended options (see Table 2). The resulting matrix for each sector is included in the annexes.

During the workshop, the participants stressed the fact that all adaptation options mentioned in the pair-wise exercise were very important. This made it difficult to select a short list of options to be analyzed. Although that implies that the adaptation options which were left out of the exercise should be taken into account, the discussions held allowed to identify priorities and to be practical when choosing adaptation options to be implemented on the ground. The results from tables 3 to 5 are summarized in the following table.

Table 2. Climate change adaptation options per sector in order of priority

Forests and biodiversity	Financial mechanisms for conservation
	Strengthening all types of protected areas and biological corridors
	Valuation and preservation of ancestral and traditional knowledge for climate adaptation
	Strengthening institutions on biodiversity matters, including the local level
	Strengthening local capabilities and citizens participation
	Research and monitoring
Agriculture and livestock	Soil conservation
	Irrigation and water storage
	Diversification of crops
	Harvest and seed storage
	Family gardens
	Integrated Pest Management
	Agroforestry systems
	Preservation of native species
	Fencing of livestock

	Use of meteorological information
Water sector	Use of information
	Protection of headwaters
	Organization of local stakeholders
	Water storage
	Improved water use efficiency
	Water infrastructure upgraded to withstand extreme events
	Water valuation
	Land planning

3.3. Recommended adaptation options according to all stages of the study

Table 3 shows the adaptation options that were mentioned throughout this assessment during workshops and consultations. There were a total of 81 options, which were then grouped in 58 options to avoid repetition.

The table lists the adaptation options in the first column and then information on the options is given in the three other columns. Each column presents:

- Adaptation options: Adaptation opportunities identified during the different consultation processes
- Source: Scenarios where consultations have occurred
- Criteria assessment: options that were considered in the feasibility assessment post workshop I
- Sectors of Interest: Options that were discussed considering biodiversity and forests, agriculture and food security and water.
- Regions of Interest: USAID areas of greater interest for those sectors in Guatemala

Table 3. Climate change adaptation options that resulted from all the stages of the study

Adaptation options	Source			Sector of interest			Regional Assessment			
	Workshop 1 (experts)	Feasibility Assessment (USAID partners and government officials)	Final workshop (stakeholders)	Forests & biodiversity	Agriculture	Water	Western Highlands	Verapaces	Sierra de las Minas	Maya Biosphere
Soil conservation	X	X	X	X	X	X	Δ	Δ	Δ	Δ
Food storage	X				X		Δ	Δ	Δ	
Collective intellectual property rights	X				X		Δ	Δ	Δ	
Increase capacity to produce, use and monitor information. Promote research on met data and baseline information that can lead to knowledge about how different systems (human and ecological) are impacted by climate change and their natural responses	X	X	X	X	X	X	Δ	Δ	Δ	Δ
Greenhouses for certain crops	X				X		Δ	Δ	Δ	
More resilient varieties of crops	X				X		Δ	Δ	Δ	
Integrated Pest Management	X		X		X		Δ	Δ	Δ	Δ
Early-warning systems	X				X	X	Δ	Δ	Δ	

Adaptation options	Source			Sector of interest			Region			
	Initial workshop (experts)	Feasibility Assessment (USAID partners and government officials)	Final workshop (stakeholders)	Forests & biodiversity	Agriculture	Water	Western Highlands	Verapaces	Sierra de las Minas	Maya Biosphere
New standards for water infrastructure	X					X	Δ	Δ	Δ	Δ
Promote systems for efficient water harvesting, storing and distribution	X	X	X		X	X	Δ	Δ	Δ	Δ
Monitoring of rivers	X			X	X	X	Δ	Δ	Δ	Δ
Payment for ecosystem services (PES) (including hydrological services)	X	X	X	X	X	X	Δ	Δ	Δ	Δ
Sewage water treatment	X			X	X	X	Δ	Δ	Δ	Δ
Industrial water treatment	X			X	X	X	Δ	Δ	Δ	Δ
Strengthening and supporting local governance, capabilities, coordination, planning and citizens participation	X	X	X	X	X	X	Δ	Δ	Δ	Δ
Crop and seed storage	X	X	X	X	X		Δ	Δ	Δ	Δ
Forest certification	X			X			Δ	Δ	Δ	Δ
Botanical gardens (conservation and ex-situ reproduction)	X			X			Δ	Δ	Δ	Δ
Protected areas including biological corridors	X		X	X		X	Δ	Δ	Δ	Δ

Adaptation options	Source			Sector of interest			Region			
	Initial workshop (experts)	Feasibility Assessment (USAID partners and government officials)	Final workshop (stakeholders)	Forests & biodiversity	Agriculture	Water	Western Highlands	Verapaces	Sierra de las Minas	Maya Biosphere
Improve capacity to prevent and control forest fires at the national and local level	X			X	X		Δ	Δ	Δ	Δ
Forestry training	X			X	X		Δ	Δ	Δ	Δ
Penalties for people that start forest fires	X			X	X		Δ	Δ	Δ	Δ
Efficient systems for sustainable wood consumption, forest-product substitutes, forest incentives and subsidies.	X			X			Δ	Δ	Δ	Δ
Penalties for illegal wood trade and collection	X			X			Δ	Δ	Δ	Δ
Raise the level of forest-related awareness and education	X			X			Δ	Δ	Δ	Δ
Forest management plans (e.g. municipal forest land).	X			X			Δ	Δ	Δ	Δ
Certified firewood forests	X			X			Δ	Δ	Δ	Δ
Enforce forestry regulation at the municipal level	X		X	X	X	X	Δ	Δ	Δ	Δ
Reintroduce the Integrated Environment and Economics Accounting System (SCAEI)	X			X			Δ	Δ	Δ	Δ

Adaptation options	Source			Sector of interest			Region			
	Initial workshop (experts)	Feasibility Assessment (USAID partners and government officials)	Final workshop (stakeholders)	Forests & biodiversity	Agriculture	Water	Western Highlands	Verapaces	Sierra de las Minas	Maya Biosphere
Market-based conservation mechanisms	X		X	X			Δ	Δ	Δ	Δ
Carbon sequestration		X		X						
Agro-forestry systems and livestock			X		X					
Economic activities diversification		X	X	X	X					
Improvement of subsistence crop management and family gardens		X	X		X					
Restoring native and endemic species		X	X	X	X					
Domestic fauna		X	X		X					
Promote efficient crop irrigation including infrastructure	X	X	X		X	X	Δ	Δ	Δ	
Fencing livestock			X	X	X					
Crop diversification		X	X		X					
Diet change (to one based on more resilient crops)		X			X					
Rural insurance			X		X					

Adaptation options	Source			Sector of interest			Region			
	Initial workshop (experts)	Feasibility Assessment (USAID partners and government officials)	Final workshop (stakeholders)	Forests & biodiversity	Agriculture	Water	Western Highlands	Verapaces	Sierra de las Minas	Maya Biosphere
Organic Fertilizers			X		X					
Promotion of infrastructure maintenance and upgrading to withstand extreme events and diminish habitat fragmentation (ensures greater ecosystem capacity to respond)			X	X	X	X				
Medicinal gardens			X		X					
Increase the capacity of project funding (private-public initiatives and micro-micro finances)			X	X			Δ	Δ	Δ	Δ
Forest fires prevention strategies	X		X	X						
Productive systems from forests (incorporating forest products into the economy)			X	X						
Strengthening local capacities and citizens participation			X	X						
Strengthening institutions on biodiversity matters at the local level		X	X	X						
Regional integration (SICA) and policies harmonization			X	X						

Adaptation options	Source	Sector of interest	Region							
	Initial workshop (experts)	Feasibility Assessment (USAID partners and government officials)	Final workshop (stakeholders)	Forests & biodiversity	Agriculture	Water	Western Highlands	Verapaces	Sierra de las Minas	Maya Biosphere
Restoration of ancestral practices that could potentially reduce the impact of climate change in rural areas			X	X						
Implementation of a national biodiversity strategy			X	X			Δ	Δ	Δ	Δ
Identification and reduction of impacts of multinationals on biodiversity			X	X						
Restoration of natural areas			X	X						
Ecosystems protection prioritization (mangroves, cloud forests)			X							
Land planning			X	X	X	X				

Table 4 presents a ranked list of high and medium priorities from the 58 proposed in table 3. All other options not listed in the table are low priority options according to this ranking.

Table 4. Final ranking of adaptation options throughout the study

Level of priority	Options
High	soils conservation and management
	Increase the capacity to generate, use and monitor information. Promote research on meteorology in order to understand the impacts on human and ecological systems.
	Promote Integrated Watershed Management, especially in areas of recharge
	Promote efficient systems to harvest, store and distribute water
	Payments for Environmental Services (PES), including hydrological ones
	Storage of harvest and seeds
Medium	Integrated Pest Management
	Early Warning Systems
	Strengthening and support to local governance, capacities, planning and citizens participation
	Strengthening all types of protected areas and biological corridors
	Enforce regulation at the municipal level
	Economic activities diversification
	Subsistence crop management and family gardens, including crops diversification
	Restoring native and endemic species
	Diet change
	Promoting infrastructure maintenance and upgrading resistant to extreme events (for enhancing communication between rural areas and cities) and diminish habitat fragmentation (ensures greater ecosystem capacity to respond)
	Increase Forest fires prevention strategies

In order to rank the adaptation options the following criteria were considered: workshop discussions, sectors that would benefit from such options (water, forest & biodiversity and agriculture) and relation of each option to climate change vulnerability reduction. For example,

improvement of information production and management was an issue discussed in all workshops, in all sectoral analysis, and a better understanding of the system by means of better baseline information could help reduce climate change vulnerability. Hence it was considered as high priority.

Early warning systems (EWS) were discussed in the expert workshop. They were options considered for the agriculture and water sectors, in the Highlands, the Verapaces and Sierra de las Minas. EWS are also key for reducing vulnerability to climate change.

Sewage water treatment relates to climate change because degradation in water quality may occur since climate change is predicted to reduce flows in some rivers, thus reducing dilution of sewage, but was discussed only at the expert workshop, related to all the sectors and regions but it is not directly related to the reduction of the impacts of climate change. This appears to be a low rank priority.

4. Cross-cutting topics to climate change adaptation

4.1. Local governance

Local authorities, such as municipal staff and community organizations will increasingly play a more central role in adaptation measures and their leadership role should be championed. Municipalities play a central role in local level governance across Guatemala, as do secondary groups such as the Municipal Development Councils (COMUDES), Community Development Councils (COCODES), and Local Emergency Committees (COE). While both knowledge and skills of members in these local governance entities vary considerably from place to place, both the definition and implementation of adaptation actions should be embedded in the relevant local institutions to guarantee uptake. In fact, many of the proposed adaptation actions would be best undertaken at local scales, taking advantage of the intimate experience and cultural knowledge available in municipalities and community organizations. There are several reasons for this:

- The development of local climate change strategies, including policies and actions related to them requires the involvement and participation of the affected communities. Communities and individuals are intimately aware of the challenges and opportunities they face from a changing climate, and can often draw on a rich portfolio of knowledge and experience when identifying actions to address climate risks.
- The solutions and proposals related to climate change will have greater legitimacy when decisions are reached in representative areas and through community participation. The need to work with existing knowledge and tools, placing special attention on approaches which have been tried in similar areas elsewhere, emerged as a priority during the second workshop. Indeed, it was clear that actions that have been tried before were more likely to succeed than those for which limited knowledge existed or were perceived to be too radical for the area.

Recognizing climate variability and change as a critical development challenge, decision makers have begun to shift the debate from one of high-level advocacy on the “need to act” on the

issue to defining appropriate responses on “how to” adapt (Schiermeier, 2007) and a growing number of local governments are beginning to explore ways in which to mainstream climate change adaptation into development objectives. The so-called mainstreaming process, aims to articulate the relationship between development and vulnerability by identifying the factors that create vulnerability and highlighting points in the development agenda where these factors can be addressed (Noble 2005, Klein et al. 2007). Mainstreaming adaptation to climate change into ongoing development efforts requires an understanding on how climate change may change the desired outcomes of a specific development activity. Under this approach, it is therefore critical to evaluate both current climate variability as well as future climate risks.

The term, local governance, defines the ways in which local decision-making, particularly in the area of public goods and services, is carried out. It is in this area where key interfaces between local and climate change can be found, particularly with regards to:

- Local planning and regulation – largely in form of land use planning and zoning which aims to avoid development in high-risk areas (low-lying, flood prone, steep slopes) and to reduce negative impacts on ecosystem goods and services due to development activities. Strategic scenario planning could be used as a mechanism to examine the consequences of climate change and develop a suite of potential responses within municipal planning instruments.
- Delivering goods and services – that impact on vulnerable communities or that need to be climate resilient. For example, maintenance of transportation systems, lifeline utility systems such as water and electricity, and high potential loss facilities such as hospitals and schools. Environmental management, particularly related to forest conservation to reduce carbon emissions or forest management to guarantee necessary firewood stocks, are also the purview of local governance functions, as is the maintenance of healthy ecosystems to provide services for livelihoods and buffer against shocks.

The extent to which actors in local governance, in this case municipalities and community groups can address climate change risks is defined by the level of the available:

- Information base – an effective information base to support decision making should be transparent and available to the public, and provide an institutional memory to enable re-adjustments of priorities and actions as circumstances change.
- Institutions and staff – technically competent institutions and staff better assume the necessary tasks of coordination during emergencies and can provide incentives for improved planning mechanisms across relevant organisms.
- Infrastructure– infrastructure, including transport, energy and water provides the mechanism for delivering critical lifeline services to local populations. Infrastructural deficits need to be addressed as part of the development agenda and in many cases will supersede the adaptation deficits in importance.

Adaptation options should build on existing information, institutions and infrastructure base, by providing technical, capacity and planning support to address shortfalls in these areas within local governance. Some specific recommendations targeted to improve local governance include:

- Build capacity at local level– from the technical personnel in municipalities to individual families and households – to better understand and cope with climate risks – primarily risks they have already experienced – as well as the more important development implications of new investments and their coordinated operations.
- Prioritize efficient dissemination of knowledge among decision-makers and strengthen leadership at the level of implementation. The awareness of key stakeholders on the impacts of climate change on people, infrastructure and the economy is increasing. However, there is still a need to strengthen leadership at the level of implementation of adaptation, including the provision of ideas and practical approaches through which to integrate climate risks into existing plans and strategies.
- Increase the knowledge base and technical expertise of planning staff to risks brought about by climate variability and change will not only help to raise awareness of these issues but could also build champions within the municipal staff to include vulnerability and risk information into existing plans. It is clear that the funding for urban planning authorities also needs to be increased. In addition, raising the level of awareness of individual citizens and communities to risks will certainly increase mobilization of responses to climate change.
- Explore public-private funding opportunities for selected adaptation measures in partnership with the private sector. Their exposure and sensitivity to climate change risks makes the private sector a receptive partner in adaptation. There is an urgent need to include the private sector in the design and implementation of adaptation measures, including feasibility and cost-benefit analyses and options for investment programs, and in securing funding for adaptation options which may be too costly to implement with public funds alone.
- Provide policy makers and technical departments of the municipalities a set of guidelines, recommendations, and examples for the development and implementation of local climate change strategies. They should be encouraged to take into account the social, economic, cultural and environmental characteristics of their municipalities.
- Include solutions aimed at mitigating emissions of greenhouse gases (GHG) in strategic areas such as power generation, transportation and cooking. These bring local benefits and some are both climate change mitigation as well as an adaptation measures.
- Providing coordination and harmonization mechanisms to help municipalities work closely with the assistance of the Interagency Commission on Climate Change, of ministries and public entities, MARN, MAGA, MOH, MEM, INAB, CONAP, CONRED, MINECO, MCD, MOE, SEGEPLAN, ANAM-AGAAI INFOM, programs such as Zero Hunger and Rural Development, and other bodies such as the Environmental Commission of Congress and Attorney of Environmental Crimes.
- Build strategic alliances with social organizations. These include the Indigenous Bureau of Climate Change, National Climate Change Bureau, Bureau of Risk Reduction, Forestry Communities Alliance, Disaster Preparedness Program of the European Commission-DIPECHO-VIII-, Italian Cooperation –COOPI-, Action Against Hunger, CARE, OXFAM, the Red Cross, agencies of the United Nations, among others.

4.2. Gender and Adaptation to climate change

Gender has been one of the cross-cutting themes in the USAID/Guatemala mission. It is therefore important to identify how climate change will impact each of the initiatives, code of practice or projects involving women and development in the country.

Part of this assessment involved integrating gender issues into the adaptation agenda. Unfortunately despite the issue being brought up in both workshops, with the experts and with the relevant stakeholders, it was not possible to draw many conclusions. Since climate change and gender equity are extremely related with sustainable development, the general consensus was that equal opportunities exist for all the population, regardless of gender, to achieve adaptation in their lives and livelihoods.

Apart from this general perspective three aspects were mentioned on gender issues and climate change: 1) Girls attendance and permanence in schools in rural areas, 2) Timber and firewood collection by women and children, and 3) Women as leaders in cutting down wood consumption.

It was mentioned that in some areas of Guatemala, girls are in charge of cattle at small scale; hence they need to be in the fields. An idea was to promote strategies of animal fencing so that girls could go to school instead of looking after the animals. This topic was brought forward because education and awareness from school level is important for all individuals. Even if the education received is not directly related to climate change, education gives girls opportunities and tools to be more resilient. An educated community at all levels increases its resilience and reduces its vulnerability to environmental changes, conflict and other disturbances. Since women usually manage the homes and are in charge of looking after their children, their level of schooling has an impact on the families' resilience too. The fencing of animals also has positive environmental impacts, as observed in the case of IUCN-led micro-catchment projects in San Marcos. Natural regeneration is affected negatively by sheep or goats as they tend to eat the sprouts and young trees. Hence, fencing these animals favors natural regeneration, with positive effects on carbon sequestration and reduction of soil erosion.

With respect to timber and firewood collection, the discussions revolved around how firewood collectors are often women and children and how introducing measures and strategies to reduce the dependence on firewood as energy source (cooking mostly) could be beneficial both for forest protection and for women and children. Not only would this contribute to reducing the potential impacts from climate change on forests, but it decreases the amount of time women and children dedicate to collecting firewood and would allow them to focus on other activities like school or family care. It is also related to health improvement, as women and children are also the most impacted from firewood burning inside confined spaces. Related to this is the role of women as main users of the wood on the pressure on forests for wood and on the potential decrease of such pressure if more efficient stoves are introduced in the households.

Besides the above three general concerns there are other aspects that could be considered and have been considered in other countries in the region and worldwide regarding women's role in climate change. Such factors are presented next.

The first factor is household administration, including energy, water and natural resources consumption. In many areas men are the heads of the household and women are the administrators. In summary this means that men command and the women are the implementers. Women are aware of how much firewood is required for cooking, water, and resources for cooking, for example. Strategies directly involving women are key and more those strategies that could lead to making their activities more effective.

It is often seen that in community meetings or projects that have a component of community participation, it is men who attend such meetings. In those meetings projects could be discussing the importance of using energy efficient stoves, or the importance of adequate use of water in the household, or a change in land use activities to improve the community's livelihoods. It is important to include men and women in such meetings and not just men, as often. Women are the ones who have to deal with these situations in a day to day basis and often they are the ones that do not receive the training or awareness.

In rural areas, often men have to move from one region to another in search for income for the household and the women are left in charge of the entire household administration and wellbeing. International migration, in particular, has been increasing the number of women who are also been left in charge their crops. If women do not have adequate knowledge on how to manage the crops, part of their livelihood becomes more vulnerable. Therefore, proper training and adaptation options in the agricultural sector should be also available to women.

The inclusion of women in community activities or projects that aim to improve their livelihood or their adaptation to climate change, for example, has to be developed according to women's time availability. For example, meetings and workshops need to be organized at a moment that is suitable for them, so they can attend.

In line with the above, there is a need to empower women at the household level. It is common for all household values to be under the name of the head of the family, normally a man. He is part of the "finance" system, as all the assets (many or few) are under his name. It is very difficult for women to have bank accounts and even more difficult to have access to credits. Some microfinance institutions have favored women and as a result have generated more revenue, as women tend to be better at paying back their credits. This is important in a climate change situation because it is possible that the livelihoods of people change with changes in environmental conditions, and therefore there is a need to look for alternative sources of income. There is a need to create more resilient communities, with a more diverse economy. If both members of the household are able to apply to credits and to work and respond for them the chances for the household are greater for responding to changes on their social or environmental conditions.

Another issue that has been widely discussed in the (natural) disasters literature is the vulnerability of women during a disaster and after the immediate event. The vulnerability during the event is that women are the last ones to leave the households, making sure that everyone has left, and/or are the ones that return to the households to look for the children that are left behind. The vulnerability post-event is related to assaults and attacks from other members of the community (or not) that make the most of the emergency status.

It is important that all early warning systems include the training of women and consider the role of women in the household to avoid greater injuries or casualties. It is also required that in a post-event situation, women and children are protected and to maintain families together.

As new hazards triggered by climate change arise in certain areas such as new pests and diseases that affect households, information should be readily available for the population. Women should be seen as a key end user of such information so they can prevent or reduce impacts. If possible, efforts should be made to help them take actions, especially in rural settings, where people's mobilization and scarce resources could potentially exacerbate such impacts significantly.

5. Key messages and recommendations for USAID/Guatemala

Many analytical frameworks exist to assess vulnerability in light of climate variability and change and define strategic interventions.

We view these as instruments to clarify strategic choices rather than cookbook approaches, varying in their scales of applicability, treatment of decision spaces, stakeholders, risk and underlying definitions. Highly uncertain situations such as those related to climate adaptation require the application of frameworks that fit the needs of the intended scales analysis and questions posed, rather than prescribing a single analytic framework for all interventions.

Creating a shared knowledge space should begin by using existing stakeholder frameworks rather than seek to build a consensus framework as operational guidelines. The attempt to adopt existing frameworks forces stakeholders, including USAID, to ask crucial questions about the key vulnerability and risk drivers, and allows for an open, transparent and systematic discussion at the outset.

Climate variability is already significant in Guatemala and this variability already threatens vulnerable populations and sectors.

High inter-and intra-annual variability results from variations in the major driving forces of atmospheric circulation, topographic heterogeneity, El Niño/La Niña cycles, and intensification of the Inter-Tropical Convergence Zone (ITCZ) and Pacific Decadal Oscillation (PDO). The El Niño phenomenon magnifies vulnerability in the region, in particular, causing frequent severe droughts in the eastern portion of the country. Both maximum and minimum temperatures have increased across the country, at an average of 0.2° and 0.3° degrees per decade, respectively in the last 40 years. The number of hot days and nights has increased by 2.5 and 1.7% per decade, respectively. Conversely the number of cold days and nights has decreased by -2.2 and -2.4%. Rainfall and moisture changes over the last 40 years suggest a strengthening of the hydrological and climate cycles, with more intense rain events.

While a limited observational base makes it difficult to derive statistically significant trends on climate variability, local histories of climate and variability can be used to define appropriate response strategies. Collecting local histories is thus an important first step in understanding the impact of climate variability on vulnerable households, especially in the heterogeneous mountain areas. This is particularly relevant due to the existence of numerous microclimates in the country.

Guatemala's major economic sectors are already sensitive to climate variability and this is likely to be exacerbated by future changes in climate.

Agriculture, a mainstay of the Guatemalan economy, is one of the country's most vulnerable sectors, with implications for food security. Changes in rainfall patterns and increased temperatures can hinder crop productivity and often lead to crop failure in already marginal areas of production.

Managing priority risks, associated with current climate variability and extremes is a useful starting point towards taking anticipatory actions to address risks associated with longer-term

climate. Early response investments with cross-sectoral benefits, such as integrated soil conservation practices, should be pursued.

Guatemala's climate is already undergoing a process of change, but future predictability varies in confidence across variables, time scales and geographies.

High confidence projections, with significant implications for priority vulnerable sectors and populations estimate that by 2050: 1) temperatures will have increased by 1.5 to 4.5° Celsius, with the month of May being the hottest. The southern part of the country may have the most significant changes in temperature and 2) an intensification of heat waves and high temperature expansion into previously cooler mountainous areas. Future projections of rainfall are of low confidence. This is due to large model uncertainties, with multi-model averages suggesting a drying trend, and some individual models suggesting a more humid future. What is clear, however, is that the future will increase climate variability and extreme events.

In spite of these differences, projected temperature increases alone will place new stresses on existing resources. For example, it is likely that the incidence and distribution of crop pests and pathogens, previously unknown in high elevations may begin to appear, with attendant farm management implications. Changes in temperature also influence soil moisture availability; hence crop water use, actual evaporation and crop yield, irrigation demands, dryland agricultural practices (especially the beginning and end of growing periods), heat wave episodes and the frequency and severity of droughts. These are all dynamics which are likely to change across Guatemala.

Many entry points exist for incorporating climate adaptation into development initiatives across USAID

In practical terms, many entry points exist for incorporating climate adaptation at all levels of activities and governance of interest to USAID, including those implemented at the:

- **field level** – promoting the sharing of knowledge and experiences, especially those related to diversifying existing sources of income/production systems and changing livelihood strategies, and awareness raising on climate change issues to support adaptation as a “learning by doing” process rather than an end point to specific point forecast.
- **project level** – support the sharing information on improved infrastructure for small scale water capture, storage and use, and improved soil management practices;
- **institutional level** – support the collection and analysis of relevant information to support adaptation planning including local meteorological data in heterogeneous environments.
- **policy level** – facilitate communication exchange and proactive, fiscal responses that include strategic interventions for high probability impacts, strengthening existing policy frameworks.

The list of responses that resulted from the different consultations and workshops in this study provides a starting point of options that could be promoted at the levels mentioned above. Because of the points discussed in section 2, the responses could be incorporated not only in programs and projects directly related to climate change but also in other areas such as environment and economic development.

Effective processes for prioritization of adaptation options engage a wide range of stakeholders, are transparent, and enable the review and adjustment of priorities as circumstances change

The process of prioritization employed can be an effective way to engage decision makers, identifying tradeoffs involved when evaluating strategic options. Results from the analyses conducted suggest that many adaptation options are desirable across sectors, while high priority ones depend on users, geographies and experience. As illustrated in this work, prioritization exercises can be used to effectively engage even the senior decision-makers in asking all the right questions when evaluating strategic options. The prioritization approaches applied suggest that these methods can be used to make useful judgments about the criteria used to identify feasibility and define critical constraints to their implementation. Furthermore, the true value of the prioritization exercise resides in the insight gained from a participative, collective effort than the specific actions themselves.

As climate variability and extreme weather events continue to impact Guatemala, decision makers will increasingly face new challenges about how to manage these risks

Guatemala's population already has experience with significant climate variability and in some areas a capacity to cope with these fluctuations. However, as climate variability and extreme weather events continue to impact the country, decision-makers will increasingly face new challenges about how to manage these risks. Furthermore, a large number of adaptation options have already been identified, and many of these are already being implemented across Guatemala.

Adaptation responses should capitalize on people's experience and knowledge - those living in marginal environments have a long history of adapting to climate variability. While traditional coping mechanisms may not be sufficiently robust in a changing climate, they can offer insights into effective strategies to address a changing climate and expand the available information base.

The need to improve partner communication and collaboration in the area of knowledge sharing will grow in importance under a changing climate

There are many initiatives and active organizations in climate change related issues and environmental action across Guatemala, however, weak institutional arrangements and lack of co-ordination between actors threaten the scalability of experiences and duplication of efforts. Furthermore, collaboration is often informal and linked to individuals rather to an institutional culture, requiring repeated awareness raising and training and making it difficult to move forward the dialogue on what to do about climate change.

USAID actions should continue to support a national dialogue around climate adaptation, and promote ownership of responses - Establishing an effective dialogue for collaborative problem-solving can provide for a shared understanding of concepts of risk, coupled with trust and credibility between the parties, whether they are internal to USAID or partner organizations. For example, the "producer's organization in the agriculture group" youth group

engages community members to actively promote soil conservation measures such as household compost, green compost, and tree planting.

Integrating adaptation with development priority and planning includes, gender, finance, and legal instruments of institutional reform

While climate may differentially impact certain population groups, such as women, it is important to consider gender within the context of vulnerability and responses, rather than separately. It is clear that many adaptation responses identified will help to relieve the pressures on women.

Efforts currently in place need to be increased and/or reinforced to continue with the successes observed to date. For example, the Climate Change and Resilient Development small grants program is now funding innovative ecosystem management practices and climate services partnerships at targeted scales, which can provide critical insights on models of adaptation implementation.

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7. Annexes

7.1. List of participants in the final workshop

Name	Institution
Haroldo Chiquín	CARE
Ana Vilma Pérez Sajoy	USAID
Glenda de Paz	USAID
Josefina Martínez	USAID
Teresa Robles	USAID
Jennifer Tikka	USAID
Sergio Vega	ICC consultant
Ricardo Roca	USAID
Janet Lawson	USAID
Carmen Lacambra	Consultora Grupo Laera
Julio Sandoval	Chac Mol S.A.
Fernanda Zermoglio	GCAP consultant
Oscar Murga	USAID
Thomas Downing	GCAP consultant
Jorge Cardona	The Nature Conservancy
Dany Vásquez	ASOCUCH
Elmer Ganeda	ASOCUCH
Rolando Gómez	FUNDAECO-Huehuetenango
Edwin Oliva	INAB-PFN
Víctor Hugo Villatoro	FUNDAECO-Huehuetenango
Oscar Núñez	Defensores de la Naturaleza
Ana María Palomo	National Climate Change Bureau
Claudia García	ARNPG
Juan de la Cruz	Climate Change Unit, Ministry of Finance
Flor de María Bolaños	UNDP
Rosa María Aguilar	ANACAFÉ
Edwin Rojas	Climate Change Unit, Ministry of Agriculture
Jorge Cabrera	ICC consultant
Vivian Lanuza	Fundación Solar
Luis Alberto Ferraté	ICC
Martin Keller	Association of Private Nature Reserves
Sergio Ajá	Counterpart International
Doris Martínez	Center for Environmental Studies, Universidad del Valle de Guatemala
Alejandra Sobenes	USAID/PRS
Aymé Sosa	USAID/PRS
Romeo Martínez	ANACAFÉ
Oscar Rojas	Defensores de la Naturaleza
Alejandro Santos	Rainforest Alliance
Patricia Orantes	USAID/PRS

Roberto Cáceres	CEMAT/ASOREMA
Amelia Coj	Ministry of Foreign Affairs
Alex Guerra	ICC

7.2. Pair-wise exercise results

Group 1: adaptation options for Forests and Biodiversity

A: Research and monitoring

B: Financial mechanisms for conservation

C: Valuation and preservation of ancestral and traditional knowledge for climate adaptation

D: Strengthening all types of protected areas and biological corridors

E: Strengthening local capabilities and citizens participation

F: Strengthening institutions on biodiversity matters, including the local level

Table 5. Pair-wise matrix for Forests and Biodiversity

Options	A	B	C	D	E	F	Option frequency
A		B	C	D	E	F	A= 0
B			B	B	B	F	B= 4
C				D	C	C	C= 3
D					D	D	D= 4
E						F	E= 1
F							F= 3

Group 2: adaptation options for Agriculture and Livestock

A: Soil Conservation

B: Agroforestry systems

C: Preservation of native species

D: Integrated Pest Management

E: Harvest and seed storage

F: Use of meteorological information

G: Family gardens

H: Fencing of livestock

I: Irrigation and water storage

J: Diversification of crops

Table 6. Pair-wise matrix for Agriculture and Livestock

Options	A	B	C	D	E	F	G	H	I	J	Option frequency
A		A	A	A	A	A	A	A	A	A	A= 9
B			B	D	E	B	G	B	I	J	B= 3
C				D	E	C	G	C	I	J	C= 2
D					E	D	G	D	I	J	D= 4
E						E	E	E	I	J	E= 6
F							G	H	I	J	F= 0
G								G	I	J	G= 5
H									I	J	H= 1
I										I	I= 8
J											J= 7

Group 3: adaptation options for the Water Sector

A: Land planning

B: Organization of local stakeholders

C: Water storage

D: Protection of headwaters

E: Improved water use efficiency

F: Use of information

G: Water infrastructure upgraded to withstand extreme events

H: Valuation of water

Table 7. Pair-wise matrix for the Water Sector

Options	A	B	C	D	E	F	G	H	Option frequency
A		B	A	D	E	F	G	H	A= 1
B			B	B	B	F	G	B	B= 5
C				D	C	F	C	C	C= 4
D					D	F	D	D	D= 6
E						F	E	E	E= 4

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Coediciones

Estudio que identifica y justifica inversiones estratégicas para adaptación al cambio climático relacionadas con el agua

Producto 2.1.1.1

Documento elaborado por el Instituto de Agricultura, Recursos Naturales y Ambiente (IARNA) de la Universidad Rafael Landívar (URL), bajo subcontrato (Grant Number: 1071-36-13-FOG-0204-01) con Weidemann Associates para el proyecto de Apoyo a Políticas y Regulaciones Para el Crecimiento Económico de USAID.

Guatemala, abril de 2013

iarna

Instituto de Agricultura, Recursos Naturales y Ambiente
UNIVERSIDAD RAFAEL LANDÍVAR



Universidad
Rafael Landívar
Tradición Jesuita en Guatemala

Estudio que identifica y justifica inversiones estratégicas para adaptación al cambio climático relacionadas con el agua

(Producto 2.1.1.1 / Grant number: 1071-36-13-FOG-0204-01)

Abril, 2013

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I. INTRODUCCIÓN

Hoy en día muchos países del mundo se encuentran frente a enormes retos en el campo de la gestión del agua. Estos retos son más grandes para los países en vía de desarrollo debido a la expansión urbana, el desarrollo industrial, así como la modernización e intensificación de la agricultura, lo cual genera una creciente demanda de este recurso para los diversos usos. Esta situación provoca la extracción intensiva de los recursos hídricos, y el aumento de su contaminación, debido al vertido de aguas negras (Bahri, 2012) y contaminantes, tanto de origen orgánico como inorgánico.

La situación de Guatemala no es muy distinta a la descrita anteriormente, ya que aunque en el país cuenta con suficiente agua, el recurso está mal gestionado (IARNA-URL, 2012). Por otro lado, el cambio climático amenaza al país con la alteración del ciclo hidrológico y la reducción de la disponibilidad del agua en el país, especialmente en el altiplano.

Es por esto que cada vez se hace más urgente que los sectores públicos y privados, así como la sociedad civil, generen iniciativas orientadas hacia una mejor gestión, la cual debe estar basada, preferiblemente, en los fundamentos de la Gestión Integrada de Recursos Hídricos.

Con el fin de generar información científica que apoye los argumentos anteriores, se desarrolló el presente trabajo para conocer la situación actual y futura de los recursos hídricos del altiplano guatemalteco, así como proponer una serie de inversiones estratégicas que permitirán mejorar la gestión del agua y promover la adaptación al cambio climático en este territorio.

Para alcanzar este objetivo, se realizaron modelaciones hidrológicas y se calculó el balance hidrológico. El estudio se realizó a nivel de las subcuencas del altiplano para luego realizar un análisis sistémico a nivel municipal.

El presente documento consta de siete partes, la primera es la introducción. En la segunda parte del documento se presentan los objetivos del estudio para luego abordar el contexto y las bases conceptuales necesarias para comprender este trabajo. Posteriormente se describe la metodología utilizada, y luego en la quinta parte, se aborda la situación de los recursos hídricos en el altiplano guatemalteco. En esta sección se presenta un análisis biofísico que se fundamenta en la modelación hidrológica de la situación actual y de los escenarios A2 y B2 del IPCC. En la sexta parte se analizan las inversiones propuestas para mejorar la gestión de los recursos hídricos en el altiplano guatemalteco, así como la adaptación al cambio climático. Para terminar, se presenta la bibliografía consultada.

II. OBJETIVOS

2.1 Objetivo general

Identificar y justificar inversiones estratégicas relacionadas con el agua para promover la adaptación al cambio climático en el altiplano occidental de Guatemala.

2.2 Objetivos específicos

- Evaluar el estado de la gestión de los recursos hídricos en los municipios del Altiplano Occidental de Guatemala.
- Identificar y clasificar los municipios del Altiplano Occidental que afrontan problemas de gestión hídrica y las áreas de gestión pública y local a mejorar.
- Identificar inversiones estratégicas para la adaptación al cambio climático encaminadas a asegurar la disponibilidad de los recursos hídricos en los municipios priorizados.
- Orientar a los tomadores de decisión clave para la implementación de políticas y planes de acción favorables a una gestión integrada y exitosa del agua.

III. MARCO TEÓRICO

3.1 Marco referencial

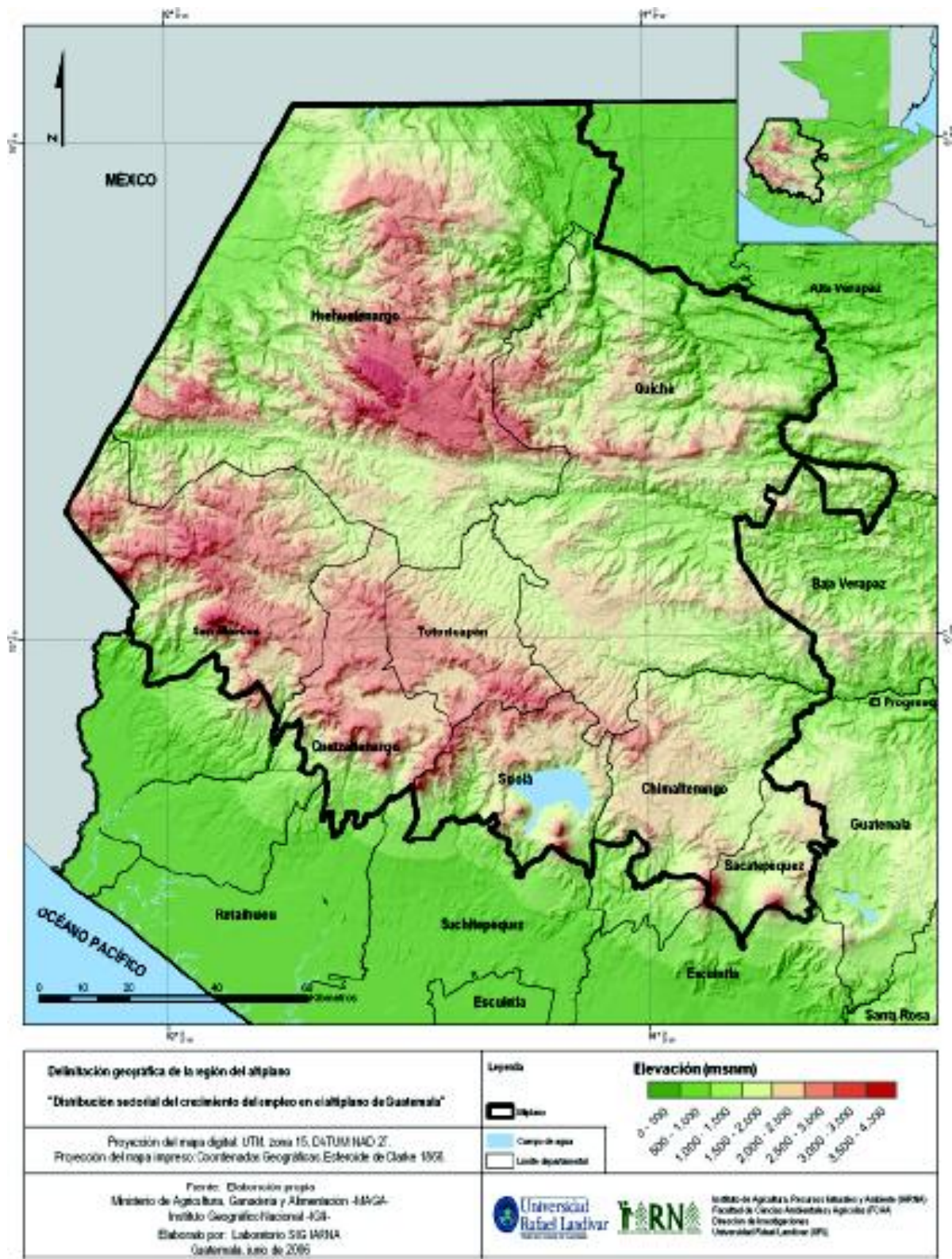
3.1.1 *El altiplano occidental de Guatemala*

El área de trabajo lo constituye el Altiplano Occidental, definido por IARNA/URL (2008) como el área comprendida por los departamentos de Sacatepéquez, Sololá, Chimaltenango (a excepción de los municipios de Yepocapa y Pochuta), Totonicapán, Quetzaltenango (a excepción de los municipios Génova, Flores Costa Cuca, Colomba y Coatepeque), Quiché (a excepción del municipio Playa Grande Ixcán), Huehuetenango y San Marcos (a excepción de los municipios Malacatán, El Rodeo, Catarina, El Tumbador, Esquipulas Palo Gordo, Pajapita, Ayutla, Ocós, Nuevo Progreso, El Quetzal y La Reforma).

La delimitación del área de estudio, según el IARNA, se basó en la división de regiones y zonas agrarias de Guatemala hecha por AVANCSO (2001), en la cual se definió la región agraria como un espacio amplio socioeconómica y territorialmente, que integra un conjunto de zonas agrarias que si bien pueden presentar ciertas diferencias entre sí, éstas no llegan a prevalecer sobre las características comunes productivas y del medio natural, así como las de naturaleza histórica, expresadas en la particular vía de desarrollo que le otorga cierta racionalidad y por lo tanto cierta coherencia a la región agraria”. El altiplano es un espacio geográfico que, si bien no puede calificarse como homogéneo, presenta características comunes de carácter biofísico, socioeconómico e histórico-cultural que permiten considerarlo como una unidad regional coherente.

En la Figura 1, se presenta el área de estudio la cual comprende 147 municipios ubicados en ocho departamentos con una superficie de 20,927 km² equivalente al 19.3% de la extensión territorial de Guatemala.

Figura 1. Delimitación geográfica de la región del altiplano guatemalteco

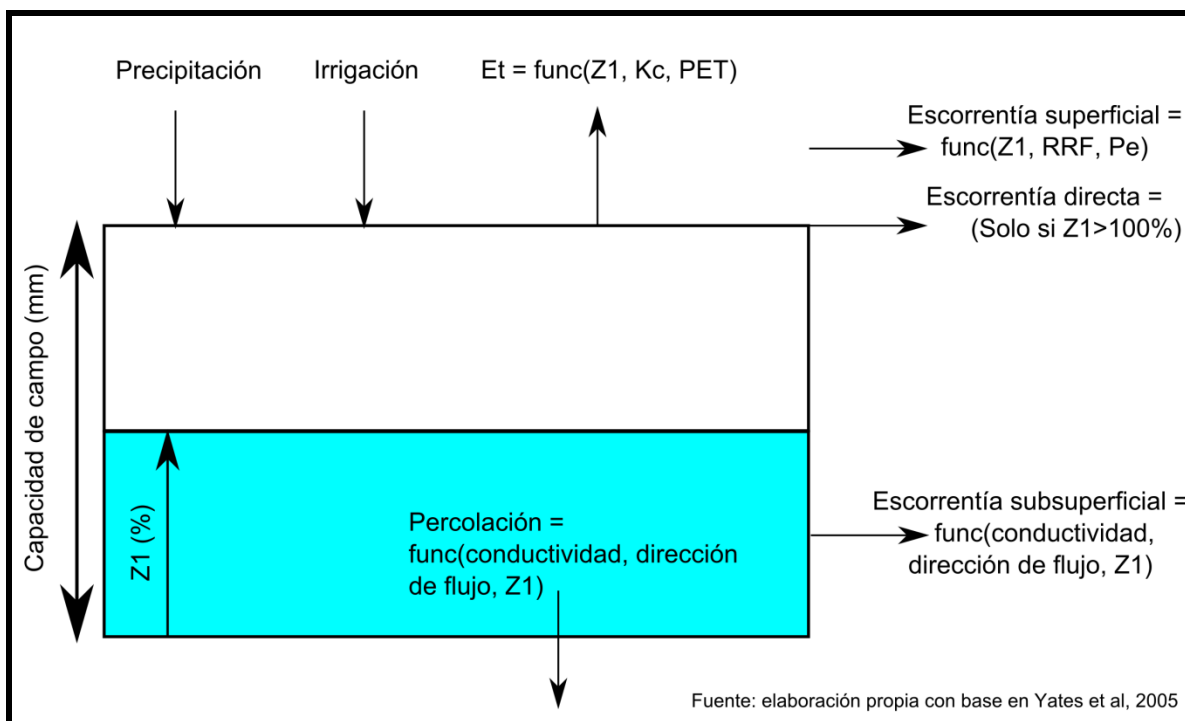


3.2 Marco conceptual

3.2.1 El modelo hidrológico de la plataforma WEAP

El modelo que se utilizó para determinar el balance hidrológico corresponde al módulo de hidrología *soil moisture method* de la plataforma WEAP (*Water Evaluation and Planning*), el cual permite realizar un balance hídrico de suelos basado en la simulación de la variación del volumen de agua almacenada en el suelo. A continuación, se dará una descripción resumida de los algoritmos del modelo, basada en Yates, Sieber, Purkey & Huber-Lee (2005).

Figura 2. Elementos del balance hidrológico modelados con WEAP



El balance de masas definido por el modelo hidrológico está dado por la siguiente ecuación. Se observa cómo cada término de la ecuación, que corresponde a un elemento del balance hidrológico, es afectado de forma diferente por los parámetros indicados:

$$Sw_j \frac{dz_{1,j}}{dt} = P_e(t) - PET(t) k_{c,j}(t) \left(\frac{5z_{1,j} - 2z_{1,j}^2}{3} \right) - P_e(t) \frac{RRF_j}{z_{1,j}^2} - f_j k_j z_{1,j}^2 - (1 - f_j) k_j z_{1,j}^2$$

Donde:

Primer término: cambio de humedad en el suelo

Segundo término: precipitación

Tercer término: evapotranspiración

Cuarto término: escorrentía superficial

Quinto término: flujo intermedio o escorrentía subsuperficial

Sexto término: percolación

- Precipitación: Corresponde a la cantidad total de agua precipitada durante el tiempo del estudio.
- Evapotranspiración: El cálculo de la evapotranspiración real para una clase de uso de la tierra en particular depende de la evapotranspiración potencial, dada por la ecuación de Penman-Montieth, por el coeficiente de cultivo/planta (K_c), y las condiciones reales de disponibilidad de agua para las plantas (Recuadro I).
- Escorrentía superficial: Su cálculo depende del nivel de precipitación, de un factor de resistencia a la escorrentía (RRF – siendo el mismo dependiente del índice de área foliar y de la pendiente), y del nivel de saturación del suelo.
- Flujo intermedio o escorrentía subsuperficial: Corresponde a los flujos horizontales de agua que ocurren debajo de la superficie del suelo. Dicha escorrentía contribuye finalmente a los caudales de los ríos. Su estimación depende de la cantidad de agua presente en el suelo, de la conductividad hidráulica del mismo, y de la dirección preferencial de los flujos.
- Percolación: Corresponde a la lámina de agua que contribuye a la recarga de los acuíferos. Depende de la cantidad de agua presente en el suelo, de la conductividad hidráulica del mismo, y de la dirección preferencial de los flujos.

3.2.2 Evaluación sistémica del estado de los recursos hídricos: El Índice de Gestión Hídrica (IGH)

Luego de realizar una evaluación puramente biofísica de los recursos hídricos en el Altiplano, se hizo una evaluación sistémica a nivel municipal. La evaluación además de tomar en cuenta el subsistema ambiental, incluye parámetros de la situación de los subsistemas económico, social e institucional en torno al tema de los recursos hídricos. El índice de gestión hídrica proporciona una idea del estado en el cual se encuentra el recurso agua en el contexto del sistema socio-ambiental. El objetivo de este acercamiento es poder evaluar de manera integrada los municipios del altiplano guatemalteco sobre la gestión de sus recursos hídricos.

El cálculo del índice de gestión hídrica para los municipios del altiplano se basa en el concepto de *índice de pobreza hídrica* definido por Sullivan (2001, 2002). A través de este acercamiento se pretende identificar los factores biofísicos, sociales, económicos e institucionales que relacionan agua y pobreza. Dichos factores están vinculados entre ellos a través de un índice compuesto único (Sullivan, 2001, 2002).

En el caso de su aplicación para el altiplano guatemalteco, la construcción del índice se apoyó sobre cinco componentes, cada uno siendo relevante para evaluar el estado de la gestión de los recursos hídricos a nivel municipal (Heidecke, 2006; Sullivan et al., 2003). A continuación se describen dichos componentes:

- Recurso: Disponibilidad física del agua, teniendo en cuenta la variabilidad y la calidad del recurso.
- Acceso: Nivel de acceso al agua para uso humano. El acceso hace referencia al uso de agua apta para el abastecimiento humano, doméstico, agrícola, e industrial.
- Capacidad: Eficacia de la capacidad de la población para manejar el agua.
- Uso: Formas de uso en las cuales el agua se utiliza para diversos propósitos; incluye uso doméstico, agrícola, ganadero e industrial.

- Ambiente: Evaluación de la integridad ambiental que relaciona el agua con el uso de recurso natural, productividad agrícola y degradación de tierras.

IV. MATERIALES Y MÉTODOS

4.1 Modelación hidrológica

4.1.1 Construcción del modelo

A. La plataforma WEAP

El modelo hidrológico utilizado para estimar la disponibilidad de agua –u oferta hidrológica– para las subcuencas del altiplano guatemalteco, corresponde al módulo “hidrología” de la plataforma WEAP (*Water Evaluation And Planning*), que se presenta como un sistema de apoyo a la toma de decisiones en materia de Gestión Integrada de Recursos Hídricos (GIRH).

Yates, Sieber, Purkey & Huber-Lee (2005) describen esta plataforma como una herramienta que permite relacionar los procesos hidrológicos a nivel de cuenca con los aspectos socio-económicos de la gestión de los recursos hídricos. Este aspecto hace de WEAP una herramienta particularmente adaptada para abordar problemáticas de GIRH. Además, permite analizar varios tipos de escenarios (climatológicos, cambios en el uso de la tierra, cambios en el nivel de la demanda y su estructura, etc.) en un entorno de modelación dinámica.

B. Datos de entrada

A continuación, se describen los datos utilizados en el modelo y los procedimientos realizados previamente a su integración. En el Cuadro I se presentan los datos requeridos por el modelo y el nivel en el cual se registraron.

Cuadro I. Datos de entrada del modelo

Dato	Nivel de entrada	Fuente
Precipitación	Subcuenca	Base de datos Worldclim (Hijmans, Cameron, Parra, Jones, & Jarvis, 2005).
Temperatura	Subcuenca	Base de datos Worldclim (Hijmans et al., 2005).
Velocidad del viento	Subcuenca	Estaciones meteorológicas del Insivumeh.
Humedad	Subcuenca	Estaciones meteorológicas del Insivumeh.
Latitud	Subcuenca	Sistema de Información Geográfica IARNA-URL.
Conductividad hidráulica	Serie de suelo	Mapa de series de suelos de Simmons (Simmons, Tarano, & Pinto, 1959).
Capacidad de campo	Serie de suelo	Mapa de series de suelos de Simmons (Simmons et al., 1959).
Categorías de uso de la tierra	Categoría de uso de la tierra	Mapa de uso de la tierra del 2003 (MAGA, 2006).
Coeficiente de cultivo	Categoría de uso de la tierra	(Allen, Pereira, Raes, & Smith,

Dato	Nivel de entrada	Fuente
		1998), Snyder, Orang, Bali & Eching (2000).
Factor de resistencia a la escorrentía	Categoría de uso de la tierra	Scurlock, Asner & Gower (2001).

Fuente: Elaboración propia.

C. Datos climáticos

- Precipitación promedio mensual: Los valores mensuales de precipitación se obtuvieron de la base de datos *WorldClim* (Hijmans, Cameron, Parra, Jones & Jarvis, 2005). A través del uso del SIG se extrajeron los datos mensuales del área de estudio a partir de las capas *raster*. Luego, se calculó el valor promedio de precipitación mensual a nivel de cada subcuenca. Este fue el valor utilizado en el modelo.
- Temperatura promedio mensual: Se empleó el mismo procedimiento utilizado para los valores de precipitación.
- Velocidad del viento: Los valores de velocidad del viento promedio mensual se obtuvieron de las estaciones de medición del Instituto de Sismología, Vulcanología, Meteorología e Hidrología (INSIVUMEH). Dichas estaciones se encuentran georeferenciadas con lo cual se lograron definir los polígonos de Thiessen. Según la ubicación de cada subcuenca dentro de dichos polígonos, se atribuyó un valor a nivel de cada subcuenca.
- Humedad: El procedimiento para obtener los valores de humedad promedio mensual fue el mismo que aquel seguido para los valores de velocidad del viento.
- Latitud: A través del SIG se calculó la latitud exacta del centro geométrico de cada subcuenca.

D. Datos de uso de la tierra

- Categorías de uso de la tierra: La superficie de las categorías presentes en las subcuencas fue obtenida a partir del mapa de uso de la tierra del año 2003 (MAGA, 2006). El uso de la tierra del 2003 fue modificado, con el fin de tomar en cuenta la totalidad del área del altiplano con alto potencial hortícola. Para la categoría de uso “hortalizas” se tomó entonces en cuenta la zonificación definida por IARNA-URL, (2008) como el área que reúne las características biofísicas favorables al desarrollo de la horticultura (**Error! No se encuentra el origen de la referencia.**). Esta decisión se justifica por el hecho que el presente estudio explora las posibles oportunidades de inversiones estratégicas positivas para el progreso de los pequeños productores en el altiplano, y precisamente el desarrollo de este tipo de agricultura ha sido identificado como una de las vías para alcanzar esta meta (IARNA-URL, 2006, 2008).
- Coeficientes de cultivo: Los valores de coeficientes de cultivos (coeficientes de evapotranspiración) para cada categoría de uso de la tierra se determinaron con base en el estudio de Allen, Pereira, Raes & Smith (1998) y la herramienta BISM (*Basic Irrigation Scheduling*) desarrollada por Snyder, Orang, Bali & Eching (2000). Los valores utilizados para cada categoría se muestran en el Cuadro 2.
- Para poder calcular el coeficiente de cultivo mensual de las categorías de uso agrícola, primero se seleccionó el cultivo más representativo de las categorías “granos básicos” y “hortalizas”, para lo cual se revisó el Censo Agropecuario (INE y MAGA, 2004) de los

departamentos de Guatemala y Chimaltenango. Asimismo, se analizaron las fechas de siembra de estos cultivos.

- En el caso de los “granos básicos” se seleccionó el maíz, pues este cultivo representa más del 60% de la superficie de esta categoría en los dos departamentos. Para la categoría “hortalizas” se seleccionó el brócoli, ya que corresponde el cultivo más representado también en ambos departamentos (17%).
- Las fechas de siembra se determinaron basados en el estudio de la FAO (2006) y usando los datos definidos para la zona agroecológica 4 de Guatemala. En el caso del maíz, se usó el primero de abril como fecha de siembra, asumiendo una sola siembra por año. Para el brócoli se usaron como fechas de siembra el primero de enero y el primero de julio, ya que se asumió había dos cosechas por año. Para la categoría “bosque” se usó el coeficiente de evapotranspiración de un bosque mixto, derivado del promedio entre los coeficientes de evapotranspiración determinados para los bosques latifoliados y coníferas.

Cuadro 2. Valores de coeficientes de cultivos

Categorías de uso de la tierra	Kc 1	Kc 2	Kc 3	Kc 4	Kc 5	Kc 6	Kc 7	Kc 8	Kc 9	KcI 0	KcI 1	KcI 2
Arbustos	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95
Asentamientos	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Bosque	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
Granos básicos	0.24	0.23	0.22	0.21	0.34	1.04	1.04	0.61	0.24	0.25	0.26	0.26
Hortalizas	0.3	0.3	0.51	0.86	0.99	0.94	0.3	0.3	0.51	0.86	0.99	0.94
Humedales	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Otros Usos	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24	0.24
Pastos nativos	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95	0.95

Fuente: Elaboración propia.

- Factor de resistencia a la escorrentía: En WEAP, dicho factor corresponde a un índice que toma en cuenta factores de pendiente y de índice de área foliar. Se extiende entre 0.1 y 10 (las valores más altos significan más resistencia a la escorrentía). En el presente estudio se construyó con base en los valores de índice de área foliar determinados por Scurlock, Asner & Gower (2001), y a los valores de pendiente derivados del modelo numérico de terreno (MNT), utilizando Sistemas de Información Geográfica (SIG). Se calcularon las pendientes promedio para cada una de las unidades de respuesta hidrológica, y se determinaron tres clases a las cuales se les atribuyó un puntaje entre uno y diez (Cuadro 3). Luego se calculó el promedio entre el índice de área foliar y el puntaje de pendiente a nivel de cada área fraccional, dándole una ponderación doble al índice de área foliar.

Cuadro 3. Clases y puntajes de pendiente

Clases	$X < 10\%$	$10\% < X < 30\%$	$X > 30\%$
Puntaje	10	5	1

Fuente: Elaboración propia.

E. Características del agua en el suelo

- Capacidad de campo: Este valor fue calculado para cada serie de suelos con base en sus clases texturales, tales como fueron descritas en Guatemala por Simmons, Tarano y Pinto (1959). Los valores de capacidad de campo (en porcentaje de volumen de suelo) se obtuvieron gracias a las ecuaciones de Saxton & Rawls (2006), reunidas y automatizadas en el modelo *Soil Water Characteristics*. Seguidamente, se multiplicó el valor obtenido por los datos de profundidad dados por Simmons, Tarano y Pinto (1959), para obtener el contenido de agua a capacidad de campo, en milímetros. Con el fin de evaluar el efecto del tipo de cobertura, se aplicó un factor de compactación para las categorías de uso agrícola (granos básicos y hortalizas), y un factor de descompresión para las categorías de uso forestal (bosques).
- Conductividad hidráulica saturada: Para cada serie de suelo, este valor (en distancia/tiempo) también se obtuvo de la descripción de textura dada por Simmons, Tarano y Pinto (1959). Luego, se utilizó el modelo *Soil Water Characteristics* para obtener el valor de conductividad hidráulica. En el caso de la categoría de uso “áreas urbanas”, se usó el valor de conductividad hidráulica para un suelo urbanizado, dado por el modelo *Soil Water Characteristics* (Saxton & Rawls, 2006).

4.1.2 Calibración

A. El modelo Cropwat

Según Droubi *et al.* (2008), el parámetro que más influye los resultados del balance hidrológico en WEAP –es decir el más sensible– es la conductividad hidráulica saturada. Los autores indican que los valores de este parámetro en WEAP no corresponden exactamente a los valores de conductividad hidráulica saturada, tales como están definidos en el ámbito de las ciencias del suelo. Es decir, el valor está utilizado de manera específica por WEAP, por lo que la conductividad hidráulica saturada según este modelo tiene que ser más baja que la conductividad hidráulica saturada determinada por las ciencias del suelo (Droubi *et al.*, 2008). Por lo tanto, este parámetro necesita pasar por una etapa de calibración.

Dada la poca disponibilidad de estudios y pruebas de campo en la zona, se propuso usar el modelo Cropwat para obtener valores de evapotranspiración. De este modo, se pudo calibrar el parámetro de conductividad hidráulica saturada en WEAP con el objetivo de acercarse a los valores de evapotranspiración obtenidos con Cropwat.

Se calcularon los valores de evapotranspiración real para cada una de las series de suelos modeladas en WEAP. No se pudieron calcular valores para las áreas urbanas, ya que los procesos de evaporación ocurren de manera diferente y no se pueden modelar con Cropwat. Algunas series de suelos tampoco pudieron ser modeladas, dado que sus valores de conductividad hidráulica (determinadas por el modelo *Soil Water Characteristics*) se encontraban fuera de rango de Cropwat.

Se observó que, dividiendo los valores de conductividad hidráulica originalmente definidos en WEAP entre 100, los valores de evapotranspiración real obtenidos en WEAP se acercaban a aquellos obtenidos con Cropwat. Por lo tanto, se aplicó el factor de división entre 100 al parámetro de conductividad hidráulica saturada, originalmente definido con el modelo *Soil Water Characteristics*, para cada una de las unidades de respuesta hidrológica modelada.

A continuación se compararon los valores de evapotranspiración real obtenidos para cada serie de suelos en WEAP y Cropwat. El promedio del valor absoluto de las tasas de variación calculadas para cada área fraccional resultó ser de 12.4%. Además, se calculó la desviación estándar a este promedio, la cual resultó ser de 8.1%. Por lo tanto, los resultados obtenidos con WEAP se consideraron como aceptables.

B. Escenarios modelados

El balance y la oferta hidrológica se estimaron tanto para la situación actual (línea base) – es decir con los datos climáticos y de uso de la tierra actuales – como para escenarios a futuro. Dichos escenarios corresponden a escenarios de cambio climático sin repuesta particular por parte de la sociedad (escenarios tendenciales). Para ellos, se usaron las proyecciones de precipitación y temperatura al 2020, 2050 y 2080 obtenidas del modelo HCCPR-HADCM3 para los escenarios A2 y B2 definidos por el Grupo Intergubernamental de Expertos sobre el Cambio Climático (IPCC). Se emplearon los datos de uso de la tierra actual.

C. Estimación del consumo y del balance hídrico

En una última fase, con el objetivo de determinar el balance hídrico en las subcuencas del altiplano, se estimó el consumo de agua para cada cuenca. La estimación de dicho consumo se realizó con base en valores de población e indicadores de consumo de agua genéricos dados por la literatura.

En la estimación poblacional para cada subcuenca se usaron datos del censo poblacional del 2002 (INE, 2002). Se utilizaron datos del 2002 registrados a nivel de poblados y proyectados hasta el año 2020 ya que dichos datos están adecuados para agregarlos a nivel de subcuenca a través del SIG. La proyección de los datos de población a nivel de poblados se basó en las tasas de evolución definidas a nivel de municipios por el INE (2002), y transferidas a nivel de cada poblado según su ubicación municipal.

Para estimar el consumo de agua per cápita se utilizó el umbral definido por el PNUD (PNUD, 2006) como la cantidad mínima de agua por habitante (1,700 metros cúbicos por habitante por año) necesaria para cubrir los varios usos (doméstico, agrícola, industrial y ambiental).

Multiplicando la población por este umbral se estimó entonces el consumo anual teórico de agua dentro de cada cuenca. Luego se obtuvo el balance hídrico haciendo la diferencia entre la disponibilidad anual por cuenca y dicho valor de consumo.

La estimación del balance hídrico para los escenarios a futuro se basó en los datos de población del 2020, incluso para el balance al 2050 y 2080, ya que no existen datos de proyección de población a plazos más largos que 2020.

4.2 El índice de gestión hídrica (IGH)

Como se explicó en la sección 3.2.2, el Índice de Gestión Hídrica (IGH) se basa en los componentes recurso (R), acceso (A), capacidad (C), uso (U), y ambiente (Am) y en el caso del presente trabajo cada uno de estos recibió diferente peso. De igual manera los indicadores dentro de cada uno de los componentes recibieron un peso específico distinto. En la selección de los indicadores y su priorización se realizaron cuatro talleres; los componentes así como sus indicadores, la fuente de información y el peso asignado se presentan a continuación en el Cuadro 4.

Cuadro 4. Indicadores priorizados para la estimación del IGH

Componente	Indicadores priorizados	Fuente	Peso (cada componente suma 100)
Recurso (25)	Disponibilidad hídrica per cápita (m ³ /hab)	IARNA-URL (2013)	40
	Recarga potencial (m ³ /ha)	IARNA-URL (2013)	25
	Numero de meses con estrés hídrico	IARNA-URL (2013)	25
	Tasa de variación de la disponibilidad hídrica al 2020 (%)	IARNA-URL (2013)	10
Acceso (20)	NBI agua (%)	INE (2002)	33.33
	NBI Saneamiento (%)	INE (2002)	33.33
	Acceso a riego (superficie regada/superficie total agrícola - %)	Elaboración propia, con base en INE/MAGA (2003)	33.33
Capacidad (20)	Tasa de crecimiento natural de la población (%)	INE (2002)	14
	Tasa de analfabetismo (%)	INE (2002)	14
	Mortalidad infantil (menores de 1 año - %)	Ministerio de salud (2009)	14
	Desnutrición crónica (%)	Mineduc/Sesan (2008)	14
	Población en condiciones de pobreza extrema (%)	INE (2002)	14
	Porcentaje del presupuesto municipal dedicado a agua y saneamiento (%)	USAID/ICEFI (2009)	30
Uso (15)	Agua consumida para uso doméstico (m ³ /habitante/año)	Elaboración propia, con base en IARNA/URL (2009)	40
	Agua consumida para riego (m ³ /ha/año)	Elaboración propia, con base en INE/MAGA (2003) y Segeplan (2006)	40
	Agua consumida para uso pecuario (m ³ /año)	Elaboración propia, con base en INE/MAGA (2003) y FAO (2009)	20
Ambiente (20)	Cobertura forestal (%)	INAB, CONAP, UVG, URL (2012)	20
	Tasa anual de deforestación (%)	INAB, CONAP, UVG, URL (2012)	20
	Índice de deterioro físico de la tierra	IARNA/URL (2006)	10
	Erosión de suelos (ton/ha/año)	IARNA/URL (2009)	15
	Tierras forestales de captación y regulación hidrológica (%)	INAB (2005)	25
	Áreas protegidas (%)	CONAP (2010)	10

Fuente: Elaboración propia.

El cálculo matemático del IGH combina los cinco componentes claves a través de la ecuación general siguiente:

$$IGH = \frac{\sum_{i=1}^N w_i X_i}{\sum_{i=1}^N w_i}$$

Donde IGH es el índice de gestión hídrica para un lugar en particular, X_i se refiere al componente i de la estructura del IGH para ese lugar, y w_i es el peso aplicado a ese componente. Cada componente tiene a su vez un número de subcomponentes, que se combinan para obtener los valores respectivos. Para los cinco componentes tomados en cuenta para el índice, la ecuación se expresa de la forma siguiente:

$$IGH = \frac{w_r R + w_a A + w_c C + w_u U + w_{am} Am}{w_r + w_a + w_c + w_u + w_{am}}$$

El IGH es el promedio ponderado de los cinco componentes: recurso (R), acceso (A), capacidad (C), uso (U), y ambiente (Am). Cada uno de los indicadores se estandariza en un rango con un valor adimensional entre 0 a 100, al igual que el valor final del IGH. Cada componente corresponde a su vez a un promedio ponderado de los indicadores que lo integran. En el caso del presente estudio, se atribuyó un peso mayor al componente de Recurso (nivel de importancia), menor al Uso y similar peso a los de Acceso, Capacidad y Ambiente. Adicionalmente, dentro de cada uno de los componentes, cada indicador tiene un peso específico (el cual se describe en la sección de materiales y métodos).

V. ANÁLISIS DE LA SITUACIÓN DE LOS RECURSOS HÍDRICOS EN EL ALTIPLANO GUATEMALTECO

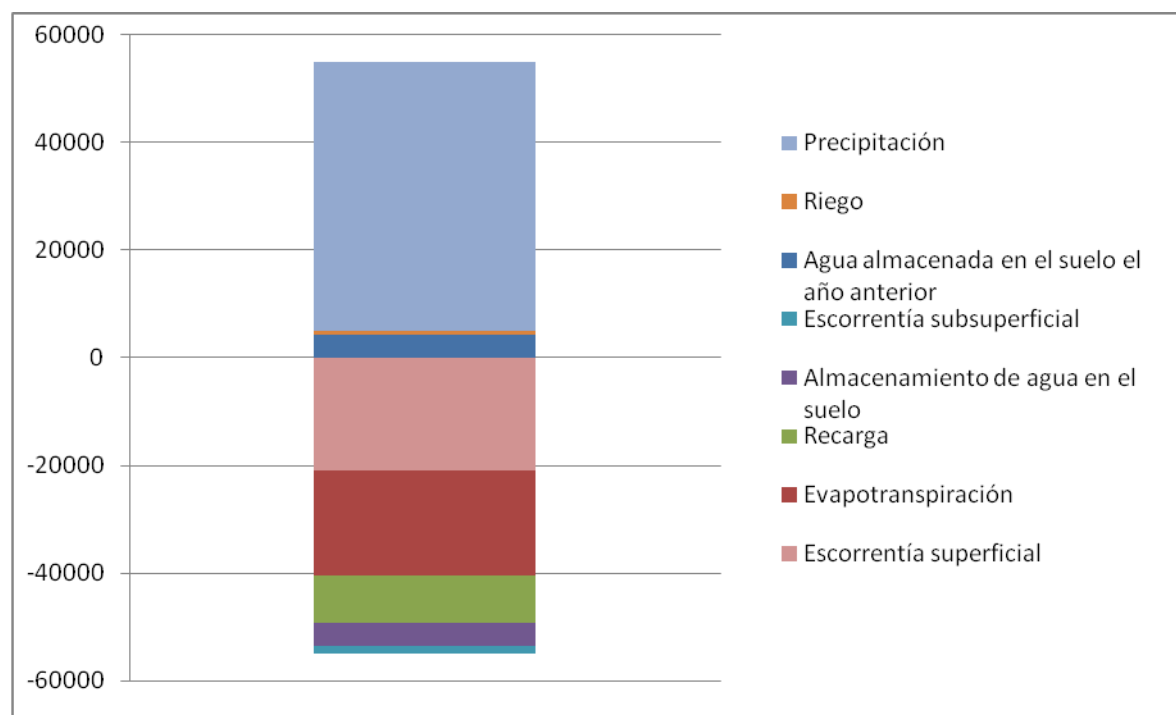
5.1 Modelación hidrológica

5.1.1 Situación actual

5.1.1.1 Balance hidrológico

A través del presente estudio se calculó el balance hidrológico o balance hídrico de suelos, y con base en dicho balance se pudieron determinar los volúmenes anuales de los principales flujos que forman parte del ciclo hidrológico superficial. En el modelo hidrológico utilizado se consideraron los flujos de entrada siguientes: Precipitaciones, riego y agua almacenada en el suelo durante el año anterior; y por otro lado, los flujos de salida siguientes: Evapotranspiración, escorrentía superficial y subsuperficial, recarga y almacenamiento de agua en el suelo. A continuación se detallan los valores de los diferentes flujos del balance hídrico de suelos (Figura 3 y Cuadro 5)

Figura 3. Balance hidrológico general en el altiplano occidental



Fuente: Elaboración propia.

Al observar los datos del Cuadro 5, se aprecia que la precipitación anual total para el área del Altiplano Occidental alcanza un poco más de los 50,000 millones de metros cúbicos, y que los flujos de salida más importantes son la escorrentía superficial y la evapotranspiración, los cuales representan respectivamente el 37.8% (20,820 millones de metros cúbicos) y el 35.8% (19,717 millones de metros cúbicos) del total de los flujos de salida. Los flujos de recarga representan el 16%, mientras que el agua almacenada en la capa de suelo alcanza el 7.69% y la escorrentía subsuperficial es menos del 3%.

Cuadro 5. Balance hidrológico general en el altiplano occidental

Tipo de flujo	Flujos	Millones de metros cúbicos	Peso relativo (%)
Flujos de entrada	Precipitación	50,075	90.92
	Irrigación	769	1.4
	Agua almacenada en el suelo el año anterior	4,235	7.69
	Total de entradas	55,078	100
Flujos de salida	Evapotranspiración	19,717	35.8
	Escorrentía superficial	20,820	37.8
	Recarga	8,761	15.91
	Escorrentía subsuperficial	1,546	2.81
	Almacenamiento de agua en el suelo	4,235	7.69
	Total de salidas	55,079	100

Fuente: Elaboración propia.

El balance hidrológico es fundamental para identificar las cuencas que más agua reciben por la precipitación, las que más pierden agua por la evapotranspiración y para estimar la disponibilidad hídrica anual.

5.1.2 Disponibilidad hídrica anual

La disponibilidad hídrica u oferta hidrológica es el volumen de agua que queda disponible anualmente en el subsistema ambiental, dicho de otra forma, es el agua que queda después de que los procesos de evapotranspiración se han llevado a cabo. En la **¡Error! No se encuentra el origen de la referencia.** se presentan los resultados de disponibilidad hídrica para la situación actual.

Al analizar la Figura 4 salta a la vista que el altiplano, y principalmente en su parte central, se caracteriza por una relativa escasez hídrica, si se compara con las áreas ubicadas en sus márgenes (Bocacosta al sur y Franja Transversal del Norte al norte).

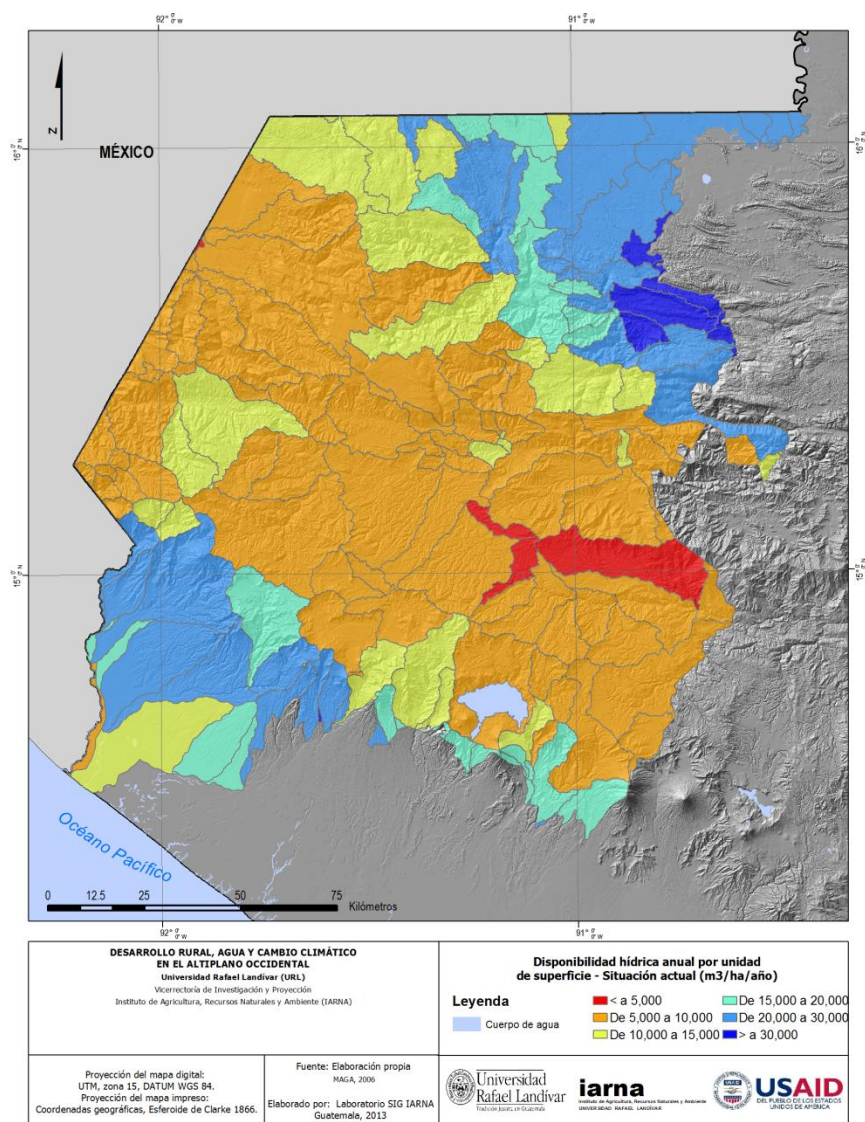
Las subcuencas más críticas están ubicadas en la parte central del altiplano, y corresponden a las subcuencas de las partes altas de las cuencas del río Motagua y del río Negro, en la parte sur de El Quiché y en Totonicapán. En dicha zona se encuentran tres subcuencas cuya disponibilidad hídrica anual ha sido estimada por debajo de los 5,000 metros cúbicos por hectárea. Situación que también se da en las partes altas del altiplano, y sobre todo en el área del corredor seco extendido.

Contrario a lo anterior, las cuencas que presentan niveles de disponibilidad más altos están ubicadas en los márgenes del altiplano. En la parte suroccidental, corresponden a las subcuencas de la vertiente Pacífico, y pertenecen principalmente a las cuencas de los ríos Ocosito, Naranjo y Suchiate. En esta zona, las subcuencas analizadas presentan niveles de disponibilidad que son por lo general arriba de los 20,000 metros cúbicos por hectárea por año. Dichas zonas pertenecen al área de la Bocacosta ubicada en los departamentos de Quetzaltenango y San Marcos. En la parte norte del altiplano, las subcuencas con más ventajas en términos de disponibilidad hídrica corresponden a las que drenan hacia la Franja Transversal del Norte y que están ubicadas en las

partes medias y bajas de las cuencas de los ríos Ixcán, Xaclbal, Copón, Chixoy y Tzejá. En muchas de aquellas subcuencas, la disponibilidad hídrica anual alcanza los 20,000 metros cúbicos por hectárea, y a veces sobrepasa los 30,000 metros cúbicos por hectárea

Los datos analizados en esta sección demuestran que en términos biofísicos la distribución del recurso hídrico en el altiplano es desigual, pero para poder entender la magnitud es necesario tomar en cuenta la demanda del ser humano sobre el recurso, es por esto que en la siguiente sección se presentan los resultados del balance hídrico incluyendo este factor.

Figura 4. Disponibilidad hídrica para la situación actual



Fuente: Elaboración propia.

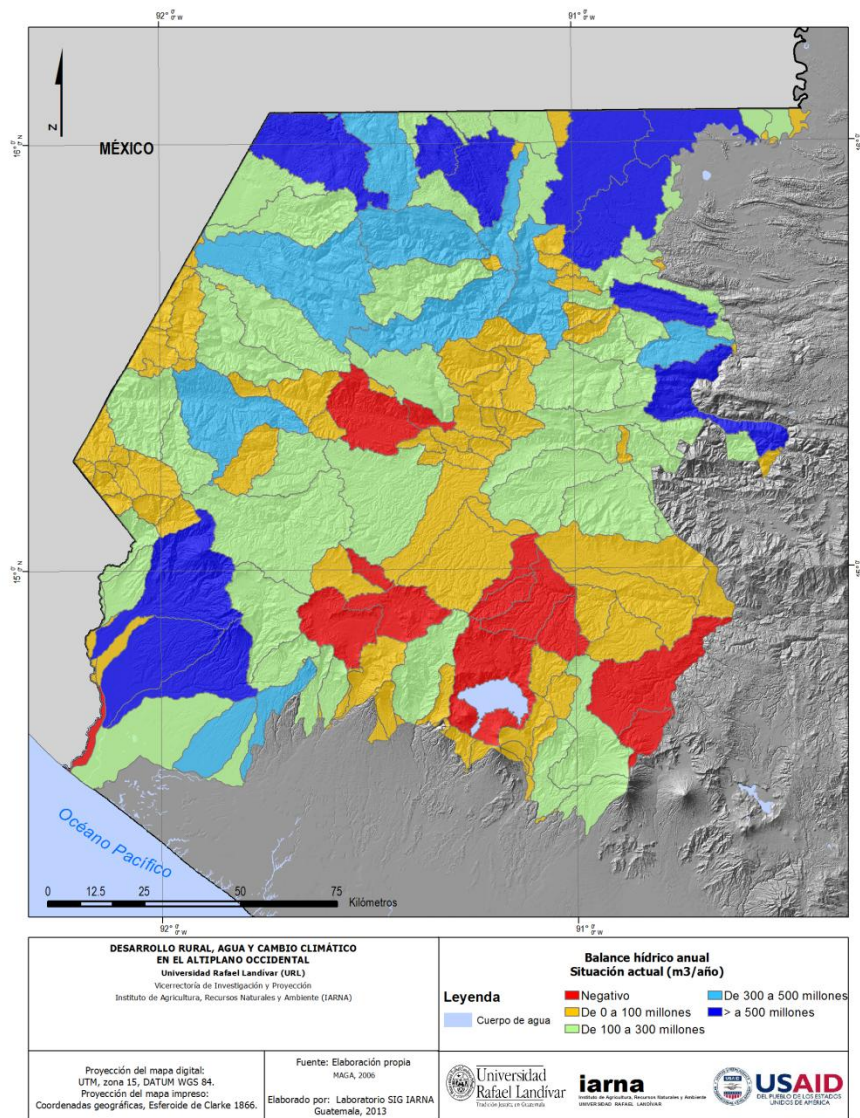
5.1.3 Balance hídrico

El cálculo del balance hídrico permite identificar aquellas subcuencas que presentan un déficit o excedente anual de recursos hídricos. Los resultados del balance hídrico anual se presentan en la Figura 5.

En el mapa a continuación (Figura 5), se puede observar que la mayor parte de las subcuencas estudiadas presentan un balance hídrico excedentario para el periodo actual. No obstante, el área del altiplano cuenta con un cierto número de cuencas deficitarias en términos de recursos hídricos.

Las subcuencas con un balance hídrico deficitario están vinculadas a las principales áreas urbanas del altiplano: Chimaltenango, Sololá, Santa Cruz del Quiché, Huehuetenango y Quetzaltenango. Es importante mencionar que este indicador no revela necesariamente la falta de recursos hídricos para dichas ciudades, ya que estas pueden recurrir a medidas estructurales (ej. Importación de agua proveniente de otras subcuencas), pero en realidad, si muestra que en estas zonas existe localmente una fuerte presión sobre los recursos hídricos. Las subcuencas que presentan un balance hídrico deficitario forman parte de las cuencas altas de los ríos Motagua, Selegua y Samalá. De igual manera resulta deficitaria la cuenca del Lago de Atitlán.

Figura 5. Balance hídrico para la situación actual



Fuente: Elaboración propia.

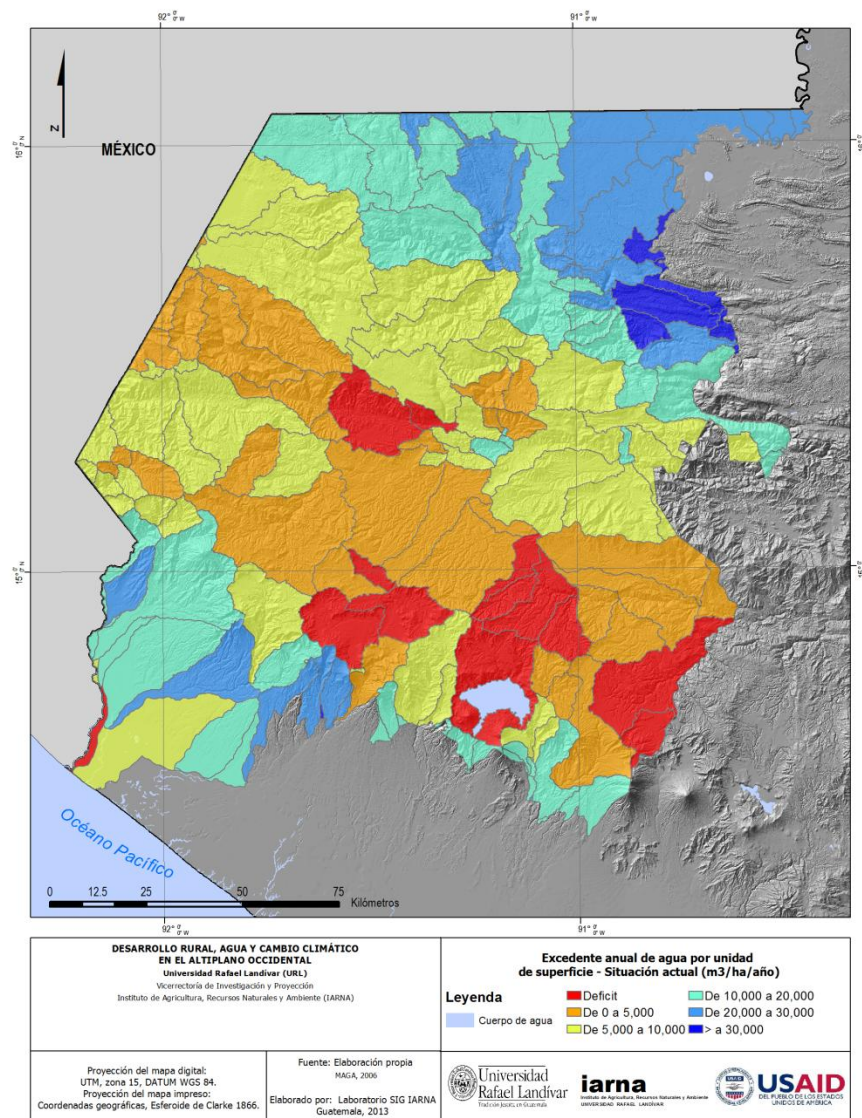
En el resto de la parte alta del altiplano, la mayor parte de las subcuencas presentan un excedente anual de recursos hídricos inferior a 200 millones de metros cúbicos.

Las subcuencas con un mayor excedente de recursos hídricos están principalmente ubicadas a los márgenes del altiplano, es decir en la Bocacosta en el suroccidente y en la Franja Transversal del Norte en la parte norte. En aquellas áreas, la mayor parte de las subcuencas presentan un excedente que supera los 300 millones de metros cúbicos al año, y en ciertos casos sobrepasa los 500 millones de metros cúbicos. En la parte suroccidental, las subcuencas que destacan en términos del excedente de recursos hídricos pertenecen a las cuencas de los ríos Ocosito, Naranjo y Suchiate, mientras en la parte norte destacan las cuencas de los ríos Nentón, Pojóm, Ixcán, Xaclbal y Tzejá.

Después de haber analizado los valores del balance bruto, es importante observar los resultados de dicho balance relativizados por el factor de superficie, ya que este indicador además de analizar

el volumen de agua disponible luego de haber satisfecho las necesidades ecosistémicas y humanas, también permite tener una idea de la eficiencia del paisaje para producir agua dentro de cada cuenca. Los resultados de este indicador se presentan en la Figura 6.

Figura 6. Excedente anual de agua por hectárea para la situación actual



Fuente: Elaboración propia.

Al igual que en el mapa anterior, se observa las mismas subcuencas con un déficit anual de agua por hectárea. Se nota que el eje central del altiplano (que corresponde a la extensión del llamado Corredor Seco) presenta valores más bajos en cuanto al excedente anual de agua por hectárea. Dicho eje central está conformado por las cuencas de los ríos Motagua, Negro y Selegua. Al alejarse de este eje central, se puede observar un gradiente positivo hacía el norte y sur en cuanto al excedente anual de agua por hectárea. Dicho gradiente está más marcado, pero alcanza los valores más grandes en la extremidad suroccidente (Bocacosta) y en la parte norte de los departamentos de Huehuetenango y Quiché.

La **¡Error! No se encuentra el origen de la referencia.** 6 muestra que 13 sub-cuencas con un total de 245,284 hectáreas (12%) presentan un déficit anual de agua por hectárea.

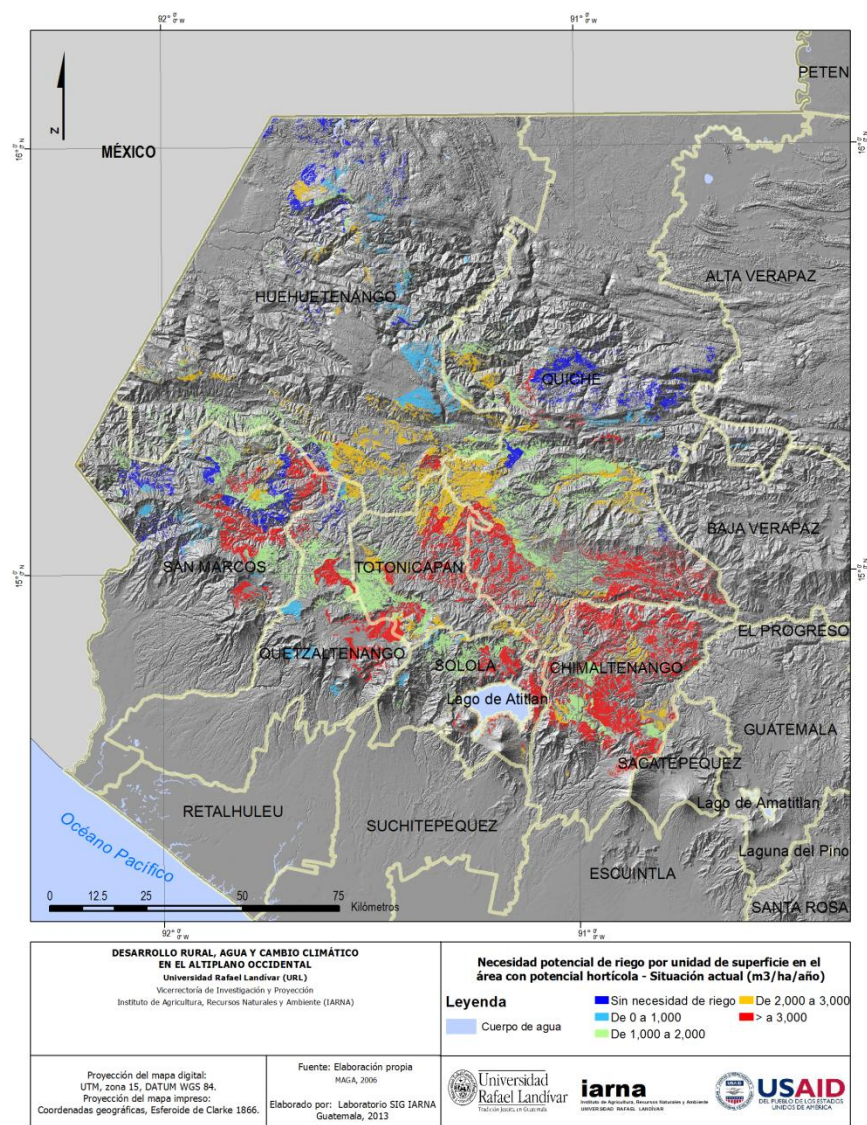
5.1.4 Necesidad de riego

La modelación hidrológica permitió aportar elementos cuantitativos en cuanto a las necesidades de riego en el altiplano. Dado que dicha modelación está basada en un balance hídrico de suelos, se pudo estimar la necesidad de riego para cada unidad hidrológica correspondiente a un uso teóricamente regado (hortalizas y caña de azúcar). En resumen, la necesidad de riego calculada en el presente estudio depende de factores climáticos, de las características de los suelos y del uso de agua por la vegetación. Los resultados de dicho análisis están presentados en el mapa a continuación (**¡Error! No se encuentra el origen de la referencia.** 7).

Al observar el mapa, se nota una concentración de áreas con poca o sin necesidad de riego en tres zonas: **El norte de Huehuetenango, el norte de San Marcos y la parte mediana de El Quiché (Zona Reina y triángulo Ixil)**. Estas áreas están vinculadas con las áreas más lluviosas del altiplano. En el caso de la Zona Reina se encuentran las series de suelo Amay y Calanté, las cuales han sido descritas como suelos profundos y bien drenados, adaptados para la agricultura permanente o anual (Simmons et al., 1959). En el triángulo Ixil, las áreas con poca necesidad de riego están también asociadas con la serie Calanté. Al noroeste de San Marcos, dichas áreas están asociadas con las series Camanchá (área de Tacaná, Sibinal e Ixchiguan) y Sinaché (entre Comitancillo y Concepción Tutuapa). Ambas series han sido descritas como suelos profundos y bien drenados, adaptados al desarrollo agrícola, inclusive hortícola (cultivo de papa) (Simmons et al., 1959). En el caso del norte de Huehuetenango, las áreas con menos necesidad de riego corresponden a la serie de suelo Jacaltenango, igualmente descritas como suelos profundos y bien drenados. Al analizar las áreas con potencial hortícola que pueden desarrollarse sin riego se tienen que estas están distribuidas en 42 municipios y cubren un área de 36,163 hectáreas (2%).

Al contrario, las áreas con más necesidad de riego (con requerimientos superiores a 3,000 metros cúbicos por hectárea por año) están principalmente en la franja ubicada directamente al norte de la cadena volcánica en los departamentos de Chimaltenango, la franja sur de El Quiché, Sololá, Totonicapán y las partes medias de Quetzaltenango y San Marcos. Corresponden por lo general a áreas con menos precipitaciones (cuencas de los ríos Motagua, Negro y Lago de Atitlán). Estas áreas están asociadas con las series de suelos Zacualpa, Cauqué, Quiché, Chol (en Chimaltenango y El Quiché), Totonicapán (en Totonicapán), Tolimán (en Sololá) Patzité (en Totonicapán, Sololá, Quetzaltenango y San Marcos). La mayor parte de estos suelos poseen características propicias al desarrollo agrícola, pero son muy erosionables o muy erosivos (ej. Patzité, Tolimán, Totonicapán, Cauqué) (Simmons et al., 1959). Al contabilizar las áreas con potencial hortícola que tienen necesidad de riego estas se distribuyen en 112 municipios y cubren un área de 171,500 hectáreas (8%).

Figura 7. Necesidad potencial de riego en el área con potencial hortícola del altiplano occidental, enfoque situación actual



Fuente: Elaboración propia.

5.1.5 Escenario B2

En esta sección se presentan los resultados de la modelación hidrológica para el escenario B2, para los años 2020, 2050 y 2080, lo que permitirá identificar las cuencas más vulnerables a los efectos del cambio climático.

5.1.6 Disponibilidad hídrica anual

Una vez que los resultados de la modelación hidrológica han sido evidenciados para la situación actual, es importante ver cuáles son las tendencias a las cuales está sometido el altiplano

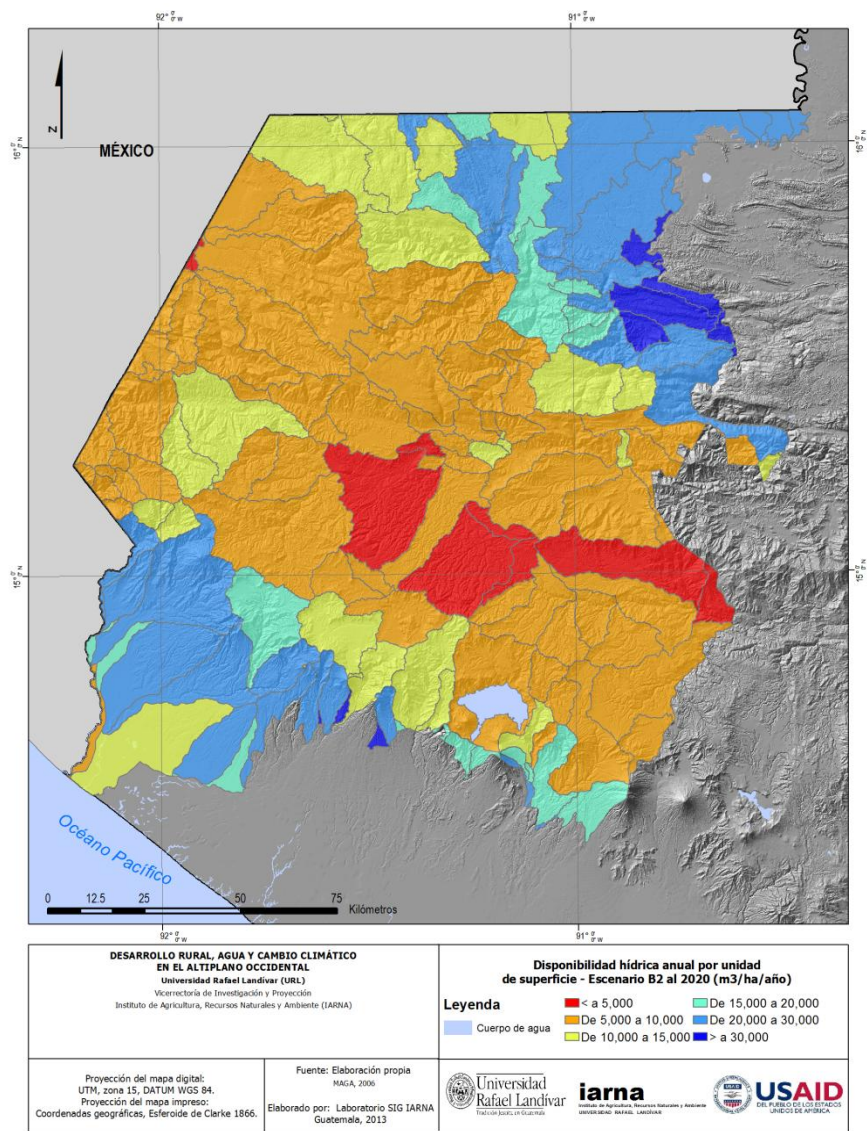
guatemalteco en términos de recursos hídricos. Los resultados de disponibilidad hídrica por unidad de superficie por cuenca están presentados en los mapas a continuación (Figuras 8, 9 y 10).

En el escenario B2 se estima que para el 2020, 20 subcuencas tendrían déficit hídrico. Estas áreas están ubicadas principalmente en la parte alta de las cuencas de los ríos Motagua y Negro. Las subcuencas con las tasas de variación más bajas en el 2020 se encuentran en la parte baja de las cuencas del noroccidente, fronterizas con México (Selegua, Nentón, Xaclbal); las subcuencas con una tasa de variación también se encuentran en el noroccidente, aunque también en la cuenca alta de los ríos Motagua y Negro. Para el año 2050, la variación climática se ve agudizada en comparación con el año 2020, ya que se pasa de un 16% del área en estrés hídrico a un 24%.

Para el año 2080 la disminución de la disponibilidad hídrica se generaliza en el altiplano, con tasas de variación entre -22.6% y -69% en comparación a la situación actual. Un total de 73 subcuencas presentarían estrés hídrico. Estas cuencas se ubican principalmente alrededor del área que corresponde a la extensión del corredor seco, en las cuencas de los ríos Motagua, Negro, Blanco, Selegua, Nentón y Xaclbal alto.

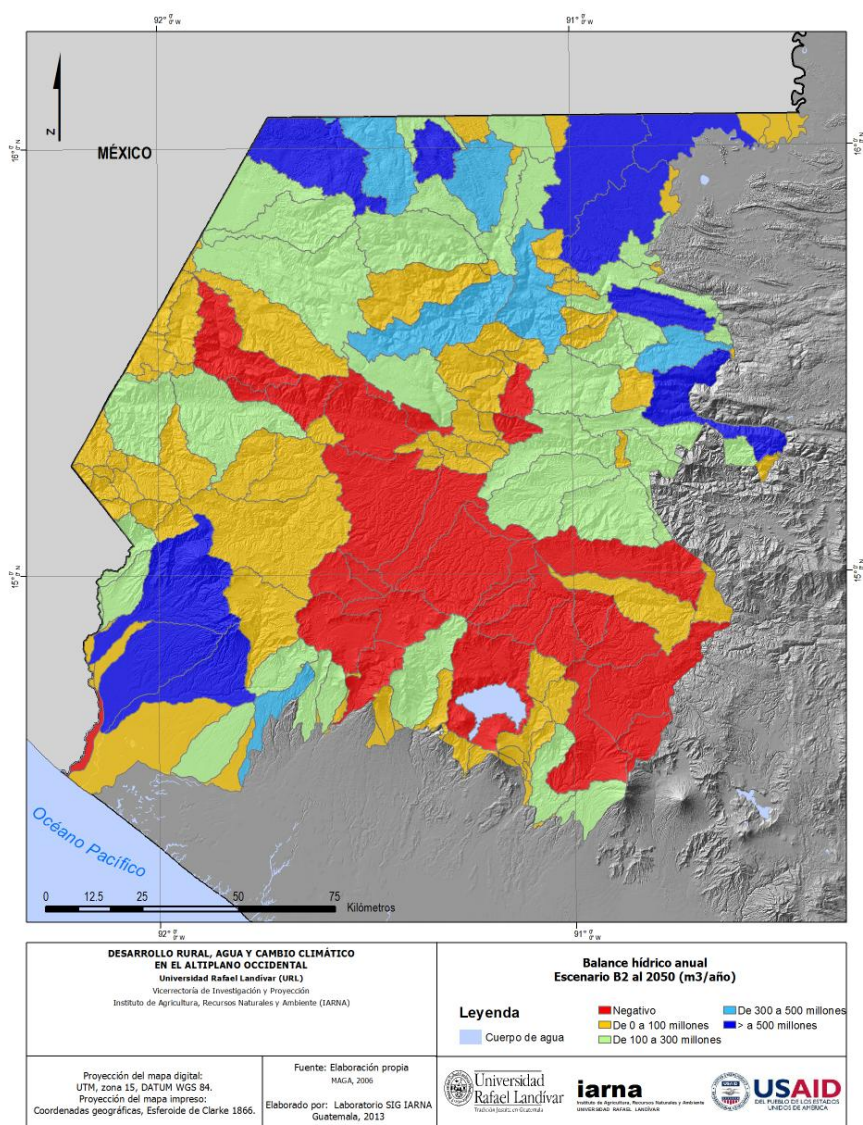
En este escenario, la disminución en la disponibilidad hídrica afectaría 20 cuencas (245,284 hectáreas que representan el 16% del área total) en el 2020, 29 cuencas (con una extensión de 590,042 hectáreas, que equivalen al 24%) en el 2050, y 73 cuencas (1,451,559 hectáreas que representan el 60% del territorio analizado) en el 2080, estas áreas se pueden apreciar en rojo en las figuras 8, 9 y 10. Para mayor detalle ver zonas azules y verdes de las figuras 8, 9 y 10.

Figura 8. Disponibilidad hídrica para el escenario B2 al 2020



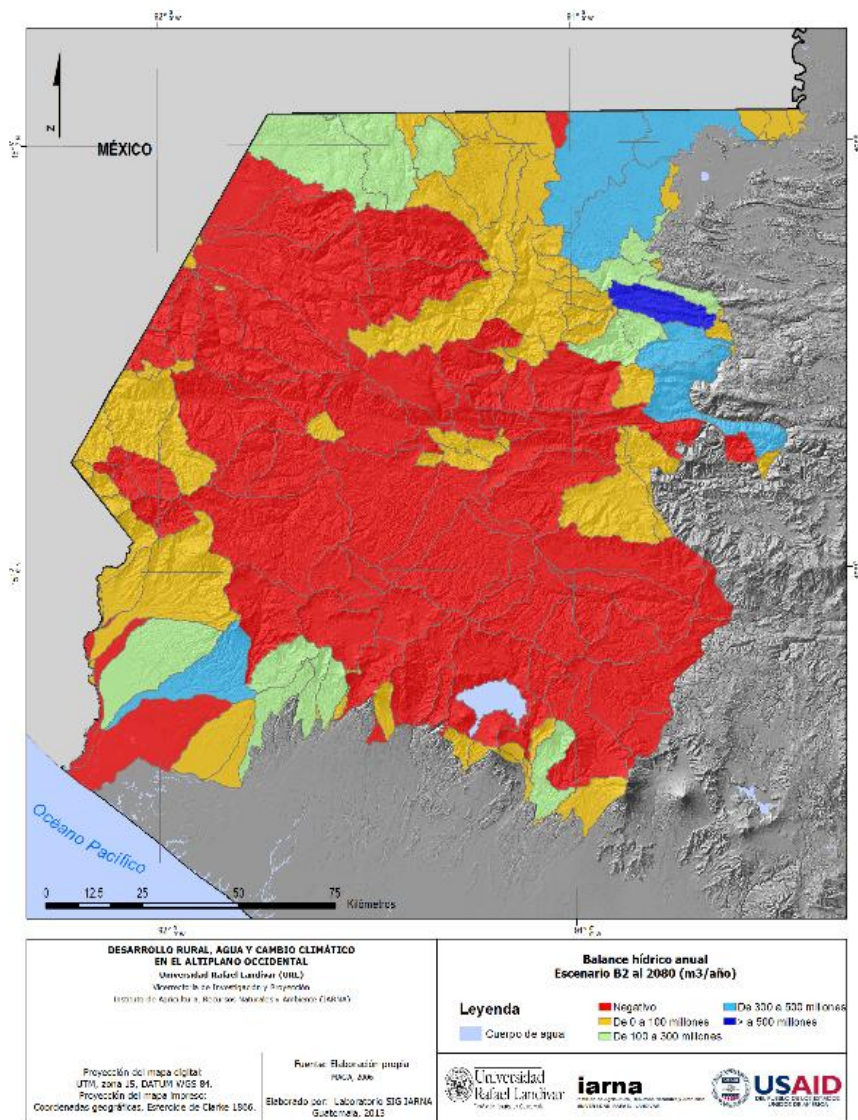
Fuente: Elaboración propia.

Figura 9. Disponibilidad hídrica para el escenario B2 al 2050



Fuente: Elaboración propia.

Figura 10. Disponibilidad hídrica para el escenario B2 al 2080



Fuente: Elaboración propia.

5.1.7 Escenario A2

Antes de empezar esta sección es necesario aclarar que el escenario A2 se caracteriza por cambios más drásticos en los factores de precipitaciones y temperatura que para el escenario B2. Al igual que para el escenario B2, el documento se enfoca únicamente en la presentación del indicador de disponibilidad hídrica anual.

A continuación se presentan los resultados de la modelación hidrológica para el escenario A2, para los años 2020, 2050 y 2080. La idea de analizar este escenario es entender que pasaría si las condiciones ambientales se agudizaran en relación a un escenario más optimista (B2).

5.1.8 Disponibilidad hídrica anual

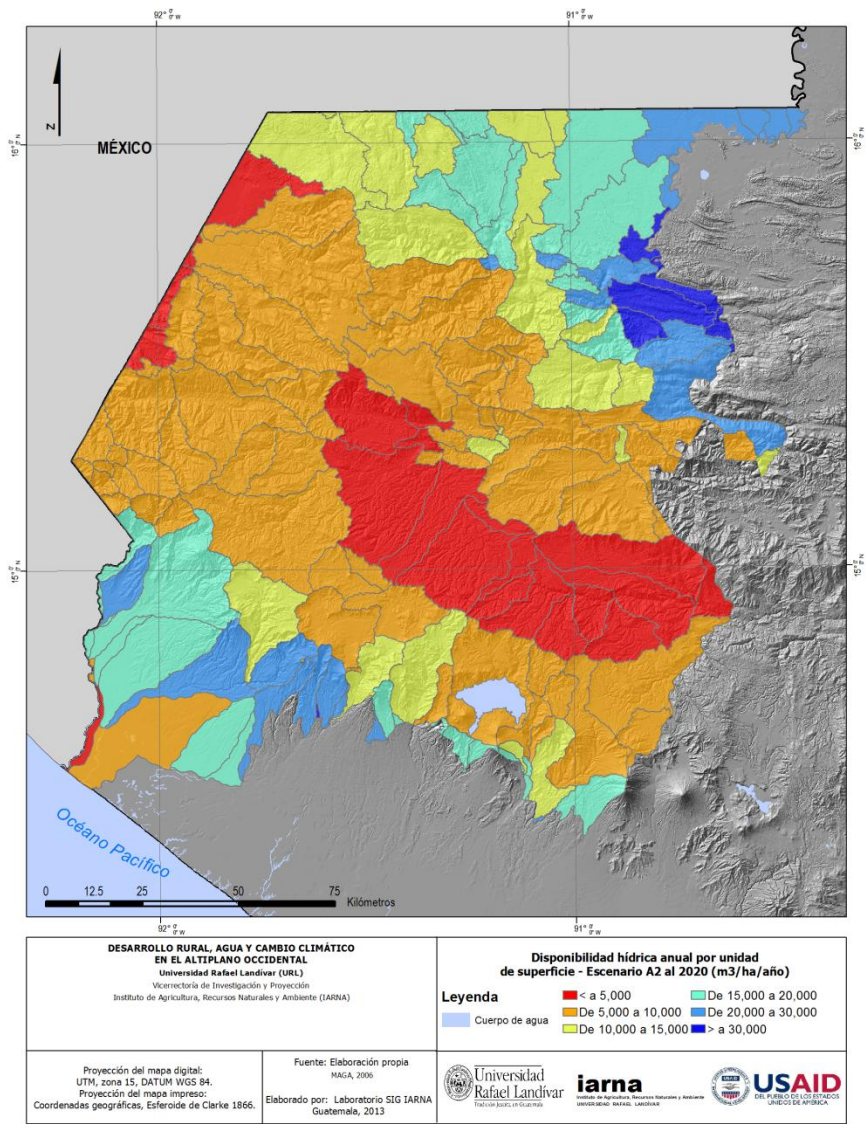
Los resultados de disponibilidad hídrica anual están presentados en las figuras 11, 12 y 13.

Para el escenario A2, la disminución de la disponibilidad hídrica ocurre de manera más drástica y rápida, esto se puede apreciar en que a partir del año 2020 la totalidad de las subcuencas del altiplano sufren una disminución de la disponibilidad hídrica de entre -4.1% y -29.8%. En el 2020, un total de 22 subcuencas (416,038 hectáreas que equivalen al 20% del área de estudio) déficit hídrico. Dichas áreas están ubicadas en las cuencas de los ríos Motagua y Negro, así como en la parte baja de las cuencas del Selegua y del río Nentón. Al igual que para el escenario B2, las subcuencas sujetas a una menor variación (superior a -10%) de la disponibilidad hídrica están ubicadas en la Bocacosta y alrededor de la Zona Reina y del Ixcán.

Al año 2050, las variaciones serían drásticas comparándoles con el año 2020. En total 42 subcuencas (875,332 hectáreas que equivalen al 36% del altiplano) entrarían en estrés hídrico. Estas subcuencas están ubicadas cerca del eje constituido por las cuencas del Motagua, Negro y Selegua/Nentón.

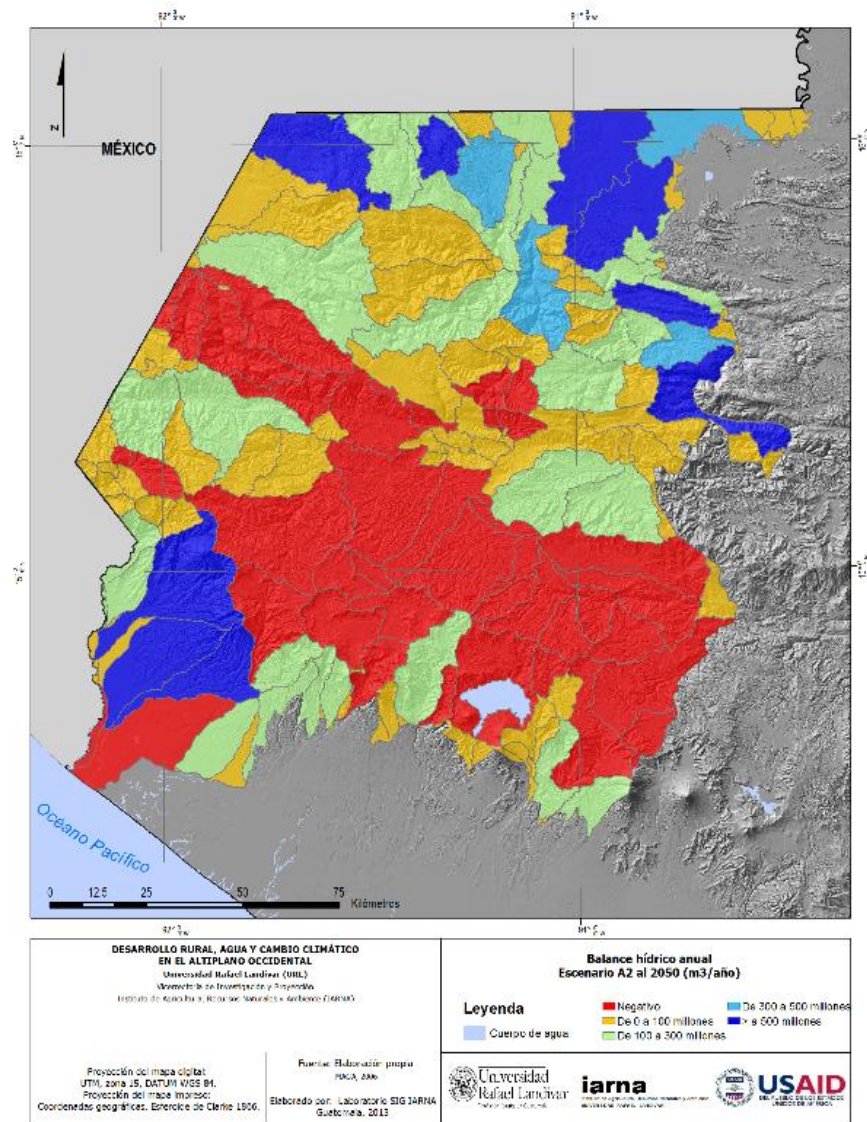
Para el 2080 los cambios son más drásticos aún, ya que en ese año 76 subcuencas (con un área de 1,486, 934 hectáreas que equivalen al 61% del área total del altiplano) tendrán estrés hídrico. La disponibilidad hídrica disminuiría en promedio del 44.3% en la zona del altiplano, llegando en ciertas subcuencas a sobrepasar el 70%. Al igual que para el escenario B2, las subcuencas sujetas a una variación más importante (inferior a -50%) se encontrarían en las cuencas de los ríos Motagua, Negro, Blanco, Xaclbal, Ixcán, Pojóm, Nentón y Selegua. Las subcuencas sujetas a variaciones menores estarían ubicadas en la Bocacosta, así como en la Zona Reina.

Figura 11. Disponibilidad hídrica para el escenario A2 al 2020



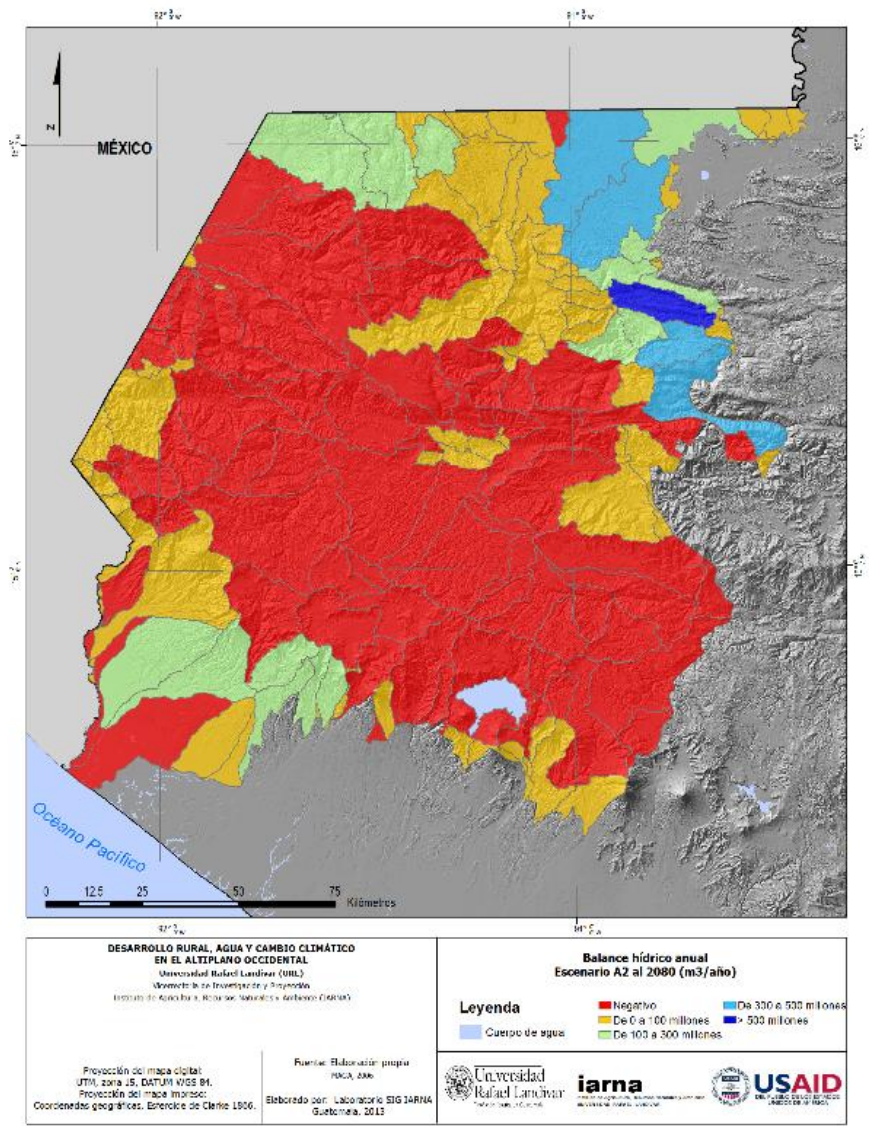
Fuente: Elaboración propia.

Figura 12. Disponibilidad hídrica para el escenario B2 al 2080 A2 al 2050



Fuente: Elaboración propia.

Figura 13. Disponibilidad hídrica para el escenario A2 al 2080



Fuente: Elaboración propia.

5.2 Índice de Gestión Hídrica y sus componentes

Como se explicó en la sección 5.1 (Índice de Gestión Hídrica y los componentes utilizados en el presente trabajo) el índice de gestión hídrica combina cinco componentes (recurso, acceso, capacidad, uso y ambiente) con ponderación relativa que va de cero a cien. Con fines de evaluar el estado de la gestión de los recursos hídricos en los municipios del altiplano occidental de Guatemala, los índices de Gestión Hídrica Municipal obtenidos fueron clasificados usando la escala que se presenta en el Cuadro 6.

Cuadro 6. Escala utilizada para evaluar el nivel de gestión hídrica en el altiplano Guatemalteco.

Clasificación	Valor del Índice de Gestión Hídrica	Disponibilidad
Alto	>75	
Medio alto	50-75	
Medio Bajo	25-50	
Bajo	< 25	

Fuente: Elaboración propia.

Es importante enfatizar que el Índice IGH no solamente es un número sino la manifestación de cinco componentes que reflejan los principales atributos relacionados con el manejo del agua a nivel municipal.

Para facilitar el análisis de la información, los municipios se dividieron en dos grupos, el primero está integrado por los municipios que tienen una gestión hídrica adecuada o aceptable (que incluye los rangos Alto y Medio Alto) y se caracterizan por presentar valores de IGH mayores a 50. El segundo, está conformado por aquellos municipios que tienen una gestión hídrica deficiente (con rangos Medio Bajo y Bajo), es decir, aquellos que presentan valores de IGH menores de 50.

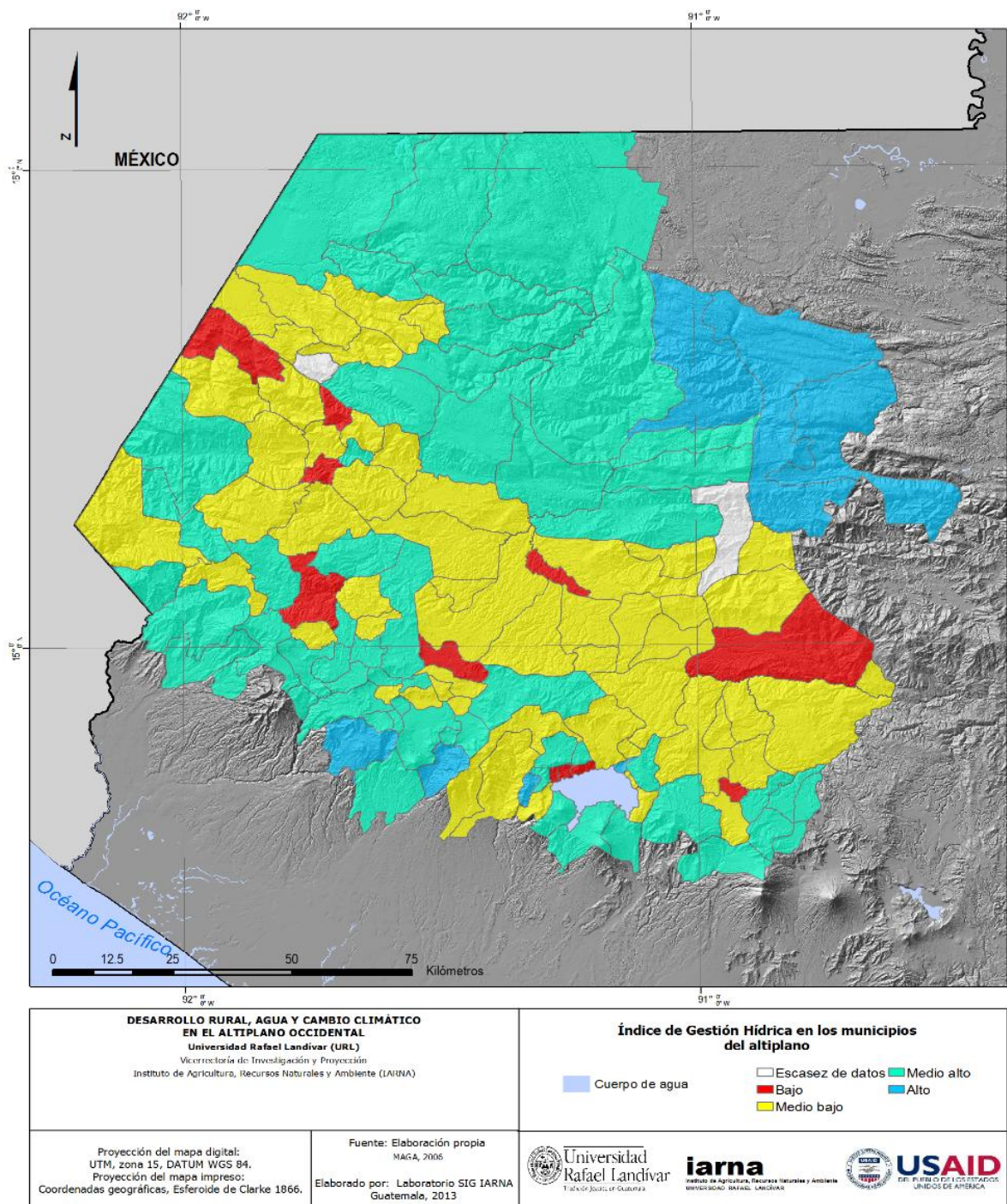
A manera de referencia, es necesario mencionar que el índice se ha aplicado para todos los países del mundo, permitiendo obtener una clasificación planetaria provisoria, en tanto a nivel de comunidades se ha desarrollado en algunos países de África (Sudáfrica, Tanzania) y en Asia (Sri Lanka). En el caso de los países africanos, Sudáfrica tiene un valor de IPH de 52.2 reflejando la mayor dificultad en el componente de acceso al agua, mientras Tanzania con un menor valor de 48.3 se ve agravada por causa de los desequilibrios ambientales a los que está sometida (Sullivan, et al., 2002).

En el caso de Guatemala, los resultados del IGH y sus componentes a nivel de territorios municipales se presentan a continuación.

5.2.1 Índice de Gestión Hídrica

De los 129 municipios evaluados, 64 presentan un IGH adecuado, es decir, con valores mayores a 50. Estos municipios representan el 59% del área total del altiplano. En este territorio el 49% del área está cubierta por hortalizas y el 41% tiene potencial para el desarrollo hortícola (para más detalle ver Cuadro 7 y Figura 14). El listado de municipios con un IGH deficiente se presenta a continuación en el Cuadro 7, así como sus áreas totales, y las áreas hortícolas actuales y potenciales.

Figura 14. Índice de Gestión Hídrica en el altiplano Guatemalteco



Fuente: Elaboración propia.

Cuadro 7. Municipios con un IGH deficiente

Departamento	Municipio	Área Municipio (ha)	Área actual Hortalizas (ha)	Área con Potencial Hortícola (ha)
Chimaltenango	Chimaltenango	4,909	109	1,666
Chimaltenango	Patzún	18,420	1,958	6,005
Chimaltenango	Acatenango	13,100	26	3,707
Chimaltenango	San Andrés Itzapa	6,766	328	2,727
Chimaltenango	Parramos	2,944	97	1,810
Chimaltenango	Zaragoza	5,192	309	1,804
Chimaltenango	El Tejar	4,556	29	2,190
Sololá	San José Chacayá	1,579	14	614
Sololá	Santa María Visitación	2,076	0	270
Sololá	Santa Lucía Utatlán	5,107	8	2,046
Sololá	Santa Clara La Laguna	1,436	1	397
Sololá	San Andrés Semetabaj	5,297	94	2,341
Sololá	Panajachel	772	13	263
Sololá	San Lucas Tolimán	7,369	18	1,436
Sololá	San Pedro La Laguna	5,066	5	544
Sololá	Santiago Atitlán	11,590	43	1,294
Totonicapán	Totonicapán	24,450	111	6,682
Quetzaltenango	Quetzaltenango	12,680	326	5,609
Quetzaltenango	San Carlos Sija	22,650	186	10,430
Quetzaltenango	Sibilia	4,106	102	2,312
Quetzaltenango	Cajolá	2,053	12	594
Quetzaltenango	San Juan Ostuncalco	10,900	365	68
Quetzaltenango	San Mateo	1,082	93	130
Quetzaltenango	Concepción Chiquirichapa	2,189	395	0
Quetzaltenango	San Martín Sacatepéquez	14,380	751	0
Quetzaltenango	Almolonga	1,255	394	512
Quetzaltenango	Cantel	4,974	34	1,275
Quetzaltenango	Zunil	7,746	617	1,006
Quetzaltenango	San Francisco la Unión	1,689	0	1,020
Quetzaltenango	El Palmar	17,590	34	766
Quetzaltenango	La Esperanza	1,225	61	539
Quetzaltenango	Palestina de los Altos	3,602	366	353
San Marcos	San Marcos	12,050	163	2,548
San Marcos	San Pedro Sacatepéquez	7,737	214	1,649
San Marcos	San Antonio Sacatepéquez	4,731	125	791
San Marcos	Sibinal	10,430	818	1,670

Departamento	Municipio	Área Municipio (ha)	Área actual Hortalizas (ha)	Área con Potencial Hortícola (ha)
San Marcos	Tajumulco	25,140	283	4,248
San Marcos	Tejutla	14,300	230	6,433
San Marcos	San Rafael Pie de la Cuesta	4,520	23	0
San Marcos	San Pablo	21,240	4	0
San Marcos	San José Ojetenam	7,861	410	1,142
San Marcos	San Cristóbal Cucho	2,970	37	62
San Marcos	Sipacapa	15,140	468	7,115
San Marcos	Río Blanco	3,119	7	1,319
Huehuetenango	Chiantla	41,310	1,670	10,290
Huehuetenango	Cuilco	45,360	124	4,341
Huehuetenango	Nentón	76,620	72	10,830
Huehuetenango	Soloma	26,300	138	1,984
Huehuetenango	Todos Santos Cuchumatán	26,920	800	80
Huehuetenango	Santa Eulalia	25,070	7	955
Huehuetenango	San Mateo Ixtatán	58,330	107	7,464
Huehuetenango	Tectitán	7,254	219	472
Huehuetenango	San Juan Ixcoy	21,070	577	1,474
Huehuetenango	San Sebastián Coatán	15,670	34	1,293
Huehuetenango	Santa Cruz Barillas	116,600	6	132
Huehuetenango	Aguacatán	32,520	341	11,750
Huehuetenango	San Rafael Pétzal	2,517	13	286
Quiché	Chajul	52,580	1	5,603
Quiché	Cunén	22,600	215	5,875
Quiché	San Juan Cotzal	16,300	8	4,957
Quiché	Nebaj	85,310	184	11,900
Quiché	Uspantán	83,730	102	6,409
Quiché	Sacapulas	36,980	497	15,890
Quiché	Chicamán	56,670	49	3,733

Fuente: Elaboración propia.

Debido a que el IGH es un promedio de cinco componentes mencionados, es posible que un valor pequeño en un componente pueda ser compensado por un valor alto en otro, por lo que a fin de comprender el tipo de vulnerabilidad que tiene cada uno de los municipios objeto de estudio, a continuación, se hace un análisis por cada uno de los componentes del IGH.

5.2.2 Componente Recurso

La variable recurso se refiere a la disponibilidad física del agua (subterránea y superficial) tomando en cuenta su variabilidad en el tiempo y calidad así como la cantidad total de agua. El análisis de

este componente permite entender la situación de la materia prima para la subsistencia de personas y agricultura en el altiplano.

Los resultados del componente muestran que solamente cinco municipios tienen niveles adecuados de recurso, estos municipios son Chicamán, Uspantán, y Chajul en el departamento de El Quiché, así como El Palmar y San Martín Sacatepéquez en el departamento de Quetzaltenango (para más detalle ver Cuadro 8).

Un total de 124 municipios tienen problemas relacionados con el recurso (valores por debajo de 50); de estos 32 presentan un índice bajo. Al analizar los 124 municipios en conjunto, representan un área municipal de 1,797,615 hectáreas (80%), de las que 29,551 (97%) corresponden a áreas con cobertura de hortalizas y 445,330 (95%) hectáreas tienen potencial para desarrollar horticultura. Los valores de este grupo se presentan en el Fuente: Elaboración propia.

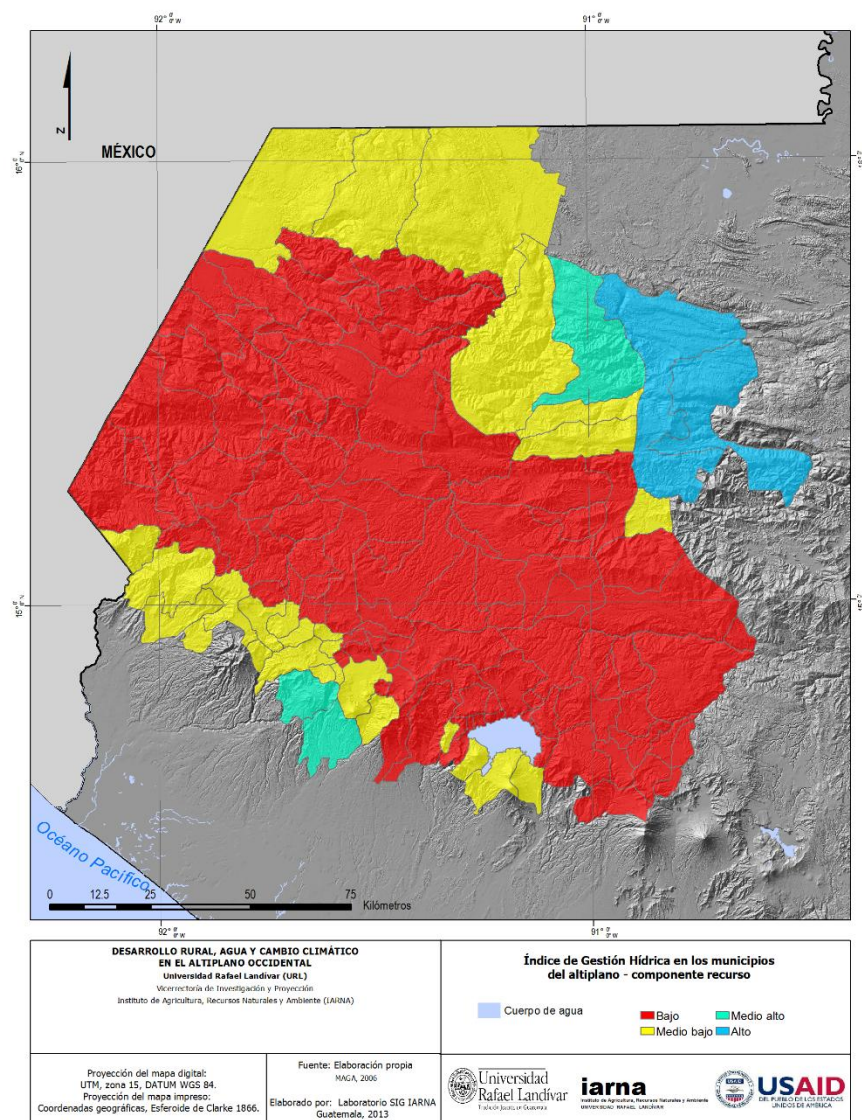
Cuadro 9 y la Figura 15. Dicho de otra forma el 91% de los municipios tienen problemas de disponibilidad física de agua, por lo que es de suma importancia implementar medidas encaminadas a la conservación de los recursos hídricos tales como estructuras de almacenamiento de agua, y protección de las zonas de recarga y descarga hídrica (estos temas serán abordados a profundidad en el documento de inversiones estratégicas).

Cuadro 8. Municipios con componente Recurso adecuado

Departamento	Municipio	Área Municipio (ha)	Área actual Hortalizas (ha)	Área con Potencial Hortícola (ha)
Quetzaltenango	San Martín Sacatepéquez	14,380	751	0
Quetzaltenango	El Palmar	17,590	34	766
Quiché	Chajul	52,580	1	5,603
Quiché	Uspantán	83,730	102	6,409
Quiché	Chicamán	56,670	49	3,733

Fuente: Elaboración propia.

Figura 15. Componente Recurso del IGH en el altiplano guatemalteco



Fuente: Elaboración propia.

Cuadro 9. Municipios con componente Recurso deficiente

Departamento	Municipio	Área Municipio (ha)	Área actual Hortalizas (ha)	Área con Potencial Hortícola (ha)
Chimaltenango	Chimaltenango	4,909	109	1,666
Chimaltenango	San José Poaquil	9,658	316	4,568
Chimaltenango	San Martín Jilotepeque	41,010	206	14,210
Chimaltenango	San Juan Comalapa	8,575	254	3,573
Chimaltenango	Santa Apolonia	4,614	183	1,677
Chimaltenango	Tecpán Guatemala	24,790	895	9,397

Departamento	Municipio	Área Municipio (ha)	Área Hortalizas (ha) actual	Área Potencial Hortícola (ha) con
Chimaltenango	Patzún	18,420	1,958	6,005
Chimaltenango	Patzicía	12,950	3	5
Chimaltenango	Santa Cruz Balanyá	6,474	1,180	3,700
Chimaltenango	Acatenango	13,100	26	3,707
Chimaltenango	San Andrés Iztapa	6,766	328	2,727
Chimaltenango	Parramos	2,944	97	1,810
Chimaltenango	Zaragoza	5,192	309	1,804
Chimaltenango	El Tejar	4,556	29	2,190
Sololá	Sololá	15,140	760	6,882
Sololá	San José Chacayá	1,579	14	614
Sololá	Santa María Visitación	2,076	0	270
Sololá	Santa Lucía Utatlán	5,107	8	2,046
Sololá	Nahualá	18,620	377	4,191
Sololá	Santa Catarina Ixtahuacán	18,980	58	3,039
Sololá	Santa Clara La Laguna	1,436	1	397
Sololá	Concepción	1,497	85	384
Sololá	San Andrés Semetabaj	5,297	94	2,341
Sololá	Panajachel	772	13	263
Sololá	Santa Catarina Palopó	473	14	55
Sololá	San Antonio Palopó	2,612	42	746
Sololá	San Lucas Tolimán	7,369	18	1,436
Sololá	Santa Cruz La Laguna	1,127	11	84
Sololá	San Pablo La Laguna	614	9	191
Sololá	San Marcos La Laguna	919	0	114
Sololá	San Juan La Laguna	3,718	2	637
Sololá	San Pedro La Laguna	5,066	5	544
Sololá	Santiago Atitlán	11,590	43	1,294
Totonicapán	Totonicapán	24,450	111	6,682
Totonicapán	San Cristóbal Totonicapán	4,426	65	3,067
Totonicapán	San Francisco El Alto	7,264	103	4,846
Totonicapán	San Andrés Xecul	1,649	9	1,078
Totonicapán	Momostenango	36,000	1,360	18,420
Totonicapán	Santa María Chiquimula	23,750	692	10,600
Totonicapán	Santa Lucía La Reforma	4,541	517	3,360
Totonicapán	San Bartolo Aguas Calientes	5,640	335	2,455
Quetzaltenango	Quetzaltenango	12,680	326	5,609
Quetzaltenango	Salcá	1,688	53	1,254

Departamento	Municipio	Área Municipio (ha)	Área actual Hortalizas (ha)	Área con Potencial Hortícola (ha)
Quetzaltenango	Olintepeque	3,218	65	1,689
Quetzaltenango	San Carlos Sija	22,650	186	10,430
Quetzaltenango	Sibilia	4,106	102	2,312
Quetzaltenango	Cabricán	8,366	327	3,072
Quetzaltenango	Cajolá	2,053	12	594
Quetzaltenango	San Miguel Siguila	1,713	2	195
Quetzaltenango	San Juan Ostuncalco	10,900	365	68
Quetzaltenango	San Mateo	1,082	93	130
Quetzaltenango	Concepción Chiquirichapa	2,189	395	0
Quetzaltenango	Almolonga	1,255	394	512
Quetzaltenango	Cantel	4,974	34	1,275
Quetzaltenango	Huitán	3,634	71	1,830
Quetzaltenango	Zunil	7,746	617	1,006
Quetzaltenango	San Francisco la Unión	1,689	0	1,020
Quetzaltenango	La Esperanza	1,225	61	539
Quetzaltenango	Palestina de los Altos	3,602	366	353
San Marcos	San Marcos	12,050	163	2,548
San Marcos	San Pedro Sacatepéquez	7,737	214	1,649
San Marcos	San Antonio Sacatepéquez	4,731	125	791
San Marcos	Comitancillo	13,480	1,266	6,870
San Marcos	San Miguel Ixtahuacán	19,610	111	8,306
San Marcos	Concepción Tutuapa	22,410	423	8,199
San Marcos	Tacaná	36,190	779	6,112
San Marcos	Sibinal	10,430	818	1,670
San Marcos	Tajumulco	25,140	283	4,248
San Marcos	Tejutla	14,300	230	6,433
San Marcos	San Rafael Pie de la Cuesta	4,520	23	0
San Marcos	San Pablo	21,240	4	0
San Marcos	Ixchiguan	10,440	540	1,788
San Marcos	San José Ojetenam	7,861	410	1,142
San Marcos	San Cristóbal Cucho	2,970	37	62
San Marcos	Sipacapa	15,140	468	7,115
San Marcos	Río Blanco	3,119	7	1,319
San Marcos	San Lorenzo	4,482	45	2,462
Huehuetenango	Huehuetenango	23,530	45	9,743
Huehuetenango	Chiantla	41,310	1,670	10,290
Huehuetenango	Malacatancito	25,680	19	16,320

Departamento	Municipio	Área Municipio (ha)	Área actual Hortalizas (ha)	Área con Potencial Hortícola (ha)
Huehuetenango	Cuilco	45,360	124	4,341
Huehuetenango	Nentón	76,620	72	10,830
Huehuetenango	San Pedro Necta	13,280	12	0
Huehuetenango	Jacaltenango	20,690	452	147
Huehuetenango	Soloma	26,300	138	1,984
Huehuetenango	San Idelfonso Ixtahuacán	18,550	127	2,734
Huehuetenango	Santa Bárbara	15,000	30	4,994
Huehuetenango	La Libertad	21,700	11	595
Huehuetenango	La Democracia	16,890	92	0
Huehuetenango	San Miguel Acatán	17,580	96	637
Huehuetenango	San Rafael la Independencia	5,657	18	311
Huehuetenango	Todos Santos Cuchumatán	26,920	800	80
Huehuetenango	San Juan Atitán	5,795	12	0
Huehuetenango	Santa Eulalia	25,070	7	955
Huehuetenango	San Mateo Ixtatán	58,330	107	7,464
Huehuetenango	Colotenango	6,182	1	448
Huehuetenango	San Sebastián Huehuetenango	9,034	317	20
Huehuetenango	Tectitán	7,254	219	472
Huehuetenango	Concepción Huista	10,400	646	562
Huehuetenango	San Juan Ixcoy	21,070	577	1,474
Huehuetenango	San Antonio Huista	6,465	2	0
Huehuetenango	San Sebastián Coatán	15,670	34	1,293
Huehuetenango	Santa Cruz Barillas	116,600	6	132
Huehuetenango	Aguacatán	32,520	341	11,750
Huehuetenango	San Rafael Pétzal	2,517	13	286
Huehuetenango	San Gaspar Ixchil	3,543	0	1,090
Huehuetenango	Santiago Chimaltenango	3,936	0	0
Huehuetenango	Santa Ana Huista	11,710	2	0
Quiché	Santa Cruz del Quiché	11,230	641	6,343
Quiché	Chiché	11,580	18	7,812
Quiché	Chinique	6,121	84	3,097
Quiché	Zacualpa	24,770	15	6,921
Quiché	Chichicastenango	24,580	714	8,846
Quiché	Patzitè	5,318	2	2,701
Quiché	San Antonio Ilotenango	13,870	462	9,106
Quiché	San Pedro Jocopilas	29,490	150	15,510
Quiché	Cunén	22,600	215	5,875

Departamento	Municipio	Área Municipio (ha)	Área Hortalizas actual (ha)	Área Potencial con Hortícola (ha)
Quiché	San Juan Cotzal	16,300	8	4,957
Quiché	Joyabaj	47,280	390	22,710
Quiché	Nebaj	85,310	184	11,900
Quiché	San Andrés Sajcabaja	16,940	0	5,280
Quiché	Sacapulas	36,980	497	15,890
Quiché	San Bartolomé Jocotenango	10,340	4	3,959
Quiché	Canillá	10,210	100	4,120
Quiché	Pachalum	4,183	23	954

Fuente: Elaboración propia.

5.2.3 Componente Acceso

La variable Acceso se refiere al nivel de provisión o abastecimiento que tiene la población al agua, en cantidad y calidad para los distintos usos humanos. En el área de estudio hay un total 88 de municipios que presentan un nivel de Acceso calificado como Adecuado. Los 41 municipios que presentan índices deficientes representan el 36% (704,511 hectáreas) del área total del altiplano, en este territorio 44% (13,482 hectáreas) del área está cubierta con hortalizas y 34% (158,942 hectáreas) del área restante tiene potencial hortícola. En el Cuadro 10 se presentan los municipios con valores de acceso clasificados como deficientes, en la **¡Error! No se encuentra el origen de la referencia.** 16 se presentan el mapa con la distribución de los municipios y su situación de acceso al agua.

El hecho de que aproximadamente el 66% del área del altiplano presente un nivel adecuado de provisión o abastecimiento de agua indica que las autoridades locales han hecho mucho énfasis en este tema, pero todavía se requieren de mayores esfuerzos en la inversión.

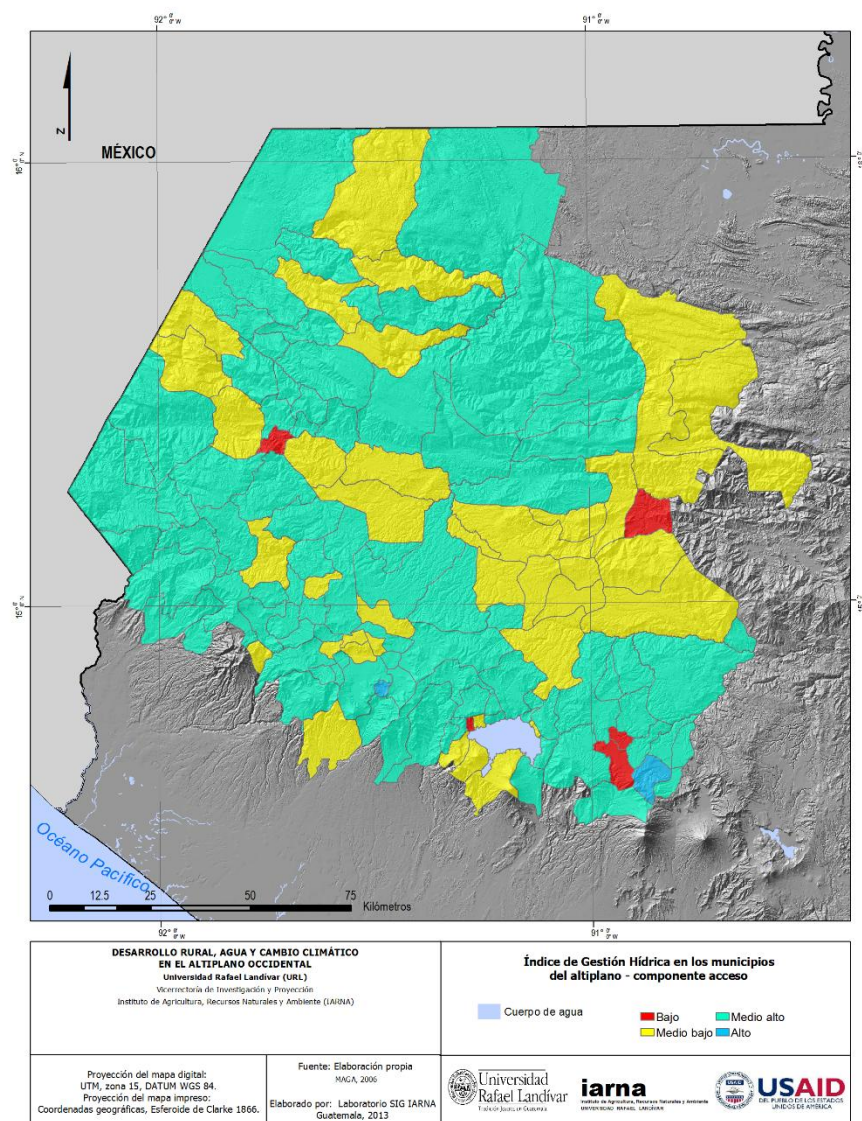
Cuadro 10. Municipios con valores del Componente Acceso "Deficientes".

Departamento	Municipio	Área Municipio (ha)	Área Hortalizas (Ha)	Área Potencial con Hortícola (ha)
Quiché	Chicamán	9,658	316	4,568
Quiché	Canillá	41,010	206	14,210
Quiché	San Bartolomé Jocotenango	8,575	254	3,573
Quiché	Uspantán	24,790	895	9,397
Quiché	Joyabaj	12,950	3	5
Quiché	San Pedro Jocopilas	6,766	328	2,727
Quiché	San Antonio Ilotenango	2,944	97	1,810
Quiché	Chichicastenango	4,556	29	2,190
Quiché	Zacualpa	1,579	14	614
Quiché	Chinique	2,076	0	270

Departamento	Municipio	Área Municipio (ha)	Área Hortalizas (Ha)	Área con Potencial Hortícola (ha)
Quiché	Chiché	5,107	8	2,046
Quiché	Santa Cruz del Quiché	18,620	377	4,191
Huehuetenango	San Gaspar Ixchil	1,497	85	384
Huehuetenango	San Juan Ixcoy	1,127	11	84
Huehuetenango	San Mateo Ixtatán	11,590	43	1,294
Huehuetenango	Santa Eulalia	24,450	111	6,682
Huehuetenango	San Miguel Acatán	36,000	1,360	18,420
Huehuetenango	La Democracia	23,750	692	10,600
Huehuetenango	La Libertad	4,541	517	3,360
Huehuetenango	Santa Bárbara	5,640	335	2,455
Huehuetenango	San Idelfonso Ixtahuacán	12,680	326	5,609
Huehuetenango	Malacatancito	2,053	12	594
Huehuetenango	Huehuetenango	10,900	365	68
San Marcos	San Cristóbal Cucho	1,255	394	512
San Marcos	Comitancillo	13,480	1,266	6,870
Quetzaltenango	El Palmar	14,300	230	6,433
Quetzaltenango	San Francisco la Unión	4,520	23	0
Quetzaltenango	Huitán	10,440	540	1,788
Quetzaltenango	San Miguel Sigüila	41,310	1,670	10,290
Quetzaltenango	Olintepeque	20,690	452	147
Totonicapán	Santa Lucía La Reforma	21,700	11	595
Totonicapán	San Andrés Xecul	5,657	18	311
Totonicapán	San Francisco El Alto	26,920	800	80
Sololá	Santiago Atitlán	58,330	107	7,464
Sololá	San Pedro La Laguna	6,182	1	448
Sololá	San Juan La Laguna	9,034	317	20
Sololá	San Marcos La Laguna	7,254	219	472
Sololá	San Pablo La Laguna	10,400	646	562
Sololá	Santa Catarina Palopó	116,600	6	132
Chimaltenango	Santa Cruz Balanyá	16,300	8	4,957
Chimaltenango	Patzicía	47,280	390	22,710

Fuente: Elaboración propia.

Figura 16. Componente Acceso del IGH en el altiplano guatemalteco



Fuente: Elaboración propia.

5.2.4 Componente Capacidad

Se refiere a la eficacia de la población para manejar el agua, se interpreta en el sentido de los ingresos que permite tener un mejor acceso a agua, educación y salud, los cuales indican también la capacidad de lobby para mejorar su provisión al agua así como su capacidad de manejo del recurso. En este componente 82 municipios presentan valores de capacidad deficiente, estos representan el 74% del área municipal estudiada (1,521,646 hectáreas) y a nivel agrícola, el 61% del área del territorio está cubierto con hortalizas actualmente (18,680 hectáreas) y el 65% de las áreas tiene potencial de desarrollo hortícola (303,958 hectáreas), los resultados se presentan en el Cuadro 11 y Figura 17.

Cuadro 11. Municipios con valores del componente Capacidad deficientes

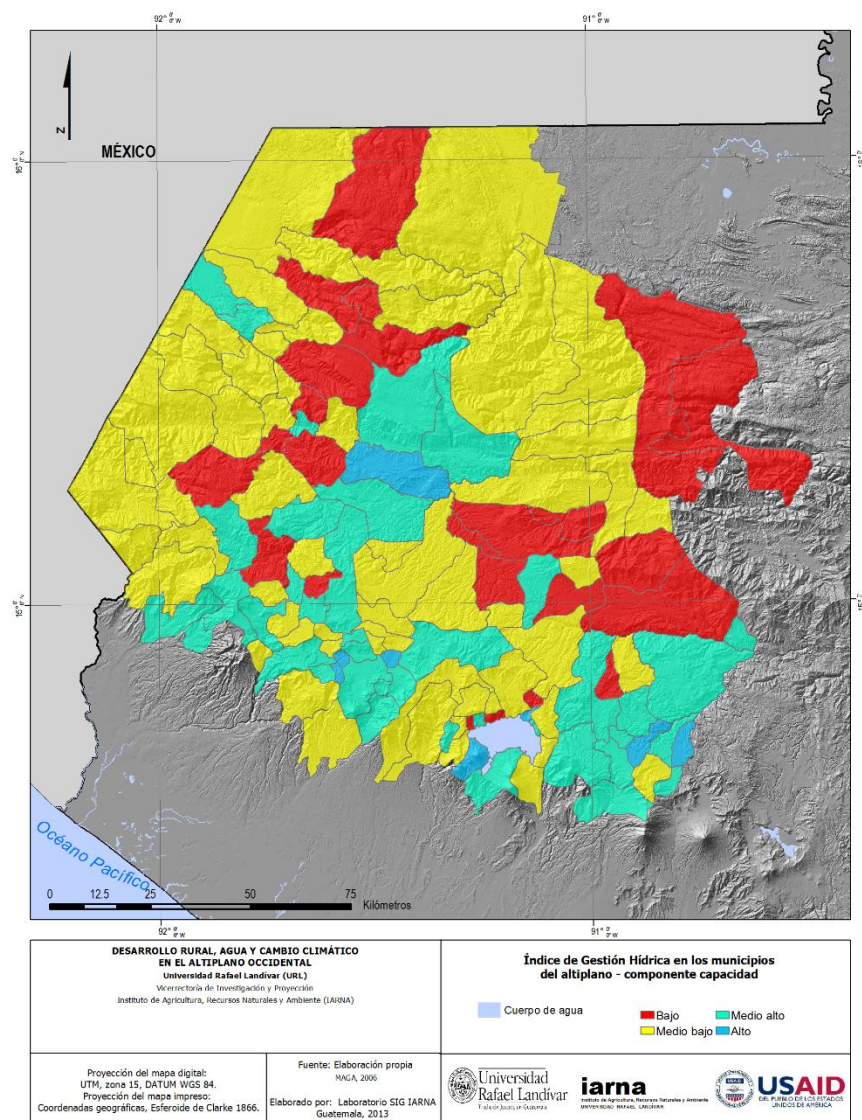
Departamento	Municipio	Área Municipio (ha)	Área actual Hortalizas (ha)	Área con Potencial Hortícola (ha)
Chimaltenango	San José Poaquil	9,658	316	4,568
Chimaltenango	Santa Apolonia	4,614	183	1,677
Chimaltenango	San Andrés Itzapa	6,766	328	2,727
Sololá	Sololá	15,140	760	6,882
Sololá	San José Chacayá	1,579	14	614
Sololá	Santa Lucía Utatlán	5,107	8	2,046
Sololá	Nahualá	18,620	377	4,191
Sololá	Santa Catarina Ixtahuacán	18,980	58	3,039
Sololá	Santa Clara La Laguna	1,436	1	397
Sololá	Concepción	1,497	85	384
Sololá	San Andrés Semetabaj	5,297	94	2,341
Sololá	San Antonio Palopó	2,612	42	746
Sololá	San Lucas Tolimán	7,369	18	1,436
Sololá	Santa Cruz La Laguna	1,127	11	84
Sololá	San Pablo La Laguna	614	9	191
Sololá	San Juan La Laguna	3,718	2	637
Totonicapán	San Cristóbal Totonicapán	4,426	65	3,067
Totonicapán	San Francisco El Alto	7,264	103	4,846
Totonicapán	San Andrés Xecul	1,649	9	1,078
Totonicapán	Momostenango	36,000	1,360	18,420
Totonicapán	Santa María Chiquimula	23,750	692	10,600
Totonicapán	Santa Lucía La Reforma	4,541	517	3,360
Totonicapán	San Bartolo Aguas Calientes	5,640	335	2,455
Quetzaltenango	Cabricán	8,366	327	3,072
Quetzaltenango	Cajolá	2,053	12	594
Quetzaltenango	San Miguel Sigüila	1,713	2	195
Quetzaltenango	San Martín Sacatepéquez	14,380	751	0
Quetzaltenango	Huitán	3,634	71	1,830
Quetzaltenango	El Palmar	17,590	34	766
Quetzaltenango	Palestina de los Altos	3,602	366	353
San Marcos	San Antonio Sacatepéquez	4,731	125	791
San Marcos	Comitancillo	13,480	1,266	6,870
San Marcos	San Miguel Ixtahuacán	19,610	111	8,306
San Marcos	Concepción Tutuapa	22,410	423	8,199
San Marcos	Tacaná	36,190	779	6,112

Departamento	Municipio	Área Municipio (ha)	Área Hortalizas (ha) actual	Área Potencial Hortícola (ha) con
San Marcos	Sibinal	10,430	818	1,670
San Marcos	Tajumulco	25,140	283	4,248
San Marcos	Ixchiguan	10,440	540	1,788
San Marcos	San José Ojetenam	7,861	410	1,142
San Marcos	San Cristóbal Cucho	2,970	37	62
San Marcos	San Lorenzo	4,482	45	2,462
Huehuetenango	Cuilco	45,360	124	4,341
Huehuetenango	Nentón	76,620	72	10,830
Huehuetenango	San Pedro Necta	13,280	12	0
Huehuetenango	Jacaltenango	20,690	452	147
Huehuetenango	Soloma	26,300	138	1,984
Huehuetenango	San Idelfonso Ixtahuacán	18,550	127	2,734
Huehuetenango	Santa Bárbara	15,000	30	4,994
Huehuetenango	La Libertad	21,700	11	595
Huehuetenango	La Democracia	16,890	92	0
Huehuetenango	San Miguel Acatán	17,580	96	637
Huehuetenango	San Rafael la Independencia	5,657	18	311
Huehuetenango	Todos Santos Cuchumatán	26,920	800	80
Huehuetenango	San Juan Atitán	5,795	12	0
Huehuetenango	Santa Eulalia	25,070	7	955
Huehuetenango	San Mateo Ixtatán	58,330	107	7,464
Huehuetenango	Colotenango	6,182	1	448
Huehuetenango	San Sebastián Huehuetenango	9,034	317	20
Huehuetenango	Tectitán	7,254	219	472
Huehuetenango	Concepción Huista	10,400	646	562
Huehuetenango	San Juan Ixcoy	21,070	577	1,474
Huehuetenango	San Sebastián Coatán	15,670	34	1,293
Huehuetenango	Santa Cruz Barillas	116,600	6	132
Huehuetenango	San Gaspar Ixchil	3,543	0	1,090
Huehuetenango	Santiago Chimaltenango	3,936	0	0
Quiché	Chiché	11,580	18	7,812
Quiché	Chinique	6,121	84	3,097
Quiché	Zacualpa	24,770	15	6,921
Quiché	Chajul	52,580	1	5,603
Quiché	Chichicastenango	24,580	714	8,846
Quiché	Patzité	5,318	2	2,701
Quiché	San Antonio Ilotenango	13,870	462	9,106

Departamento	Municipio	Área Municipio (ha)	Área actual Hortalizas (ha)	Área con Potencial Hortícola (ha)
Quiché	San Pedro Jocopilas	29,490	150	15,510
Quiché	Cunén	22,600	215	5,875
Quiché	San Juan Cotzal	16,300	8	4,957
Quiché	Joyabaj	47,280	390	22,710
Quiché	Nebaj	85,310	184	11,900
Quiché	Uspantán	83,730	102	6,409
Quiché	Sacapulas	36,980	497	15,890
Quiché	San Bartolomé Jocotenango	10,340	4	3,959
Quiché	Canillá	10,210	100	4,120
Quiché	Chicamán	56,670	49	3,733

Fuente: Elaboración propia.

Figura 17. Componente Capacidad del IGH en el altiplano guatemalteco



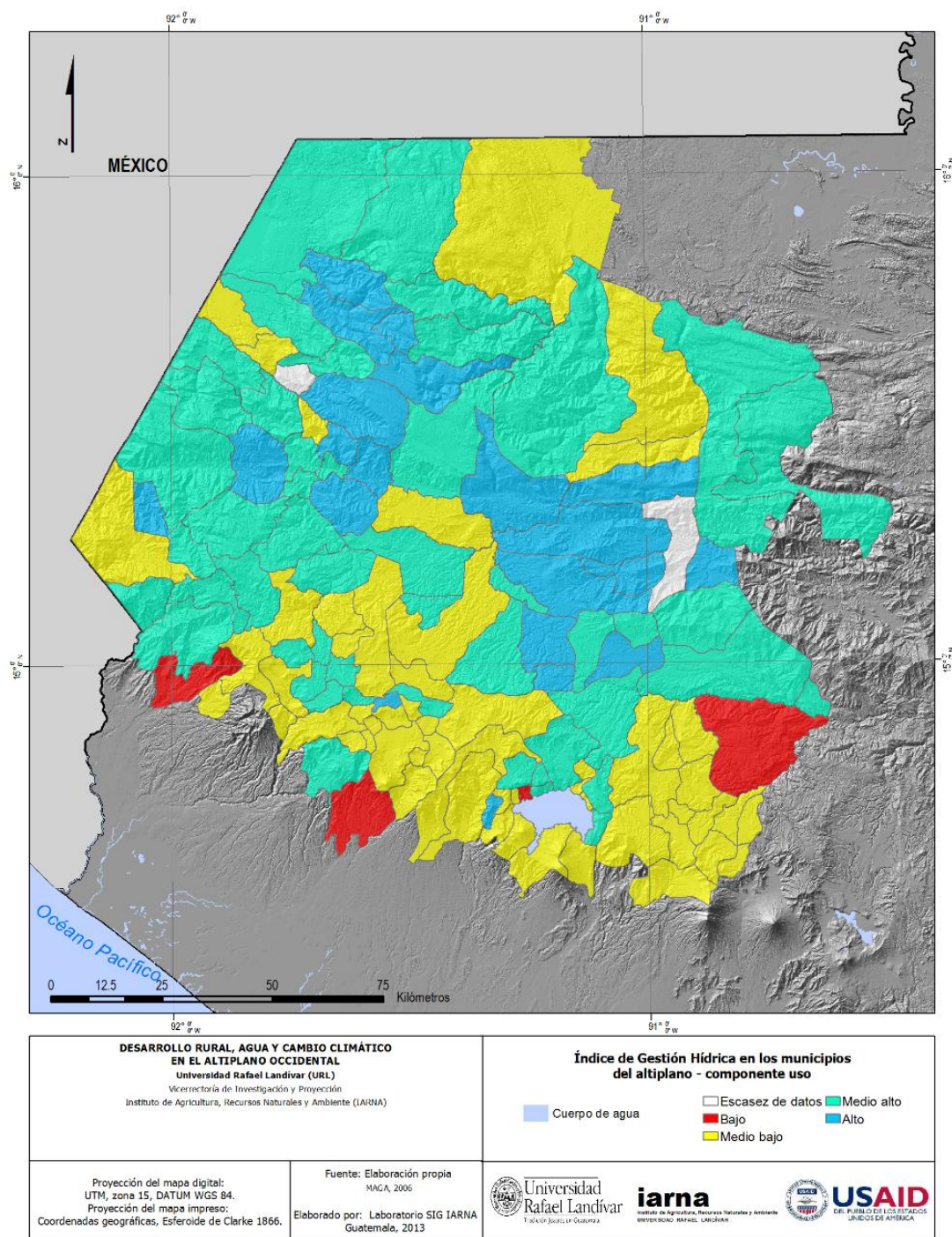
Fuente: Elaboración propia.

Debido a que el 74% de las áreas estudiadas tienen una baja eficacia de la capacidad de la población para manejar el agua, se hace necesario desarrollar una serie de inversiones estratégicas que permitan a la población subsanar esta debilidad. Aunque este asunto se tratará en un documento aparte, se sugiere desarrollar acciones encaminadas a fortalecer la organización comunitaria en torno al manejo de los recursos hídricos, así como incrementar la capacidad de lobby para mejorar la provisión de agua.

5.2.5 *Componente Uso*

Como su nombre lo indica, el componente se refiere a las formas en las cuales el agua se utiliza para diversos propósitos (incluye uso doméstico, agrícola, ganadero e industrial). De los municipios evaluados, 70 presentaron niveles aceptables en este componente. Los restantes 59 municipios presentan deficiencias en el uso del recurso constituyendo un área municipal de 734,593 hectáreas (36%) cuyo territorio tiene actualmente 13,674 hectáreas (44%) cubiertas con horticultura, y 166,663 hectáreas (46%) con potencial de desarrollo hortícola (los resultados se muestran en el Cuadro 12 y Figura 18).

Figura 18. Componente Uso del IGH en el altiplano guatemalteco.



Fuente: Elaboración propia.

Cuadro 12. Municipios con valores del componente Uso "Deficientes".

Departamento	Municipio	Área Municipio (ha)	Área actual Hortalizas (ha)	Área con Potencial Hortícola (ha)
Chimaltenango	Chimaltenango	4,909	109	1,666
Chimaltenango	San José Poaquil	9,658	316	4,568
Chimaltenango	San Martín Jilotepeque	41,010	206	14,210
Chimaltenango	San Juan Comalapa	8,575	254	3,573
Chimaltenango	Santa Apolonia	4,614	183	1,677
Chimaltenango	Tecpán Guatemala	24,790	895	9,397
Chimaltenango	Patzún	18,420	1,958	6,005
Chimaltenango	Patzicía	12,950	3	5
Chimaltenango	Santa Cruz Balanyá	6,474	1,180	3,700
Chimaltenango	Acatenango	13,100	26	3,707
Chimaltenango	San Andrés Iztapa	6,766	328	2,727
Chimaltenango	Parramos	2,944	97	1,810
Chimaltenango	Zaragoza	5,192	309	1,804
Chimaltenango	El Tejar	4,556	29	2,190
Sololá	Nahualá	18,620	377	4,191
Sololá	Santa Catarina Ixtahuacán	18,980	58	3,039
Sololá	Santa Clara La Laguna	1,436	1	397
Sololá	Concepción	1,497	85	384
Sololá	Panajachel	772	13	263
Sololá	Santa Catarina Palopó	473	14	55
Sololá	San Lucas Tolimán	7,369	18	1,436
Sololá	San Pablo La Laguna	614	9	191
Sololá	San Marcos La Laguna	919	0	114
Sololá	San Juan La Laguna	3,718	2	637
Sololá	San Pedro La Laguna	5,066	5	544
Sololá	Santiago Atitlán	11,590	43	1,294
Totonicapán	Totonicapán	24,450	111	6,682
Totonicapán	San Francisco El Alto	7,264	103	4,846
Totonicapán	San Andrés Xecul	1,649	9	1,078
Totonicapán	Momostenango	36,000	1,360	18,420
Quetzaltenango	Quetzaltenango	12,680	326	5,609
Quetzaltenango	Salcajá	1,688	53	1,254
Quetzaltenango	Olintepeque	3,218	65	1,689
Quetzaltenango	San Carlos Sija	22,650	186	10,430
Quetzaltenango	Cabricán	8,366	327	3,072
Quetzaltenango	San Miguel Siguila	1,713	2	195
Quetzaltenango	San Juan Ostuncalco	10,900	365	68

Departamento	Municipio	Área Municipio (ha)	Área actual Hortalizas (ha)	Área con Potencial Hortícola (ha)
Quetzaltenango	San Mateo	1,082	93	130
Quetzaltenango	Concepción Chiquirichapa	2,189	395	0
Quetzaltenango	Almolonga	1,255	394	512
Quetzaltenango	Cantel	4,974	34	1,275
Quetzaltenango	Huitán	3,634	71	1,830
Quetzaltenango	Zunil	7,746	617	1,006
Quetzaltenango	El Palmar	17,590	34	766
Quetzaltenango	La Esperanza	1,225	61	539
San Marcos	San Marcos	12,050	163	2,548
San Marcos	San Pedro Sacatepéquez	7,737	214	1,649
San Marcos	Comitancillo	13,480	1,266	6,870
San Marcos	Tacanán	36,190	779	6,112
San Marcos	San Rafael Pie de la Cuesta	4,520	23	0
San Marcos	San Pablo	21,240	4	0
San Marcos	San Cristóbal Cucho	2,970	37	62
Huehuetenango	Huehuetenango	23,530	45	9,743
Huehuetenango	San Antonio Huista	6,465	2	0
Huehuetenango	Santa Cruz Barillas	116,600	6	132
Huehuetenango	Santiago Chimaltenango	3,936	0	0
Huehuetenango	Santa Ana Huista	11,710	2	0
Quiché	Chajul	52,580	1	5,603
Quiché	San Juan Cotzal	16,300	8	4,957

Fuente: Elaboración propia.

5.2.6 Componente Ambiente

Se refiere a la evaluación de la integridad ambiental relacionada con el agua, y con los bienes y servicios provenientes de los ecosistemas acuáticos de la zona (ver Figura 19). En este componente 92 municipios (71% del altiplano) tienen valores adecuados, los 37 restantes presentan deficiencias ocupando un área municipal de 430,672 hectáreas (21%). En este territorio 8,681 hectáreas (28%) están cubiertas con hortalizas y 146,541 hectáreas (31%) tienen potencial hortícola (para más detalle ver Cuadro 13).

Dentro de las inversiones estratégicas que se pueden abordar para mejorar este componente están el incremento de la cobertura forestal, reducción de la tasa anual de deforestación, promover prácticas de conservación de suelos para reducir la erosión, promover la gestión integrada de cuencas con el fin de mantener o incrementar las tierras forestales de captación y regulación hidrológica, así como el establecimiento y manejo de áreas protegidas.

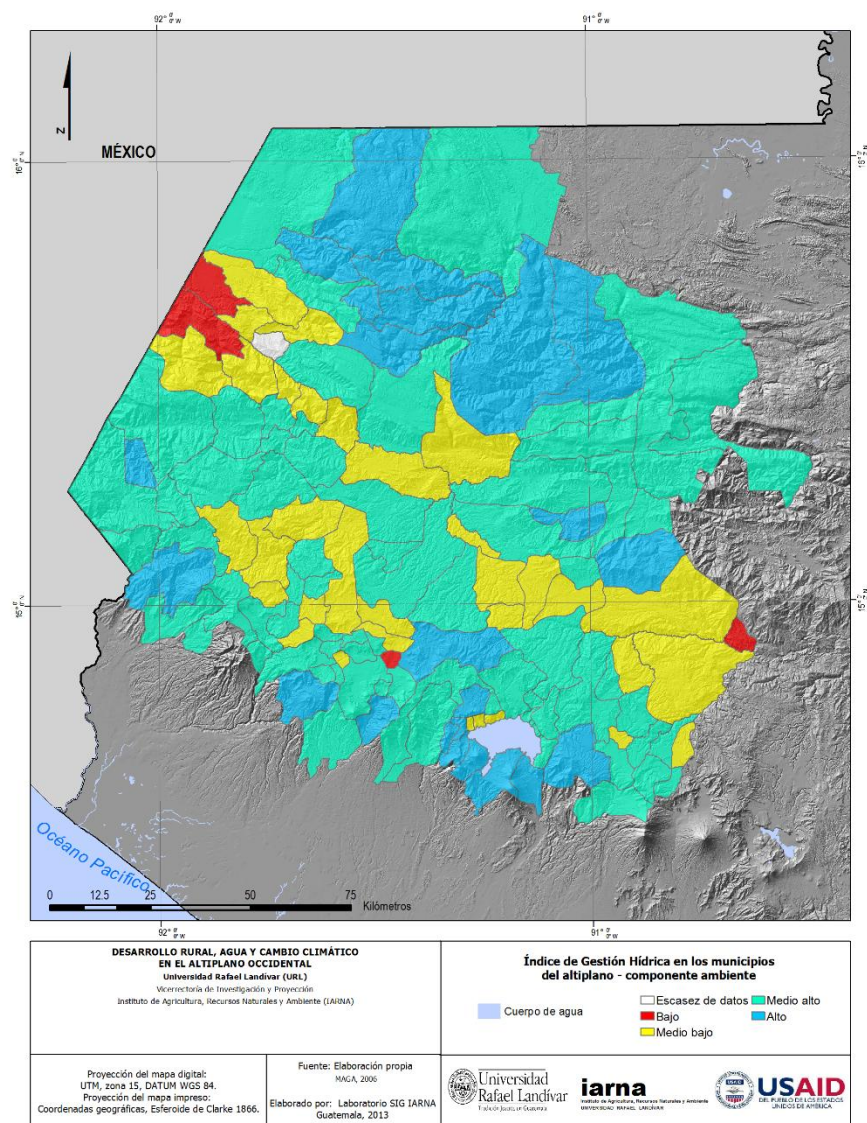
Cuadro 13. Municipios con valores del componente Ambiente deficientes

Departamento	Municipio	Área Municipio (ha)	Área actual Hortalizas (ha)	Área con Potencial Hortícola (ha)
Chimaltenango	San José Poaquil	9,658	316	4,568
Chimaltenango	San Martín Jilotepeque	41,010	206	14,210
Chimaltenango	Santa Cruz Balanyá	6,474	1,180	3,700
Chimaltenango	El Tejar	4,556	29	2,190
Sololá	Santa Cruz La Laguna	1,127	11	84
Sololá	San Pablo La Laguna	614	9	191
Sololá	San Marcos La Laguna	919	0	114
Totonicapán	San Cristóbal Totonicapán	4,426	65	3,067
Totonicapán	San Francisco El Alto	7,264	103	4,846
Totonicapán	Santa Lucía La Reforma	4,541	517	3,360
Quetzaltenango	Salcajá	1,688	53	1,254
Quetzaltenango	San Carlos Sija	22,650	186	10,430
Quetzaltenango	Sibilia	4,106	102	2,312
Quetzaltenango	La Esperanza	1,225	61	539
Quetzaltenango	Palestina de los Altos	3,602	366	353
San Marcos	Comitancillo	13,480	1,266	6,870
San Marcos	Tejutla	14,300	230	6,433
San Marcos	Sipacapa	15,140	468	7,115
San Marcos	San Lorenzo	4,482	45	2,462
Huehuetenango	Huehuetenango	23,530	45	9,743
Huehuetenango	San Pedro Necta	13,280	12	0
Huehuetenango	Jacaltenango	20,690	452	147
Huehuetenango	La Libertad	21,700	11	595
Huehuetenango	La Democracia	16,890	92	0
Huehuetenango	San Juan Atitán	5,795	12	0
Huehuetenango	San Sebastián Huehuetenango	9,034	317	20
Huehuetenango	Concepción Huista	10,400	646	562
Huehuetenango	San Antonio Huista	6,465	2	0
Huehuetenango	Aguacatán	32,520	341	11,750
Huehuetenango	Santiago Chimaltenango	3,936	0	0
Huehuetenango	Santa Ana Huista	11,710	2	0
Quiché	Santa Cruz del Quiché	11,230	641	6,343
Quiché	Chiché	11,580	18	7,812
Quiché	Patzité	5,318	2	2,701
Quiché	San Antonio Ilotenango	13,870	462	9,106
Quiché	Joyabaj	47,280	390	22,710

Departamento	Municipio	Área Municipio (ha)	Área actual Hortalizas (ha)	Área con Potencial Hortícola (ha)
Quiché	Pachalum	4,183	23	954

Fuente: Elaboración propia.

Figura 19. Componente Ambiente del IGH en el altiplano guatemalteco



Fuente: Elaboración propia.

VI. INVERSIONES ESTRATÉGICAS

Las secciones anteriores del documento presentan evidencia sólida que la situación del recurso hídrico en el altiplano es problemática para varios municipios, y al hacer el análisis a futuro la situación se complicará mucho más. Dentro de la información que soporta esta afirmación está la siguiente:

- Bajo las condiciones actuales, la disponibilidad hídrica anual demuestra que la distribución del recurso hídrico en el altiplano es desigual, y el balance hídrico por hectárea indica que el 12% presenta un déficit anual de agua, por lo que desde un punto de vista biofísico se puede afirmar que el altiplano Guatemalteco presenta escasez de agua.
- Al analizar el número de meses con estrés hídrico, la variación de la disponibilidad hídrica neta, la disponibilidad hídrica per cápita y la recarga potencial, se tiene que el 80% de los municipios del altiplano Guatemalteco presentan problemas de disponibilidad física del agua (subterránea y superficial), esto afecta al 97% de las áreas con cobertura de hortalizas y al 95% de las zonas con potencial para desarrollar horticultura.
- Actualmente el 40% del altiplano guatemalteco cuenta con una gestión hídrica deficiente, lo cual tiene un efecto directo sobre el 51% del área cubierta por hortalizas actualmente y el 59% de las áreas que actualmente no se están utilizando pero tienen potencial agrícola.
- 35% del área de trabajo presentan índices deficientes de provisión o abastecimiento de agua, en cantidad y calidad para los distintos usos humanos, esto incide directamente sobre el 44% de áreas cubiertas con hortalizas y el 34% de las áreas que no se utilizan pero tienen potencial hortícola.
- 74% del área municipal estudiada tienen problemas de capacidad para la gestión del agua, esto incluye el 61% del área cubierta con hortalizas actualmente y el 65% de las áreas con potencial hortícola.
- Los escenarios climáticos muestran que la disponibilidad hídrica irá disminuyendo en el altiplano, y se estima que en el 2080 entre el 39 y el 58% del territorio alcanzarán valores críticos. Estas proyecciones también estiman que en promedio disponibilidad hídrica puede disminuir en promedio alrededor del 44.3% en la zona del altiplano, llegando en ciertas subcuencas a sobrepasar el 70%.

Con base en la información anterior se puede afirmar que es fundamental desarrollar una serie de inversiones estratégicas encaminadas a mejorar la gestión de los recursos hídricos y promover la adaptación al cambio climático en el altiplano guatemalteco. Es por esto que en las siguientes secciones se hace una propuesta de inversiones priorizadas por municipio.

El marco de análisis para priorizar los municipios se basó en la disponibilidad de recurso hídrico y los componentes del IGH. Luego de analizarlos se llegó a la conclusión de que la disponibilidad del recurso, y los componentes recurso y ambiente obedecen a aspectos biofísicos, por lo que pueden agruparse en una sola categoría. Por su lado los componentes uso, acceso y capacidad también presentan aspectos que permiten su agrupación. Es por esto que las inversiones estratégicas se clasificaron en los dos grupos que se presentan a continuación.

6.1 Programa de Gestión Integrada de Recursos Hídricos

6.1.1 Descripción

La información generada en el presente trabajo demuestra que uno de los principales problemas en 67 municipios priorizados es la disponibilidad hídrica, lo cual se debe principalmente a la

cantidad de agua que precipita (que es un aspecto climático) así como a la condición de los ecosistemas ubicados en las zonas estratégicas para la regulación del ciclo hidrológico.

Debido a la naturaleza del problema no es posible hacer nada con respecto a los aspectos climáticos, pero si es posible mejorar las condiciones de las zonas estratégicas para la captación y regulación hidrológica, así como promover una administración y uso equilibrado del agua que permita alcanzar los intereses sociales, económicos de los distintos actores de la sociedad, al mismo tiempo que se asegura la salud de los ecosistemas.

Con base en lo anterior, se puede afirmar que es fundamental promover la gestión integrada de recursos hídricos en los municipios priorizados. Por gestión integrada de recursos hídricos se entiende al proceso que promueve el desarrollo y gestión coordinados del agua, la tierra y los recursos asociados dentro de una cuenca, para maximizar el resultante bienestar económico y social de manera equitativa sin comprometer la sostenibilidad de ecosistemas vitales (GWP TAC, 2000, y GWP, 2004).

Para poder desarrollar una gestión integrada de recursos hídricos a nivel de cada uno de los municipios priorizados debe elaborarse un diagnóstico que permita conocer de manera general los aspectos biofísicos, socioeconómicos y ecológicos que existen de cada subcuenca o microcuenca, esta información permitirá conocer la oferta y demanda hídrica (por tipo de uso del agua). Con base en el diagnóstico se deben priorizar las subcuencas o microcuencas en base a la producción y consumo de agua y hacer una estrategia de intervención escalonada, en la que se inicie con las que presentan más problemas, hasta llegar gradualmente a las que tienen mejores condiciones.

Una vez hecha la priorización el procedimiento a seguir será similar en cada una de las subcuencas o microcuencas. El primer paso es la conformación de un concejo de cuenca con el fin de asegurar la participación de todos los actores involucrados en la gestión del recurso hídrico. Este permitirá la gobernanza para el manejo sostenible y equitativo de los recursos naturales relacionados con el agua. En este concejo se incluirá a la municipalidad, y de manera conjunta con esta se elaborará un perfil de proyecto para conseguir financiamiento de los Consejos Departamentales de Desarrollo (CODEDE), para implementar los procesos que se describen a continuación.

A partir del punto anterior, deberá elaborarse un diagnóstico a profundidad de las condiciones biofísicas, socioeconómicas y ecológicas, que permita la formulación del plan de manejo de la cuenca, que es el instrumento que da las directrices para ordenar las acciones que requiere una cuenca, para lograr un uso sostenible de sus recursos naturales (en este caso enfocado a la producción y utilización del agua). Para esto se deberá elaborar un modelo de uso potencial de la tierra con el cual se clasificará la aptitud de la tierra y se definirán las acciones que se deben implementar para optimizar la producción y el uso del agua. Este proceso será acompañado y validado por los actores locales.

Una vez identificadas y definidas las líneas estratégicas y las líneas de acción, se priorizarán las actividades a desarrollar en el corto, mediano y largo plazo, se asignarán responsabilidades a los diferentes actores a involucrarse en implementación del plan de manejo, se estimarán los costos de las actividades propuestas.

Con el fin de apoyar la sostenibilidad de los planes de gestión integrada de los recursos hídricos (y/o las tecnologías aplicables en el plan de manejo de cuencas) en las áreas priorizadas se deben desarrollar una serie de instrumentos para apalancar los fondos provenientes de los CODEDES, siendo estos:

1. **Esquemas de pago por servicios ambientales hídricos:** son mecanismos en los que los usuarios de dichos servicios pagan a los proveedores, por implementar una serie de prácticas gracias a las cuales existe el flujo de servicios ambientales. Para que el esquema funcione, los proveedores y los usuarios deben ponerse de acuerdo y se debe establecer un mecanismo de compensación, el cual debe considerar el cobro, y pago, así como los mecanismos de monitoreo y control de los acuerdos. Este proceso puede efectuarse directamente entre estos dos actores, aunque generalmente existe un intermediario que es quien se encarga de estas tareas. Para la implementación de este tipo de mecanismo se debe:
 - Identificar las zonas que proporcionan los servicios ambientales hídricos
 - Cuantificar el flujo de servicios ambientales y asignarles un valor monetario
 - Desarrollar negociaciones entre proveedores y usuarios para establecer el funcionamiento del esquema, el cual debe incluir:
 - Monto de pago
 - Periodicidad de los pagos
 - Sistemas de monitoreo de la provisión de los servicios y de los pagos
 - Mecanismos de resolución de conflictos
2. **Incentivos para promover la reforestación o conservación de las tierras estratégicas para la recarga hídrica.** La idea de este programa es pagar a los propietarios de zonas de recarga hídrica para que conserven los bosques o para que promuevan la reforestación en estas áreas, las diferencias fundamentales con los esquemas de pago por servicios ambientales son: 1) los fondos provendrían de entes estatales, y 2) el pago se realizaría por los bosques y no por los servicios proveídos por estos. El procedimiento para la implementación del sistema de incentivos debe considerar:
 - Negociación con autoridades locales o de gobierno central para establecer las prioridades de inversión (en este caso deben estar relacionadas con el bosque para la provisión de agua)
 - Desarrollo del mecanismo el cual incluye:
 - Definición de acciones que califican para recibir el pago
 - Establecimiento del monto a pagar
 - Periodicidad del pago
 - Sistemas de monitoreo
 - Mecanismos de resolución de conflictos

Aunque también se puede considerar la promoción y uso de incentivos existentes (por ejemplo PINFOR y PINPEP).

6.1.1.1 Objetivo

- Contribuir al abastecimiento de agua en cantidad y calidad para consumo humano, y desarrollo hortícola de las familias en los 67 municipios priorizados, a través de identificación e implementación de programas de Gestión Integrada de recursos hídricos.

6.1.1.2 Metas de la inversión estratégica

- Promover la gestión integrada de 267 subcuencas
- Asegurar el abastecimiento de agua para 500,000 familias
- Asegurar el abastecimiento de agua para la producción hortícola en 474,068 hectáreas.

6.1.2 Municipios priorizados

Con base en un análisis de la situación hidrológica (disponibilidad hídrica per cápita, número de meses con estrés hídrico, variación de la disponibilidad hídrica neta al 2020, recarga potencial) y ambiental (cobertura forestal, tasa anual de deforestación, índice de deterioro físico de la tierra, erosión de suelos, superficie municipal de las tierras forestales de captación y regulación hidrológica y áreas protegidas), se consideró como prioritarios para implementar inversiones en Gestión integrada de recursos hídricos a los siguientes municipios:

Cuadro 14. Municipios priorizados para implementar inversiones en Gestión integrada de recursos hídricos

Número	Departamento	Municipio
1	Huehuetenango	La Democracia
2	Huehuetenango	San Pedro Necta
3	Totonicapán	San Bartolo Aguas Calientes
4	Huehuetenango	La Libertad
5	Quiché	Santa Cruz del Quiché
6	Totonicapán	Santa Lucía La Reforma
7	Huehuetenango	Santiago Chimaltenango
8	Totonicapán	Momostenango
9	Huehuetenango	Huehuetenango
10	Huehuetenango	Jacaltenango
11	Huehuetenango	San Rafael la Independencia
12	Huehuetenango	Concepción Huista
13	Chimaltenango	San Juan Comalapa
14	Chimaltenango	Zaragoza
15	Huehuetenango	Colotenango
16	Chimaltenango	Santa Cruz Balanyá
17	Quiché	Chichicastenango
18	Chimaltenango	Chimaltenango
19	Huehuetenango	San Juan Atitán
20	Huehuetenango	San Sebastián Huehuetenango
21	Totonicapán	Santa María Chiquimula
22	Quiché	Chiché
23	Quiché	Pachalúm
24	Chimaltenango	Santa Apolonia
25	Chimaltenango	San José Poaquil
26	Huehuetenango	San Miguel Acatán
27	Huehuetenango	San Rafael Pétzal
28	Huehuetenango	San Sebastián Coatán
29	Quiché	San Antonio Ilotenango
30	Chimaltenango	San Martín Jilotepeque

Número	Departamento	Municipio
31	Chimaltenango	El Tejar
32	Huehuetenango	Todos Santos Cuchumatán
33	Quiché	Joyabaj
34	Quiché	Patzité
35	Chimaltenango	Patzicía
36	Chimaltenango	Tecpán Guatemala
37	Quiché	Chinique
38	Huehuetenango	Malacatancito
39	Huehuetenango	Santa Ana Huista
40	Chimaltenango	San Andrés Itzapa
41	Huehuetenango	Aguacatán
42	Chimaltenango	Parramos
43	Huehuetenango	Chiantla
44	Totonicapán	San Francisco El Alto
45	San Marcos	Comitancillo
46	Totonicapán	Totonicapán
47	Quetzaltenango	Huitán
48	Sololá	Sololá
49	Sololá	San Andrés Semetabaj
50	Quetzaltenango	Cabricán
51	Sololá	Panajachel
52	Totonicapán	San Cristóbal Totonicapán
53	Sololá	Santa Catarina Palopó
54	Sololá	San Pablo La Laguna
55	San Marcos	San Lorenzo
56	Quetzaltenango	Salcá
57	Sololá	Santa Clara La Laguna
58	Huehuetenango	San Idelfonso Ixtahuacán
59	Sololá	Santa Cruz La Laguna
60	Huehuetenango	Santa Bárbara
61	San Marcos	Tejutla
62	Sololá	San Marcos La Laguna
63	San Marcos	Tacaná
64	Huehuetenango	Santa Eulalia
65	Sololá	Santa Lucía Utatlán
66	Quiché	Zacualpa
67	Sololá	Concepción
68	Totonicapán	San Andrés Xecul
69	San Marcos	Río Blanco
70	Sololá	San Antonio Palopó

Número	Departamento	Municipio
71	Huehuetenango	San Juan Ixcoy
72	Chimaltenango	Patzún
73	Quetzaltenango	Sibilia
74	San Marcos	Ixchiguan
75	San Marcos	San Miguel Ixtahuacán
76	Quetzaltenango	San Carlos Sija
77	Quetzaltenango	San Francisco la Unión
78	Quiché	Sacapulas
79	Sololá	San José Chacayá
80	Quiché	San Pedro Jocopilas
81	Huehuetenango	Cuilco
82	San Marcos	San José Ojetenam
83	San Marcos	Concepción Tutuapa
84	Sololá	San Juan La Laguna
85	Huehuetenango	Tectitán
86	San Marcos	Sipacapa
87	Quetzaltenango	Cantel
88	Chimaltenango	Acatenango
89	Quetzaltenango	Olintepeque
90	Quiché	San Bartolomé Jocotenango
91	Quetzaltenango	La Esperanza
92	Quetzaltenango	Almolonga
93	Huehuetenango	San Gaspar Ixchil
94	Sololá	Nahualá
95	Sololá	Santa Catarina Ixtahuacán
96	Quetzaltenango	San Mateo
97	Quetzaltenango	Cajolá
98	Sololá	Santiago Atitlán
99	Quetzaltenango	San Miguel Siguila
100	Sololá	San Pedro La Laguna
101	Quetzaltenango	Concepción Chiquirichapa
102	Sololá	San Lucas Tolimán
103	Quetzaltenango	Quetzaltenango
104	Quiché	Cunén
105	San Marcos	San Marcos
106	Quiché	Nebaj
107	Sololá	Santa María Visitación
108	Huehuetenango	Nentón
109	Quiché	San Juan Cotzal
110	San Marcos	San Antonio Sacatepéquez

Número	Departamento	Municipio
111	Huehuetenango	Santa Cruz Barillas
112	San Marcos	San Pedro Sacatepéquez
113	Quetzaltenango	San Juan Ostuncalco
114	San Marcos	Sibinal
115	Quetzaltenango	Zunil
116	Quetzaltenango	Palestina de los Altos
117	Quiché	Canillá
118	San Marcos	San Cristóbal Cucho
119	Huehuetenango	San Mateo Ixtatán
120	San Marcos	San Pablo
121	San Marcos	San Rafael Pie de la Cuesta
122	San Marcos	Tajumulco
123	Huehuetenango	Santa Ana Huista
124	Quetzaltenango	Salcajá
125	Huehuetenango	San Antonio Huista

Fuente: Elaboración propia.

6.1.3 Costos

A continuación, en el cuadro 15, se presentan los costos requeridos para las implementar inversiones estratégicas relacionadas con la Gestión Integrada de Recursos Hídricos.

Cuadro 15. Costos requeridos para las implementar inversiones estratégicas relacionadas con la Gestión Integrada de Recursos Hídricos (Monto en Quetzales)

Concepto	Costo año 1	Costo año 2	Costo año 3	Costo año 4	Costo año 5	Costo año 6	Costo año 7	Costo año 8	Costo año 9	Costo año 10
Diagnóstico general de los aspectos biofísicos, socioeconómicos y ecológicos y priorización de intervenciones	436,800									
Conformación de los concejos de cuenca	14,994,720	14,994,720								
Desarrollo de proyectos para el financiamiento de los esquemas de gestión integrada de recursos hídricos	23,400									

Concepto	Costo año 1	Costo año 2	Costo año 3	Costo año 4	Costo año 5	Costo año 6	Costo año 7	Costo año 8	Costo año 9	Costo año 10
Elaboración planes de manejo por cuenca		41,932,800								
Implementación de los planes de manejo de cuencas	0	852,921,491	852,921,491	852,921,491	852,921,491	852,921,491	852,921,491	852,921,491	852,921,491	852,921,491
Total	15,454,920	909,849,011	852,921,491	852,921,491	852,921,491	852,921,491	852,921,491	852,921,491	852,921,491	852,921,491

Fuente: Elaboración propia.

6.2 Programa de mejoramiento de la infraestructura de los sistemas de mini riego actuales y construcción de nuevos sistemas de irrigación en 37 municipios priorizados del altiplano

6.2.1 Descripción

La disponibilidad y operación de sistemas de irrigación eficientes es prioritaria en el sector agrícola del altiplano. Las obras de infraestructura y equipos de los sistemas de mini riego actuales han sobrepasado su vida útil, ocasionando pérdidas del recurso hídrico en los sistemas de captación, distribución y uso (equipos desgastados) en las pequeñas unidades de producción campesina. Adicionalmente está el incremento de la demanda de usuarios y la reducción significativa de caudales por la variación extrema y cambio climático y por la falta de protección de las fuentes de agua o planes de manejo integrado de las microcuencas.

La disponibilidad de agua para riego es claves para combatir la inseguridad alimentaria, mejorar los ingresos económicos de las familias campesinas e incrementar los niveles de empleo en el altiplano.

El programa de mejoramiento de los sistemas actuales de mini riego consistirá de una revisión técnica por parte de la Dirección General de Riego del MAGA en estrecha colaboración con las Asociaciones comunitarias administradoras o regantes de cada área, elaborando para el efecto, un análisis y un plan operativo de acción. La gobernabilidad del riego entendida como la aplicación de la autoridad y las normativas establecidas por procedimientos tradicionales dentro de grupos organizados en asociaciones o comités comunitarios, será reconocidas y mejoradas por el MAGA a través de procesos participativos, con el objetivo de regular el uso, aprovechamiento del recurso, evitar conflictos sociales y por otro lado, coadyuvar a la generación de un plan de operación y mantenimiento eficiente del sistema de irrigación. De igual manera, en las áreas nuevas se propiciará el fortalecimiento y la capacitación de las asociaciones comunitarias administradoras del riego.

Los estudios para el diseño de los sistemas de mini riego en las nuevas zonas de desarrollo hortícola (estudios de prefactibilidad y factibilidad técnica, social, económica y ambiental) serán dirigidos por el MAGA. En todo el proceso se tendrá estrecha colaboración con las

asociaciones de productores locales organizados, COCODES, COMUDES y las respectivas municipalidades. El desarrollo de las nuevas áreas tomará como base la propuesta elaborada por el IARNA (2006) la cual ha sido conocida tanto por el MAGA como por el Ministerio de Comunicaciones, Transportes y Vivienda. Dicha propuesta también incluye los cultivos a sembrar en las nuevas zonas y la necesidad de mejorar las vías de acceso a través de extender y pavimentar la red de caminos rurales para facilitar la comercialización de los diferentes productos agrícolas.

Las unidades de mini riego contarán con planes de inversión y planes de negocios de acuerdo a la demanda de los mercados nacionales e internacionales a fin de incrementar su productividad y alcanzar la sostenibilidad económica.

Se fortalecerán las cadenas productivas y apertura de canales de comercialización de los productos hortícolas a nivel nacional e internacional. A nivel nacional se dará impulso al establecimiento de acuerdos comerciales entre Asociaciones de Productores (Empresas Asociativas), las municipalidades y empresa privada para la venta de productos hortícolas en los mercados municipales y supermercados. Por otro lado, se Incrementará el valor agregado de los productos hortícolas a través del mejoramiento de las cadenas de valor y la aplicación de buenas prácticas de procesamiento (BPM) acordes a las regulaciones y estándares establecidos. Se incorporarán procesos agroindustriales de acuerdo a estudios de inteligencia de mercados buscando oportunidades según la demanda (ej. Jugos envasados de zanahoria-naranja, zanahoria-piña, té de hierbabuena, té de alcachofa, alimentos procesados, envasados y congelados).

Los estudios de mercados y la generación de cadenas de valor serán coordinados entre el MAGA y la AGEXPORT con el patrocinio del gobierno central y organismos internacionales.

6.2.1.1 Objetivos

- Mejorar la eficiencia de los sistemas de mini riego en las áreas de producción actuales e incorporar nuevas zonas hortícolas estableciendo técnicas modernas de irrigación, mecanismos de gobernabilidad transparentes, planes de productividad y competitividad con el adecuado apoyo financiero y crediticio requerido por los pequeños productores.
- Contribuir a la generación de empleos rurales (reducción de la pobreza) a través del incremento de la productividad y el área de cultivos de exportación de las unidades productivas de pequeños y medianos productores de 37 municipios priorizados.

6.2.1.2 Metas

- Renovar en cuatro años consecutivos los sistemas de captación, conducción, distribución y uso eficiente del agua a través de técnicas de riego por goteo para irrigar 6,969 hectáreas del altiplano en 37 municipios priorizados.
- Diseñar y establecer sistemas de mini riego eficientes para abastecer de agua (agua de calidad y cantidad) en la irrigación de 25,000 has en el primer año, 25,000 has en el

segundo año, 24,033 has en el tercer año y 15,500 has en el cuarto año en la zona con potencial de desarrollo hortícola de 37 municipios priorizados.

- Crear un total de 31,000 empleos agrícolas permanentes al término de cuatro años de haber establecido los sistemas de mini riego y sistemas de producción intensiva en las nuevas zonas con potencial hortícola (89,533 has).

6.2.2 Municipios priorizados

Los municipios priorizados se detallan en el cuadro siguiente:

Cuadro 16. Municipios priorizados para implementar el Programa de mejoramiento de la infraestructura de los sistemas de mini riego.

No.	Departamento	Municipio
1	Sololá	San Pedro La Laguna
2	Quiché	Chicamán
3	Huehuetenango	San Mateo Ixtatán
4	Sololá	Santiago Atitlán
5	Huehuetenango	Santa Eulalia
6	Quiché	Uspantán
7	Quetzaltenango	San Francisco la Unión
8	Huehuetenango	San Juan Ixcoy
9	Quetzaltenango	El Palmar
10	San Marcos	San Cristóbal Cucho
11	San Marcos	San Pablo
12	Quetzaltenango	Quetzaltenango
13	Sololá	San Lucas Tolimán
14	San Marcos	San Pedro Sacatepéquez
15	San Marcos	San Rafael Pie de la Cuesta
16	Quetzaltenango	San Mateo
17	Quetzaltenango	La Esperanza
18	Quetzaltenango	Almolonga
19	San Marcos	San Marcos
20	Quetzaltenango	Zunil
21	Quetzaltenango	San Juan Ostuncalco
22	Huehuetenango	Santa Cruz Barillas
23	Chimaltenango	Chimaltenango
24	Sololá	Panajachel
25	Chimaltenango	El Tejar
26	Chimaltenango	Acatenango
27	Totonicapán	Totonicapán
28	Chimaltenango	Parramos
29	Quetzaltenango	Cantel

No.	Departamento	Municipio
30	Sololá	Santa Clara La Laguna
31	Chimaltenango	San Andrés Itzapa
32	Quetzaltenango	San Carlos Sija
33	Chimaltenango	Zaragoza
34	Quiché	Chajul
35	Quetzaltenango	Concepción Chiquirichapa
36	Quiché	San Juan Cotzal
37	Chimaltenango	Patzún

Fuente: Elaboración propia.

6.2.3 Costos

El costo del programa para 37 municipios donde se requiere la renovación y modernización de los sistema de mini riego (6,969 has) es de Q 292 millones en cuatro años, y el costo para el establecimiento de los sistemas de irrigación 89,533 has en la zonas nuevas de producción agrícola es de Q 3760 millones (ver cuadro).

Cuadro 17. Costos de mejoramiento de los sistemas actuales de mini riego y el establecimiento de nuevos sistemas en zonas de potencial hortícola en 37 municipios priorizados de la zona del altiplano (cifras en millones de Quetzales).

Concepto	Costo año 1 (millones de Quetzales)	Costo año 2 (millones de Quetzales)	Costo año 3 (millones de Quetzales)	Costo año 4 (millones de Quetzales)
Renovación y mantenimiento de los sistemas actuales de mini riego	73	73	73	73
Nuevos sistemas de mini riego en zonas c/potencial hortícola	1,050	1050	1,009	651
Total para 37 municipios	1,123	1,123	1,082	724

Fuente: Elaboración propia.

6.3 Implementación de sistemas de investigación-extensión-capacitación campesina para cubrir 84 municipios priorizados en la zona del altiplano.

6.3.1 Descripción

Como resultado de la eliminación de los servicios de extensión agrícola por el gobierno en la década de los '90, se ha incrementado la vulnerabilidad de los pequeños agricultores tanto del altiplano como de otras regiones del país, incrementando los niveles de pobreza y extrema pobreza. La asistencia técnica actual se caracteriza por ser aislada, descoordinada, basada principalmente en la entrega de insumos (fertilizantes) y sin la orientación debida para la formación del capital humano. Existen enormes pérdidas de los productos agrícolas, por la degradación de suelos (erosión hídrica y deterioro de la fertilidad), uso de mala calidad de agua (contaminación por residuos de agroquímicos y desechos sólidos urbanos), emergencia de nuevas plagas e incremento de su resistencia a plaguicidas y pérdidas de la producción-bienes ante la variación climática extrema y cambio climático. La asistencia técnica agrícola es urgente y necesaria para mejorar la productividad y la competitividad agrícola. Es clave para la sostenibilidad ambiental y fundamental para combatir la inseguridad alimentaria toda vez que se mejoran las capacidades de los agricultores en la implementación de buenas prácticas que permitan adaptarse a la evolución del mercado y al cambio climático.

La asistencia técnica estará enfocada al incremento de la productividad y la competitividad de los pequeños productores tomando como base los factores limitantes identificados en el manejo agronómico de los cultivos, especialmente en el uso de variedades mejoradas (de ciclo corto, tolerantes a sequías y lluvias intensas, resistentes al viento, a plagas y enfermedades, de buen rendimiento, etc.), manejo de la humedad y fertilidad del suelo, plagas y enfermedades, prácticas de post-cosecha, manejo de residuos orgánicos e inorgánicos, procesamiento y empaque, aplicando las buenas prácticas agrícolas (BPAs) y las buenas prácticas de manufactura (BPM). La asistencia técnica estructurada y planificada incrementará en un 20% los rendimientos agrícolas (Propuesta de plan de acción para el Desarrollo Rural, IARNA, 2008).

Los programas de asesoría técnica tendrán carácter permanente y estarán estructurados utilizando técnicas participativas. Tanto la investigación como la capacitación tendrán como enfoque los sistemas productivos del pequeño agricultor. En los procesos de extensión, se tomarán en cuenta las experiencias y metodologías realizadas por los diferentes programas del ICTA y FAO en Guatemala, CATIE, Red SICTA, CIAT y CIMMYT en la región latinoamericana.

El conocimiento y las experiencias que tienen los productores en el desarrollo y manejo de tecnologías locales, serán la base para generar los procesos de capacitación de campesino a campesino, desarrollando parcelas demostrativas y ferias tecnológicas para el intercambio de experiencias.

Se contarán con facilitadores técnicos que no solamente darán la asistencia técnica sino registrarán los avances en la implementación de las prácticas agrícolas y propiciarán el intercambio de experiencias entre los productores. Dichos facilitadores deberán contar con la experiencia en los aspectos técnicos, manejo de grupos, manejo de técnicas de dialogo, método y técnicas de género, motivación y reconocimiento al buen desempeño.

Se integrarán equipos multidisciplinarios que permitan la búsqueda de alternativas viables para la sostenibilidad ambiental, económica, social y alimentaria de los pequeños productores. El equipo

proveerá de las herramientas efectivas para el manejo exitoso de las unidades productivas. Se mantendrá una comunicación directa entre los facilitadores técnicos y el equipo multidisciplinario para analizar y elaborar los programas de capacitación adecuados para cada grupo de productores. Se estructurarán planes de manejo del cultivo y sistemas de manejo de proceso para fines agroindustriales aplicando las buenas prácticas y siguiendo las regulaciones internacionales establecidas en los mercados de exportación.

Se construirán e implementarán siete centros o escuelas campesinas, uno por departamento del altiplano occidental. Las escuelas de capacitación campesina serán responsables de la capacitación integral usando las mejores prácticas de manejo de los cultivos y del proceso agroindustrial. La instrucción será desarrollada por facilitadores técnicos o agricultores experimentados y estará dirigida a los pequeños productores en horarios de fines de semana (viernes o sábados) completando 200 horas de instrucción, a costos relativamente bajos y en horarios de una jornada de trabajo. Cada productor cubrirá los gastos de transporte de su comunidad a la escuela y pagará Q25 por el almuerzo. Se establecerán una o más escuelas campesinas por departamento a efecto de integrar más productores a los procesos de tecnificación agrícola, facilitando su acceso y en horarios más convenientes al ritmo agrícola. Al completar la instrucción, cada participante recibirá un reconocimiento (diplomado) en técnicas o tecnologías específicas (ej. Selección masal de semillas de maíz, construcción de invernaderos, manejo integrado de plagas del tomate, manejo y conservación del suelo y del agua, costos de producción, manejo de cultivos nativos -Quilete, Amaranto-, etc.

Un equipo técnico integrado por facilitadores de campo del MAGA y representantes técnicos de las empresas agroexportadoras, efectuarán una auditoría integral para certificar las unidades de producción de los productores organizados como "Modelos de Producción y Empresarialidad Campesina" resaltando los avances de implementación de las buenas prácticas (BPAs mas BPM). Dichas unidades deberán reflejar no solo la responsabilidad ambiental y social sino la alimentaria y nutricional de la comunidad.

El MAGA a través del ICTA, será responsable de planificar y desarrollar la investigación agrícola. Se reforzarán y se establecerán nuevos centros de investigación en zonas de alta producción hortícola de los departamentos de Chimaltenango, Quetzaltenango, El Quiché y Huehuetenango. El MAGA invertirá recursos públicos y buscará alianzas con organismos internacionales (FAO, CATIE, USAID, JAPON), organizaciones no gubernamentales y mancomunidades para reforzar los centros actuales de investigación, la construcción y equipamiento de los nuevos centros.

6.3.1.1 Objetivo

- Incrementar las capacidades individuales y colectivas de los pequeños productores para mejorar la seguridad alimentaria en los 84 municipios priorizados a través de la aplicación de técnicas efectivas de producción agrícola y de adaptación a las variaciones del cambio climático.

6.3.1.2 Metas

- Implementar programas permanentes de investigación agrícola y asistencia técnica para incrementar las capacidades de 37,736 productores de 84 municipios priorizados, utilizando los avances tecnológicos en manejo intensivo de cultivos bajo ambientes controlados (invernaderos, macro y micro túneles) y en terrenos abiertos, planes de

manejo integrado de plagas, conservación y manejo de suelos, gestión de riesgo a la variación climática extrema, planes de manejo de residuos agrícolas.

- Establecer al término de cuatro años, siete escuelas de formación y capacitación campesina (una por departamento) para facilitar procesos de divulgación y adopción participativa de las tecnologías generadas en la investigación, y propiciar el intercambio de experiencias de campesino a campesino (parcelas demostrativas, diplomados de 200, ferias tecnológicas).
- Fortalecer dos centros regionales de investigación agrícola (Chimaltenango, Quetzaltenango) para la generación de nuevas tecnologías.

6.3.2 Municipios priorizados

Los municipios priorizados se detallan en el cuadro siguiente:

Cuadro 18. Municipios priorizados para implementar el Programa de sistemas de investigación-extensión-capacitación campesina para cubrir 84 municipios priorizados en la zona del altiplano.

No.	Departamento	Municipio
1	Huehuetenango	Santa Bárbara
2	Huehuetenango	San Rafael la Independencia
3	Quiché	San Bartolomé Jocotenango
4	San Marcos	Comitancillo
5	Sololá	San Pablo La Laguna
6	Sololá	Concepción
7	Totonicapán	Santa Lucía La Reforma
8	Quiché	Zacualpa
9	Sololá	Santa Cruz La Laguna
10	Quiché	San Pedro Jocopilas
11	Huehuetenango	San Miguel Acatán
12	Huehuetenango	San Mateo Ixtatán
13	Quiché	Chicamán
14	Quetzaltenango	Huitán
15	Chimaltenango	Santa Apolonia
16	Quiché	San Antonio Ilotenango
17	Huehuetenango	San Juan Ixcoy
18	Huehuetenango	San Gaspar Ixchil
19	Quiché	Chiché
20	Quiché	Uspantán
21	Huehuetenango	San Juan Atitán
22	Quiché	Joyabaj
23	Huehuetenango	Todos Santos Cuchumatán
24	San Marcos	Concepción Tutuapa

No.	Departamento	Municipio
25	San Marcos	San José Ojetenam
26	Quiché	San Andrés Sajcabaja
27	Quiché	Chichicastenango
28	Sololá	Nahualá
29	Quiché	San Juan Cotzal
30	Huehuetenango	Santiago Chimaltenango
31	Totonicapán	Santa María Chiquimula
32	Huehuetenango	Santa Eulalia
33	San Marcos	Sibinal
34	Quetzaltenango	Palestina de los Altos
35	Huehuetenango	Tectitán
36	Huehuetenango	San Sebastián Huehuetenango
37	Huehuetenango	San Pedro Necta
38	Quiché	Cunén
39	San Marcos	Ixchiguan
40	Sololá	San José Chacayá
41	Sololá	Santa Clara La Laguna
42	Sololá	Santa Catarina Ixtahuacán
43	Sololá	San Antonio Palopó
44	Sololá	San Juan La Laguna
45	Huehuetenango	Concepción Huista
46	Quiché	Nebaj
47	San Marcos	Tajumulco
48	Totonicapán	Momostenango
49	San Marcos	Tacaná
50	Quetzaltenango	Cabricán
51	Quiché	Canillá
52	San Marcos	San Miguel Ixtahuacán
53	Quiché	Chajul
54	Quiché	Chinique
55	Quiché	Patzité
56	Totonicapán	San Bartolo Aguas Calientes
57	Sololá	Sololá
58	Huehuetenango	La Libertad
59	Huehuetenango	San Sebastián Coatán
60	Quetzaltenango	Cajolá
61	Huehuetenango	Nentón
62	Huehuetenango	Unión Cantinil

No.	Departamento	Municipio
63	Huehuetenango	Santa Cruz Barillas
64	San Marcos	San Cristóbal Cucho
65	Huehuetenango	La Democracia
66	Quiché	Sacapulas
67	Totonicapán	San Andrés Xecul
68	Huehuetenango	San Idelfonso Ixtahuacán
69	San Marcos	San Lorenzo
70	Totonicapán	San Francisco El Alto
71	Quetzaltenango	San Martín Sacatepéquez
72	Chimaltenango	San José Poaquil
73	Quetzaltenango	El Palmar
74	Chimaltenango	San Andrés Iztapa
75	Huehuetenango	Cuilco
76	Huehuetenango	Soloma
77	Huehuetenango	Jacaltenango
78	Totonicapán	San Cristóbal Totonicapán
79	Huehuetenango	Colotenango
80	San Marcos	San Antonio Sacatepéquez
81	Sololá	San Lucas Tolimán
82	Sololá	San Andrés Semetabaj
83	Sololá	Santa Lucía Utatlán
84	Quetzaltenango	San Miguel Sigüila

Fuente: Elaboración propia.

6.3.3 Costos

El costo del programa de asistencia-extensión agrícola requerirá la inversión de Q145 millones por año. La construcción y operación de escuelas campesinas requerirá de Q6 millones (dos escuelas) en el primer año, y Q9 millones (tres escuelas) en el segundo año y Q3 millones (una escuela) en el tercer año.

El fortalecimiento de los dos centros de investigación requerirá la inversión de Q15 millones por año.

Cuadro 19. Costos de implementación del programa investigación y capacitación campesina para cubrir 84 municipios priorizados en la zona del altiplano (cifras en miles de Quetzales).

Concepto	Costo año 1 (millones Quetzales)	Costo año 2 (millones Quetzales)	Costo año 3 (millones Quetzales)
Asistencia técnica directa productores	145	145	145
Construcción y operación Esc. Campesinas	6	9	3
Centros investigación	15	15	15
Total para 84 municipios	166	169	163

Fuente: Elaboración propia.

6.4 Arreglos institucionales para la puesta en marcha

La estrategia principal para implementar el plan de inversiones será la suscripción de alianzas público-privado- a nivel regional, departamental y municipal, articulando las asociaciones comunitarias con todas las organizaciones de desarrollo que operen en los territorios. Los COCODES, COMUDES, CODEDES y las Mancomunidades también formarán parte dentro de las alianzas estratégicas de desarrollo rural.

En relación al manejo integrado de cuencas y desarrollo de los sistemas de producción agrícola, la coordinación entre las organizaciones públicas, privadas, academia y organismos internacionales serán claves para la optimización de los recursos financieros y técnicos. Los planes de acción a nivel de territorio municipal y de microcuencas serán discutidos en este foro así como las metodologías y lecciones aprendidas. Con fines de crear estabilidad de la Coordinadora Interinstitucional, se elaborarán planes de acción integrados que especifiquen los objetivos, actividades y áreas geográficas a trabajar. También se generará un normativo interno a fin de mantener la armonía entre los sectores y organizaciones involucradas. La Coordinadora contará con Junta Directiva y una sede de trabajo, por lo tanto, en el caso del manejo de los recursos naturales y desarrollo agrícola, el Ministerio de Medio Ambiente, Instituto Nacional de Bosques y el Ministerio de Agricultura y Alimentación están directamente nominados para ser parte de la Coordinadora.

6.5 Cronograma para la implementación de las inversiones estratégicas.

Para poder atender las necesidades descritas en conservación del recurso hídrico, abastecimiento de la población y las capacidades para el uso eficiente del agua, el cronograma siguiente ejemplifica el calendario de implementación.

Cuadro 20. Cronograma para la implementación de las inversiones estratégicas

Programas	Año 1	Año 2	Año 3	Año 4	Año 5	Año 6	Año 7	Año 8	Año 9	Año 10
Programa de gestión integrada de recursos hídricos.	X	X	X	X	X	X	X	X	X	X
Programa de mejoramiento de la infraestructura de riego actual y construcción de sistemas en áreas nuevas de potencial agrícola.	X	X	X	X						
Programa de investigación-extensión-capacitación	X	X	X	X						

Fuente: Elaboración propia.

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Coediciones

Estudio que identifica prácticas de manejo del agua para adaptación al cambio climático

Documento técnico

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Guatemala, junio de 2013

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Instituto de Agricultura, Recursos Naturales y Ambiente
UNIVERSIDAD RAFAEL LANDÍVAR



Universidad
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I. INTRODUCCIÓN

Estudios realizados por USAID y IARNA-URL (2013) indican que al analizar el número de meses con déficit o stress hídrico, la variación de la disponibilidad hídrica neta, la disponibilidad hídrica per cápita y la recarga potencial, se tiene que el 80% de los municipios del altiplano guatemalteco presentan problemas de disponibilidad física de agua (subterránea y superficial). Esto afecta al 97% de las áreas con cobertura de hortalizas y al 95% de las zonas con potencial para desarrollar horticultura en este territorio.

Para empeorar las cosas, el cambio climático incrementará el estrés hídrico de la zona del altiplano. De acuerdo al presente estudio realizado, los escenarios climáticos muestran que la disponibilidad hídrica irá disminuyendo en el altiplano y se estima que, en el 2080 entre el 39 y el 58% del territorio alcanzarán valores críticos. Estas proyecciones también estiman que en promedio disponibilidad hídrica puede disminuir en promedio alrededor del 44.3% en la zona del altiplano, llegando en ciertas subcuencas a sobrepasar el 70%.

Debido a la magnitud del problema, se decidió elaborar el presente documento, y que responde a la consultoría *“Evaluación regional de los recursos hídricos y la agricultura con enfoque de gestión y adaptación a los impactos negativos de la variabilidad climática y los eventos extremos asociados al cambio climático”*, la cual entiende que la sistematización de una serie de buenas prácticas de manejo de agua que están siendo implementadas por los agricultores en el Altiplano Occidental, es fundamental para desarrollar medidas de adaptación al cambio climático que puede ser adaptada en otras zonas del altiplano, y de esta manera dar respuesta y apoyar la implementación de la Política nacional de cambio climático.

El presente documento consta de ocho secciones, las primeras tres corresponden a la presentación, la introducción y los objetivos que persigue el trabajo. Luego se presenta el marco teórico, que describe el sitio de estudio, los conceptos fundamentales y posteriormente se hace una descripción de la metodología utilizada.

La sección seis es la parte fundamental del trabajo y en ella se presentan seis casos de buenas prácticas que actualmente están siendo implementadas por pequeños productores en el altiplano y que ayudarán a la población a adaptarse al cambio climático. Estas medidas son diversas en cuanto a los mecanismos que utilizan, así como las escalas de implementación. De manera general, se enfocan en la protección del recurso forestal para el abastecimiento de agua en cantidad y calidad a lo largo del tiempo, y van desde el ahorro de leña para reducir la presión del bosque, hasta llegar al manejo comunitario y municipal de los bosques. De todos los casos analizados hay una medida que no está en la línea con las anteriormente descritas y es la captación de agua de lluvia para uso doméstico en la Aldea Xiquín Sanahí, ya que se enfoca en la obtención de agua directamente sin pasar por el bosque.

Las buenas prácticas identificadas pueden contribuir a la implementación de las líneas estratégicas definidas en la Política Nacional de Cambio Climático (Acuerdo Gubernativo 329-2009) y, por lo tanto, conviene que sean tomadas en cuenta en los planes regionales y locales de inversión.

Al final del trabajo, se presenta una serie de conclusiones y la bibliografía utilizada.

2. OBJETIVOS

2.1 Objetivo general

Conocer y promover las buenas prácticas de manejo de agua que están siendo implementadas por algunos agricultores en el Altiplano Occidental y que sirven como una medida de adaptación al cambio climático.

2.2 Objetivos específicos

- Identificar y sistematizar buenas prácticas de manejo de agua que sirvan como medida de adaptación al cambio climático, con la finalidad de asegurar la disponibilidad de los recursos hídricos en el altiplano occidental.
- Orientar a los tomadores de decisión clave para la implementación de políticas y planes de acción favorables a una gestión integrada y exitosa del agua.

3. MARCO TEÓRICO

3.1 Marco referencial

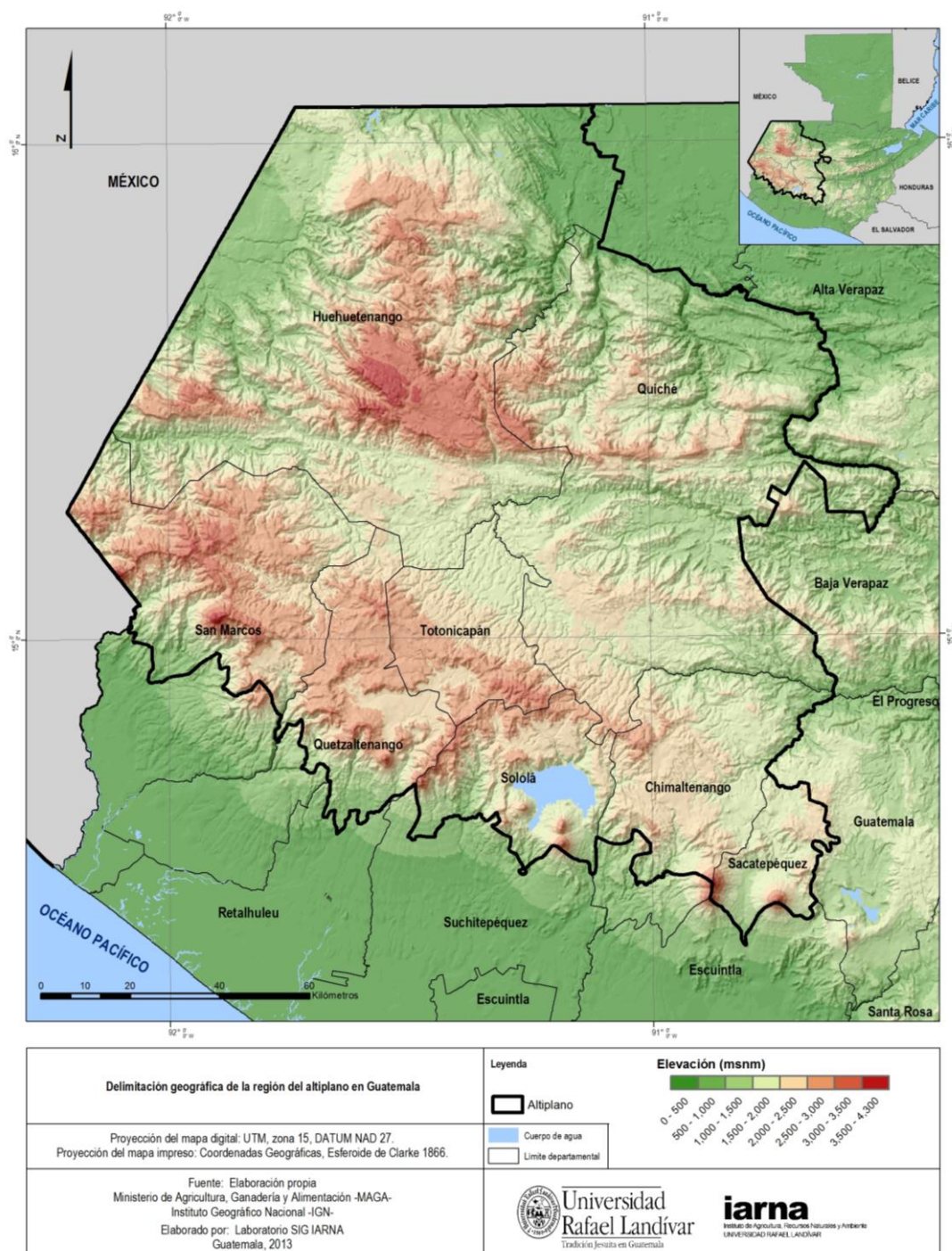
3.1.1 El altiplano occidental de Guatemala

El área de trabajo lo constituye el Altiplano Occidental, definido por IARNA/URL (2008) como el área comprendida por los departamentos de Sacatepéquez, Sololá, Chimaltenango (a excepción de los municipios de Yepocapa y Pochuta), Totonicapán, Quetzaltenango (a excepción de los municipios Génova, Flores Costa Cuca, Colomba y Coatepeque), Quiché (a excepción del municipio Playa Grande Ixcán), Huehuetenango y San Marcos (a excepción de los municipios Malacatán, El Rodeo, Catarina, El Tumbador, Esquipulas Palo Gordo, Pajapita, Ayutla, Ocós, Nuevo Progreso, El Quetzal y La Reforma).

La delimitación del área de estudio, según el IARNA, se basó en la división de regiones y zonas agrarias de Guatemala hecha por AVANCSO (2001), en la cual se definió la región agraria como un espacio amplio socioeconómico y territorialmente, que integra un conjunto de zonas agrarias que, si bien pueden presentar ciertas diferencias entre sí, éstas no llegan a prevalecer sobre las características comunes productivas y del medio natural, así como las de naturaleza histórica, expresadas en la particular vía de desarrollo que le otorga cierta racionalidad y, por lo tanto, cierta coherencia a la región agraria". El altiplano es un espacio geográfico que, si bien no puede calificarse como homogéneo, presenta características comunes de carácter biofísico, socioeconómico e histórico-cultural que permiten considerarlo como una unidad regional coherente.

En la Figura 1, se presenta el área de estudio, la cual comprende 147 municipios ubicados en ocho departamentos con una superficie de 20,927 km², equivalente al 19.3% de la extensión territorial de Guatemala.

Figura 1. Delimitación geográfica de la región del altiplano guatemalteco



Fuente: Elaboración propia.

3.2 Marco conceptual

3.2.1 Vulnerabilidad hídrica del altiplano guatemalteco

El altiplano guatemalteco es una zona altamente vulnerable en términos hidrológicos. Información generada por USAID y IARNA-URL (2013) demuestra que, al analizar el número de meses con estrés hídrico, la variación de la disponibilidad hídrica neta, la disponibilidad hídrica per cápita y la recarga potencial, el 80% de los municipios del altiplano Guatemalteco presenta problemas de disponibilidad física de agua (subterránea y superficial). Este mismo autor, explica que el 40% del territorio del altiplano tiene problemas con la eficiencia en el uso del recurso, y que el 74% del área tiene problemas de capacidad para la gestión del agua, lo cual incide directamente en el 61% del área cubierta con hortalizas y en el 65% de las áreas con potencial hortícola de la región.

El cambio climático en el altiplano occidental de Guatemala, impulsará una variabilidad del clima de la zona en la que los principales efectos serán la alteración del ciclo hidrológico y cambios en el régimen de temperaturas. Las alteraciones en el ciclo hidrológico se traducirán en un incremento de los periodos de estrés hídrico (periodos de sequía) y en una mayor precipitación en la estación lluviosa (inundaciones y deslaves). Según USAID y IARNA-URL (2013), los escenarios climáticos muestran que la disponibilidad hídrica irá disminuyendo en el altiplano, y se estima que en el 2080 alrededor del 58% del territorio alcanzarán valores críticos. Estas proyecciones también estiman que la disponibilidad hídrica puede disminuir alrededor del 44.3% en la zona del altiplano, llegando en ciertas subcuencas a sobrepasar el 70%.

Debido a la densidad poblacional del área, el consumo humano debe considerarse dentro de los usos prioritarios del agua. Así mismo, debido a la importancia que tiene la agricultura para la economía y los medios de vida de la zona, especialmente las hortalizas, maíz, frijol y café, estos cultivos también deben ser priorizados como fuentes de consumo de agua.

Dado a que los más vulnerables a la variabilidad climática son los pequeños agricultores, es necesario realizar los esfuerzos debidos para apoyar a este grupo, a efecto de que puedan acceder al recurso hídrico y manejarlo de una manera sostenible, de tal forma que mejore sus condiciones de vida, al mismo tiempo que se adapta a los efectos de la variabilidad y cambio climático.

3.2.2 Buenas prácticas (BP)

3.2.2.1 Definición de buenas prácticas (BP)

De acuerdo con la Organización de las Naciones Unidas para la Agricultura-FAO (s.f. a) las buenas prácticas se definen como:

- “Un proceso o una metodología que representa la forma más efectiva de conseguir un objetivo específico”.
- “La práctica que se ha demostrado que funciona bien y produce buenos resultados, y por lo tanto se recomienda como un modelo.”

En relación con las buenas prácticas de manejo de agua, México (s.f.) establece que... “las prácticas en el uso y gestión del agua son todos aquellos conocimientos, técnicas y modos de actuar, bajo criterios de sostenibilidad ambiental que redundan en una mayor disponibilidad de agua en el medio natural y en una mayor calidad de la misma”. Este mismo autor diferencia entre buenas prácticas de uso y de gestión. Las buenas prácticas de uso se relacionan con el aprovechamiento responsable del agua, a través de ahorro en el consumo y reducción en la carga de contaminantes tras su utilización, en tanto que las buenas

prácticas de gestión, se refieren al manejo del entorno ambiental, que provee los servicios hidrológicos, así como de la infraestructura de suministro y tratamiento de agua.

Partiendo de esta base, en el presente trabajo **se entenderá como buena práctica, los procesos agrícolas, de uso de agua para riego, generación de servicios ambientales, agua potable, y de manejo de ecosistemas, utilizados por los pequeños productores del altiplano occidental para adaptarse e incrementar su resiliencia ante el cambio climático.**

3.2.2.2 Criterios generales para seleccionar buenas prácticas

Según la FAO (s.f. b), al momento de seleccionar una buena práctica se deben tomar en cuenta los siguientes criterios generales:

- **Efectivo y exitoso:** Para cumplir con este criterio la práctica debe haber demostrado su importancia estratégica, o bien haber producido resultados tangibles.
- **Sostenible:** Con este criterio se evalúa si la práctica satisface las necesidades actuales, en particular las necesidades esenciales de los más pobres, sin comprometer la capacidad para hacer frente a las necesidades futuras. Para ello, la práctica debe apoyar el desarrollo económico, desarrollo social y la protección del medio ambiente.
- **Ecológicamente racional:** Debe proteger el ambiente.
- **Socialmente aceptable:** La BP no debe ofender a nadie ni molestar a las actitudes sociales, y tiene que encajar en el contexto cultural.
- **Técnicamente posible:** Debe ser técnicamente viable.
- **Económicamente eficiente:** Debe cumplir con el objetivo para el que fue diseñada y tener un coste menor que el de las otras alternativas.
- **Intrínsecamente participativo:** La comunidad, las partes interesadas y los socios deben colaborar en cada etapa de un proyecto.
- **Replicable y adaptable:** Debe poder adaptarse y aplicarse a una diversidad de entornos.

Por su lado USAID (2011) indica que antes de evaluar una práctica, deben establecerse una serie de criterios para saber si es buena o no, así mismo indica que estos criterios también deben ser parte del marco analítico que dirigirá la evaluación de las buenas prácticas. Los criterios propuestos por este autor son:

- **Relevancia:** ¿Es relevante la práctica en términos del objetivo que se está evaluando?
- **Eficacia:** ¿La práctica cumple el objetivo para el cual fue diseñada?, si lo hace, ¿Existe evidencia que la práctica tiene un impacto positivo en los medios de vida de las familia?
- **Escalabilidad:** ¿Es posible implementar la práctica a una mayor escala?
- **Transferibilidad:** ¿Existen las condiciones necesarias para transferirla a otros lugares?
- **Sustentabilidad:** ¿Requiere la práctica fondos externos (de donantes) para seguir funcionando?

Para efectos de este estudio, se utilizaron estas dos clasificaciones para definir los criterios que debían cumplir las prácticas para ser objeto de análisis los cuales se presentan en la sección 5.1.1.

4. MATERIALES Y MÉTODOS

4.1 Selección de las prácticas y aplicación del instrumento para recabar información

4.1.1 Selección de las mejores prácticas.

Para seleccionar las buenas prácticas agrícolas de manejo del agua se hicieron entrevistas a actores clave. Durante dichas entrevistas se presentaron los objetivos del estudio y el tipo de práctica que se estaba buscando, luego se discutía con los actores clave las opciones que a su consideración tenían potencial y se solicitaba la información de los contactos en campo que pudieran dar información detallada.

Posteriormente se llamaba a los contactos de campo y se daban a conocer los objetivos de la investigación y se discutía la posibilidad de visitarlos para recabar información. Durante la entrevista, se analizaba el caso a la luz de los criterios de selección definidos para el presente trabajo, y si cumplía con todos elementos, se hacía una visita de campo para aplicar la encuesta.

Los criterios de selección utilizados fueron:

1. **Relevancia:** ¿Es relevante la práctica en términos de agricultura, agua y su adaptación al cambio climático?
2. **Eficacia:** ¿La práctica cumple el objetivo para el cual fue diseñada?, si lo hace, ¿Existe evidencia de que la práctica tiene un impacto positivo en los medios de vida de las familias?, ¿es una alternativa económicamente viable?
3. **Tiempo de estar funcionando:** ¿Ha funcionado durante más de cinco años? ¿ha producido resultados tangibles?,
4. **Escalabilidad:** ¿Es posible implementar la práctica a una mayor escala?
5. **Transferibilidad:** ¿Existen las condiciones necesarias para transferirla a otros lugares?
6. **Sostenibilidad:** ¿La práctica requiere fondos externos (de donantes) para seguir funcionando?, ¿la práctica es ecológicamente racional y trata el ambiente con cuidado?, ¿es social y culturalmente aceptable?, ¿su aplicación se basa en un enfoque participativo?

En total, los informantes propusieron 40 sitios de estudio. Después de conversar y verificar la existencia de las prácticas con los socios en campo, se definieron 29, y de estas, seis demostraron ser buenas prácticas que debían ser sistematizadas. Las buenas prácticas de manejo de agua para la adaptación al cambio climático que se sistematizaron se presentan en el cuadro 1.

Cuadro 1. Buenas prácticas de manejo de agua que se utilizan en el altiplano occidental de Guatemala

Buena práctica
1. Uso de estufas de plancha mejorada para reducir la presión sobre el bosque a través del ahorro de leña, en el Barrio El Mirador, San Juan Comalapa.
2. Captación de agua de lluvia para uso doméstico en la Aldea Xiquín Sanahí, San Juan Comalapa, Chimaltenango.
3. Gestión comunitaria de bosques para el abastecimiento de agua en la parcialidad San Vicente Buenabaj.
4. Administración y gestión de los recursos naturales de Totonicapán por la Asociación de Alcaldes Comunales de los 48 cantones.
5. Protección de bosques para el abastecimiento hídrico en la subcuenca del Río Ixtacapa.
6. Manejo forestal municipal para el abastecimiento de hídrico en San Juan Olinstepeque, Quetzaltenango.

Fuente: Elaboración propia.

4.2 El instrumento para recabar la información

La información sobre las buenas prácticas se recabó *in situ*, a través de entrevistas y observación directa de las actividades o la práctica. La encuesta utilizada fue la reportada en el documento técnico Estudio de Casos del Buen Manejo del Agua (Manejo Integrado y Uso del agua para Riego y Servicios de suministro de agua potable) en la región del Altiplano Occidental, producto 1.1.2.1, razón por la cual no se presenta en este documento.

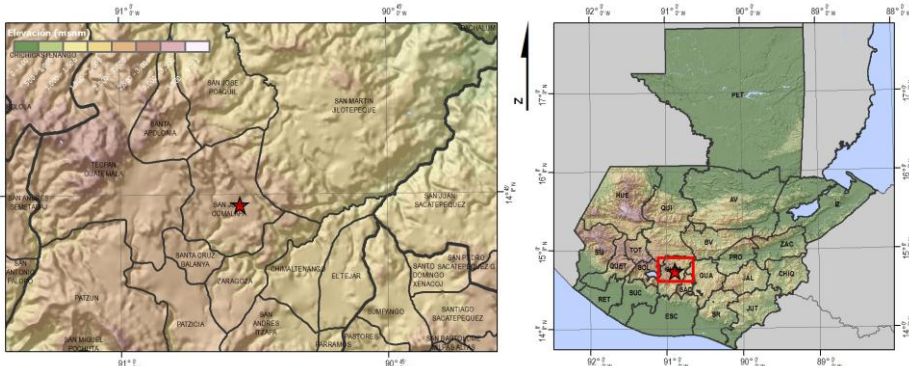
5. RESULTADOS

A continuación, se presentan las buenas prácticas de manejo de agua identificadas en los sitios de estudio y que son realizadas por algunos pequeños productores para adaptarse al cambio climático. El énfasis de cada una depende de las circunstancias de cada lugar, en tal sentido, la mayoría se enfocan en la protección y manejo del bosque, aunque las estrategias que utilizan son diferentes. Hay una práctica que se enfoca en la recolección del agua de lluvia, por lo que es la única que no considera al bosque.

Las buenas prácticas encontradas fueron analizadas tomando en consideración su localización, objetivos, eficacia, impactos, lecciones aprendidas, factores claves para su éxito, limitaciones o dificultades, su nivel de transferibilidad, escalabilidad y sostenibilidad, tal como se presentan en el apartado 3.2.2.2. La relevancia de la práctica se traduce en los niveles de eficacia e impacto.

El uso de estufas de plancha mejorada para reducir la presión sobre el bosque a través del ahorro de leña, en el Barrio El Mirador, San Juan Comalapa, se detalla en el Cuadro 2.

Cuadro 2. Descripción del uso de estufas de plancha mejorada para reducir la presión sobre el bosque en el Barrio El Mirador, San Juan Comalapa

Elementos	Descripción
Objetivos	- Ahorrar combustible de leña en la cocción de alimentos. - Mejorar la salud familiar por reducción de humo en la cocina. - Reducir la presión sobre bosques de importancia hidrológica.
Localización	El barrio El Mirador se encuentra en la parte oriental de la cabecera municipal de San Juan Comalapa. Dista 82 km de la ciudad capital. La población es de 42,200 habitantes de la etnia Maya-Kakchiquel. Su altitud es de 2,215 msnm, temperatura media anual de 18 a 20°C y precipitación pluvial de 1,300 mm anuales. Sus indicadores socioeconómicos indican que el 65% de la población vive en pobreza, 12.7% en pobreza extrema, 18% tiene déficit en servicios de agua potable y 65.1% padece de desnutrición crónica. La localización de área de estudio se presenta a continuación. 
Descripción y tiempo de funcionamiento de la práctica en el sitio	La tecnología consiste en una estufa de plancha de metal compuesta por un polletón o pollo fuego (de adobe o block), una cámara de fuego (de ladrillo cocido), una plancha de metal con cuatro hornillas desmontables (diferentes diámetros) y una chimenea de metal o tubo de cemento. Otros materiales requeridos son arena y cemento para pegar los blocks, arcilla, panela y agua para el lodo de cobertura de la cámara de fuego y pegado de ladrillos (Linares, F., 2012). En el caso del barrio El

Elementos	Descripción
	Mirador, la tecnología fue introducida por el Cuerpo de Paz a través del Proyecto Turismo Comunitario Sostenible en el 2011. Las estufas ahorradoras de leña tipo Plancha Mejorada se ha venido utilizando en esta comunidad por dos años y medio, y en la cabecera municipal por 15 años.  
Actores involucrados	Líderes y lideresas de 15 familias del barrio El Mirador gestionaron la construcción de 15 estufas a través de un proyecto tripartito con la participación directa de los beneficiarios, municipalidad y una agencia donante. Los costos fueron compartidos entre los participantes. Las familias beneficiarias aportaron materiales locales, ladrillos cubriendo el 60% del costo por unidad (Q 800 por estufa).
Eficacia	Las estufas mejoradas cumplen con los objetivos propuestos. La plancha mejorada favorece el ahorro del 50% de leña en comparación con la estufa tradicional o fuego abierto (Guerra Samayoa, E, 2009), lo que a su vez tienen implicaciones directas en la extracción de leña para usos energéticos del bosque, reduciendo así la presión sobre los recursos forestales de la zona. Desde el punto de vista de seguridad, reduce o evita accidentes de quemaduras en los niños, así como los incendios de la casa. A nivel de la salud familiar, reduce el ardor de ojos, lagrimeo, dolor de espalda y el 50% de riesgo a las enfermedades respiratorias (J. McCracken et. al. 2005).
Impacto	Cuando la estufa de Plancha Mejorada se usa correctamente y se le da el mantenimiento indicado, favorece un ahorro del 50% de leña en comparación con la estufa tradicional o fuego abierto. Las estufas mejoradas en general, reducen la mitad del tiempo en la obtención de la leña, por lo que las mujeres disponen de más tiempo para realizar otras actividades productivas. Desde el punto de vista de seguridad, la estufa mejorada reduce o evita accidentes de quemaduras en los niños y niñas, así como incendios de la casa (Guerra Samayoa, E, 2009). Impacta en la economía campesina y en la salud de la familia, reduciendo su exposición a enfermedades. Reduce el ardor de ojos, lagrimeo, dolor de espalda y el 50% de riesgo a las enfermedades respiratorias (asma, neumonía) (J. McCracken et. al. 2005). También dicho autor consigna que reduce significativamente la presión arterial en mujeres y la susceptibilidad de contraer enfermedades del corazón.

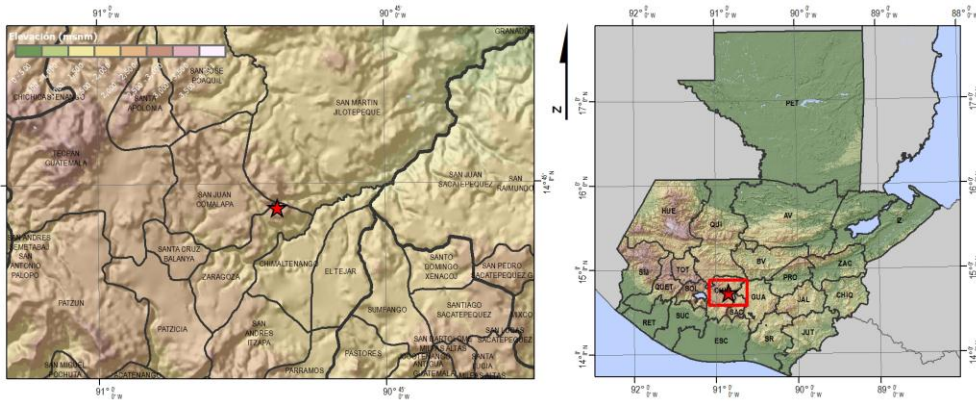
Elementos	Descripción
	El modelo de estufa de Plancha Mejorada también brinda mayor comodidad para cocinar comparado con el fogón o fuego abierto porque evita esfuerzos en la espalda, evitando inclinarse o agacharse para realizar las labores de preparación y cocción de los alimentos. Desde el inicio, los beneficios económicos y de salud resultan ser lo más obvios. Una familia de ocho personas que cocina con Fuego Abierto o Tres Piedras consume aproximadamente 200 trozos de leña por semana a Q0.50 por trozo o leña (Manual de Tecnología Apropiada, Cuerpo de Paz, 1996). Esto representa un costo promedio de Q100.00 a la semana. Al reducir su consumo de leña a la mitad, una familia con estufa mejorada ahorraría aproximadamente, Q400.00 al mes (equivalente a un árbol comercial por mes). En otras palabras, podemos decir que la presión sobre los macizos forestales que regulan el ciclo hidrológico y abastecen de agua a la comunidad se reduce.
Factores de éxito	• Participación familiar. La participación de la familia (padre, madre e hijos) en la construcción, incrementó sus capacidades para construir otras estufas o bien hacer reparaciones de la propia en caso fuera necesario. • Uso de recursos locales. El modelo de estufa de plancha mejorada requiere del uso de materiales que están localmente disponibles. La plancha de metal es fácilmente adquirible en ferreterías locales. • La solidez y el tamaño de la superficie de la estufa, brinda un espacio amplio para sostener los utensilios de cocina (ollas, sartenes, cacerolas) reduciendo el riesgo de derrame de alimentos. • Capacitación de la familia. El acompañamiento de un mes para orientar a la familia sobre sus cuidados, uso y mantenimiento ayudaron a que cada una aprendiera y adquiriera confianza en el uso de la estufa. • Solamente necesita de tres leños secos para cocinar. A diferencia de las estufas de plancha tradicionales, la estufa mejorada tiene un diseño especial en la cámara que permite mayor eficiencia en la combustión de leña y en la extracción del humo por la chimenea. • Reduce las enfermedades respiratorias de la familia, especialmente del ama de casa (y de niños cargados dentro de la cocina) porque elimina el humo en la cocina, menos partículas sólidas suspendidas, reduce el riesgo a accidentes (quemaduras de niños, incendios) y mejora la higiene en la casa.
Limitaciones	• La construcción de la estufa Plancha Mejorada requiere de un albañil experto o un padre de familia que haya tenido experiencias o que haya sido capacitado. • El involucrar a las familias beneficiadas en su construcción ayuda a prolongar la vida útil de la estufa (más de 15 años) con buenas actividades de mantenimiento. • Su alto costo inicial se ve como un gasto, aunque su inversión se recupera al año por los ahorros derivados de menor consumo de leña. Sin embargo, tiene la ventaja que las familias rurales pueden obtener a nivel local la mayoría de los materiales requeridos.
Lecciones aprendidas	• Paciencia por parte de la familia usuaria. El uso de la estufa de plancha de mejorada requiere de un mes de espera después de haber terminado su construcción, que es el tiempo requerido para su secamiento o curado. • Los capacitadores deben de hacer énfasis en los cuidados de la estufa durante su uso a efecto de prolongar su vida útil.

Elementos	Descripción
	Aunque la construcción de este modelo es muy sencillo, es importante tener la práctica y compartir con la familia usuaria un pequeño manual o afiche que especifica su construcción y uso efectivo.
Transferibilidad	La estufa de plancha mejorada es una técnica altamente transferible a más familias campesinas. Es de fácil construcción, uso y mantenimiento. Su construcción requiere de un facilitador experto o con experiencia en haber construido estufas similares y con disponibilidad de enseñar a la familia sobre su buen uso y mantenimiento. El costo de su construcción es compensado por el ahorro de leña obtenido en un año, por lo tanto, las familias rurales pueden tener acceso a la tecnología sin hacer mayores sacrificios.
Escalabilidad	La tecnología de estufa plancha de metal mejorada puede ser replicada a mayor número de familias en cualquier parte del altiplano. Proyecto de esta naturaleza requieren de aportaciones familiares, ya sea en especie a través de materiales de construcción disponibles localmente y de aportaciones en dinero, especialmente en la compra de cemento, plancha de metal y chimenea.
Sostenibilidad	La estufa de plancha mejorada es altamente aceptada por las familias campesinas por las ventajas mencionadas. Los actores aprenden a construirla y por lo tanto, a hacer las reparaciones correspondientes. Su diseño permite reunir a la familia alrededor de la estufa durante los tiempos de comida, sin peligro alguno o sin molestias causadas por el humo. Es económicamente viable por el bajo costo de construcción y prácticamente, la inversión realizada se recupera a través del ahorro de la leña alcanzado en un año. Ambientalmente, permite tener mayor eficiencia en el uso de la leña, menos consumo y mejor salud para la familia, al respirar menos humo en la cocina.
Conclusiones	- La estufa ahorradora de leña Plancha Mejorada promueve un ahorro significativo en el consumo de leña (un fogón o fuego abierto requiere de 18 leños por día (6 por tiempo de comida), mientras que con la estufa mejorada solamente se necesitan nueve leños diariamente), con lo que reduce la presión sobre los bosques (Guerra Samayoa, E, 2009). Además, es una forma cómoda de cocinar lo que puede facilitar su aceptación en el ámbito rural. - Aunque la técnica o los modelos de estufas mejoradas se han popularizado, todavía requieren de mayor promoción para familias que viven en pobreza y pobreza extrema. Debido a la facilidad de su construcción, bajo costo, durabilidad y adaptación cultural, la Plancha Mejorada ha sido un modelo más aceptado a nivel rural, especialmente por núcleos familiares mayores de cinco miembros. - La estufa ahorradora de leña Plancha Mejorada es una buena práctica que debe ser priorizada en los planes de acción locales favorables a una gestión exitosa para reducir la presión de los recursos forestales.
Información del contacto en campo	Rolando Mux. San Juan Comalapa. 57881974 Celular.

Fuente: Elaboración propia.

La captación de agua de lluvia para uso doméstico en la Aldea Xiquín Sanahí, San Juan Comalapa, Chimaltenango, se describe en el Cuadro 3.

Cuadro 3. Captación de agua de lluvia para uso doméstico en la Aldea Xiquín Sanahí, San Juan Comalapa, Chimaltenango

Elementos	Descripción
Objetivos	Mejorar la calidad de vida de los habitantes a través de un sistema de almacenamiento y manejo del agua de lluvia que permitan satisfacer las demandas de consumo humano.
Localización	La aldea de Xiquín Sanahí se localiza a 7 kilómetros del casco urbano del municipio de Comalapa y a 89 km de la ciudad capital. Su altitud es de 2,000 msnm, precipitación media anual de 1,200 mm. El municipio tiene una población estimada de 40,000 habitantes, y en Xiquín Sanahí habitan 150 familias. A continuación se puede apreciar la ubicación de la experiencia. 
Descripción y tiempo de funcionamiento de la práctica.	El abastecimiento de agua en la comunidad de Xiquín Sanahí se reduce considerablemente en la estación seca (especialmente en el período comprendido de enero a abril), por lo que para obtener agua del tanque comunitario y lavar la ropa se deben hacer largas colas, o en muchos casos, realizar estas actividades en la madrugada (SEGEPLAN et al. 2011). Con el fin de evitar caminatas y pérdida de tiempo para recolectar agua, en 2005 el Consejo Comunitario de Desarrollo –COCODE– de Xiquín Sanahí inicia negociaciones con la Asociación Cooperación Regional y Proyectos de Desarrollo –CREPD– para la implementación de un proyecto novedoso de captación de agua de lluvia a escala familiar. En 2006 CREPD establece acuerdos con la comunidad y se gestiona el financiamiento para el proyecto de captación de agua de lluvia. El proyecto consta de 43 módulos de captación de agua de lluvia que benefician a un número igual de familias. Actualmente se tiene planificada una ampliación para 45 familias más. Cada módulo de captación o cosecha de agua de lluvia, está compuesto por una estructura techada de lámina de zinc de 2x4 metros (aérea recolectora del agua), sobre soportes de madera y un piso de cemento. El techo de zinc se conecta a dos depósitos de agua de 2,500 litros cada uno a través de un canal recolector.

Elementos	Descripción
	 Antes del inicio de la estación lluviosa, cada familia hace una limpieza minuciosa del techo, del canal recolector y de los tanques de almacenamiento. El agua se capta durante la estación lluviosa y se revisa el techo cada 15 días para que esté libre de suciedad. Cuando inicia la estación seca se recoge el canal colector y se guarda para la estación siguiente. De igual forma se ha recomendado que cada siete años se aplique pintura al techo para evitar que el material se oxide. Los parales de madera tienen una vida útil de 10 años y los depósitos y tubos un promedio de 30 años. Según los entrevistados, el agua almacenada sólo se utiliza para cocinar y para consumo humano, ya que de otra forma no alcanzaría. Esto se entiende cuando se toma en cuenta que el volumen almacenado es de 5,000 litros. Según Soto (2012) el consumo de agua en áreas rurales en el altiplano es de aproximadamente 100 litros/persona/día, por lo que para abastecer una familia de cinco miembros durante cuatro meses se debería almacenar 60,000 litros y actualmente se almacena una doceava parte. En el caso de las familias numerosas, el agua se acaba antes de que inicie la estación lluviosa y deben comprar agua en toneles con valor de Q5 cada uno.
Actores involucrados	CREPD: es una Asociación con sede en Chimaltenango que promueve el desarrollo humano con integralidad y enfoque a la ruralidad, sin fines de lucro y apolítica. Esta institución fue la que aportó los fondos y las capacitaciones para echar a andar la iniciativa. Grupo de mujeres Las Margaritas: Es una institución local que fue la encargada de la implementación y mantenimiento del proyecto.
Eficacia	Las entrevistadas manifiestan que la práctica cumple con el objetivo propuesto, el sistema de captación permite satisfacer las demandas de consumo humano en los periodos más críticos del año.
Impacto	El proyecto de cosecha de agua de lluvia es muy importante para las familias beneficiadas, en especial para las mujeres, que expresaron que para recoger una tinaja de agua (4 galones) en el tanque comunitario, tienen que invertir alrededor de una hora y media, y en ocasiones pueden esperar hasta tres horas. Esta situación afecta la atención de la familia en especial la de los niños y reduce significativamente en las actividades productivas artesanales (especialmente textiles típicos), así como de apoyo en la agricultura.

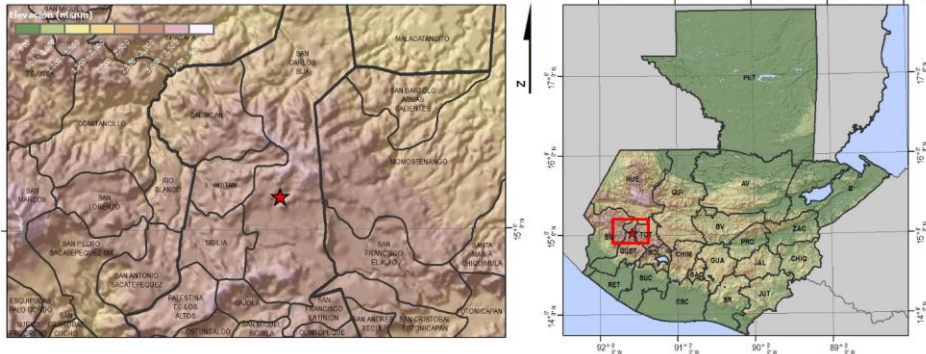
Elementos	Descripción
	El número de beneficiados ha aumentado significativamente y actualmente tiene una cobertura de 23 familias en la comunidad. El proyecto de esta naturaleza se ha expandido a otros centros poblados como Paraxaj con 78 familias beneficiadas y San José las Minas con 7 familias.
Factores de éxito	• Se trata de una tecnología bastante simple de utilizar, y una vez establecido el módulo, los costos de mantenimiento son relativamente bajos (Q120 al año). • La instalación y manejo de los módulos se han acompañado con capacitaciones constantes, lo que ha facilitado su utilización y mantenimiento. • El mantenimiento que se da a los módulos y el hecho de que el agua sea de lluvia, aseguran que el vital líquido no esté contaminado y sea apto para consumo humano.
Limitaciones	• El costo de cada módulo es de Q8,500, lo que es un monto muy alto para las familias pobres del altiplano, por lo tanto, si se quiere masificar la tecnología se deberá contar con apoyo financiero y técnico externo. • El volumen de agua que se almacena actualmente no es suficiente para satisfacer las necesidades relacionadas con el consumo familiar, apenas alcanza para beber y cocinar durante la época de escasez de agua. Es por esto que los usuarios quisieran aumentar el tamaño y capacidad de los módulos.
Lecciones aprendidas	• La cosecha de agua de lluvia es una alternativa que ayuda a satisfacer parcialmente las necesidades de agua para consumo domiciliario, pero para satisfacerlas en su totalidad se requieren módulos doce veces mayores, lo cual tendría un costo aproximado de Q102,000 por familia. El costo es tan elevado que los habitantes no podrían cubrirlo.
Transferibilidad	La tecnología utilizada es bastante simple, por lo que el modelo se puede replicar a otras áreas en el altiplano guatemalteco, siempre y cuando se cuente con fondos para desarrollar un proyecto de esta naturaleza.
Escalabilidad	Actualmente el proyecto beneficia a 43 familias de 150 que habitan en la comunidad, y según las entrevistas, las 107 familias restantes están interesadas en adquirir un módulo de captación de agua de lluvia. También están interesadas en construir una estructura comunitaria con mayor capacidad que pueda abastecer de agua a la comunidad. La idea es ubicar la estructura en la parte alta de la aldea y conducir el agua por gravedad.
Sostenibilidad	Dado que la captación de agua suple una necesidad básica y el método es culturalmente aceptado, las familias tienen mayor cuidado en su consumo durante la época de sequía. Es una tecnología de fácil aplicación, de bajo costo de mantenimiento. Ambientalmente, el método y la tecnología permiten proporcionar agua segura para beber y cocinar.
Conclusiones	El limitado acceso y disponibilidad de agua incide directamente en los niveles de pobreza, salud, educación, género, etc. La captación de lluvia es una alternativa técnicamente viable para apoyar la adaptación al cambio climático. La implementación de este tipo de proyectos requiere de acompañamiento en capacitación y aportaciones estatales o privadas y comunitarias. Esta práctica puede funcionar como medida de adaptación al cambio climático, pero para esto se debe aumentar la escala, lo cual requerirá de cálculos para estimar el volumen de agua requerida por familia, y con esta base y la precipitación del área,

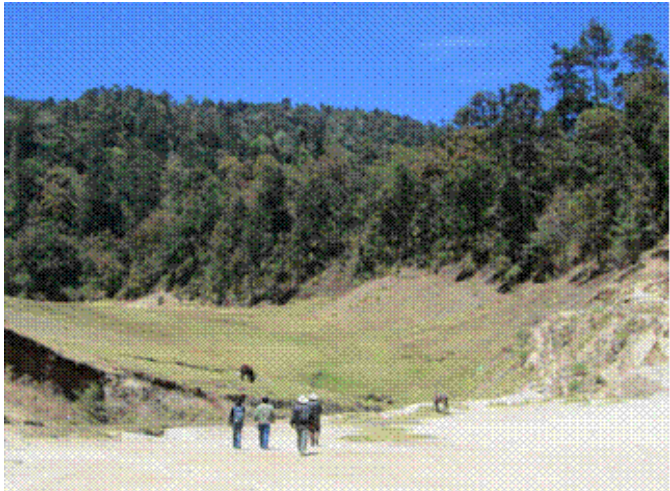
Elementos	Descripción
	diseñar módulos para que puedan satisfacer las necesidades de uso doméstico.
Información del contacto en campo	- Sra. María Adelina Tubac Calicio, miembro del Grupo de Mujeres las Margaritas, Aldea Xiquín Sanahí, Celular 5459 0488 - Sra. Odilia Elizabeth Tubac, miembro del Grupo de Mujeres las Margaritas, Aldea Xiquín Sanahí, Celular 4548 2953

Fuente: Elaboración propia.

La gestión comunitaria de bosques para el abastecimiento de agua en la parcialidad San Vicente Buenabaj, se describe en el Cuadro 4.

Cuadro 4. Gestión comunitaria de bosques para el abastecimiento de agua en la parcialidad Vicentes, San Vicente Buenabaj

Elementos	Descripción
Objetivos	Proteger los bosques de la parcialidad Vicentes para promover la recarga hídrica y la calidad del agua que abastece a 3,700 familias de la comunidad San Vicente Buenabaj.
Localización	El bosque se encuentra ubicado en la aldea San Vicente Buenabaj, que se localiza al noroccidente de la cabecera municipal de Momostenango y es operado por la Asociación Parcialidad Vicentes. La población de la Parcialidad es de 3,700 familias distribuidas en 13 comunidades. La Parcialidad se ubica a 2,800 msnm, con temperatura promedio anual de 15 grados centígrados y precipitación media anual de 1,500 mm. La ubicación de la buena práctica se puede apreciar a continuación. 
Descripción y tiempo de funcionamiento de la práctica.	El agua que abastece a la aldea San Vicente Buenabaj, proviene de las partes altas del bosque comunitario de dicha comunidad, y es conducida por gravedad a través de un sistema que beneficia a 3,700 familias de 13 comunidades. El bosque tiene un estatus de comunitario-colectivo, y es administrado por la parcialidad Vicentes. En Guatemala la figura de parcialidad es una estructura organizativa indígena, que posee tierras privadas, pero bajo una administración colectiva. Las máximas autoridades de la aldea la constituyen la parcialidad y la alcaldía auxiliar (FAO, 2005). Las comunidades están conscientes de la relación bosque-agua, por ello protegen los bosques. En cada comunidad existe un Comité de Agua que coordina los trabajos de protección del bosque. En la década de los ochenta la comunidad logra gestionar su sistema de agua potable.

Elementos	Descripción
	En 1988, las talas ilegales condujeron a la población a hacer denuncias ante 1988 al DIGEBOS (actualmente INAB), lo que llevó a una veda de 10 años. En el 2000 se elaboró el plan de manejo comunitario, el cual incluía los planes estratégicos y operativos, que detallaban las labores de manejo silvicultural que se deben realizar, así mismo a partir de ese año inician con el apoyo de un regente forestal. En el 2003 se ingresaron 165 hectáreas al PINFOR de protección, y 257 hectáreas al PINFOR de producción. Cabe mencionar que para el desarrollo de los proyectos de protección, existe coordinación estrecha entre la junta directiva de la parcialidad y el regente forestal; al momento de implementar acciones de vigilancia y monitoreo se cuenta con el apoyo de 12 guardabosques. La práctica tiene más de 12 años de estar funcionando.  A la fecha se ha promovido el manejo forestal de 815 hectáreas, las labores de aprovechamiento se realizan con base en el plan operativo anual, y cada caserío aporta 30 personas por jornada para labores forestales. Dentro de las labores se considera la recolección de leña, la cual es repartida equitativamente como pago por servicios prestados a la parcialidad en los trabajos que forman parte del plan de manejo. Cabe mencionar que todos los nacimientos están protegidos y no es posible cortar árboles en un radio de 50 metros. Un aspecto interesante de este caso es que las medidas de vigilancia para la protección del bosque (tala ilícita, pastoreo en el bosque, protección contra incendios forestales) se realizan por parte de guardabosques y un alguacil, quienes reportan cualquier actividad a la alcaldía auxiliar, quién dependiendo de la falta, puede imponer una multa que va de Q50 a Q500, en caso de que la deforestación sea significativa se convoca a una asamblea que impone multas que pueden llegar a los Q5,000.00 El caso es tan exitoso que fue premiado en el 2008 por el INAB, y en 2009-2010 recibió un premio a nivel latinoamericano.
Actores involucrados	Parcialidad los Vicentes: cuenta con aproximadamente 1,400 socios que participan en el manejo del bosque, estos se turnan para conformar una planilla de 12 guardabosques, así mismo cada caserío está a cargo del mantenimiento de los

Elementos	Descripción
	nacimientos mediante los comités de agua. Helvetas ProBosques: apoyó la elaboración e implementación del reglamento del manejo del bosque, proporcionó equipo de radio a los guardabosques, además dio apoyo técnico para el manejo del bosque, así como para el cuidado y protección de los nacimientos de agua. INAB: ha apoyado con incentivos del programa PINFOR y con asesoría técnica para la evaluación y monitoreo del área que recibe incentivos forestales, revisión de la documentación del registro de propiedad y personería jurídica de la asociación. U'tz che: es una red de organizaciones comunitarias, que ha proporcionado asesoría técnica, inversión en el mejoramiento y producción del vivero forestal, así como inversión para la implementación de un plan estratégico para el estudio de almacenamiento de carbono en el bosque y el proyecto del marcaje de la periferia del bosque.
Eficacia	La práctica ha cumplido con el objetivo para el que fue diseñada, de esa cuenta es que se ha promovido la reforestación de 170 ha, la conservación de 178 ha, la producción forestal en 256 ha, y aunque existen 211 hectáreas dedicadas a la agricultura se tienen planificado su reforestación. Con lo que se está dando manejo a un área de 815 hectáreas. Para esto ha sido fundamental la organización comunitaria. La junta directiva ha promovido el ordenamiento de cada actividad, así como el uso del plan de manejo forestal para lograr la participación de todos los habitantes de la parcialidad. Aunque no se cuenta con un estudio hidrológico, ni con monitoreos de cantidad y calidad del agua, los entrevistados aseguran que el bosque mantiene la cantidad y la calidad del agua, además de proporcionar otros beneficios tales como la protección de la biodiversidad, la belleza escénica y el abastecimiento de bienes del bosque como madera y leña.
Impacto	Este es un caso emblemático de cómo la participación comunitaria a través de la aplicación de las normas consuetudinarias han dado paso al desarrollo de instrumentos técnicos (como lo son los planes de manejo forestal), lo que ha permitido la satisfacción de la demanda local de leña y la provisión de madera de construcción. No obstante que la práctica no fue desarrollada como una estrategia para la adaptación al cambio climático, según los entrevistados resulta eficaz para estos fines ya que la protección de la cobertura forestal regula el flujo de agua que va a dar a las fuentes superficiales y subterráneas. Además, la protección de las fuentes garantiza la calidad de los manantiales. En cuanto a la salud del bosque, el manejo forestal ha incidido en la densidad de árboles por hectárea, la cual cambió de 600 a 300, que desde el punto de vista técnico es un valor adecuado (comunicación personal con el técnico Marvin Camposeco).
Factores de éxito	• Se cuenta con una institucionalidad fuerte que se ha visto reforzada por herramientas técnicas, tales como el plan de manejo forestal y los planes operativos anuales. • La participación de un profesional especializado en manejo de bosque, garantiza

Elementos	Descripción
	un soporte para la utilización de las herramientas técnicas para el manejo forestal de la zona. • En el 2008 HELVETAS, promovió planes de manejo forestal comunitario, lo que hizo que las comunidades se apropiaran del conocimiento técnico y es una de las razones por las que actualmente se facilita el manejo técnico del bosque. • Se cuenta con un sistema monitoreo que se basa en normas de trabajo comunitario, y planes preestablecidos, el cual es implementado por un grupo que trabaja en el manejo forestal a tiempo completo. • Para el manejo forestal y mantenimiento del sistema de agua, cada caserío aporta mano de obra para los trabajos que se requieran, el trabajo es voluntario y se aporta con el fin de no hacer pagos para el mantenimiento de los nacimientos y tubería para el agua potable. Además, se cuenta con aproximadamente Q500,000 anuales, generados a través del programa de incentivos forestales del INAB. Este dinero se utiliza para el pago del técnico forestal y para cubrir los jornales que no son cubiertos por el trabajo comunitario para implementar el plan de manejo forestal. • El sistema de manejo del bosque incluye no sólo el pago por la utilización de los recursos del bosque para consumo familiar, sino también la restauración del ecosistema. Un ejemplo es la extracción de leña para uso familiar, que establece que por cada metro cúbico de leña extraído las familias deben pagar Q50 (Q35 por concepto de pago de motosierras y Q15 para el pago de papelería de extracción al INAB), y sembrar 20 árboles (los que se obtienen a través del vivero de la asociación). 
Limitaciones	• No se tiene un estudio hidrológico que demuestre la relación que existe entre la protección del bosque y la recarga hídrica.
Lecciones aprendidas	• En sus inicios, la implementación del PINFOR causó confusión ya que las personas no entendían por qué se les iba a pagar, o si el pago comprometía la tenencia del bosque. Pero esto se solucionó con la implementación de capacitaciones para dar a conocer detalladamente las acciones y el proceso que se lleva a cabo en el programa. Otro aspecto importante fue la entrega del primer incentivo, ya que con esto la comunidad pudo visualizar que era real la generación ingresos por el manejo sostenible del bosque • El proceso de gestión comunitaria ha sido exitosa gracias al continuo

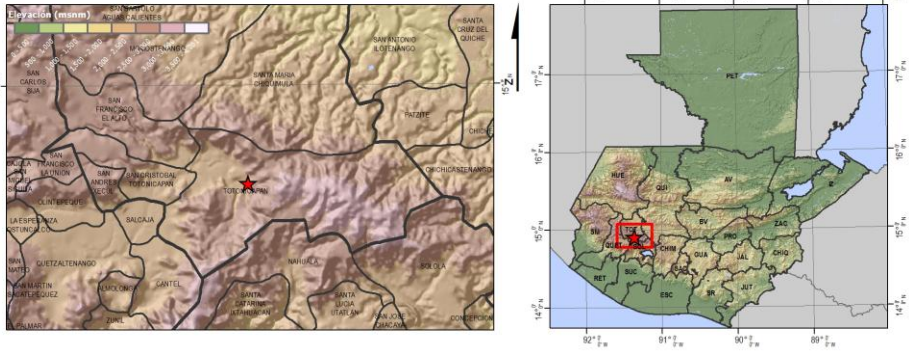
Elementos	Descripción
	acompañamiento de Helvetas, quien desde un inició estableció buenas relaciones con la comunidad. Actualmente, el proyecto cuenta con alta participación de las autoridades comunitarias y con un técnico contratado directamente por la comunidad. • Para promover el manejo forestal comunitario se requiere de una institucionalidad fuerte, así como capacidades técnicas y financieras (que fueron aportadas por HELVETAS e INAB). La transferencia de capacidades técnicas hacia las comunidades es fundamental para el manejo adecuado del macizo forestal, cabe mencionar que el proceso ha sido bastante completo, ya que ha contemplado el desarrollo de herramientas técnicas (como el plan de manejo forestal y planes operativos anuales), el apoyo de personal especializado (a través del regente forestal), y procesos de capacitación a los comunitarios. En lo financiero, el apoyo se ha dado por el gobierno a través del PINFOR, lo que ha permitido sostenibilidad financiera al proceso.
Transferibilidad	Esta práctica es transferible otras áreas y comunidades que tengan un sistema institucional fuerte, que cuenten con macizos forestales significativos y fuentes de agua, pero deben tomarse en cuenta los siguientes aspectos: • Se debe contar con una autoridad local que sea reconocida y respaldada por la comunidad, y que a su vez haga valer las normas consuetudinarias acompañadas de herramientas técnicas de manejo forestal. • Considerar un programa de capacitación técnica que les permita a los comunitarios entender y acompañar en campo el manejo forestal sostenible. • Es fundamental alinear el conocimiento técnico con el conocimiento local, por lo que es importante conformar equipos técnicos con personal originario de la región. • En el área muchas comunidades se oponen al manejo forestal argumentando que hace grave daño al bosque. De hecho, hay informes que en las restantes parcialidades del departamento de Totonicapán no se han podido implementar los planes de manejo en la misma forma (FAO, 2010).
Escalabilidad	Para alcanzar toda el área que es propiedad de la parcialidad, hace falta la restauración forestal de 211 hectáreas que actualmente están siendo utilizadas con fines agrícolas. Aunque existe buena voluntad de las comunidades para realizar el cambio de uso del suelo, es problemático ya que el área provee de alimentos a algunos de los comunitarios, por lo que este será un proceso que llevará tiempo para implementarse.
Sostenibilidad	• La sostenibilidad de la práctica se debe a una institucionalidad fuerte, la que a través de la junta directiva de la parcialidad los Vicentes ha promovido el manejo forestal sostenible. Dentro de este tema, otro factor importante es la participación de la comunidad que aporta su mano de obra para la implementación de dicho plan manejo del bosque. • La generación de ingresos, y la provisión de recursos (como madera y leña) son aspectos importantes para la sostenibilidad de la iniciativa, ya que promueven la mejora de los medios de vida. • El crecimiento poblacional de la zona hace que se incremente la necesidad de tierras para agricultura, lo que en un futuro cercano empezará a hacer presión sobre el bosque.
Conclusiones	• La combinación de una institucionalidad fuerte, acompañada de instrumentos técnicos y financieros es una combinación que ha demostrado que el manejo forestal comunitario es posible en el altiplano guatemalteco.

Elementos	Descripción
	Aunque no se cuenta con estudios hidrológicos que demuestren la relación bosque-agua, las comunidades creen firmemente que el bosque de la parcialidad es responsable del abastecimiento del agua lo que, unido a prácticas de manejo e incentivos forestales, han hecho que los habitantes de la parcialidad Vicentes protejan su bosque.
Información del contacto en campo.	- Sr. Marvin Camposeco, Técnico Forestal Helvetas, Celular 4076 9066 - Sr. Daniel Vicente, Alcalde Auxiliar, aldea San Vicente Buenabaj, Celular 4980 2074

Fuente: Elaboración propia.

La administración y gestión de los recursos naturales de Totonicapán por la Asociación de Alcaldes Comunales de los 48 Cantones, se detalla en el Cuadro 5.

Cuadro 5. Administración y gestión de los recursos naturales de Totonicapán por la Asociación de Alcaldes Comunales de los 48 Cantones

Elementos	Descripción
Objetivos	- Proteger 1,200 manantiales para abastecer a 110 comunidades que dependen de los recursos hídricos de los bosques comunitarios. - Promover el cumplimiento eficiente de las consignas, normas y reglamentos de las comunidades, así como la legislación y normatividad ambiental para garantizar el adecuado uso y manejo del bosque comunal.
Localización	El municipio de Totonicapán y cabecera del departamento tiene una población de 134,373 habitantes del grupo sociolingüístico Maya K'iche'. El 66% vive en pobreza y el 14% en pobreza extrema. Su altitud es de 2,495 msnm, temperatura media de 12 grados centígrados y una precipitación media anual de 1,000 a 1,500 mm. Dista a 203 km de la ciudad de Guatemala. La ubicación de Totonicapán aparece a continuación: 
Descripción y tiempo de duración de la práctica en el sitio.	El Consejo de Alcaldes de los 48 cantones de Totonicapán es una organización comunitaria sin fines de lucro, integrada por 1,900 voluntarios al servicio de 110 comunidades. Su propósito principal es afirmar y defender los derechos de sus habitantes, asegurar el acceso del agua a más de 50,000 personas y conservar 21,043 hectáreas de bosque comunal. La Asociación Alcaldes Comunales de los 48 Cantones, se fundamenta en el cumplimiento de consignas ancestrales trasladadas de generación en generación, que le ha permitido mantener en secreto el significado del poder, y así ha legitimado y preservado la unión del pueblo como una forma de expresar su

Elementos	Descripción
	identidad inconfundible en el ámbito nacional, pues su sistema político territorial, organización social y divinización de su poder ancestral se recompone ante la imposición de otro orden social centralizado, jerárquico, vertical, autoritario y prepotente de poder (Saquimux Castuj, V. 2009) La buena práctica ha estado funcionando desde hace más de 250 años. La Asociación está integrada por cinco Juntas Directivas independientes pero altamente coordinadas (Junta de los Recursos Naturales, de Alguaciles, de alcaldes Comunales, de Baños Termales y 2 juntas directivas de alguaciles (Junta de alguaciles primera quincena, Junta de alguaciles segunda quincena). Los cargos para dichos puestos, se realizan como servicio voluntario (k'axk'ol). La protección, vigilancia y conservación de los recursos naturales está a cargo de la Junta Directiva de Recursos Naturales la cual fue creada en el 2,007. Sus principales responsabilidades son cuidar, conservar y manejar los recursos naturales de 22,266 hectáreas (497 caballerías) del pueblo Maya K'iche' de Totonicapán. Dentro de este territorio se localiza el área protegida Parque Regional los Altos de San Miguel Totonicapán. Las operaciones de campo vinculadas con el bosque y las fuentes de agua (captación, limpieza distribución, reparaciones, control del servicio, etc.) son realizadas a través del servicio voluntario de cada habitante (con edad mayor de 18 años), el cual comprende de un año calendario y se repite cada diez años. Personas 60 años de edad se excluyen del servicio. En Totonicapán, la “ciudadanía cantonal” depende del cumplimiento de una serie de obligaciones hacia la comunidad como tal. Si el hombre no presta su servicio, pierde respeto y por lo tanto también sus derechos (Ochoa, C. s. f.) Actualmente la Junta Directiva de Recursos Naturales cuenta con un Plan Estratégico que define los lineamientos de trabajo según los objetivos de conservación y las normas consuetudinarias establecidas. Las normas establecidas para la conservación del bosque y que se rigen por derecho consuetudinario son: • PIXAB: Los abuelos y abuelas dicen que debemos de cuidar y conservar el bosque. • PIXAB: Los abuelos y abuelas deben de enseñar a sus nietos y nietas que es malo cortar árboles cuando son pequeños o cuando son muy jóvenes • PIXAN: los abuelos y las abuelas deben orientar a los niños y niñas sobre el uso correcto del agua. • PIXAB: Los comités de agua, las autoridades comunitarias y familiares, deben de transmitir de manera permanente el Pixab. • PIXAB: Los abuelos y abuelas, padres o madres de familia que van a la montaña no deben de permitir que los niños y niñas lleven machete y fósforos, ya que por curiosidad y travesuras pasen cortando un árbol pequeño o provocar un incendio. • TOJ: Debemos de demostrar nuestro agradecimiento con el Ajaw por medio de un Toj. • TOJ: Antes de cortar un árbol en el bosque, debemos de pedir permiso al Ajaw del bosque. • REPUJ: No desperdiciar el agua, debe de usarse de una forma equilibrada.

Elementos	Descripción
	• RAWASIL – TEWECHIB’AL: Debemos de recordar que si queremos recibir todo con abundancia debe de existir respeto por la unidad de la montaña y cada uno de sus elementos árboles, animales, plantas silvestres, agua. • EL AJAW DEL AGUA: Las mujeres que quieran integrarse a un comité deben de pedirle permiso a los ancestros para que la relación del agua con ellas sea positiva, ya que el Ajaw del agua es una mujer. • APROVECHAMIENTO DE LOS RECURSOS DEL BOSQUE: La leña que se recoge del bosque debe de ser ramas secas. • RESPETO AL BOSQUE: No se debe de utilizar sierras que dañan el bosque. • ORGANIZACIÓN SOCIAL: Todas las personas que son miembros del comité deben ocupar cargos directivos. • RESPETO AL AGUA: Todos debemos de ver al agua como un recurso fundamental de la vida. • RESPONSABILIDAD DE LA ORGANIZACIÓN: La Junta Directiva de los 48 Cantones, a través de su Junta Directiva de Recursos Naturales, debe proteger los recursos naturales del municipio de Totonicapán • COMPROMISOS DE TODOS LOS K’ICHE’S: No debemos de permitir que se pierda el conocimiento de nuestros ancestros (memoria tradicional), porque son la base de la existencia en la vida. Los derechos individuales dentro de tierras comunales están sujetos a regulaciones comunitarias siguientes: • No es permitido asentamientos humanos. • Es prohibido abrir caminos dentro del bosque comunal. • El aprovechamiento de los recursos forestales debe ser autorizado por la autoridad comunitaria. Las comunidades (cantones y caseríos) están en la periferia del bosque comunal, rodeándolo como cinturón protector. • Cada familia puede cortar un solo árbol al año para subsistencia. • La extracción de ocote se realiza en áreas seleccionadas en las partes bajas de las montañas, en donde se practica la regeneración artificial. Las comunidades van repoblando el bosque en los sitios que quedan libres por la muerte de los árboles. • Todo beneficiario de agua potable proveniente de los manantiales del bosque, tiene la obligación de sembrar y cuidar 10 árboles anualmente, de lo contrario será sujeto de sanciones” (Tzaquitza, Ixchiú, Tíu, 2000; CEEI, EcoLogic. s f.). Las infracciones más frecuentes corresponden a la tala sin permiso. A las personas capturadas <i>in fraganti</i>, se les decomisa las herramientas y deben pagar una multa. Generalmente las sanciones se pagan en trabajo gratuito comunitario y se producen sanciones de orden moral. La vigilancia de los bosques está a cargo de guardabosques voluntarios y en el caso del agua por fontaneros. Las acciones que han permitido conservar el bosque y cuidar los 1,200 manantiales son: • Establecimiento de viveros forestales en ocho invernaderos adoptando tecnologías nuevas en las cuales resalta el involucramiento de las comunidades en la producción de árboles. • La vigilancia y control constante del bosque por parte de los delegados o

Elementos	Descripción
	guardabosques con reforzamiento en diciembre para la protección del Pinabete. • Involucramiento de las comunidades por medio de autoridades, escuelas, comités de agua para reforestar diferentes puntos dentro del Bosque Comunal. • Sensibilización de la población a través de eventos como “La Semana Verde” y actividades de educación ambiental directamente en escuelas o con maestros-as. • Reconocimiento de los límites territoriales con presencia de autoridades comunitarias, así como la lectura de documentos ancestrales, legales y actuales. • Capacitaciones para el fortalecimiento de capacidades y conocimientos de Delegados de Recursos Naturales. • Reuniones semanales y asambleas entre Delegados de Recursos Naturales. • Coordinación entre las cinco Juntas Directivas. • Reuniones de coordinación institucional con apoyo técnico y financiera a las juntas directivas en acciones específicas. En relación al agua se estima que hay más de 60 comités quienes son los responsables de administrar el recurso. Cada uno tiene su propio reglamento, aunque con muy pocas diferencias. Entre algunas normas establecidas están: La venta del chorro solo se permite si la persona ya hizo su servicio voluntario y en este caso debe de dejar del 5% al 10% al Comité de agua. Generalmente hay dos beneficiarios por cada paja de agua. No está permitido el uso del agua para riego, ni usar manguera para lavar carros, regalar agua a desconocidos (solo dos tinajas), no entregar agua a las familias que ya han sido sancionadas por el comité. Los comités se reúnen ocho veces al año. No existe tarifa de cobro por el consumo de agua debido a que todos participaron en el desarrollo del proyecto. La mayoría (90%) no aforan ni monitorean el caudal de agua, ni realizan pruebas de calidad (análisis químico y bacteriológico).
Actores involucrados	Los actores involucrados son principalmente la población de los 48 cantones de Totonicapán (aproximadamente 130,000 habitantes). Entre las organizaciones acompañantes de los procesos de gestión de la Asociación están Helvetas (ONG Suiza), Instituto Nacional de Bosques, Asociación Ut'z che', Ministerio de Salud Pública y Asistencia Social, Consejo Nacional de Áreas Protegidas, Ministerio de Ambiente y Recursos Naturales. La cooperación está enfocada a apoyar a la Asociación de los 48 cantones en la formulación de estrategias para mejorar las condiciones de vida de la población, fortalecer procesos de sensibilización de la población y desarrollar capacitaciones de acuerdo a las necesidades definidas por la Asociación.
Eficacia	La gestión comunitaria ha sido altamente eficiente conservando y protegiendo las fuentes de agua y el bosque comunal. La organización comunitaria tiene alto poder de convocatoria para luchar en defensa de su patrimonio natural (agua, bosque, suelo, etc.).
Impacto	El bosque comunal se ha mantenido a pesar de las presiones de crecimiento de la población y la mayor demanda de alimentos. La organización comunal ha regulado de manera participativa y consuetudinaria, el acceso y la disponibilidad del agua potable a

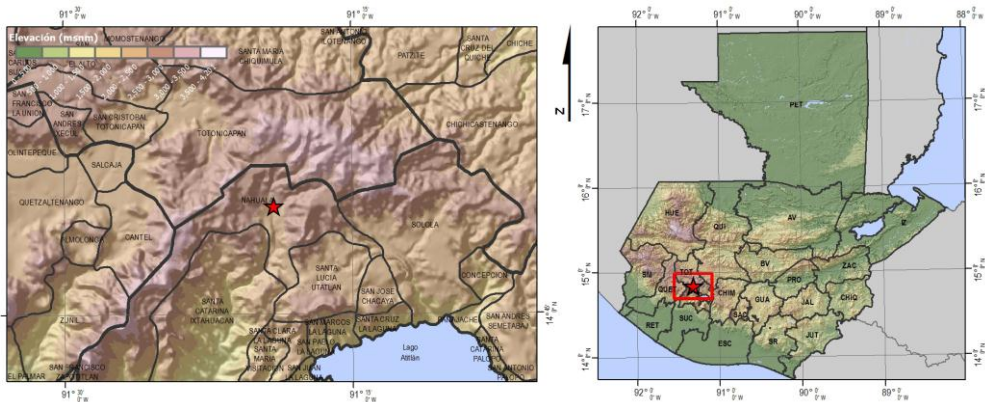
Elementos	Descripción
	través de la conservación del ecosistema natural del bosque comunal.
Factores de éxito	• El modelo de organización comunitaria de los 48 cantones. • La tradición oral de respeto en nombre de los ancestros Maya K'iche'. • Servicio Voluntario k'axk'ol
Limitaciones	• Apoyo de la municipalidad local. Existe una limitada coordinación con las autoridades locales. Generalmente la Asociación emite acuerdos y exige que se respeten. • Colaboración comunitaria. Actualmente solo 25 cantones participan activamente, por lo que se hacen los esfuerzos para integrar al resto de cantones. • Elecciones anuales de la Junta Directiva de Recursos Naturales. Los nuevos integrantes requieren de un tiempo prudencial para ponerse al tanto sobre las situaciones que afectan o amenazan la conservación del bosque. Esta situación causa dilación de los procesos, aunque las elecciones tienen la ventaja de ser altamente democráticas. • Limitados recursos financieros: La estrategia y planes de acción se coordinan con organizaciones afines a la conservación de los recursos naturales. • Aspectos políticos: Se afronta división de las comunidades derivadas de la influencia de partidos políticos.
Lecciones aprendidas	• Las reglas y sanciones establecidas e implementadas por la Asociación de los 48 Cantones, revela la importancia que dan a los recursos agua y al bosque. • Las normas consuetudinarias establecidas desde tiempos ancestrales tienen alto respeto por todos los comunitarios y por lo tanto, permiten la gestión de conservación participativa en honra a sus ancestros. • Cuando existen problemas mayores con los violadores a los principios consuetudinarios (deforestación), la Organización procede a coordinar esfuerzos con DIPRONA y con la Procuraduría de los Derechos Humanos, informando sobre el caso a las autoridades municipales.
Transferibilidad	La buena práctica puede transferirse parcialmente a otras regiones, pero requiere de la existencia de una buena organización comunitaria que vele por el patrimonio natural del territorio. Actividades campesino a campesino como el intercambio de experiencias podrían acelerar los procesos de transferencia.
Escalabilidad	La organización comunitaria de los 48 cantones puede parcialmente ser llevada a otros territorios y a mayor escala, especialmente en cuanto a las regulaciones sobre el uso del bosque, la prestación del servicio voluntario ligado a la prestación del servicio del agua. Existen comunidades que tienen principios similares, retribuyendo en trabajo el servicio de agua potable.
Sostenibilidad	Desde el punto de vista social y cultural, las normas consuetudinarias son respetadas y aceptadas por la población, delegando en La Junta Directiva de Recursos Naturales y las Autoridades de los 48 Cantones todo lo relacionado con su aplicación. El servicio voluntario para participar en las juntas directivas, así como en las faenas establecidas por las Directivas más que una obligación es un alto honor en memoria a sus ancestros. Estos elementos indican que la práctica continuará debido a su alta penetración y práctica comunitaria. Desde el punto de vista económico, la estructura horizontal de la Asociación de los 48 Cantones no busca beneficios ni intereses económicos y por lo tanto, no maneja

Elementos	Descripción
	fondos. El servicio voluntario es efectivo (controlado por los propios comunitarios) para efectuar los trabajos necesarios. En su defecto, se hace apoyar de organizaciones amigas, siempre y cuando se acoplen a los principios y valores establecidos por las autoridades comunitarias. Los principios y estructura organizacional, así como las prácticas implementadas son ecológicamente compatibles y beneficiosos para la población. La existencia de un plan estratégico de conservación y búsqueda de alternativas para mejorar las condiciones de vida de la población rural constituye un paso esencial y necesario para reducir la presión de la población hacia el bosque.
Conclusiones	El sistema organizativo comunal de los 48 cantones de Totonicapán ha conservado los recursos naturales del municipio, regulando su uso basado en normas consuetudinarias. La estructura local ha garantizado el acceso y disponibilidad al recurso hídrico a pesar de la presión demográfica y la difícil situación económica que afronta la población rural. Actualmente el municipio tiene 55% de su territorio con áreas protegidas. El nivel de conciencia de los pobladores es muy amplio para participar en las distintas actividades que son designadas por las autoridades comunitarias, lo cual permite mantener los esfuerzos de conservación de las fuentes de agua y la cobertura forestal. La actual Junta Directiva de los Recursos Naturales tiene una clara visión del trabajo de conservación y ha suscrito convenios de cooperación con varias organizaciones afines a sus principios y valores. Debido a los efectos de la variabilidad climática, es necesario que la Asociación implemente un programa de monitoreo de caudales y calidad de agua de los nacimientos. Las pruebas de calidad deberán de realizarse en coordinación con el Ministerio de Salud Pública. También programas efectivos de reforestación de las áreas degradadas. La gestión integrada en la administración del bosque y del recurso hídrico deberá de ampliarse a la búsqueda de alternativas que reduzcan la presión de la población hacia el bosque a través de programas de estufas ahorradoras de leña, proyectos productivos no maderables, artesanales, etc., especialmente de las comunidades más pobres y cercanas al bosque.
Información del contacto en campo	Andrea Ixchíu. Presidenta de la Junta Directiva de Recursos Naturales. Celular 47335999. Email: andrea.ixchiu@gmail.com Germán García. Delegado del CONAP. Celular 59075611. sidgamora@hotmail.com. Rufino Zapeta. Técnico Social de Helvetas en Totonicapán. Celular 55874741.

Fuente: Elaboración propia.

El Cuadro 6 muestra la descripción de la protección de bosques para el abastecimiento hídrico en la subcuenca del Río Ixtacapa.

Cuadro 6. Protección de bosques para el abastecimiento hídrico en la subcuenca del Río Ixtacapa

Elementos	Descripción
Objetivos	El objetivo de la práctica es recuperar y resguardar 900 hectáreas del bosque ubicado en la subcuenca del río Ixtacapa, con el fin de garantizar la disponibilidad de agua para satisfacer las necesidades de las comunidades que habitan en la subcuenca, así como el uso en actividades agrícolas e industriales.
Localización	La buena práctica se lleva a cabo en la subcuenca del río Ixtacapa, que está ubicada en los departamentos de Quetzaltenango, Sololá y Suchitepéquez. El río nace en la cima de los volcanes Santo Tomás Pecul y Zunil y realiza un recorrido de 60 kilómetros hasta llegar al río Nahualate y fluye hacia la costa del pacífico. La precipitación pluvial en su punto más bajo 80 msnm oscila entre 1,500-2,000 mm al año y en una parte más alta 1,000-2,000 msnm oscila entre 4,000-4,500 mm al año. La temperatura anual varía entre 15 a 25 °C. A continuación, se ilustra la localización de la experiencia de manejo integrado de la cuenca Ixtacapa. 
Descripción y tiempo de funcionamiento de la práctica en el sitio.	El bosque de la cabecera de la microcuenca del río Ixtacapa tiene una extensión aproximada de 2,000 hectáreas, y cuenta con catorce fuentes de agua que, en conjunto transportan 2.28m³/seg en época de estiaje. El agua abastece a usuarios domésticos (aproximadamente 90,000 habitantes) y agrícolas y agroindustriales (de caña de azúcar) que se localizan en la parte media y baja de la subcuenca, así como a las nueve comunidades (4,500 habitantes) de la parte alta que cuidan el bosque. En el año de 1998, nueve comunidades (Tzamjuyub, Pacaman, Chirijsacasiguan, Pajá, Pakim, Pasaquijuyub, Chuicha, Chuattarras, Sacasiguan), preocupadas por la reducción de los caudales de las fuentes de agua, establecieron viveros para hacer reforestaciones con el fin de proteger los recursos hídricos. En 2005 las comunidades gestionan ante la municipalidad de Nahualá un usufructo 900 hectáreas, con el objetivo de ingresarlas en Programa Piloto de Apoyos Forestales Directas (PPAFD) para su protección.

Elementos	Descripción
	El PPAFD era un programa del Ministerio de Agricultura, Ganadería y Alimentación (MAGA), cuyo objetivo compensar económicamente los servicios ambientales que brindan los bosques, en posesión de los sectores que no tienen acceso al Programa de Incentivos Forestales –PINFOR– por falta de certeza jurídica en la tenencia de la tierra. El PPAFD se enfocaba en áreas ambientalmente estratégicas del altiplano central y occidental de Guatemala, y el incentivo consistía en un pago de aproximadamente Q400/ha/año por la protección del bosque y tenía una duración de cinco años. En 2006 el Ingenio Palo Gordo comprende la importancia de la conservación del bosque para el abastecimiento de agua y realiza aportes de maíz, frijol y herramientas a las comunidades, en reconocimiento de la labor que habían desempeñado para proteger el bosque. En 2007 los usuarios del agua de la parte media y baja de la cuenca empiezan a tener problemas de agua y se organizan para unir con las comunidades de la parte alta. Este grupo de usuarios está integrado por cinco municipalidades del departamento de Suchitepéquez con una población de 90,000 habitantes (San Pablo Jocopilas, San Bernardino, Samayac, San Antonio Suchitepéquez y San José el Ídolo) y seis fincas privadas (López, 2009). En 2008 se conforma legalmente la Asociación Amigos del Río Ixtacapa –AADRI-, que es un grupo de la sociedad civil, no lucrativa, sin afiliación política, ni religiosa, y cuyo objetivo es la recuperación y conservación de la subcuenca. En ese mismo año se contrata a un profesional en recursos hídricos para que guíe el trabajo de la asociación. Así mismo se elaboró un Plan Estratégico para los años 2009-2012 y se abrieron dos oficinas, una oficina técnica en una de las comunidades de la parte alta y la otra oficina en San Antonio Suchitepéquez, que es la sede de la asociación. Los costos de funcionamiento son cubiertos por las municipalidades y usuarios de la parte media y baja de la subcuenca. La asociación está integrada por un presidente, un vicepresidente, un secretario, un tesorero y tres vocales. Además, cuenta con un técnico forestal, una técnica social y un

Elementos	Descripción
	promotor forestal que son los encargados de monitorear los avances de los planes operativos y del cumplimiento de las metas (Guerra y Reyes, 2009). Entre el 2005 al 2010 los costos de protección, reforestación y funcionamiento técnico eran cubiertos con el incentivo del PPAFD que era de Q 350,000 al año. A partir del 2008 los usuarios del agua a través de AADRI hacen un pago de Q 243,000 para compensar a los proveedores de la parte alta de la cuenca. La actividades realizadas son la protección de bosques (a través de rondas corta fuegos, control de incendios, y patrullajes constantes), reforestación, conservación de suelos y protección de fuentes de agua. Desde que el incentivo del PPAFD terminó el único aporte monetario que se tiene es el AADRI, y cubre los costos del personal técnico y su movilización en la cuenca, así como algunas capacitaciones. Es por esto que las actividades de protección de bosques, reforestación y protección de fuentes de agua son realizadas por 18 guardabosques comunitarios que trabajan ad honorem. Cada comunidad aporta dos guardabosques que prestan servicio voluntario durante 2 años. Así mismo AADRI hace aportes en especie para mejorar la salud de las comunidades que protegen el bosque.
Actores involucrados	Programa de Apoyos Forestales Directos: era un componente del Programa de Reconversión Productiva Agroalimentaria (PARPA) del Ministerio de Agricultura, Ganadería y Alimentación (MAGA), que dio un incentivo para la conservación de bosques durante cinco años, el cual sirvió como impulso inicial del proceso. Proveedores del agua: este grupo está constituido 4,500 personas de las comunidades Tzamjuyub, Pacaman, Chirijacasiguan, Pajá, Pakim, Pasaquijuyub, Chuicha, Chuattarras, Sacasiguan, y son los encargados legales de 900 hectáreas de bosques donde se localizan catorce nacimientos que abastecen de agua para consumo doméstico y agroindustrial en la parte media y baja de la subcuenca. Usuarios del agua: aquí se ubican a los municipios de San Pablo Jocopilas, San Bernardino, Samayac, San Antonio, Suchitepéquez, San José el Ídolo, del departamento, de Suchitepéquez; seis fincas privadas y el ingenio Palo Gordo, que se localizan en la parte media y baja de la cuenca, y que hacen uso del agua para el cultivo de caña de azúcar, hule, producción de ganado bovino, producción de peces (tilapia) y turismo. Asociación de Amigos del Río Ixtacapa (AADRI): está integrada por los proveedores y usuarios del agua.
Eficacia	El objetivo de la práctica es la protección del macizo forestal de la subcuenca Ixtacapa con el fin de garantizar la disponibilidad de agua para usos doméstico, agrícola y agroindustrial. A la fecha se ha logrado la protección de 900 hectáreas de bosque, pero no se cuenta con estudios hidrológicos que demuestren la relación entre protección del bosque y abastecimiento de agua.
Impacto	En el período 2005-2010 el PPAFD invirtió aproximadamente Q1,750,000 por concepto de incentivo para la conservación de bosques. Este dinero fue repartido equitativamente entre las nueve comunidades para compensar económicamente a los comunitarios que aportaron su mano de obra en el proceso de conservación

Elementos	Descripción
	(aproximadamente Q38,000 por comunidad por año), lo que generó bienestar en los hogares. Además, los miembros de AADRI hacen un pago de Q 243,000 al año, que sirve para sostener un equipo técnico que es el responsable del manejo del bosque, así mismo han instalado un vivero de bandejas con un capacidad de 11,000 plantas al año. También hacen aportes en especie para mejorar las condiciones de salud a través de un centro de convergencia, una farmacia, y una clínica que brinda asistencia médica.
Factores de éxito	• Los habitantes de las nueve comunidades también se abastecen del agua proveniente del bosque, lo que es el principal motor para la conservación de los macizos forestales. • Para desarrollar el proceso, el PPAFD concientizó a los representantes de las comunidades a través de información básica como estudios de pérdida de suelos, aforos, maquetas y mapas, simultáneamente se montaron procesos de diseminación de información en la comunidad, lo que creó conciencia de la importancia del bosque para la protección del recurso hídrico. • La buena organización de las comunidades que habitan en la parte alta de la subcuenca del río Ixtacapa les permitió la obtención de un derecho de usufructo que les permitió acceder a los incentivos de protección forestal del PPAFD. • El seguimiento que dio AADRI al programa de incentivos del PPAFD fue fundamental para que la iniciativa siguiera funcionando. • Cuentan con instrumentos técnicos y personal especializado para dirigir las actividades de conservación y manejo del bosque, lo cual asegura la solidez de la implementación de acciones en campo. • No obstante que uno de los mayores problemas en la zona es la distribución inequitativa del agua, principalmente en los usuarios que utilizan el agua para la producción agrícola e industrial (azúcar, fundamentalmente), la asociación juega un rol de mediador para la solución de conflictos, en el futuro cercano se espera desarrollar un reglamento para la regulación del uso del recurso. • Organización en torno al agua incluye a la mayoría de los actores que hacen uso del recurso, lo que facilita los espacios de discusión y resolución de conflictos.
Limitaciones	• Desde un punto de vista económico se puede decir que una gran limitación es que el pago realizado por los usuarios sólo cubre los costos del personal técnico y de capacitaciones, y no cubre los costos del servicio ambiental. Aunque desde el punto de vista social, esto no es una limitante, ya que el pago es un elemento extra que se recibe por actividades que las comunidades de la parte alta van a tener que realizar de cualquier manera. • Aunque se han realizado mediciones del caudal del río en varios puntos estratégicos, no existe un estudio que demuestre la relación bosque agua. • Debido a que las comunidades no poseen documentos legales que les garanticen la propiedad del bosque, no pueden introducirlo en el PINFOR.
Lecciones aprendidas	• Los proyectos de incentivos por la protección de los bosques como el Proyecto Piloto de Apoyos Forestales Directos –PPAFD- han sido importantes para las comunidades, ya que por medio de estos fondos ha podido mantener, recuperar y proteger sus bosques. Aunque debido a que son incentivos con un período de tiempo relativamente corto (cinco años) su sostenibilidad es cuestionable. • Mientras estuvo el PPAFD el proyecto funcionaba por un incentivo económico basado en el costo de oportunidad del maíz, pero actualmente funciona gracias a

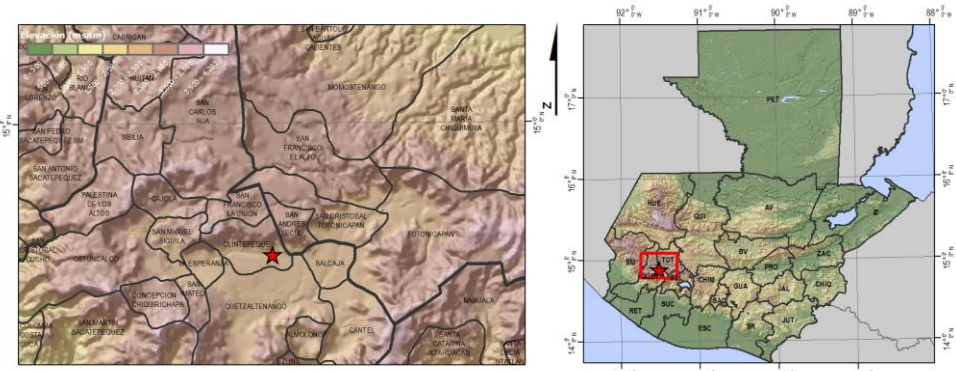
Elementos	Descripción
	arreglos sociales que se apoyan en pequeños incentivos en especie y asistencia técnica.
Transferibilidad	La experiencia puede ser transferida a otros sitios en el altiplano occidental, pero es importante tener en cuenta lo siguiente: • Los dueños de los bosques que proporcionan el agua también deben hacer uso del recurso hídrico que están protegiendo. • Para articular a los distintos usuarios del agua en torno a la protección del bosque, se debe contar con un ente con credibilidad que presente información sólida y que desarrolle procesos de capacitación (en el caso del presente caso este ente fue el MAGA a través del PPAFD). • Es fundamental un acompañamiento profesional y técnico permanente, que dé seguimiento al proceso. • El funcionamiento de la iniciativa tiene un costo Q230,000/año (en este rubro se incluyen los gastos de personal, reuniones, capacitaciones y transporte). Además para conformar y legalizar la AADRI, así como para dotarla de equipo de oficina y para instalar un vivero y equipo de trabajo para la protección del bosque se requirieron Q300,000.
Escalabilidad	Según los entrevistados, la experiencia debería de implementarse a nivel de subcuenca y no sólo proteger 900 hectáreas bosque. Pero para aumentar la escala se requiere de tiempo y capacidad financiera, por lo que lo más probable es que la iniciativa no aumente su escala.
Sostenibilidad	• La experiencia es sostenible y se seguirá implementando en el futuro debido a que las comunidades de la parte alta consideran que es fundamental la protección del bosque para asegurar la disponibilidad de agua que ellos mismos consumen. • Si bien es cierto que el esquema actual de compensación les ofrece una serie de beneficios adicionales por actividades que deben realizar de todas formas, los aportes que hacen los usuarios a través de AADRI sirven para sostener un equipo técnico que apoya y supervisa el trabajo voluntario de las comunidades para la protección del bosque, lo cual da solidez al momento de la implementación de los procesos en campo. Por otro lado, los aportes en especie para el mejoramiento de la salud en las comunidades es considerado una ayuda fundamental por parte de los comunitarios.
Conclusiones	• Este caso demuestra que la conservación de los macizos forestales comunitarios es posible a través de esfuerzos de la sociedad civil organizada. Pero es necesario tomar en cuenta que debe existir una necesidad común en torno a la cual se aglutinen los actores sociales; en este caso, fue la escasez de agua y la necesidad de reforestar y proteger el bosque por su función en la regulación del ciclo hidrológico. • Los incentivos para la protección del bosque fueron un catalizador gracias al cual se consolidó el proceso, en el cual los proveedores y usuarios se organizaron para trabajar conjuntamente. • Aunque actualmente se trabaja con un monto que no cubre los costos de protección del bosque, la necesidad de agua de los habitantes de la parte alta hace que la asistencia técnica y los pagos en especie sean un complemento satisfactorio para las actividades de conservación que abastecen de agua tanto a los habitantes de la parte alta, media y baja.
Información del contacto	• Sr. Diego Perechú Tzoc Integrante de la Asociación, Celular 4064-5794. E-mail: diegotzoc5@hotmail.com

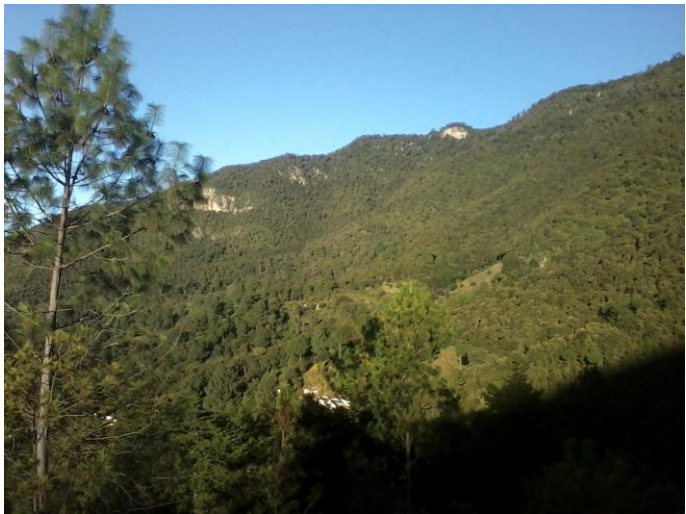
Elementos	Descripción
en campo.	Sr. Ottoniel Ixmatá Tambríz, Promotor Forestal. E-mail: tecnioto55@hotmail.com; ottonielixmatatambriz@gmail.com.

Fuente: Elaboración propia.

El Cuadro 7 muestra la descripción del manejo forestal municipal para el abastecimiento del recurso hídrico en San Juan Olintepeque, Quetzaltenango.

Cuadro 7. Manejo forestal municipal para el abastecimiento del recurso hídrico en San Juan Olintepeque, Quetzaltenango

Elemento	Descripción
Objetivos	El objetivo de esta práctica es proteger y conservar el bosque municipal de Olintepeque para garantizar la disponibilidad de agua en cantidad y calidad a la población.
Localización	La Oficina Forestal Municipal se localiza en San Juan Olintepeque, Quetzaltenango. Este municipio tiene una superficie de 36 km², una población aproximada de 33,000 habitantes y se habla el k'iche' y el español; está ubicado a una altura de 2,350 msnm y anualmente precipitan entre 800 a 900 mm de lluvia. A continuación se muestra la ubicación de la experiencia que se está analizando. 

Elemento	Descripción
Descripción y tiempo de funcionamiento de la práctica en el sitio.	El bosque municipal de Olinstepeque fue registrado el 20 de abril de 1888 en el Segundo Registro de la Propiedad con el nombre de Ejidos del pueblo de San Juan Olinstepeque, con el número de finca 7,203, en el libro 51 y folio 146. Con el objetivo de proteger y administrar el bosque municipal, en 1973 se conformó una Comisión Municipal de Medio Ambiente, la que estaba integrada por un representante de cada aldea, cantón y caserío del municipio. Pero por presiones de habitantes que hacían uso de los recursos forestales la comisión abandonó su labor en 1980. En el 2000 se inician conversaciones entre la municipalidad y Helvetas para montar la oficina forestal municipal y para hacer un manejo sostenible del bosque (Municipalidad de Olinstepeque, 2012). En el 2006, con apoyo de Helvetas, se crea la Oficina Forestal Municipal de Olinstepeque, con el objetivo de proteger, conservar y manejar sosteniblemente el bosque municipal, que tiene una extensión de 1,376 hectáreas. Actualmente la oficina cuenta con un técnico forestal, 10 guardabosques y un educador ambiental (Helvetas, 2007). Para implementar acciones, la oficina cuenta con un Plan de Manejo Forestal que fue elaborado conjuntamente con Helvetas a través de un proceso participativo. Dentro de las principales actividades que realiza la oficina para el mantenimiento del bosque se encuentran: la construcción y mantenimiento de brechas cortafuego para el control de incendios forestales, la reforestación en áreas sin cobertura forestal y en áreas degradadas, producción de plantas en vivero municipal, control y vigilancia, aprovechamiento selectivo, podas y raleos. Para fomentar la conciencia ecológica y generar conciencia de la importancia del bosque y los recursos naturales del municipio, la oficina forestal municipal junto con Helvetas dan capacitaciones sobre contaminación, la importancia de los bosques, el ciclo hidrológico, el reciclaje y el medio ambiente. La municipalidad de Olinstepeque cuenta con un vivero forestal municipal con capacidad para producir 56,000 plantas al año. 

Elemento	Descripción
	 Fuente: Oficina Forestal Municipal, 2013. En 2012 el INAB realizó un estudio hidrológico que, como se verá más adelante, indica que el bosque es fundamental para el abastecimiento de agua. Este estudio servirá de base para desarrollar un esquema de pagos por servicios ambientales, en el que los usuarios del agua pagarán a la municipalidad para que ésta proteja el bosque y aumente su cobertura. Aunque el proyecto ya está aprobado por la municipalidad todavía está su negociación con los usuarios del agua. Dentro del funcionamiento del mecanismo se contempla que los habitantes tendrán que apoyar con trabajo voluntario un día al año, y las actividades a realizar serán las establecidas en el plan de manejo. A la fecha ya se informó a los comités de agua potable y en las asambleas comunitarias, y ellos están de acuerdo con lo planteado. Debido a que los habitantes de las zonas urbanas en su mayoría tienen trabajos fijos, no pueden proporcionar su mano de obra, por lo que tendrán que aportar una cuota mensual de Q8.33 por usuario. El dinero servirá para el pago de los trabajadores que cuidan el bosque y también para establecer un fondo que permita comprar más tierras para incrementar el área boscosa. Para garantizar el pago, este se incluirá dentro de la cuota mensual del servicio de agua potable, con lo cual se espera recaudar Q16,660 mensuales.
Actores involucrados	• El Alcalde y el Concejo Municipal de Olinstepeque, son los encargados de avalar las actividades de la oficina y brindan los recursos necesarios para el funcionamiento de la misma. La Comisión Municipal de Medio Ambiente, es el vínculo directo entre la oficina y el Concejo Municipal y canaliza las necesidades e iniciativas de la oficina forestal municipal. • <i>Helvetas Swiss Intercooperation</i>: ha apoyado a la oficina forestal municipal para que realice la buena práctica de manejo forestal, a través de la donación de equipo de cómputo y oficina, insumos, herramientas, así como asesoría técnica y capacitación al técnico de la oficina forestal en manejo forestal, técnicas de conservación de suelos, control de plagas forestales, evaluación de incendios forestales, sistemas de información geográfica, y resolución de conflictos. Así mismo, ha dado capacitaciones a los guardabosques en medición forestal y uso de los instrumentos, técnicas de poda, raleo y corta selectiva, manejo de plagas y enfermedades, cubicación de madera y leña, técnicas de conservación de suelo, métodos de prevención y combate de incendios. • Instituto Nacional de Bosques: ha dado apoyo a través de incentivos forestales

Elemento	Descripción
	de conservación para 110.5 hectáreas de bosque. Dicho apoyo ha permitido a la Oficina contar con fondos para cubrir parte de los gastos para la protección del bosque. También ha realizado el estudio hidrológico del Bosque Municipal de Olinstepeque.
Eficacia	Con la práctica se está protegiendo y conservando el bosque municipal de Olinstepeque para garantizar la disponibilidad de agua en cantidad y calidad a la población. El estudio hidrológico demuestra que el bosque promueve la captación de 3.4 millones de m³/año de agua. En relación a la función del bosque para la adaptación al cambio climático, se puede mencionar que el estudio hidrológico indica que este protege el suelo y previene derrumbes y deslizamientos, especialmente en las zonas de ladera (donde se ubica el 66 % del bosque). Así mismo el bosque favorece la infiltración y reduce la escorrentía en la parte media y baja de los ríos Xequijel y Pabacul, que son tributarios del río Samalá.
Impacto	El estudio hidrológico demuestra que la cobertura forestal tiene un impacto directo en el abastecimiento de agua. A continuación, se presentan los resultados que apoyan esta afirmación: • El bosque representa el 29.42% (404.90 hectáreas) del área de captación de la microcuenca Pabacul, así también abarca 9.63% (132.50 hectáreas) del área de captación de la microcuenca Tumulá, y representa el 60.95% (838.87 hectáreas) del área de captación de la microcuenca Xequijel. Dentro del bosque se cuenta con la presencia de 20 nacimientos, de los cuales 3 son aprovechados, pero no se tiene información sobre el caudal que ofrecen y el caudal que es utilizado. • 715 hectáreas del bosque (52 %) tienen un aporte alto en la regulación del flujo del agua. El 66 % del bosque está conformado por laderas. • El bosque ayuda a incrementar la recarga hídrica y a disminuir la escorrentía, lo cual favorece la recarga de los mantos freáticos en 3.4 millones de m³/año. Esto equivale al 28.51 % del total de precipitación que se recibe en el área de la cuenca, siendo los meses de mayo a octubre cuando existe mayor disponibilidad de agua.
Factores de éxito	• Se ha fomentado la participación ciudadana que cada vez es más consciente de la importancia de los recursos naturales de su municipio y exige a la municipalidad proteger y mantener al bosque. • El incremento en la participación y la concientización se ha logrado gracias a las capacitaciones que se han realizado en las escuelas, a grupos organizados y a las personas que cuentan con bosques privados. • Un aspecto fundamental para el éxito de la iniciativa fue el apoyo técnico y financiero de entes de la sociedad civil organizada (a través de Helvetas) y del Estado (a través del INAB), gracias al cual se han desarrollado los planes de manejo forestal, planes operativos anuales y el estudio hidrológico, que son las herramientas técnicas necesarias para promover el manejo forestal sostenible para la gestión hídrica, así mismo han proporcionado herramientas para trabajo forestal y han apoyado la consolidación de la oficina forestal municipal con materiales y equipo.
Limitaciones	• El costo anual del manejo forestal y el funcionamiento de la oficina forestal municipal es de Q500,000 y la recaudación proveniente del bosque que tiene la municipalidad es de 113,500, lo que deja un déficit anual de Q386,500 que hasta

Elemento	Descripción
	la fecha se han cubierto con fondos municipales. Para dar solución a este problema, se está desarrollando instrumentos económicos que darán sostenibilidad al manejo forestal. Dentro de dichos instrumentos están: ○ Un esquema de pago por servicios ambientales, que según los entrevistados es un mecanismo viable que generaría Q16,660 mensuales (Q199,200 al año). ○ La incorporación del bosque al Programa de Incentivos Forestales. Actualmente ya se cuenta con un incentivo por el manejo del 10.5 hectáreas (que generan un ingreso anual de Q103, 000), y se planea hacer incorporaciones sucesivas hasta llegar a cubrir las 1,376 hectáreas del bosque municipal, con lo que se generaría un ingreso anual de Q1,282,606. En este punto hay que mencionar que actualmente ya se inició el trámite para la incorporación de 441.5 hectáreas y se está a la espera de la resolución del INAB. • Debido a que la extensión del bosque es de 1,376 hectáreas, se requiere de más personal para su protección (actualmente sólo se cuenta con 10 guarda recursos). • Personas del municipio se han adueñado de 217.39 hectáreas de bosque municipal. Esto ha motivado que la Comisión de Medio Ambiente y la Oficina Forestal Municipal busquen apoyo en el la Secretaría de Asuntos Agrarios, quien ha realizado la medición y ubicación de los límites del bosque e inició el proceso para devolverlas a la municipalidad (a la fecha se recuperaron 10.86 hectáreas). • Las condiciones climáticas extremas de las partes altas del bosque dificultan el proceso de reforestación, lo que ha obligado a que en estas zonas se promueva la regeneración natural en lugar de la reforestación. • El monitoreo periódico de la cantidad y cantidad de agua es una tarea pendiente.
Lecciones aprendidas	• Los estudios técnicos son fundamentales para que la población entienda la relación entre la cobertura forestal y la provisión de agua en cantidad y calidad a lo largo del tiempo. • La participación de los miembros de la comunidad en el manejo del bosque (especialmente en la reforestación), unido a las capacitaciones técnicas, han ayudado a formar conciencia sobre la protección del bosque. • Los estudios técnicos y la conciencia generada en la sociedad han facilitado las discusiones para la implementación de esquemas de pagos por servicios ambientales.
Transferibilidad	La práctica es potencialmente transferible a otras municipalidades, pero para lograrlo se debe: • Contar con un concejo municipal fuerte y con liderazgo, • Concienciar a la población sobre la importancia de los bosques para la regulación hidrológica y el abastecimiento en un contexto de cambio climático. • Desarrollar procesos participativos, que involucren a la población en la gestión de sus recursos naturales. • Contar con herramientas técnicas que permitan el desarrollo del manejo forestal sostenible (como lo son el plan de manejo forestal y los planes operativos anuales) y estudios que demuestren la importancia del bosque en la regulación hídrica y el abastecimiento de agua. • Contar con personal que tenga conocimientos técnicos que pueda implementar en campo las herramientas técnicas para el manejo sostenible del bosque.

Elemento	Descripción
Escalabilidad	Los actores involucrados consideran que con la extensión actual, el bosque cumple con la protección hidrológica de sus fuentes de agua, por lo que no planean aumentar la escala.
Sostenibilidad	• Los entrevistados consideran que la conciencia que se tiene en relación a la importancia de la protección del bosque para la generación de agua, permitirá que en el futuro se siga conservando el macizo forestal. Evidencia de esto es que el bosque se ha mantenido desde 1888. • La serie de campañas de concientización que implementa la municipalidad, unidas a la participación comunitaria (especialmente de niños de las escuelas) en la reforestación, ayudaron a crear esa conciencia de respeto por el bosque por la función que desempeña para la sociedad. • En el futuro, la cobertura forestal puede verse amenazada por el crecimiento demográfico y la creciente demanda de alimentos. Una muestra de esto es que ya ha habido apropiaciones ilegales, con fines agrícolas, de 217.39 hectáreas.
Conclusiones	• La descentralización del manejo forestal a través de las municipalidades es un proceso que puede ser exitoso para asegurar la protección y mantenimiento de las fuentes de agua. Pero para alcanzar los resultados previstos se requiere de instrumentos y personal técnico capacitado. En este sentido, la sociedad civil organizada a través de ONGs como Helvetas, y el Estado a través de instituciones como el INAB, pueden apoyar el desarrollo de las herramientas técnicas antes mencionadas, así como de personal técnico. • Para dar sostenibilidad al manejo forestal municipal, se requiere de instrumentos económicos tales como los esquemas de pagos por servicios ambientales y el Programa de Incentivos Forestales (PINFOR). • La protección y manejo sostenible del macizo forestal redundará en la mejora de la distribución de los recursos hídricos, lo que tiene impactos positivos en la estación seca, al mejorar la disponibilidad de agua, y en la estación lluviosa, al promover la infiltración del agua, y reducir la escorrentía superficial, que a su vez causa inundaciones y deslaves. Por ello, se puede asegurar que la protección forestal es una herramienta eficaz para la adaptación al cambio climático.
Información del contacto en campo.	• Profesor Damián Mazariegos, Presidente Comisión Municipal de Medio Ambiente, Celular 3005-5088, Tel. 7763-9221. • Perito Hugo Aguilar, Técnico Forestal Municipal, Celular 5046-8585. E-mail: aguilar_gol@hotmail.com

Fuente: Elaboración propia.

6. CONCLUSIONES

- Las buenas prácticas de manejo de agua que están siendo implementadas por los agricultores en el Altiplano Occidental demostraron que pueden ser utilizadas como medidas eficientes de adaptación al cambio climático y que puede ser replicadas en otras zonas del altiplano. Con lo que se puede asegurar que si se quiere apoyar la implementación de la Política nacional de cambio climático, una medida fundamental es la promoción de dichas prácticas.
- El manejo forestal sostenible de bosques localizados en zonas de recarga hídrica es una herramienta que puede ser utilizada para la adaptación al cambio climático. Es conveniente que la estrategia incluya otras iniciativas como estufas ahorradoras de leña y cosecha de agua de lluvia para consumo doméstico.
- De las tres experiencias analizadas que buscan la protección del bosque para asegurar el abastecimiento hídrico, solamente la práctica de manejo forestal de Olinstepeque (microcuencas Pabacul, Tumulá, y Xequijel) cuenta con estudios técnicos que demuestran la influencia positiva del bosque en la recarga y descarga hídrica. No obstante, en todos los casos las comunidades están seguras que el bosque mejora la distribución y calidad del agua. Esta creencia popular puede ser utilizada para promocionar programas de conservación de bosques de importancia para la captación y regulación hidrológica.
- El estudio hidrológico de Olinstepeque demuestra que la protección y manejo sostenible del macizo forestal redundará en la mejora de la distribución de los recursos hídricos, lo que tiene impactos positivos en la estación seca, al mejorar la disponibilidad de agua; y en la estación lluviosa, al promover la infiltración del agua, y reducir la escorrentía superficial que a su vez causa inundaciones y deslaves. En este contexto, se puede asegurar que la protección forestal es una herramienta eficaz para la adaptación al cambio climático.
- Para alcanzar el éxito en las experiencias de manejo forestal comunitario y municipal ha sido fundamental la organización comunitaria. En todos los casos se contaba con una institucionalidad fuerte que promovía el ordenamiento de cada actividad, así como el uso del plan de manejo forestal para lograr la participación de los habitantes.
- Si bien es cierto la organización social es fundamental para desarrollar procesos de manejo forestal sostenible, también se requiere de capacidades técnicas y financieras que den sostenibilidad a los procesos. Es importante contar con apoyo de personal especializado (a través del regente forestal), y procesos de capacitación a los comunitarios para el manejo adecuado de los macizos forestales.
- En las experiencias analizadas, el trabajo comunitario es básico para el manejo forestal sostenible. La utilización de instrumentos económicos como los incentivos forestales (PINFOR, y PPAFD), los esquemas de pagos por servicios ambientales, o la obtención de ingresos por concepto de bienes del bosque (madera y leña) dan sostenibilidad financiera a los procesos. En este sentido, debe tenerse en cuenta que al momento de implementar cualquiera de los instrumentos económicos antes mencionados, se requiere de capacitaciones para dar a conocer detalladamente las acciones y el proceso que se lleva a cabo en el programa.

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Objetivo de Desarrollo 2: Niveles más altos de crecimiento económico y desarrollo social en el Altiplano Occidental

IR 2.1: Crecimiento económico de base amplia y seguridad alimentaria mejorados

PREGUNTAS DE ANÁLISIS DE GÉNERO <i>¿Qué necesitamos saber? ¿Cuáles son las posibles brechas de género?</i>	RECURSOS <i>¿En dónde encontramos las respuestas? (Personas, Documentos)</i>	RESPUESTAS	RELEVANCIA <i>¿Hay una brecha de género? ¿Es relevante al Project Appraisal Document (PAD)? (sí/no)</i>	RESPUESTA DEL PROYECTO <i>Describe la forma en que, de ser relevante, se aborda la brecha de género en el PAD, incluyendo las actividades</i>
1. ¿Existe una brecha de género entre las personas indígenas en el altiplano occidental en: • ¿Las tasas de alfabetización? • ¿% que habla español?	• Edgar Hidalgo • Encuesta de Salud Materno-Infantil	• 38% de las mujeres indígenas son analfabetas vs. El 20% de hombres indígenas • Las mujeres sin educación formal representan un 11% más que los hombres en el Proyecto Cadenas de Valor Rurales¹ (PCVR) • PCVR: 23% de los hombres jefes de familia son analfabetas vs. 50% de las mujeres jefas de hogar • El 27% de los hombres jefes de familia no tienen educación, vs el 56% de las mujeres jefas de hogar • Niñas: El 51% de las niñas de seis años de edad no han asistido a la escuela. ¿Cuál es la tasa de comparación para los niños? Los Informantes Clave (KIs <i>por sus</i>	Sí. Es relevante al PAD. La barrera de idioma y las tasas de analfabetismo impiden que las mujeres participen plenamente y que se beneficien de las intervenciones del proyecto si no se hacen arreglos necesarios. • Las mujeres analfabetas requieren diferentes estrategias de abordaje y materiales impresos • Las personas que no hablan español requieren materiales, capacitación, servicios del proyecto e interacciones en el idioma local	<u>Posibles Respuestas</u> • Materiales de apropiados de los proyectos (imágenes, pictogramas) para mujeres analfabetas – tal como se está realizando en varias actividades de los proyecto • Trabajar a través de mujeres indígenas representantes de sus comunidades para llegar a las mujeres indígenas, generar confianza y comunicarse en su propio idioma • Trabajar para promover una mayor retención de niñas y mujeres jóvenes

¹ Estudio Línea Base: Promoción de la Seguridad Alimentaria y Nutricional en las Familias Integrantes de 30 Encadenamientos Empresariales de los Departamentos de San Marcos, Huehuetenango, Quetzaltenango, Quiché, Totonicapán, AGEXPORT, INCAP, USAID, agosto 2012 bajo el Programa de Acceso a Mercados Dinámicos para PYMES Rurales. Convenio de Cooperación 520-A-00-05-00009-00.

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PREGUNTAS DE ANÁLISIS DE GÉNERO <i>¿Qué necesitamos saber? ¿Cuáles son las posibles brechas de género?</i>	RECURSOS <i>¿En dónde encontramos las respuestas? (Personas, Documentos)</i>	RESPUESTAS	RELEVANCIA <i>¿Hay una brecha de género? ¿Es relevante al Project Appraisal Document (PAD)? (sí/no)</i>	RESPUESTA DEL PROYECTO <i>Describe la forma en que, de ser relevante, se aborda la brecha de género en el PAD, incluyendo las actividades</i>
		<i>siglas en inglés</i>) indicaron que los padres no les permiten a l@s niñ@s empezar a estudiar si son muy pequeñ@s (de tamaño), es frecuente que envíen a sus hij@s hasta que tienen 7 años de edad. • El 31% de las niñas de 13-14 años nunca han asistido a la escuela o han dejado de asistir – lo cual sugiere una tasa alta de deserción para niñas en estas edades. (Estas estadísticas están disponibles solo para niñas). • El monolingüismo afecta principalmente a las mujeres. Hay necesidad de usar traductores (Estudio de Vital Voices/VV- Agexport) • Incluso entre las mujeres indígenas que hablan español, las normas culturales pueden evitar que usen el español con un extraño; hablarán en el idioma local hasta que lleguen a conocer bien al extraño.		en la escuela, para que el analfabetismo y el idioma con el tiempo ya no sean una barrera. • Necesidad de invertir en generar habilidades de las mujeres indígenas que pueden convertirse en personal técnico del proyecto (por ej.: que las mujeres jóvenes que necesitan empleo y que hablan dos idiomas, sirvan como “puente”) • Obtener la aceptación de los líderes hombres de la comunidad para contar con su aprobación para trabajar con las mujeres indígenas.

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2. ¿Quién está haciendo qué y cuándo en los hogares que se dedican a la agricultura – por cultivo, artesanías, otras actividades? • ¿Cuáles son las diferencias de género en los patrones de uso del tiempo?	• Estudios de uso del tiempo • Ginny Lambert • Universidad del Valle • Universidad San Carlos • FLACSO • INE	Estudio de línea base ² VV/AGEXPORT: • # de horas /al día invertidas en – ✓ Trabajo doméstico: hombres: 0.5 horas, mujeres: 9.9 horas ✓ Trabajo pagado: hombres: 8.8 horas, mujeres 5.5 horas ✓ Tiempo libre: hombres: 2.3 horas, mujeres: 1.4 horas • Tiempo para participar en la comunidad durante el mes: hombres: 2.8 horas, mujeres: 3.2 horas. • En 80% de las casas son las niñas las que ayudan a sus mamás con los oficios domésticos. • Las niñas indicaron que los niños juegan mientras ellas hacen los oficios de la casa. • Los hombres no les permiten a los niños hacer oficios domésticos debido a su cultura. • El 62% de las mujeres	Sí – Hay una brecha de género en los patrones de uso del tiempo. Los hombres pasan más tiempo en trabajos pagados mientras que las mujeres pasan más tiempo en oficios domésticos. Los hombres tienen más tiempo libre que las mujeres, pero las mujeres pasan más tiempo participando en la comunidad. Estos patrones probablemente contribuyen a la subvaloración, tanto por parte de los hombres como de las mujeres, del trabajo de las mujeres en la casa y en el campo. Conforme la carga laboral de las mujeres en la producción agrícola (fuera	<u>Posibles Respuestas</u> • Actividades que promuevan una valoración más realista del trabajo de las mujeres, tanto por parte de los hombres como de las mujeres (por ej.: requerir que los extensionistas agrícolas dirijan la asistencia técnica tanto a hombres como a mujeres, pues cambia la percepción de los dos grupos sobre el valor de las opiniones de las mujeres) • Integración de mensajes de cambio de comportamiento en las

² Estudio línea base: Promoción de la Equidad de Género y Liderazgo Empresarial de la Mujer Rural en 45 Encadenamientos Empresariales de los Departamentos de Alta Verapaz, Chiquimula, Chimaltenango, Guatemala, Huehuetenango, Petén, Quetzaltenango, Quiché, Sacatepéquez, Sololá, San Marcos y Totonicapán: USAID, AGEXPORT, DANIDA y Voces Vitales. Programa de Acceso a Mercados Dinámicos para PYMES Rurales Convenio de Cooperación 520-A-00-05-00009-00.

PREGUNTAS DE ANÁLISIS DE GÉNERO <i>¿Qué necesitamos saber? ¿Cuáles son las posibles brechas de género?</i>	RECURSOS <i>¿En dónde encontramos las respuestas? (Personas, Documentos)</i>	RESPUESTAS	RELEVANCIA <i>¿Hay una brecha de género? ¿Es relevante al Project Appraisal Document (PAD)? (sí/no)</i>	RESPUESTA DEL PROYECTO <i>Describe la forma en que, de ser relevante, se aborda la brecha de género en el PAD, incluyendo las actividades</i>
		entrevistadas en el índice de empoderamiento de la mujer en la agricultura reportaron que tienen una carga de trabajo manejable. Las opiniones de los informantes clave difieren de este hallazgo. Ellos dijeron que las mujeres (indígenas) no definen los oficios domésticos, el trabajo en su propia finca y el cuidado de sus niños como “trabajo”; ellas consideran “trabajo” únicamente cuando trabajan en otra finca. Dijeron que preguntarle a las mujeres indígenas sobre “cargas de trabajo manejables” permite que halla un sesgo en la encuesta. Los informantes clave reportaron que conforme las mujeres participan más en las actividades de proyecto (generación de ingreso, asociaciones, juntas, consultas) o en asuntos cívicos, reduciendo su tiempo para oficios domésticos y mano de obra agrícola, la carga les pasa a sus hijas, que luego son retiradas	de casa) aumenta, el trabajo se les pasa a las niñas obligándolas a desertar de la escuela; y/o las mujeres disminuyen el tiempo que invierten en actividades que generan ingreso personal, lo cual traslada mayor control de los recursos a los hombres (quienes controlan la mayor parte del ingreso agrícola).	intervenciones que se están llevando a cabo en los proyectos (en vez de campañas de comunicación de cambio de comportamiento-CCC- que se realizan una sola vez) que trabajen con las familias a través del tiempo (por ej.: por medio de promotores comunitarios) que cambien la percepción de que sólo las niñas pueden hacer los oficios domésticos, que los niños pueden contribuir, que las niñas tienen que seguir en la escuela para ser más productivas cuando sean adultas, que el trabajo de las mujeres en la casa y en el campo es valioso para el

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		de la escuela.		bienestar de la familia y que la toma de decisiones conjuntas por el hombre y la mujer en la casa es algo positivo. • Aplicación de una metodología simple como “Cerrando Brechas” para ser utilizada con las organizaciones locales.
3. ¿Tanto las mujeres como los hombres tienen la misma influencia sobre las decisiones relacionadas con el uso de los recursos, las actividades y las ganancias del trabajo agrícola? • ¿Existen ciertos cultivos (plantas, animales o productos) en el altiplano occidental cuyo ingreso sea		• El 26% de las mujeres reporta tener influencia sobre las decisiones relacionadas con el uso de los ingresos, comparado con el 90% de los hombres³ • El 77.9% de las familias cría animales. De ellas, el 94% cría aves de corral; el 44%, cerdos; el 22%, vacas y el 12%, ovejas. El 89% de las familias indicó que consumen algunos de los productos o sub-productos de origen animal y el 55% de los	Hay una gran brecha de género de autoridad en la toma de decisiones acerca de los ingresos de producción agrícola, las mujeres están involucradas en la toma de decisiones y se la delegan a los hombres por costumbre.	<u>Posibles Respuestas</u> • Si la meta del proyecto es incrementar los ingresos bajo el control de la mujer, las actividades del proyecto deben incluir ganadería a pequeña escala y productos no agrícolas, que tienen más posibilidad de ser controlados por mujeres. • Pedirle a las mujeres que identifiquen la actividad

³ Ibid 2.

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controlado en su mayoría por la mujer en el hogar?		casos indicó que venden parte de la producción.⁴ - Las mujeres controlan gran parte de las artesanías (y son realizadas en la casa, para combinar en forma flexible la generación de ingresos con las tareas domésticas y del cuidado de los niños). - Informantes clave (ICs): Las mujeres en el Altiplano Occidental están involucradas en y son capaces de realizar la mayoría de tipos de producción agrícola – no hay cultivos específicos que ellas controlen o en los que se les impida trabajar. Ellas NO controlan el ingreso de ningún cultivo agrícola; es costumbre que le deleguen a su esposo, le permitan que controle los ingresos aún cuando ellas se lo ganan trabajando en otras fincas. Las excepciones son las viudas (a menos que sean viudas jóvenes).		generadora de ingresos que funcionará mejor para ellas (ej.: que les permita combinar actividades de generación de ingreso con sus responsabilidades existentes en sus casas y en el campo)

⁴ Ibid 1. These percentages do not add to 100% since some families may be raising more than one type of animal. The sample size is 348 families.

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		Los ICs están altamente de acuerdo en que en el Altiplano Occidental, los hombres controlan todas las decisiones relacionadas con el trabajo agrícola, a pesar que las mujeres participan bastante hasta en las etapas finales, cuando hay dinero de por medio.		
4. ¿Participan por igual los hombres y las mujeres? (por ej.: calidad de la participación, no sólo igual número de personas que asisten) a las consultas comunitarias? ¿Cooperativas o asociaciones? ¿Juntas directivas? ¿Hay una variación en su participación entre las asociaciones de artesanías y las asociaciones de productores? ¿Las mujeres del altiplano		- Total participando: 48% de hombres, 31% de mujeres participa. Brecha del 17%.⁵ ✓ En las juntas directivas: 21% de hombres, 8% de mujeres ✓ En las asociaciones: 15% de hombres, 14% de mujeres ✓ En los comités: 6% de hombres, 5% de mujeres ✓ En COCODES/COMUDES: 5% de hombres, 3% de mujeres - ICs: aún cuando hay números similares de mujeres y hombres participando en la región del altiplano occidental, las mujeres frecuentemente asisten únicamente porque los oficiales	En general, las mujeres participan en grupos cívicos/sociales/económicos menos que los hombres, pero la mayor brecha parece estar en las tasas de participación en puestos de liderazgo dentro de los comités (juntas directivas). Estos patrones son promovidos/adoptados tanto por hombres como por mujeres en las áreas de la región del altiplano occidental, quienes defienden las normas tradicionales en relación a	<u>Posibles respuestas</u> - Ampliar o replicar las asociaciones de mujeres productoras que han tenido éxito - Políticas/estrategias institucionales de género que promuevan igual valoración de mujeres y hombres, que motiven un cambio de normas entre el personal técnico de la institución/proyecto – convencer primero al personal propio, luego enviar los mensajes a los participantes en los

⁵ Ibid 2.

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occidental participan más activamente en grupos sólo de mujeres en comparación a grupos mixtos? • ¿La toma de decisiones es compartida en los grupos mixtos? • ¿Existen restricciones de tiempo, conocimiento o de idioma para poder participar, que difieran entre hombres y mujeres? • ¿Qué hace que existan excepciones? Por ej.: ¿Qué factores crean conductas de cambio positivas? El caso de las mujeres vendedoras en los mercados nocturnos: ellas cuentan con habilidades matemáticas, toman riesgos - ¿Cómo podemos replicar su experiencia?		de proyecto indicaron que las mujeres deben asistir a las reuniones, por lo que sus esposos hacen que asistan. Raras veces participan en forma activa en estas actividades en grupos mixtos – los hombres dominan las decisiones en los grupos del altiplano occidental, incluyendo en las asociaciones de productores. Hay muy pocos grupos formados exclusivamente por mujeres; las mujeres casadas siguen la costumbre y dan el poder a sus esposos, no se ven a ellas mismas como capaces de realizar esas actividades. Existen algunas excepciones en la producción de café en la que los donantes han estado activos, por ej.: Manos Campesinas y Asociación de Mujeres en Café. • El hecho de que las mujeres indígenas en el altiplano occidental también se vean limitadas por el idioma, la falta de educación, la baja autoestima y la creencia que otras personas	la participación (o falta de la misma) de las mujeres. Existen algunos ejemplos exitosos de asociaciones/grupos exclusivos de mujeres que tienen la posibilidad de ampliarse o replicarse (Ej.: Mujeres 4 Pinos – café, Manos Campesinas).	proyectos. • Fomentar (no obligar) la participación de mujeres en las asociaciones dominadas por hombres; buscar agentes de cambio positivos (hombres/mujeres) y compartir sus experiencias como modelos a seguir; identificar papeles específicos en que las mujeres se identifiquen como más capaces, por ejemplo en la administración y gerencia de las asociaciones. • Revisar las prácticas dentro de las asociaciones que ofrecen únicamente beneficios limitados a las mujeres, como “las esposas de los asociados” y no como miembros; revisar las cuotas de las asociaciones o los requisitos relacionados

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		no pueden cuidar a los niños y que se espera que las mamás cuiden de sus propios hijos, hace que la participación en las actividades del proyecto sea difícil pues ellas frecuentemente traen a sus hijos con ellas, lo cual disminuye aún más la calidad de su participación. • <i>Agentes de Cambio Positivos:</i> Debido a que las viudas y las mujeres jefes de hogar se convierten en miembros de las asociaciones por derecho propio, incluso llegan a ser miembros de los COCODEs, se convierten en modelos para otras mujeres. A veces algún hombre migrante que regresa a la comunidad y a la asociación también es un modelo positivo, más abierto a la participación activa de las mujeres en el ámbito público (no es siempre el caso, pues algunos regresan a casa y quieren la comodidad de la cultura tradicional machista).		con la portación de título de propiedad de la tierra, como posibles barreras para que las mujeres sean miembros de las asociaciones de productores.
5. ¿Quién (esposo, esposa,	• Encuesta de	• Sobre peso en mujeres que no	SI – la mitad de las mujeres	<u>Posibles respuestas</u>

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abuela, abuelo) toma las decisiones en la casa acerca de la nutrición, la alimentación, la salud en el altiplano occidental? • ¿Cuál es el estado de desnutrición de las mujeres? • ¿Quién toma cuál decisión? • ¿Existe una norma de género que determine si los hombres o las mujeres toman estas decisiones?	Salud Materno-Infantil • Estudio de la toma de decisiones dentro del hogar – Determinar si se ha realizado alguno en la región del altiplano occidental	están embarazadas del PCVR: 29.1%; obesidad: 12.8%⁶ • Estatura de las mujeres que no están embarazadas (15-49 años): 145.1 cms. promedio. 50% miden menos de 145 cms. 72% entre 45-49 años miden menos de 145 cms. • Mujeres indígenas: 55.7% y: 28.4% de mujeres que no son indígenas están por debajo de 145 cms.⁷ • Anemia en mujeres que no están embarazadas (15-49 años): 7.4% • Sólo una pequeña brecha de género en las tasas de desnutrición crónica y anemia – tanto los niños como las niñas están desnutridos y anémicos. ✓ La desnutrición crónica para los niños es 76.9%; para las niñas es 69.5% (0-59 meses) ✓ La anemia en niños entre 6-59 meses: niños: 20.7%; niñas: 22.7% • Informantes clave: Están en desacuerdo sobre el sesgo de	indígenas en edad reproductiva miden menos de 145 cms., por ej., fueron alimentadas incorrectamente durante su etapa de crecimiento y es muy probable que sigan los mismos hábitos nutricionales con sus propias familias, continuando el ciclo. El papel de los hombres (y de las abuelas) en la toma de decisiones con relación a los gastos del hogar quiere decir que se requiere de un enfoque que integre a toda la familia para promover la nutrición, incluyendo la necesidad de continuar alimentando a las niñas cuando entran la pubertad.	• Intervenciones de cambio en el comportamiento específicas a la comunidad dirigidas por actores locales para involucrar a las familias completas y educarlas para que adopten hábitos alimenticios más nutritivos, y que alimenten a las niñas y a las mujeres. • Integrar la capacitación sobre la elaboración de presupuestos del hogar tanto para hombres como para mujeres (y abuelas) dentro de las otras actividades del proyecto; brindar acompañamiento a través del tiempo para llevar control de los patrones de gasto.

⁶ Ibid 1.

⁷ Ibid 1.

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		género en los patrones de alimentación en el altiplano occidental. Algunos reportan que las niñas (mayores de 6 años) son las últimas en la distribución de la comida, lo cual aumenta el riesgo de estar desnutridas cuando entren a la pubertad y enfrenten un posible embarazo a una edad temprana. Los hombres comen primero, los niños de segundo, las madres de tercero y finalmente las niñas comen de último. Otros ICs no están de acuerdo y dijeron que la decisión acerca de quién come carne y más comida se basa en quién recibe pago por su trabajo, saliendo de la casa temprano pasando todo el día en el campo con poco o nada de comida. Es más probable que las niñas y las mujeres trabajen cerca del hogar o en el hogar y que puedan comer más frecuentemente, tal vez en porciones más pequeñas durante el día. Entonces la pregunta se basa en si la distribución de alimento se concentra más en la		

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		práctica que en el sesgo por sexo. No hay datos actuales, confiables sobre los hábitos alimenticios – sólo encuestas a pequeña escala o datos de la encuesta sobre la dieta de hace más de 15 años. • Informantes clave: Los hombres en el altiplano occidental deciden cuánto dinero se utiliza para la casa/presupuesto de comida; frecuentemente, en muchas áreas rurales, también deciden qué comida comprar (van ellos mismos al mercado a comprarla), aún escogen/compran la ropa de sus esposas y deciden si la esposa/hijos pueden tener acceso a servicios de salud. Los ICs indican que el grado de control puede variar dramáticamente entre comunidades – los proyectos deben consultar con cada comunidad local para encontrar el patrón. Si la esposa es joven, la abuela/suegra tendrá más influencia (especialmente si el jefe de hogar es migrante o está		

PREGUNTAS DE ANÁLISIS DE GÉNERO ¿Qué necesitamos saber? ¿Cuáles son las posibles brechas de género?	RECURSOS ¿En dónde encontramos las respuestas? (Personas, Documentos)	RESPUESTAS	RELEVANCIA ¿Hay una brecha de género? ¿Es relevante al Project Appraisal Document (PAD)? (sí/no)	RESPUESTA DEL PROYECTO Describe la forma en que, de ser relevante, se aborda la brecha de género en el PAD, incluyendo las actividades
		ausente). <i>El patrón general</i> es que el esposo decide la cantidad de dinero, mientras que la esposa toma la decisión de cómo gastarlo en el mercado.		
6. ¿Qué alimentos son considerados de estatus alto? (ej.: comida chatarra, alimentos empacados) • ¿Están los hombres y las mujeres involucrados de igual manera en asignar un “estatus” a la comida? ¿En determinar qué comida se sirve en el hogar? • ¿Cómo podemos cambiar la percepción de “estatus alto” para fomentar mejores hábitos nutricionales en el hogar? • ¿Hay normas/roles de género que deben ser considerados para diseñar una campaña de mercadeo social o de		• Las tasas de sobrepeso y obesidad son más altas en mujeres que no son indígenas (31.3% sobrepeso y 22.4% obesidad en mujeres que no son indígenas, versus 28.5% sobrepeso y 10.2% obesidad en mujeres indígenas). • El informe para Guatemala de Alimentando el Futuro (2011) sugiere que conforme aumenta el papel remunerado de la mujer en el procesamiento de productos agrícolas (plantas procesadoras), ellas pueden empezar a comprar comida rápida menos nutritiva para darles a los niños como refacción o cena, por la falta de tiempo. <i>Los informantes clave no creen</i> que esto suceda en el área rural del altiplano occidental (dijeron que tal vez sea el caso en las áreas urbanas o en donde habitan los ladinos): reportaron	???? El problema de la comida chatarra y los alimentos empacados parece tener más relevancia en las áreas urbanas, no tanto en el área rural del altiplano occidental. Un problema más apremiante en el altiplano occidental son los malos hábitos nutricionales y cómo maximizar la nutrición con recursos limitados.	<u>Posible Respuesta</u> La misma de arriba—promover intervenciones sobre educación en nutrición para la población meta, usando un enfoque de trabajo con “toda la familia”; ser cuidadosos y evitar trabajar únicamente con las mujeres en dichas intervenciones, ya que los hombres están altamente involucrados en las decisiones de gasto en el hogar que afectan los resultados en la nutrición.

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PREGUNTAS DE ANÁLISIS DE GÉNERO <i>¿Qué necesitamos saber?</i> <i>¿Cuáles son las posibles brechas de género?</i>	RECURSOS <i>¿En dónde encontramos las respuestas?</i> <i>(Personas, Documentos)</i>	RESPUESTAS	RELEVANCIA <i>¿Hay una brecha de género? ¿Es relevante al Project Appraisal Document (PAD)? (sí/no)</i>	RESPUESTA DEL PROYECTO <i>Describe la forma en que, de ser relevante, se aborda la brecha de género en el PAD, incluyendo las actividades</i>
cambio en el comportamiento?		que ésta es una parte esencial de la cultura, las mujeres indígenas no están abandonando las comidas tradicionales, todavía preparan la misma clase de comida aún cuando trabajan fuera de la casa, sólo están más cansadas, y le pasan la carga del trabajo a sus hijas; también dicen que la mayoría no tiene acceso a comida chatarra (porque no tienen dinero para comprarla). • Los ICs reportaron que las familias indígenas aún le brindan el estatus más alto a la comida tradicional, cocinada en casa, y no hay diferencia de género en esa valoración. Las familias pueden comprar sodas/alimentos azucarados como un regalo para los niños, pero de ninguna forma son un sustituto de la comida normal y frecuentemente los niños/otros no les gusta el sabor porque es muy diferente.		
7. ¿Cuáles son las oportunidades basadas en género en la promoción		• En el 75% de los casos, los alimentos sólidos se introducen a muy temprana edad a la dieta de	Hacer referencia aquí a los resultados del Sector Salud- programas de salud	<u>Posibles Respuestas:</u> Coordinar con los programas de salud.

PREGUNTAS DE ANÁLISIS DE GÉNERO <i>¿Qué necesitamos saber? ¿Cuáles son las posibles brechas de género?</i>	RECURSOS <i>¿En dónde encontramos las respuestas? (Personas, Documentos)</i>	RESPUESTAS	RELEVANCIA <i>¿Hay una brecha de género? ¿Es relevante al Project Appraisal Document (PAD)? (sí/no)</i>	RESPUESTA DEL PROYECTO <i>Describe la forma en que, de ser relevante, se aborda la brecha de género en el PAD, incluyendo las actividades</i>
de actividades nutricionales? • ¿Cuáles son los papeles de la mujer en los sistemas municipales de agua (agua potable, riego)? • ¿Qué trabajo está involucrado? • ¿Hay vínculos entre el papel de la mujer en el manejo del agua, la nutrición familiar y los huertos familiares?		los niños. • Sólo el 36% de los hogares produce frijoles, lo cual contribuye a los altos índices de desnutrición proteico-calórica para mujeres y niños menores de 5 años. • Informantes clave: Las madres jóvenes con poca educación, frecuentemente aisladas y mal informadas poseen un riesgo muy alto de dejar la lactancia materna exclusiva antes de tiempo si encuentran dificultades y suplementarán la lactancia materna con otros líquidos/agua contaminada para calmar la sed del niño; por consiguiente la enfermedad hace que la lactancia materna se dificulte y el niño sucumbe a la desnutrición o se empeora. Las intervenciones exitosas se han enfocado en trabajar con ambos--esposo y esposa, para que los hombres se unan como aliados en la adopción de la lactancia materna exclusiva, para brindar el apoyo	materno infantil y nutrición	Integrar la consejería (para ambos esposo y esposa) con relación a las prácticas alimenticias para los niños dentro de otras actividades del proyecto para reforzar los mensajes de salud materno-infantil del sector de salud.

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		para seguir con el régimen. No se encontró información específica de Guatemala sobre el papel de la mujer en el manejo del agua potable; no hay información de los ICs en relación a los huertos familiares.		
8. ¿Los hombres y las mujeres tienen el mismo acceso al crédito, como individuos y/o miembros de las asociaciones? Acceso a otros activos	- BANRURAL - Vital Voices/AGEXPOR T	El estudio de línea base de VV/AGEXPORT muestra brechas en el acceso al mercado y al crédito: ✓ Capacitación: 73% hombres, 25% mujeres ✓ Título de propiedad de la tierra: 80% hombres, 35% mujeres ✓ Insumos productivos: 95% hombres, 50% mujeres ✓ Tecnología: 90% hombres, 46% mujeres ✓ Crédito: 66% hombres, 28% mujeres ✓ Monto promedio de crédito: \$1,990 hombres, \$333 mujeres ✓ Trabajo en la tierra: 100% hombres, 74% mujeres - El Índice de Empoderamiento de la Mujer en la Agricultura reportó que el 85% de las mujeres en Guatemala tienen una propiedad	SI- Hay una brecha significativa de género en el acceso al crédito y a otros activos. Las asociaciones de productores, en la práctica, presentan barreras significativas al acceso de las mujeres al crédito y a otros beneficios que brinda la asociación, restringiendo la capacidad de las mujeres de beneficiarse directamente del proyecto (se benefician indirectamente a través del esposo/o del ingreso familiar).	<u>Posibles Respuestas</u> Las mismas que el #4 arriba

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		de activos adecuada. Los ICs disputaron firmemente esta estadística para la región del altiplano occidental. Culparon al sesgo en las encuestas a las definiciones utilizadas. Indicaron que los hombres controlan los activos, siempre y cuando estén presentes en el hogar. - Las mujeres casadas no tienen acceso completo al crédito o a otros beneficios en las asociaciones de productores. Tienen beneficios limitados como “<i>esposas de los asociados</i>” y puede que no tengan dinero para las cuotas o el título de propiedad para convertirse en miembros con pleno derecho. Las mujeres a menudo son desalentadas para unirse a estas asociaciones en la región del altiplano occidental. - Las viudas y las mujeres jefes de hogar tienen mejor acceso a las asociaciones de productores, frecuentemente tienen una membresía completa como <i>asociadas</i> en la ausencia del		

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		esposo (si está muerto o es un migrante).		
9. ¿Las actividades del proyecto dirigidas a incrementar el acceso de los productos al mercado benefician los cultivos/productos dominados por los hombres? ¿Hay otras iniciativas que benefician únicamente a las mujeres?	•	• Los proyectos de acceso al mercado benefician a todos, pero los hombres controlan el ingreso de los productos agrícolas en el altiplano occidental (ver #3 arriba) • Las artesanías son manejadas principalmente por las mujeres. • Algunos ejemplos de asociaciones sólo de mujeres en café	Sí – los hombres en el altiplano occidental controlan el ingreso de los cultivos agrícolas; si se trata de un hogar con un hombre como jefe, entonces él controla el ingreso. En este sentido, las iniciativas de acceso al mercado para los productos agrícolas, incrementarán directamente los ingresos bajo el control de los hombres; pero al incrementar el ingreso en general, esto puede tener beneficios positivos para toda la familia. En general, mayores ingresos bajo el control de las mujeres, usualmente se correlacionan con beneficios positivos para la familia, incrementando el	<u>Posible Respuesta</u> Para asegurarse que las actividades del proyecto relacionadas con acceso al mercado también incrementan los recursos bajo el control de las mujeres, el proyecto debe también incluir actividades para facilitar el acceso al mercado a productos no agrícolas (artesanías y otros productos que elaboran las mujeres, usualmente en el hogar para generar ingresos que ellas controlen).

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			gasto en salud y educación. Pero en el altiplano occidental, donde las mujeres les ceden la toma de decisiones a los hombres, incluso entregándoles voluntariamente sus propios ingresos, se puede asumir que el incrementar los ingresos para los hombres o mujeres, beneficiará a la familia por igual.	
10. ¿Los hombres valoran a las mujeres como sus socias en la economía? • ¿Los hombres reconocen el valor de su trabajo no remunerado tanto en el hogar como en el campo? • ¿Existe algún riesgo de que se incremente la violencia de género (GBV <i>por sus siglas en inglés</i>) en los hogares en que las mujeres	•	• Línea de base VV/AGEXPORT: El trabajo de las mujeres es invisible aunque el 64% de ellas indicaron que apoyan el proceso de producción agrícola. • Los ICs reportan que el trabajo de las mujeres no lo valoran ni los hombres ni las mujeres en el altiplano occidental: ni los hombres ni las mujeres “valoran” (por ej.: asocian un valor monetario con) el trabajo de las mujeres en el hogar, en el campo o en los huertos familiares. El	SI – El machismo tiene un amplio impacto en las mujeres del altiplano occidental. Se reporta que se promueve y se transmite por igual por parte tanto de los hombres como de las mujeres. Esto limita la participación plena de las mujeres en el desarrollo económico, incluyendo su libertad de movilidad, capacidad para tomar decisiones acerca de su	<u>Posibles Respuestas</u> • Uso de los <i>promotores comunitarios</i> para trabajar en cambios de normas a través del tiempo tanto con hombres como con mujeres en los hogares y en las comunidades para incrementar el reconocimiento del valor del trabajo de las mujeres; fomentar relaciones maritales

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participan en actividades del proyecto que incrementan su ingreso (por ej.: cambio en las dinámicas de poder)? • ¿Existen agentes de cambio positivos (hombres como agentes de cambio, parejas que apoyan a su cónyuge) y se puede replicar su experiencia? • ¿Existe necesidad de intervenciones para mejorar la comunicación en pareja que se ejecuten junto a las actividades de generación de ingresos?		trabajo de la mujer solamente es reconocido explícitamente como valioso cuando ella renta su trabajo a otras fincas (usualmente con su esposo y/o niños) y le pagan por su trabajo. (Ella usualmente le pide al esposo que cobre su pago en estos casos, pues ella ve su trabajo como una tarea familiar/matrimonial). • Se reporta que la GBV es tan común, que es difícil dar seguimiento a los incrementos en la violencia derivados de la generación de ingresos de las mujeres, aunque ciertamente se conoce de casos en que no se pidió la aprobación y el involucramientos de los hombres antes de iniciar las actividades de generación de ingresos para las mujeres (por ej.: en una comunidad los hombres quemaron el mercado en que las mujeres estaban vendiendo sus productos) • Los programas para mejorar la comunicación en pareja son raros/o no existen de acuerdo con	trabajo, actividades productivas y uso de los ingresos percibidos. Como tal, el machismo limita la contribución de las mujeres como agentes económicos, desalentando su potencial para generar ingresos y crear riqueza.	respetuosas y libres de violencia; e integrar dichos mensajes en las intervenciones de los proyectos en curso. • Incluir mensajes de cambio de comportamiento que vinculen el aumento de la valoración de las mujeres (y niñas) a los objetivos más amplios de incrementar el bienestar familiar y el desarrollo comunitario.

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		los ICs. Sin embargo, consultar con los líderes masculinos de la comunidad es una buena práctica identificada como exitosa/esencial en el altiplano occidental para conseguir el consentimiento de los hombres antes de trabajar con las mujeres en la comunidad. • Agentes de cambio positivos: ver las notas anteriores con relación a: algunos ejemplos de hombres migrantes que regresan a sus comunidades con puntos de vista más liberales acerca del estatus/papel de las mujeres. • Las mujeres jóvenes solteras son reconocidas ampliamente por los ICs como catalizadoras para generar cambios de normas – se tiene que trabajar con ellas antes de que se casen aunque: algunas indican que el ser <i>mujer</i> no es la barrera más grande en el altiplano occidental, sino ser una <i>mujer casada</i>.		

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Lista de nombres de informantes clave entrevistados para los análisis de Género para los Documentos de Proyectos de USAID/Guatemala – febrero 2013

No.	Nombre	Organización	Sector(es)
1.	Ana Victoria Román	INCAP	AGR, ENR
2.	Iván Buitrón Ligia Rosales	AGEXPORT Project	AGR, ENR
3.	Leslie Marroquin Isabel Moraán (CONFECOOP) Carlos Lima	ANACAFE	AGR, ENR
4.	Daniela Martínez Connie de Paiz	Vital Voices	AGR, ENR, CS
5.	Ingrid Schreuel Timoteo López	Consultores Independientes	AGR, ENR, CS
6.	Paula Broll Alejandra Colom Ana Lucia Rodriguez	Population Council	AGR, ENR, CS
7.	Lucia Quiroa	SEPREM	CS
8.	Pedro Carrillo	USAID	ENR
9.	Alejandro Santos	Rainforest Alliance	ENR, CS
10.	Maria Teresa (Mayte) Rodriguez	Fundación Guatemala	ENR, EDU, CS
11.	Gloria Laynez Rosa Choguj	DEMI	EDU, CS
12.	Norma Cruz	Fundación Sobrevivientes	CS
13.	Daniel Cifuentes Hector Ruiz Eric Babilion	CONJUVE	CS
14.	Sandra Arroyo	CONRED	ENR
15.	Alba Trejo	Comisionada Presidencial para el Tema de Femicidio	CS, Health
16.	Ana Silvia Monzón	FLACSO	CS, ENR, AGR
17.	Elena Hurtado	Nutrisalud	Health
18.	Zulma Subillaga Dubón	Secretaría Contra la Violencia	CS, Health

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		Sexual, Explotación y Trata de Personas	
19.	Armida Tejeda	Proyecto Prevención de la Violencia	CS, Health
20.	Herminia Reyes Susana Palma Marisela de la Cruz	H&E Policy Project	Health, EDU
21.	Mario Aragón Arnoldo Melgar Amalia Alberti	ANACAFE	AGR, ENR



Guiding Principles for Integration

The USAID Country Development Cooperating Strategy aims to reduce chronic malnutrition and poverty through improved integration of USAID implementing mechanisms. USAID Guatemala values a variety of integration approaches and works closely with implementing partners to identify opportunities for integration that increase the impact of its program. Below are some integration approaches valued by USAID

Integration Approaches	
Cross-Training	Field workers receive cross-sectoral training and may also deliver coordinated program elements or referrals from multiple sectors
Collaboration	Field workers with separate sectoral training come together to implement joint activities
Coordination	Program elements and/or messages are harmonized between sectors but training and implementation are separate

Guiding Principles for Integration

USAID/Guatemala encourages implementing partners to use a range of integration approaches to maximize the impact of our programs in each department. USAID Guatemala expects integrated activities to address a common set of guiding principles:

- Work toward a Shared Goal:** Seek ways to complement and mutually reinforce the activities of other implementing mechanisms.
- Address Cross-Cutting Obstacles:** Work together to tackle significant barriers to program successes, such as health center stock outs or local leadership changes.
- Ensure Citizen Participation:** Ensure equitable inclusion of all participants, use of existing solutions and resources, and focus on community priorities.
- Have One Voice:** Harmonize messaging and communications with key stakeholders including government officials, other donors, community leaders, and participant families.
- Prioritize Efficiency:** Pursue ways to protect resources and time by avoiding duplication of activities within the same geographic area.

Annex 8 - Strategic Communication to Augment Program Results and Impact

The following is language that may be incorporated in new concept papers and instrument designs, as relevant and not necessarily in the following order.

The cornerstone of sustained development is behavior change. To date, most programs to achieve these changes have relied upon disseminating information in top down style. Research demonstrates, however, that simply providing information has little or no effect on what individuals or businesses do and how they act.

For a development program to be successful, it must be based on an understanding of the needs, perceptions, aspirations and existing resources of the audiences most affected and those who influence them, rather than by programmers and development experts' assumptions of their needs.¹ A state-of-the-art approach to planning audience-driven programs will create "win-win" situations that expand and deepen the impact of development programs.

Studies show that the determining factors for development program success or failure are: 1) effective communication and 2) active participation from the people who can and want to change their behavior to achieve personal aspirations and reach mutual development goals.² The World Bank reminds us of the value-added that social and behavior change communication (SBCC) brings to development programs in sectors as diverse as rule of law, reproductive health and environment conservation. Using SBCC as a program building block will take an important step towards more effective programs that significantly move the needle on behavior change.

I. Strategic Communication in USAID Guatemala

USAID Guatemala Communication Strategy:

USAID Guatemala implements a Communication Strategy designed to tell the story of results and impact achieved under the Country Development Coordination Strategy (CDCS). The Communication Strategy was developed by staff in 2012 and has a Results Framework whose overarching objective is to achieve: *Greater social and behavior change among Guatemala target audiences and enhanced awareness and understanding among target audiences of the USAID development partnership with Guatemala.*

The three key Communications Results are:

Result 1: Citizen Input: Increased citizen/participant voice is incorporated into communications

Result 2: Social and Behavior Change: Increased design and implementation of full social and behavior change communication (SBCC) strategies in programs

Result 3: Institutional Visibility Communications: More effective, consistent messages and information on the impact of USAID development partnership resonate with target audiences

¹ U.S. Department of Health and Human Services, National Institutes of Health, National Cancer Institute. Making health communication programs work: A planner's guide, 2008.

² World Bank. Development Communication Sourcebook: Broadening the boundaries of communication, 2008.

All USAID implementing partners contribute to achieving these Results.

What USAID Guatemala expects to achieve with Strategic Communication:

The USAID Guatemala Country Development Coordination Strategy (CDCS), Communication Strategy states that: “With SBCC we get better results and with institutional communication we share results.” (See CDCS, CDCS Communication Strategy and Results Framework, and (See Categories of Communications in Development chart)

Strategic communication for development is a theory of change that USAID Guatemala embraces and encourages in programs and projects in all development sectors. Strategic communication has been proven to generate and enhance the structural and social support that people need to be empowered to become actors and adopters of behavior change that is sustained beyond the life of project assistance.

USAID Guatemala seeks to include Social and Behavior Change Communications (SBCC) and/or Social Marketing as technical approaches to establish a foundational base for program design, planning and implementation. These technical approaches are particularly essential for community-led development projects that discover and incorporate local systems and solutions into program design, planning, implementation, monitoring and evaluation.

USAID Guatemala also seeks to include institutional (corporate) communications to tell the story of change to stakeholder audiences so as to engage them in the development process, through their support and/or active participation (see Objectives of CDCS Communication Strategy).

A robust communications strategy and appropriate staffing and resources to ensure strong, effective development communications are particularly important to the success of [project name]. The [Partner, Contractor] will develop an overarching Strategic Communication Plan with distinct sections for social marketing and/or SBCC, and institutional communications, as well consideration/identification of expected synergies between the two disciplines of communication. This Plan will guide the design, pretest, dissemination and monitoring of all communication activities, messages and materials produced. Please consult ADS 558 for guidance on social media.

The Branding Strategy and Marking Plan will contemplate verbal, textual and visual branding/marketing for events, materials and messages for both social marketing/SBCC and institutional communication. (Consult ADS 320 and the 2016 Graphic Standards Manual)

In terms of institutional communication, the [Partner, Contractor] will be responsible for preparing materials for high-level visitors to project activities that include but are not limited to: scene setters, trip itineraries, photographs, event agendas, press releases, reports, and videos.

Suggested Deliverables and Staffing:

Formative Research:

- Situational analysis based on secondary and primary formative research, qualitative and quantitative. Participant research is desired, where relevant and possible.
- Creative Brief including but not limited to: Problem Statement (problem that communication



Imagine how engagement in development would grow if program staff, especially community-based partners wore vests, boots, backpacks and pads that communicate their role in supporting family well-being and community development.

will address), Audiences (primary and secondary), Barriers and Opportunities for Change, Key Message and Supporting Information, Tone(s), Communications Channels, Messenger(s)

Strategic Communication Plan: Theory of Change; behavior change desired and activities; communication objectives; audience segmentation; program approaches; communication channels; work plan; M&E plan to monitor behavior change; results expected with benchmarks; local, native solutions to be expanded, replicated and other elements.

Work Plan: Communication for change as foundational element of program activities, messages and materials. Include consideration of audiences, expected results, timelines and budget.

Illustrative Staff:

Social marketing or SBCC expert (program communication for change)

Strategic Communication/Public Relations expert (institutional communication)

M&E specialists with experience monitoring and evaluating behavior change

Staff or Contracted Assistance:

Creative team (designers, artists, writers, producers, knowledge translators, broadcasters, social media, etc.)

Communications Materials:

All communications materials must be submitted to the COR or AOR for review and approval at key points during concept, design, development and pre-production. COR or AOR approval will focus on the technical content of the material, presentation, and compliance with the approved [Project name] Branding Strategy and Marking Plan. The [Partner, Contractor] must ensure that all branding and marking specifications laid out in the Branding Strategy and Marking Plan have been followed prior to submitting the material for USAID approval.

All camera-ready art, final production files, production master videotapes and other final versions of all program and communications products shall be submitted to USAID upon agreement termination, unless submitted previously. The COR or AOR will receive a minimum of three copies of all program and communications final products as they are produced.

Experimentation is essential to innovation and effectiveness. The [Implementer] must utilize a knowledge management methodology that facilitates continuous learning and adapting. Ongoing learning will allow the project to obtain timely information on successes and allow for adjustments in design and management, as needed. This learning will be communicated to target audiences through activities, messages and materials as noted in the [Project] Communication Plan and annual work plans.

2. Theory of Change: Communication is an Essential Ingredient of Sustained Development

Development is generally understood as change in a positive direction that is sustained over time. To have lasting impact, development requires behavior change which, in turn, requires active participation from those who want the change to happen. Because behavior change is closely associated with social norms, beliefs, attitudes, policy and practice, human beings tend to participate actively when they perceive they have social support for their behavior. Communication, in its myriad forms, conveys this needed social support and acts to generate trust in the desired change; this is how communication engenders sustained behavior change.

“Meaningful participation cannot occur without communication. Unfortunately, too many development programs, including community-driven ones, seem to overlook this aspect and, while paying attention to participation, do not pay similar attention to communication, intended as the professional use of dialogic methods and tools to promote change. To be truly significant and meaningful, participation needs to be based on the application of genuine two-way communication principles and practices.”³

Experience shows that behavior change interventions are most effective when designed and managed by the target audiences themselves, either through their direct participation in research, program activity design and implementation or through formative research conducted on the audiences.

“...Communication is increasingly considered essential in facilitating stakeholders’ engagement in problem analysis and resolution. ... Many past project and program failures can be attributed directly or indirectly to the limited involvement of the affected people in the decision-making process. The horizontal use of communication, which opens up dialog, assess risks, identifies solutions [and existing systems and resources], and seeks consensus for action came to be seen as a key to the success and sustainability of development efforts.”⁴

“When not involved from the beginning, stakeholders tend to be more suspicious of project activities and less prone to support them. Conversely, when communication is used to involve them in the definition of an initiative, their motivation and commitment grow stronger.....The involvement of stakeholders in defining development priorities has advantages other than just gaining their support. It gives outside experts and managers valuable insights into local reality and knowledge that ultimately lead to more relevant, effective and sustainable project design.”⁵

“The adoption of two-way communication [i.e. community-led design] to involve stakeholders as partners in the problem-analysis and problem-solving processes of development initiatives, rather than treating them as mere receivers of information, is fundamental for making changes effective and sustainable.”⁶

3. Methodologies for Communication for Development:

Social marketing and Social and Behavior Change Communication (SBCC) have been shown to deepen and expand the impact of development initiatives by generating behavior change above and beyond the traditional program activities of information dissemination, education, and awareness-raising. The methodologies are both based on an intimate understanding of target audiences.

Both methodologies are most effective when they underwrite or form the basis for the overall strategy design and implementation activity planning and tracking. Both social marketing and SBCC approaches to sustained development are based on applied formative research to understand target audiences from all perspectives: social, emotive, political, economic, historical, and aspirational. Ideally the formative research is a complement of qualitative and quantitative research from a variety of primary and secondary sources.

³ From: [Development Communication Sourcebook: Broadening the Boundaries of Communication](#). PMefalopoulos, World Bank, 2008. Pg. 7

⁴ Ditto

⁵ Ditto, pg. 10

⁶ Ditto, pg. 16

Social Marketing

Social marketing is part science, part art. It studies what influences and motivates given behaviors among groups of people; it includes the concept of exchange and competition—the assumption that people do things in exchange for benefits they hope and expect they can receive. Social marketing strategies are designed and implemented to either change or sustain the behaviors over time. Strategies are constructed around four traditional “P”s: Product (and/or Service and/or Idea), Place, Price (or cost) and Promotion (Communication).

Social marketing applies market research, strategic planning, advertising, public relations and other marketing tools to motivate and support the adoption and consistent use of ideas, services and/or products that lead to desired behavior change. It is most effective when it draws upon various technical skills and resources—audience research, behavioral science, creative communications, media and message development—to design and implement programs that offer meaningful benefits and reduce perceived and real barriers for the people it aims to reach. These technical tools and their strategic management are best complemented by solid community mobilization and services, as well as supportive and responsive local and national policies. Often the most powerful channels for engaging a target audience are the least obvious. Integrating these many voices to achieve common objectives is the cornerstone of an effective social marketing based program.⁷ An essential component of social marketing is the development of effective communication campaigns.

USAID uses social marketing around the world in integrated and single sector program efforts in environment, reproductive health, maternal and child health, malaria control and HIV AIDS.

Social and Behavior Change Communication (SBCC)

USAID considers social and behavior change to be a product of multiple overlapping levels of influence, including individual, interpersonal, community and organizational as well as political and environmental factors. As such, social and behavior change communication is a best practice in development organizations; an essential basis for effective programming that deepens and expands the impact and sustainability of development programs.

USAID defines SBCC as the systematic application of interactive, theory-based, and research-driven communication processes and strategies to create/enhance ‘tipping points’ and social support/mobilization for change at the levels of individual, community and society (the enabling environment). SBCC employs communications strategies in three areas of action: Interpersonal, Social Mobilization and Advocacy.

High-quality SBCC is characterized by grounding in behavior change theory; use of a proven programmatic process; attention to both individual behaviors and interpersonal and social influences; and bi-directional, interactive communication.

SBCC is based on formative research among audiences to develop and distribute coordinated messages, materials and activities through a range of different communication channels, including but not limited to

⁷ (from: “Why Social Marketing” U.S. Department of Health and Human Services and Centers for Disease Control and Prevention)

traditional mass media and social media; community-level activities; interpersonal communication; and non-traditional media.

USAID uses SBCC in integrated and single sector programs in reproductive health, nutrition, maternal and child health, and infectious disease control.

Provide background documents including but not limited to (available in P:\Communications Guidelines\Current.2016\4. CDCS Communication Strategy):

CDCS Communication Strategy

CDCS Communication Strategy Results Framework

Categories of Communications in Development (Institutional, Social & Behavioral Change and Internal)

6-Dec-16

RESUMEN DE HALLAZGOS ESTUDIO DE AUDIENCIAS 2016

						
	Dimensión	Hallazgos generales	Participantes directos e indirectos de proyectos USAID	Actores vinculados a desarrollo a nivel local	Actores vinculados a desarrollo a nivel nacional	Diáspora de guatemaltecos en Estados Unidos
	Conceptos vinculados a desarrollo	Connotación positiva (excepciones aisladas, vinculadas a capitalismo, imposición y RRNN). "Desarrollo" y "vivir mejor" interdependientes. Palabras clave: mejora, avance, buen vivir. Vinculado con carencias personales. Prosperidad connotación positiva, aspiracional.	"Desarrollo es lo que hacen los proyectos". 	Vivir mejor es vivir en armonía, es lo que los abuelos han trasladado de generación en generación (autoridades y líderes indígenas).	Desarrollo es oportunidad de generar riqueza (empresarios).	Desarrollo y vivir mejor no son lo mismo. Vivir mejor es individual y desarrollo es colectivo.
	Definición de desarrollo					
	Definición de pobreza	Vinculado con carencias personales. Vinculado con: tierra y RRNN, alimentos, salud, conocimiento.	Ni comida/salud, ni educación para salir de eso; "somos pobres pero no de espíritu".	La pobreza es causada por el sistema de desigualdad y privilegios (academia, diáspora). Tendencia a culpar a los pobres de su situación de pobreza: pereza, "tienen muchos hijos" (actores locales y nacionales).		
	Participación en procesos de desarrollo					
	Participación general	Participación "presencial" no "efectiva" (las opiniones no inciden en la toma de decisiones).	Limitaciones porque "la prioridad es sobrevivir"; temor por criminalización; procesos corrompidos; imposición de ideas de fuera; estigmatización de jóvenes (inmaduros, desinteresados, delinquentes).	Se ha avanzado pero el sistema sigue siendo excluyente. Tendencia a culpar a poblaciones excluidas de su situación (ej., mujeres no tienen educación, jóvenes son inmaduros, pueblos originarios tienen divisiones internas).		
	Temas de interés para participación	"De todo menos minería".	Opciones para los jóvenes. Mejor manejo de recursos naturales, cambio climático, educación.	Educación y empleo para que represente desarrollo "sostenible".	Ambiente, educación, formación a nivel técnico, emprendedurismo y empresarialidad.	 Formación a nivel técnico.
	Áreas priorizadas	Todas las áreas son equivalentes, necesarias e interdependientes, menos migración. Prioridades en pirámide de necesidades: básicas, seguridad y participación y espiritualidad e integralidad.	Todas importantes pero prioridad es empleo, tierra y educación.   	Cumplimiento de la ley (empresarios). Que empresas que provean empleo y el Estado cumpla su rol (academia).		
	Migración	"La gente migra por necesidad, no porque lo quiera hacer" 	Los que se van logran que los que se quedan estudien y mejoren. Es una alternativa para quienes no tienen oportunidades. Causa de transculturación, desintegración familiar y hasta muertes. Es peligroso pero se corre el riesgo porque no hay opción mejor.	La migración es un problema que debe verse más allá de las remesas (academia).		Todo es importante. La estructura y rol del Estado debe ser velar porque se logre.
	Percepciones de mejoras y retos en desarrollo	Mayoría (73%) cree que está mejor que hace cinco años. Mejora relativa: hay avances pero aún muchas necesidades. Menor percepción de mejora en seguridad, empleo y RRNN.	Avances en servicios básicos, leyes y respeto a derechos humanos; estancamiento en empleo, tierra, RRNN. Mayor demanda a nivel local: empleo y generación de ingresos.	— Peor – Necesario cambios estructurales y fortalecimiento del Estado (academia y diáspora). + Mejor – Lucha contra corrupción (empresarios).		
	Percepción general de mejora					
	Mejora en acceso a tierra	Tema crítico por cosmovisión de pueblos originarios. Conflictividad histórica por tema de tierra aún no resuelta.	Peor – Añoranza por tierra. Limitaciones de acceso /propiedad por costos y herencias. Falta de conocimientos para mejor manejo de RRNN.	Algunos actores no comprenden la importancia de tierra/ territorio para pueblos originarios. Mejor – Hay leyes y políticas de acceso pero falta educación para aprovecharla (empresarios).		
	Mejora en seguridad y justicia	Mejora en presencia de autoridades y DDHH; estancamiento en procesos de justicia, criminalización de activistas, seguridad ciudadana y estigmatización de jóvenes.	Tres dimensiones de seguridad: seguridad ciudadana, seguridad de servicios básicos/bienestar y conflictividad socioambiental.   	Peor- Vinculado con pobreza y desigualdad. La falta de seguridad afecta salud de los/as ciudadanas.		
	Mejora en ambiente y RRNN	Importancia de RRNN e implicaciones del cambio climático. Estrecha relación con cosmovisión de pueblos originarios.	Preocupa falta de conocimientos para enfrentar cambio climático y mejor uso de RRNN; incremento de conflictos sociambientales. 	Ineficacia en aplicación de leyes, indiferencia de ciudadanos, tema de agua, industrias extractivas. 		



RESUMEN DE HALLAZGOS ESTUDIO DE AUDIENCIAS 2016

	Dimensión	Hallazgos generales	Participantes directos e indirectos de proyectos USAID	Actores vinculados a desarrollo a nivel local	Actores vinculados a desarrollo a nivel nacional	Diáspora de guatemaltecos en Estados Unidos
Uso de comunicación para el desarrollo	Uso de medios de comunicación	Uso combinado de medios “tool kit”). Uso moderado (ninguno supera el 51%). Alto potencial de redes sociales (y crecimiento de chats y periódicos digitales). Medios masivos aún muy utilizados, patrón de urbanidad – ruralidad (radio más rural, prensa más urbano). Uso de TV medio-bajo. En redes, mayor uso FB, seguido de YouTube. Audiencias más receptoras que emisoras.	Alto uso de medios locales –interpersonales (Ej. Asambleas comunitarias), radio, redes sociales (jóvenes) y mensajes de texto en celular (SMS). Municipalidades es fuente importante de información. Requieren talleres y seminarios (percepción de utilidad y credibilidad). Demanda de contenidos diferentes en medios masivos, en especial en la televisión (“televisa nos está matando”). Estereotipo de redes sociales como “distractores” de la juventud.	Actores vinculados a desarrollo a nivel local	Actores vinculados a desarrollo a nivel nacional	Diáspora de guatemaltecos en Estados Unidos
	Credibilidad en medios de comunicación	Baja credibilidad general (43% nada – 31% poco – 21% mucho). Mayor credibilidad en medios más “cercanos” interpersonales/ institucionales: Asamblea comunitaria, iglesia en áreas rurales; periódicos en áreas urbanas. Redes sociales media-baja credibilidad. Alto potencial de seminarios y talleres.	Muy importante la fuente. Asambleas comunitarias. Talleres y Seminarios (que generen conocimiento). Municipalidades y COCODES. Iglesia	Asambleas comunitarias. COCODES. Medios informativos tradicionales (prensa, TV y radio).	Preferencia por periódicos (impresos y digitales) e internet (redes sociales, chats, email).	Medios digitales informativos y redes.
	Accesibilidad de los medios	Alto acceso a redes sociales y medios digitales a pesar de brechas tecnológica, de infraestructura y educacional. Bajo acceso a periódicos a pesar de credibilidad.	Asambleas, radio, altoparlantes y pregón, redes. No tienen pero quieren más acceso a periódicos.	Redes sociales, medios digitales, medios informativos tradicionales (prensa, TV y radio).	Medios digitales.	Medios digitales.
	Características de comunicación	Que respeten y resuenen con su identidad, cultura y opiniones (respeto a tradiciones, en su mismo idioma, tome en cuenta su opinión, no manipulen). Que generen conocimiento.	● Fuentes con credibilidad. ● Que generen conocimiento. ● Desde su idioma y cultura.	● Construcción conjunta. ● Estampas de su vida real.	Uso moderado de redes sociales – abruma. Mensajes con menos estereotipos y politización.	Mensajes sencillos, combinar varios medios y usar más narrativas resonantes con la población (ej. Radio y telenovelas)
Percepciones de USAID	Actitud hacia actores	— Actitud más negativa hacia gobierno, legisladores y empresarios de Guatemala. + Actitud más positiva hacia pueblos indígenas, cooperación internacional y medios de comunicación. + Estadounidenses y gobierno de EEUU al medio del espectro. + Participantes es la audiencia con actitud más positiva hacia estadounidenses y gobierno de EEUU.				
	Conocimiento y percepciones USAID	Alto reconocimiento de USAID (71% reconocen su logo o nombre; 41% reconocen que es agencia de cooperación; 80% reporta que conoce el trabajo de USAID, sobre todo en empleo, alimentación y educación). Sin embargo, bajo conocimiento a detalle del tipo de trabajo, forma e impactos que éste tiene. La mayoría de percepciones y opiniones son positivas y de valoración del trabajo pero requieren más información, comunicación directa y que escuchen las necesidades de los/as participantes de los proyectos.	Reconocimiento de la “marca” pero desconocimiento a detalle del trabajo que realizan. Requieren mayor comunicación directa, que se les escuche y que los proyectos reflejen sus necesidades. Se conoce más a socios implementadores que a USAID.	Alto conocimiento de USAID y se les requiere que trabajen más con actores locales.	Se les reconoce como agencia altamente profesional pero con baja visibilidad. Se les critica falta de transparencia en intereses políticos. Se les sugiere mayor comunicación de impactos positivos de sus intervenciones. Se les requiere que se acerquen a empresas privadas y con sociedad civil para coordinar trabajo.	Se les reconoce como agencia altamente profesional pero con baja visibilidad. Se les critica falta de transparencia en intereses políticos. Se les sugiere mayor comunicación de impactos positivos de sus intervenciones. Se les requiere que se acerquen a empresas privadas y con sociedad civil para coordinar trabajo.



USAID
DEL PUEBLO DE LOS ESTADOS
UNIDOS DE AMÉRICA

**Programa de
Monitoreo y Evaluación**



USAID
FROM THE AMERICAN PEOPLE

RFA-520-17-000001
Attachment No. 1
OMB 0412-0577
EXPIRATION DATE: 04/30/19

PARTNER INFORMATION FORM
(See Burden and Privacy Act Statements on Page 3)

Part I: Information About Proposed Activities		
1. Name of the prime contractor, grantee or recipient proposing the award or other assistance		
a. Name of Parent Company (if any)*:		
b. Company website URL*:		
2. Type of proposed award or other assistance (check one)*: ☐ Contract or Subcontract ☐ Grant or Subgrant ☐ Training ☐ Equipment ☐ Other		
3. US\$ amount and estimated start/end date of proposed award or assistance*: Dollar amount: \$ Start: End:		
4. Purpose of proposed award or assistance*:		
a. Location of Proposed Activity – Country*: State*: Province/Region*:		
5. Organization proposed to receive award or other assistance*:		
a. Name*:		
b. Address*:		
c. Telephone Primary Phone*:	d. 2 nd Phone:	e. 3 rd Phone:
f. fax*: 2 nd fax:	h. email*:	i. alternate email:
6. Information on key individuals associated with the organization named in 5 above, or, if no organization is listed, information on each individual to receive cash or in-kind assistance (including technical assistance). Use continuation sheets as necessary.		
i. Name (As in passport or other government-issued photo ID)*:		Government-issued photo ID number, type of ID and country of issuance*:
Place of birth*:	Date of birth* (mm/dd/yyyy)	Rank or title in organization listed in #5 (if "key individual")*:
Other names used (may include nicknames, pseudonyms not listed under "Name")*:		Gender:
Current employer and job title:		Occupation:
Address of residence:		Citizenship(s):
Province/Region:		Tribal Affiliation (if any):
Email:	Is the individual a U.S. citizen or legal permanent resident?* Yes ☐ No ☐	
Alternate Email:	Professional Licenses – State Issued Certifications:	
Part II: Contractor/Grantee/Recipient Certification:		
Contractor/Grantee/Recipient certifies in submitting this form that it has taken reasonable steps (in accordance with sound business practices) to verify the information contained in this form. Contractor/Grantee/Recipient understands that the U.S. Government may rely on the accuracy of such information in processing this vetting request.		
Name:		Signature:
Title/Organization:		Date:

Part III: Submission details (to be completed by USG vetting official)	
Vetting request number	
Staff member who initiated request	
Project name	
Date submitted for screening	

Partner Information Form Continuation Sheet for Part I, Section 6: List of Individuals
(Use additional continuation sheets as necessary):

ii. Name (As in passport or other government-issued photo ID):*		Government-issued photo ID number, type of ID and country of issuance:*
Place of birth:*	Date of birth:*(mm/dd/yyyy)	Rank or title in organization listed in #5 (if "key individual"):
Other names used (may include nicknames, pseudonyms not listed under "Name"):		Gender:
Current employer and job title:		Occupation:
Address of residence:		Citizenship(s):
Province/Region:		Tribal Affiliation (if any):
Email:	Is the individual a U.S. citizen or legal permanent resident?* Yes ☒ No ☐	
Alternate Email:	Professional Licenses:	
iii. Name (As in passport or other government-issued photo ID):*		Government-issued photo ID number, type of ID and country of issuance:*
Place of birth:*	Date of birth:*(mm/dd/yyyy)	Rank or title in organization listed in #5 (if "key individual"):
Other names used (may include nicknames, pseudonyms not listed under "Name"):		Gender:
Current employer and job title:		Occupation:
Address of residence:		Citizenship(s):
Province/Region:		Tribal Affiliation (if any):
Email:	Is the individual a U.S. citizen or legal permanent resident?* Yes ☐ No ☐	
Alternate Email:	Professional Licenses:	
iv. Name (As in passport or other government-issued photo ID):*		Government-issued photo ID number, type of ID and country of issuance:*
Place of birth:*	Date of birth:*(mm/dd/yyyy)	Rank or title in organization listed in #5 (if "key individual"):
Other names used (may include nicknames, pseudonyms not listed under "Name"):		Gender:
Current employer and job title:		Occupation:
Address of residence:		Citizenship(s):
Province/Region:		Tribal Affiliation (if any):
Email:	Is the individual a U.S. citizen or legal permanent resident?* Yes ☐ No ☐	
Alternate Email:	Professional Licenses:	

V. Name (As in passport or other government-issued photo ID):*		Government-issued photo ID number, type of ID and country of issuance:*
Place of birth:*	Date of birth:*(mm/dd/yyyy)	Rank or title in organization listed in #5 (if "key individual"):
Other names used (may include nicknames, pseudonyms not listed under "Name"):		Gender:
Current employer and job title:		Occupation:
Address of residence:		Citizenship(s):
Province/Region:		Tribal Affiliation (if any):
Email:	Is the individual a U.S. citizen or legal permanent resident?* Yes ☐ No ☐	
Alternate Email:	Professional Licenses:	

* Indicates mandatory information

PARTNER INFORMATION FORM INSTRUCTIONS

Part I

Question 1 – Self-explanatory

Question 2- Indicate the proposed type of mechanism to be utilized by placing a check mark on the line in front of the appropriate term

Question 3 – Enter the amount of award or assistance in U.S. dollars and indicate the start and end date of the program using a mm/dd/yyyy format

Question 4 – Indicate the purpose of the award or assistance. Use additional sheets and attach to page one of the vetting form if necessary

Question 5 a-e – Self-explanatory

Question 6 - “**Key individual**” means (i) principal officers of the organization's governing body (e.g., chairman, vice chairman, treasurer and secretary of the board of directors or board of trustees); (ii) the principal officer and deputy principal officer of the organization (e.g., executive director, deputy director, president, vice president); (iii) the program manager or chief of party for the USG-financed program; and (iv) any other person with significant responsibilities for administration of the USG-financed activities or resources. Note that this definition differs from the definition of “key personnel” under contracts and cooperative agreements. Complete for each of these four categories or indicate “N/A” if a category does not apply.

Part II

Individual filling out form must read the Certification and print their name where indicated, sign where indicated, print their title and the name of their organization where indicated, and print the date where indicated.

Part III

This section is not for individual's information and will be completed by the USG vetting official.

PUBLIC BURDEN STATEMENT

Public reporting burden for this collection of information is estimated to average 75 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. The Agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the U.S. Agency for International Development, Office of Security (SEC), Washington, D.C. 20523-2600.

PRIVACY ACT STATEMENT

Authority: Public Law 109-446 §3(b)(2), 120 Stat. 3318, 3322 (Dec. 21, 2006); 18 U.S.C. 2339A, 2339B, 2339C; Executive Orders 13224 and 12947, applicable Homeland Security Presidential Directives and other legislative or executive branch prohibitions on providing support or resources to, or engaging in transactions with, individuals or entities associated with terrorism constitute the authority for collecting this information; Foreign Assistance Act of 1961 as amended (22 U.S.C. 2151 et seq.).

Purpose: Information in this form is used to conduct screening of individuals and entities as required by applicable U.S. laws and implementing procedures to ensure that USAID funds do not inadvertently provide support to entities or individuals associated with terrorism.

Routine Uses: Disclosure of the information provided on this form will be done in accordance with the Privacy Act, as well as with USAID's System of Records Notice concerning the Partner Vetting System (USAID-29, 77 FR 72319 (Dec. 5, 2012)), which establishes the routine uses and Privacy Act exceptions that apply to this system of records.

Disclosure: Providing personal information is voluntary, but failure to provide certain information may result in denial of your application for USAID a contract, grant, cooperative agreement, or other funding, or for registration with USAID as a Private and Voluntary Organization (PVO).



USAID | GUATEMALA

ASSISTANCE BRANDING AND MARKING TEMPLATE

- **Blue** filled out by the Apparently Successful Applicant

Branding Strategy for the [Name] Project

With reference to ADS 320.3.3 and 2 CFR 700, below is the Branding Strategy:

1. **Program Name:** [Name] (Follow guidelines in March 16, 2016 USAID Graphic Standards Manual and Partner Co-branding Guide, Section 4 entitled Grants, Cooperative Agreements & Assistance.

1.1 Identify project name in English and host-country language(s).

2. **How the program will be positioned:** This section discusses how to publicize the program, visibility considerations, and includes a description of the communications tools to be used.

The Recipient may use co-branding and co-marking in accordance with ADS 320.3.3.1 for visual, textual and verbal materials and communications, which may be translated into host-country languages as appropriate. Presumptive exceptions will be outlined in the Marking Plan and if/when a situation arises that is not considered in the Marking Plan, it will be evaluated on a case-by-case basis by the Agreement Officer's Representative (AOR) and Agreement Officer (AO).

3. **Desired level of visibility:** Select high, medium or low visibility determined by considerations for each project and its communication strategy.
4. **Other organizations to be acknowledged:** The Apparently Successful Applicant may propose to acknowledge other organizations during project activities such as the Host Country Government Counterparts by including this Section into its Branding Strategy. The proposed Marking Plan may also outline these situations as well. Situations that arise that are not considered in the Marking Plan, will be evaluated on a case-by-case basis by the Agreement Officer's Representative (AOR) and Agreement Officer (AO).

6. AUDIENCES

Subject to approval by USAID, [REDACTED] has the following target audiences with whom it will promote and publicize USAID sponsorship:

5.1 Primary audience(s):

5.2 Secondary audiences:

7. MESSAGES

All communication materials and activities will use USAID visual, textual and/or verbal branding. As such, all materials and activities will acknowledge that they were produced with support “from the American people.”

Guidelines for visual branding and marking are contained in the USAID Graphic Standards Manual and Partner Co-Branding Guide (March 2016) and the Recipient will use the following verbal and textual branding:

Examples:

The USAID [Name] Project.

XYZ, Director of the USAID [Name] Project.

In cases where a host-country language predominates over English, the appropriate translation into the host-country language will be used in branding and marking the program.

The [Name] Project will follow specific procedures for including the Branding Strategy requirements as stated in the mandatory internal reference Branding and Marking in USAID Direct Contracting in the Automated Directives System, Chapter 320 and 2 CFR 700

8. COMMUNICATION TOOLS

The following communication tools will be used (see ADS 320 and ADS 558 on Social Media). [REDACTED] The Recipient may add to this list.

Each item listed below will be considered in the Table 1. Marking Plan and, as relevant, in Table 2. Exceptions to Marking.

Item

9. KEY MILESTONES AND OPPORTUNITIES

The following key milestones are anticipated to generate awareness that the program is from the American people. These milestones may be linked to specific points in time, such as at the beginning or end of a program, or to an opportunity to showcase reports or other materials (consult ADS ADS 320 and 2 CFR 700). These include, but are not limited to:

- training events,
- publishing reports,
- highlighting success stories,
- promoting final or interim reports, and
- communicating program impact/overall results
- speaking engagements, including in communities.

10 ACKNOWLEDGEMENTS

10.1 ACKNOWLEDGING USAID AND THE USAID [Name] PROJECT

The following acknowledgment will be included on internal publications, such as quarterly reports, as appropriate:

This document was produced for review by the United States Agency for International Development. It was prepared by [redacted] for the [Name] Project, [award number].

10.2 ACKNOWLEDGING HOST-COUNTRY GOVERNMENTS

All [Name] Project communication material and activities will follow USAID Branding Guidelines. Decisions to co-brand with a host-country government entity may be made and will be considered in the Marking Plan. Co-branding with host-country partners may be desirable to communicate ownership and engagement.

10.3 ACKNOWLEDGING OTHER HOST-COUNTRY PARTNERS

Co-branding with other host-country partners will occur when these organizations have contributed funds and/or significant in-kind items or assistance to the activity. Co-branding with in-country partners may be desirable to communicate ownership and engagement.

10.4 CO-BRANDING WITH OTHER INTERNATIONAL ORGANIZATIONS AND OTHER USG AGENCIES

The ADS 320 and USAID Graphic Standards Manual and Partner Co-Branding Guide (March 2016) guidelines for co-branding with other international organizations will be followed.

Marking Plan for the [Name] Project

With reference to ADS 320.3.3 and 2 CFR 700, below is the required Marking Plan:

1.0 MARKING

1.1 MARKING PLAN

Table 1 outlines the types of materials and activities that may be produced under the USAID [Name] Project. Any materials and activities that are not anticipated below, but are produced under the initiative, will also be subject to branding guidelines and AO approval, as appropriate. The goal is to mark programs and projects, and not implementing partners.

All materials, activities and deliverables marked with the USAID logo for the [Name] Project will follow design guidance for color, type, and layout in the USAID Graphic Standards Manual and Partner Co-Branding Guide (March 2016) as related to equipment, reports, studies, events, and public communication (including printed products, audio, visual, and electronic materials), etc. The USAID logo will be used for programmatic correspondence. Recipient's letterhead will be used for administrative correspondence and will not have the USAID logo. Business cards will not show the USAID logo but may use text: USAID Recipient.

Please provide graphic examples of visual marking of materials, activities and deliverables using the USAID logo and project name in situations of co-branding and no-branding, in both English and Spanish.

There are two criteria used to determine when the disclaimer provision must be used:

- a) As per 2 FR 700.16(c) (1) Studies, reports, publications, Web sites, and all informational and promotional products not authored, reviewed, or edited by USAID; and
- b) As per the discretion of the AOR and Recipient's consideration of a specific situation.

The provision is as follows in English and Spanish:

This study/report/Web site (specify) is made possible by the support of the American People through the United States Agency for International Development (USAID). The contents of this (specify) are the sole responsibility of (name of organization) and do not necessarily reflect the views of USAID or the United States Government.

Est(e/a) [especificar: publicación, video, sitio Web u otro producto de información] es posible gracias al apoyo del Pueblo de los Estados Unidos a través de la Agencia de los Estados Unidos para el Desarrollo Internacional (USAID). El contenido de este (especificar) es responsabilidad exclusiva de (nombre de la organización y autor) y el mismo no necesariamente refleja la perspectiva de USAID ni del Gobierno de los Estados Unidos de América.

Marking Requirements for the [Name of the Project]

TABLE 1. MARKING PLAN FOR MATERIALS AND ACTIVITIES (illustrative examples only)

Follow the guidelines contained in the USAID Graphic Standards Manual and Partner Co-Branding Guide (March 2016).

Category/Material	Type of Marking	Visual, Verbal, Textual
		Disclaimer
Administrative		
Program related stationery products	The USAID logo will be used.	Visual Textual
Contract Deliverables: documents, publications, studies, reports, papers, technical assistance consultant reports	Follow guidelines for exclusive marking. Use specific language for deliverables when submitted to USAID for review.	Visual Textual
Program Communication		
Technical reports, publications, documents, studies	The USAID logo will appear on the cover; design follows guidelines for exclusive branding unless co-branding is acceptable or an exemption is provided for no branding.	Visual Textual Consider Disclaimer
Training materials, manuals and sessions	The USAID logo will appear on the cover of documents and verbal branding will be used at training sessions; design follows guidelines for exclusive branding unless co-branding or an exception for no marking is indicated.	Visual, Textual, Verbal Consider Disclaimer for Visual & Textual
Audiovisual: Video, CDs-ROM, Animated Infographics	The USAID logo will be printed on CD labels, splash screen/menus, and packaging; design follows guidelines for exclusive branding unless co-branding or an exemption is indicated for no marking.	Visual

TABLE 1. MARKING PLAN FOR MATERIALS AND ACTIVITIES (illustrative examples only)

Follow the guidelines contained in the USAID Graphic Standards Manual and Partner Co-Branding Guide (March 2016).

Category/Material	Type of Marking	Visual, Verbal, Textual — Disclaimer
PowerPoint presentations	The USAID logo is required as per USAID presentation template; design follows guidelines for the exclusive branding unless co-branding is acceptable or an exemption for no branding is indicated. Templates available at www.usaid.gov/branding/resources	Visual
Posters, banners, exhibition booth signs, event signage	The USAID logo will appear on the material; design follows guidelines for exclusive branding unless co-branding or an exemption for no branding is indicated.	Visual
Program public awareness, advocacy and behavior change materials and activities	The USAID logo will appear on each material based on the purpose and type of material, target audience and how to be used. Design follows guidelines for exclusive branding unless co-branding or an exemption for no branding is indicated.	Visual, Textual or Verbal
Web portal and social media platforms (Facebook, Twitter, Flickr, blogs, others)	Follow guidelines in ADS 558 for appropriate branding and marking.	Visual Textual
Institutional Communication		
Photographs, Infographics	The USAID logo or “USAID” in text will appear on the material; design follows guidelines for exclusive branding unless co-branding or an exemption for no branding is indicated.	Visual Textual — Consider Disclaimer on Infographics

TABLE 1. MARKING PLAN FOR MATERIALS AND ACTIVITIES (illustrative examples only)

Follow the guidelines contained in the USAID Graphic Standards Manual and Partner Co-Branding Guide (March 2016).

Category/Material	Type of Marking	Visual, Verbal, Textual — Disclaimer
Collateral, print information material (i.e., success stories, fact sheets, articles, feature stories, others)	The USAID logo will appear on printed materials; design follows guidelines for exclusive branding.	Visual Textual
Commodities and Equipment	The USAID logo will appear on items; exclusive branding unless co-branding is acceptable or an exemption for no branding is indicated.	Visual

Table 2. Exceptions to Contract Marking Requirements

Use one or several of the following exceptions to fill out Table 2, depending on the circumstances.

2 CFR 700.16 (h) Presumptive Exceptions

The following exceptions reflect USAID's usual, non-emergency practices in not marking certain communication materials for programmatic reasons. The AO, in consultation with the Activity Manager/AOR, has the authority to determine that marking in accordance with is not appropriate:

- a. Compromise the intrinsic independence or neutrality of a program or materials where independence or neutrality is an inherent aspect of the program and materials. This includes, but is not limited to, the following: • Election monitoring or ballots, and voter information literature; • Political party support or public policy advocacy or reform; • Independent media, such as television and radio broadcasts, and newspaper articles and editorials; and • PSAs or public opinion polls and surveys.
- b. Diminish the credibility of audits, reports, analyses, studies, or policy recommendations whose data or findings must be seen as independent.
- c. Undercut host-country government "ownership" of constitutions, laws, regulations, policies, studies, assessments, reports, publications, surveys or audits, PSAs, or other communications better positioned as "by" or "from" a cooperating country ministry, organization, or government official.
- d. Impair the functionality of an item, such as sterilized equipment or spare parts.
- e. Incur substantial costs or be impractical, such as items too small or other otherwise unsuited for individual marking, such as food in bulk.

- f. Offend local cultural or social norms, or be considered inappropriate on such items as condoms, toilets, bed pans, or similar commodities.
- g. Conflict with international law, such as the international recognized neutrality of the International Red Cross (IRC) or other organizations.
- h. Deter achievement of program goals, such as cooperating with other donors or ensuring repayment of loans.

Category/Material for exception	Specific Exception(s)	Visual, Verbal, Textual
Administrative		
Program Communication		
Institutional Communication		
Commodities and Equipment		



Operational Security - General Information

An Additional Help for ADS Chapter 303

New Reference: 06/19/2006
Responsible Office: M/OAA/P
File Name: 303sae_061906_cd44

Operational Security – General Information

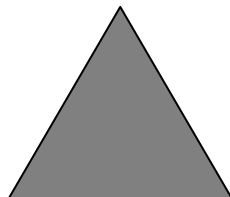
Operating in a Developing Country Context

This document raises a number of issues and provides general information regarding security. It is not prescriptive and does not seek to place any requirements on implementing partners. Additionally, every area/region presents its own specific and unique security challenges, so implementing partners must make their own determinations as to how to address such challenges. Therefore, implementing partners (i.e. contractors and recipients) should not interpret the information in this document as technical instructions, nor should they assume that the language herein constitutes a USAID position regarding the allow ability of certain security costs. This document will not be incorporated into any binding legal agreement between USAID and an implementing partner. When implementing any USAID award, the implementing partner bears the ultimate responsibility for ensuring adequate steps are taken to safeguard the security and safety of its personnel, and any USAID funded equipment/property/vehicles. The implementing partner is also responsible for ensuring that USAID funded equipment/property/vehicles are stored/maintained in accordance with applicable federal rules/regulations, as well as Mission-specific directives.

An intrinsic aspect of operating in a developing country is recognizing and addressing issues related to security. Most importantly, this includes the well-being of staff. The safety of personnel is a precondition for the activities of USAID and its implementing partners.

To achieve an adequate level of security, our contractors, non-governmental organizations (NGOs), and other implementing partners must see security as a top priority. It must be an integral component of program design and project management. Given the diversity of USAID's implementing partners, it is not possible to create a one-size-fits-all model. It is, however, essential for every organization to have both a well-defined concept of security as well as clearly articulated and consistently applied operational policies and procedures.

One of the most commonly used models, or analytical frameworks, for security consists of three axes: acceptance, deterrence, and protection:



New Reference: 06/19/2006

Acceptance is the process of gaining widespread understanding and support for an organization's work on the part of local authorities, belligerents, and the population at large. This has been one of the fundamental principles under which civilian agencies have worked in conflict zones for many years. Acceptance depends in part on the articulation and adherence to humanitarian codes of conduct, such as impartiality. Acceptance has long been the foundation on which many non-governmental and international humanitarian organizations build their security approaches. While some would hold that undertaking humanitarian activities and building strong personal relationships accomplish acceptance, the process is more involved. Acceptance requires active outreach in the communities in which organizations conduct business, live, and implement programs. In short, outreach must extend to all parties with which an organization may come into contact – there should be no doubt about the identity of the organization or what it is doing.

It should be noted that a number of recognized experts in the field of humanitarian security suggest that acceptance has never been enough in and of itself, “everyone locks their doors.” Regardless of an organization’s view of this statement, each organization must be aware of the context in which it is working in order to determine the most appropriate approach to security and to what degree that approach includes or combines acceptance, protection, or deterrence strategies.

Protection encompasses the use of devices, such as physical barriers, armored vehicles, bullet-resistant vests, and satellite and two-way communications. It also includes procedures such as driving in convoys, varying routine, and the observance of curfews and "no-go" areas.

Deterrence is an approach whereby the threat is contained or deterred by the use of a counter threat. This could be legal, political, or economic sanction, but is most commonly an armed response.

In practice, most organizations use a combination of all three strategies. What's important is for an organization to make a conscience decision about where it wants to be inside the triangle, and to understand the advantages and drawbacks of this choice. Of note in that regard is the symbiotic relationship between organizations working in the same environment. For example, if one organization uses armed guards on convoys, others who do not may be more vulnerable.

Situational Awareness

It's clear that security begins with an appreciation of the environment in which one is operating. Nevertheless, it is frequently overlooked that what is safe in one place may actually increase risk in another. Whether to carry a weapon or stop after a vehicle accident depends on the nature of the threat and the specific situation. It is nearly impossible to create a list of hard and fast rules, which is why situational awareness is so critical. Effective situational awareness normally depends on team members developing accurate expectations for team performance by drawing on a common knowledge base –

New Reference: 06/19/2006

a security plan. A security plan usually contains a policy statement, management responsibilities, procedural guidelines for prevention, guidance on radios and communications, evacuation procedures, checklists, and personnel contact numbers.

Threatening confrontations in the field can take many forms, including robbery, armed assault, vehicle hijack, crossfire, bombing, land mines, kidnapping and hostage taking. While some precautions can be taken to avoid such situations, even the most prepared field staff can become victims in a sudden confrontation. Therefore, advanced familiarity with the organization's principles and security plan will increase your staff's safety and chances for survival during a security incident.

An implementing partner may wish to designate a point person to handle these and other responsibilities related to security. This could be a senior position that reports directly to the Country Director or Chief of Party.

Information Sharing

Many organizations collect, analyze, and disseminate information on security. USAID's implementing partners may wish to establish and maintain regular contact with the Embassy Regional Security Officer (RSO) and other organizations, such as the Overseas Security Advisory Council (OSAC), United Nations groups (UNSECOORD, UNHCR, etc), and other larger umbrella groups operating in a country.

The sharing of information is often critical to situational awareness. For that reason, USAID suggests that each implementing partner report through the appropriate reporting organization all security incidents. In addition, any incidents involving death or injury to staff or which may materially affect the implementation of USAID-funded programs must be reported directly to USAID within 24 hours after the incident.

Field Travel

Most USAID implementing partners have the traditional structure of a headquarters office in the capital city and often sub-offices in the regions which implement programs in the field. Road accidents remain a major cause of injury and death for USAID workers and at least half of all security incidents occur during travel. Implementing partners may wish to establish and enforce procedural guidelines for field travel. Although the following list is not intended to be all-inclusive, an implementing partner might want to consider some of the following in generating its own guidelines:

- **Type of vehicle.** Choice of vehicle can impact on safety and security. Consider two- or four-wheel drive, choice of color, SUV/pickup or passenger vehicle, new or used, gasoline or diesel. New SUVs are the popular model for carjacks. The use of unmarked local or armored vehicles may be a better option in some cases.
- **Vehicle reliability.** Regularly scheduled maintenance and inspections should be conducted. Critical spare parts (e.g.: belts and hoses), consumables (oil, water,

New Reference: 06/19/2006

battery) and ancillary supplies (tools, tow rope, rations, first aid kit, spare fuel, etc.) should be carried at all times. Because armored vehicles have additional weight added on due to the armoring process, the vehicle is working harder than originally designed. Therefore, at a minimum, the normal manufacturers' maintenance cycle is half of what the manual reads (e.g. vehicle manufacturer recommends brake pads be replaced every 30,000 miles. In the case of an armored vehicle, USAID typically replaces its brake pads every 15,000 miles).

- **Number of vehicles and passengers.** A single vehicle and driver is a much easier target. USAID usually requires at least two people to ride in each of its vehicles, including one with language skills. Implementing partners might want to consider similar arrangements.
- **Day vs. night travel.** USAID does not recommend that its USAID staff drive at night, except in emergencies. Implementing partners might want to consider similar arrangements.
- **Cash in Transit.** The implementing partner might want to consider establishing procedures and guidelines for cash in transit. The implementing partner might consider varying travel parameters for each trip to the bank (time of day, day of week, route of travel, etc.) and consider the risks involved by combining bank runs with other errands.
- **Use of armed escorts.**
- **Use of bullet-resistant vests.**
- **Communications and GPS.** The implementing partner might want to consider both radio and satellite systems in each vehicle (see below), as well as a hand-held GPS unit.
- **Trip preparation.** The implementing partner might consider establishing a clear set of procedures be followed for planning the trip and notifying the appropriate parties beforehand. This may include checking the security situation, marking of primary and alternative routes, designating checkpoints/landmarks along the route to track the traveler's location, listing points of contact along the route, and estimating the approximate timeframe for the trip. Although it may not be necessary for short trips, the implementing partner might consider requiring that this information be put in writing and left with someone who will monitor the trip and be notified at its conclusion.
- **Emergency procedures.** These encompass a range of situations, from ambushes to landmines to checkpoints. The implementing partner might consider providing training or a detailed briefing to all drivers on standard procedures to follow in the event of an emergency.

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Communications

Each implementing partner may wish to establish and maintain effective and reliable voice communications systems at all of its offices and with vehicles or personnel traveling in the field (including a back-up system). As appropriate, these systems may include HF and VHF/UHF radio systems and should include a minimum of one voice satellite system such as Thuraya, Inmarsat, or Iridium. Implementing partners might consider requiring that at least one system should not rely upon locally controlled infrastructure (e.g. cellular telephone systems).

Each implementing partner might want to consider the need to establish and maintain effective and reliable data communications at all of their offices. Discrete systems such as Vsat, Websat, or BGAN may be preferable, as well as a reliable source of power.

Each implementing partner should consider the wisdom of establishing and maintaining its own policies and procedures for the creation and maintenance of the following:

- (1) Distributing and updating, at least monthly, a list of contact information for all internal and key external parties, including detailed information such as the location of staff housing and the tracking of staff on leave.
- (2) A phone tree or warden system among the agency's staff that ensures all personnel can be contacted and accounted for in a timely manner.
- (3) Training of staff on telephone and radio procedures and copies of frequencies/numbers and procedures available in offices and vehicles.
- (4) Regular reporting or call-in procedures for staff living or traveling in the field.

Site Security

The goal of site selection and management is to establish, occupy, and maintain physical space(s) (residences, offices and warehouse) required to achieve operational objectives. The most effective site selection follows after a security assessment has been completed. Implementing partners might consider the following when selecting an office location:

- **Neighborhood** – level of crime, proximity to potential threats, known regions of adversarial activity, and politically or militarily significant buildings.
- **Accessibility** – single/multiple route access, road condition, ease of access or egress from the site, density of traffic, and accessibility of authorized and unauthorized vehicles.
- **Services** – water and electricity (including backup or portable generators).

New Reference: 06/19/2006

- **Lighting** – to illuminate the site and surroundings, deter intruders, and aid observations.
- **Susceptibility to Hazards** – fire, floods, landslides, and winds.
- **Physical Space** – adequate for office, parked vehicles, storage, etc.

Based on the profile the implementing partner chooses to portray, and the dangers presented in any particular country situation, the following is a list of possible security applications. The list is not all-inclusive nor prescriptive; however, it provides general information on basic security applications that may help to improve the security posture of a facility.

- Construction of fencing or walls around the perimeter with alternate exit/entrances.
- Installation of perimeter barriers. Several types of temporary barriers, both passive and active, are available to mitigate vulnerability. To prevent bomb-laden vehicles from gaining access to a building's exterior, the implementing partner may wish to consider one of several types of barriers systems , including, but not limited to, the following:
 - Passive barriers provide anti-ram protection. They are stationary and may include planters, jersey barriers, bollards, earth berms, Hesco, Bastion revetment, and revetted trapezoidal ditches.
 - Active barriers provide anti-ram protection. These barriers move either side-to-side or up and down to allow vehicle entry and include hydraulic bollards, wedges, and sliding gates.
- For access control, installation of both passive and active barriers. For the exterior of a building, passive barriers may consist of razor wire, window grilles, steel plating, and other sustainable building materials. Active barriers may consist of turnstiles, security doors, and movable or hinged grille work.
- Protection of generators, water, and fuel. Heavy duty construction or the use of sandbags may be appropriate. The implementing partner may want to consider the wisdom of locating fuel supplies in the most remote area of the compound.
- Use of shatter resistant window film (SRWF) to all exterior and interior glass surfaces to reduce fragmentation of glass shards during a blast event. The implementing partner may wish to consult with USAID/SEC or the RSO for information concerning certified vendors.
- Installation of heavy-duty deadbolt locks near the top and bottom of a door to mitigate forced entry. To maximize the forced-entry protection, USAID normally installs deadbolt locks on either solid wooden or hollow steel doors.

New Reference: 06/19/2006

- Installation of heavy duty forced-entry window grilles on all windows and/or man-passable openings as appropriate to mitigate civil disturbance and/or criminal activity. **Fire Safety Note:** Window grilles are a fixed security application and careful consideration of fire egress should be considered. If a window requires movable or hinged grille work for fire egress purposes, the window grille will not be as effective for forced-entry protection. Fire protection, safety, and egress take priority over security. In most cases, both fire protection/safety and security can be achieved.
- Installation smoke detectors and security alarm system.

Implementing partners might consider the following when establishing their site security management:

- Testing smoke detectors and security alarm systems monthly.
- Maintaining a key rack and locked spare key box for facilities and vehicles, for easy access in case of an emergency. Strict control and accountability for keys is established.
- Ensuring that fire escape routes are known and fire extinguishers are charged and in correct locations and that staff know how to use the fire extinguishers.
- Ensuring that first aid kits are located strategically in the facility.
- Securing parking for vehicles. Street parking is normally discouraged.
- Establishing procedural boundaries – checkpoints, monitoring, and accountability for team member and visitor access.
- Closing and locking interior doors and windows when the office is empty, even for short periods of time. Establishing a daily office lock-up procedure with clearly defined staff responsibilities.
- Staggering lunch hours and breaks so that office is occupied during work hours.
- Hiring guards for both office and parking area, if needed.
- Informing all staff members of security measures and procedures including:
 - Visitor access controls
 - Employee identification procedures
 - Key control
 - Security alarms
 - Location of emergency exits
 - Fire and evacuation drills
 - Location and use of fire extinguishers and first aid kits

New Reference: 06/19/2006

- Providing the location and purpose of safe havens.
- Furnishing bomb and bomb threat procedures.

Emergency/Evacuation Plans

Implementing partners might want to consider developing a plan to guide their actions in the event of an emergency. Any such plan might consider a rapid, forced withdrawal from an area of high risk and the temporary suspension of activities. Such a plan might also include some of the following:

- Tracking of security phases/operational alert levels (green, yellow, red, etc.).
- Coordination with USAID, other donors, and appropriate embassies.
- Shutdown procedures, including the collection or destruction of sensitive materials and equipment.
- Designation of assembly points.
- Stockpiling of survival equipment and supplies (amount, location, access).
- Transportation methods and designated POCs for evacuation (road, air, water).
- Evacuation points and routes (airport, border, specific road, etc.) marked on maps.
- Preparation of vehicles.
- Rehearsal and refinement of the plan on a regular basis.

The need for additional plans and planning is area or program specific, i.e. plans developed for one area or organization will most likely be ineffective in/for another.

Additional Resources and Information

The Overseas Security Advisory Council (OSAC), the Embassy Regional Security Officer (RSO), USAID's Office of Security, the United Nations Minimum Operating Security Standards (UNMOSS), RedR, Geneva Centre for Security Policy (GCSP), and Humanitarian Practice Network's (HPN) Good Practice Review "Operational Security Management in Violent Areas" are all excellent resources in security planning and management.

New Reference: 06/19/2006

Final Note

The aspects of security outlined above are listed in order of importance and difficulty. Situational awareness is undoubtedly the hardest to accomplish, but it is also the most critical to good security. Many organizations hire a security consultant to make such recommendations as the required security countermeasures, security guidelines, evacuation plan, etc. A security plan should be kept current.

In most cases, the organization's senior leader has the overall responsibility to monitor and relay safety and security issues to those in his or her group. Being aware of personal and team safety and security is the responsibility of every group member. USAID and the State Department's Regional Security Office may be seen as a resource for developing effective countermeasures. Specific questions and comments may be directed to your Contracting Officer's Representative. He/she may then refer you to an appropriate party.

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Attachment 4

Global Climate Change - Adaptation (GCC-AD) Funding Requirements

The goal of adaptation programming is to enhance resilience and reduce vulnerability to climate change of people and the places and livelihoods upon which they depend. Adaptation activities are guided by or inform countries' plans, strategies and policies. Activities may support one of the following areas: improving access to science and analysis for decision making in climate-sensitive areas or sectors; establishing effective governance systems to address climate-related risks; and identifying and disseminating actions that increase resilience to climate change by decreasing exposure or sensitivity or by increasing adaptive capacity.

A Focused Adaptation program or component will have the explicit objective of enhancing resilience and reducing vulnerability; will be based on an understanding of vulnerability; will include actions designed to reduce that vulnerability and build adaptive capacity; will be flexible to deal with uncertainty; and will add value beyond the scope of other funding sources. Ideally, indirect Adaptation programs will meet these criteria, as well.

Vulnerability Analyses: Activities that support adaptation programs should be built upon climate vulnerability and adaptation analyses. In some communities and countries, useful analyses may exist, including, but not limited to:

- a. National Adaptation Plans (NAPs)
- b. Adaptation portions of Nationally Determined Contribution (NDCs)
- c. National Adaptation Programs of Action (NAPAs)
- d. National Communications to the UN Framework Convention on Climate Change
- e. World Bank Climate Risk and Adaptation Country Profiles, available on the World Bank Climate Portal. Not all developing countries are covered.
- f. Country profiles summarizing key adaptation information, resources and projects, as well as a document database, available on the Adaptation Learning Mechanism site.
- g. USAID and other donor-supported vulnerability analysis.
- h. Other Adaptation priorities, policies, and programs, as described in the Adaptation Partnership-commissioned review of existing and planned adaptation action.

Where an assessment is not available, or is not recent enough or specific to the targeted sector or geographic area, Adaptation funds can also be used to conduct and build capacity for vulnerability and adaptation analyses. A number of resources on vulnerability and adaptation are available on the Adaptation Resources section of the USAID web site.

Illustrative examples of Focused Adaptation activities (i.e. using GCC-AD funds):

- a. Improving access to science & analysis for decision-making in support of countries' plans, strategies and policies for reducing vulnerability or increasing resilience
 - i. Developing tools for information dissemination, building new capacity among hydro-meteorological information providers, or extending the reach of the SERVIR and FEWS NET programs, in order to increase access to climate information and services that meet

- the needs of user groups and decision-makers in sectors like agriculture, health, water resources, coastal and disaster management
 - ii. Providing support for modeling, mapping, and research to better understand climate impacts in specific regions or sectors
 - iii. Building capacity for and conducting vulnerability assessments to inform adaptation planning and action in support of development or implementation of country plans
- b. Establishing effective governance systems for climate resilience in support of countries' plans, strategies and policies for reducing vulnerability or increasing resilience
- iv. Strengthening government and local community preparedness for and response to climate change-related disasters, such as floods, through participatory adaptation planning
 - v. Building capacity among decision-makers, such as public health officials, to use hydro-meteorological data to inform climate-resilient planning
 - vi. Facilitating creation and sustainable operation of an inter-ministerial working group to address adaptation priorities, including support for national adaptation plan (NAP) development and implementation
- c. Identifying and disseminating actions that increase resilience to climate change in support of countries' plans, strategies and policies for reducing vulnerability or increasing resilience
- vii. Introducing, communicating and enforcing flood management plans and zoning and building codes to reduce vulnerability to rising sea levels and storm surges
 - viii. Reducing barriers to widespread use of affordable micro-insurance products that cover vulnerable populations against drought risks
 - ix. Testing the effectiveness of drought resistant crops or other risk reduction strategies in areas where climate change is reducing rainfall

NOTE: The above activities could also qualify as indirect Adaptation activities if they are supported using funds other than GCC funds.

2. Illustrative examples of activities eligible for Indirect Adaptation attribution (i.e. NOT using GCC funds):

- a. A program using Feed the Future funding that:
 - i. Promotes conservation agriculture practices to reduce soil erosion, counteracting reductions in productivity that would otherwise result from climate change impacts like more intense rainfall
 - ii. Distributes drought-resistant seeds or promotes the use of more efficient irrigation techniques to increase farmers' ability to cope with reduced rainfall
- b. A Biodiversity-funded activity to preserve mangroves as habitat for threatened species, which will also have the benefit of buffering coastal zones at risk of increased storm surge

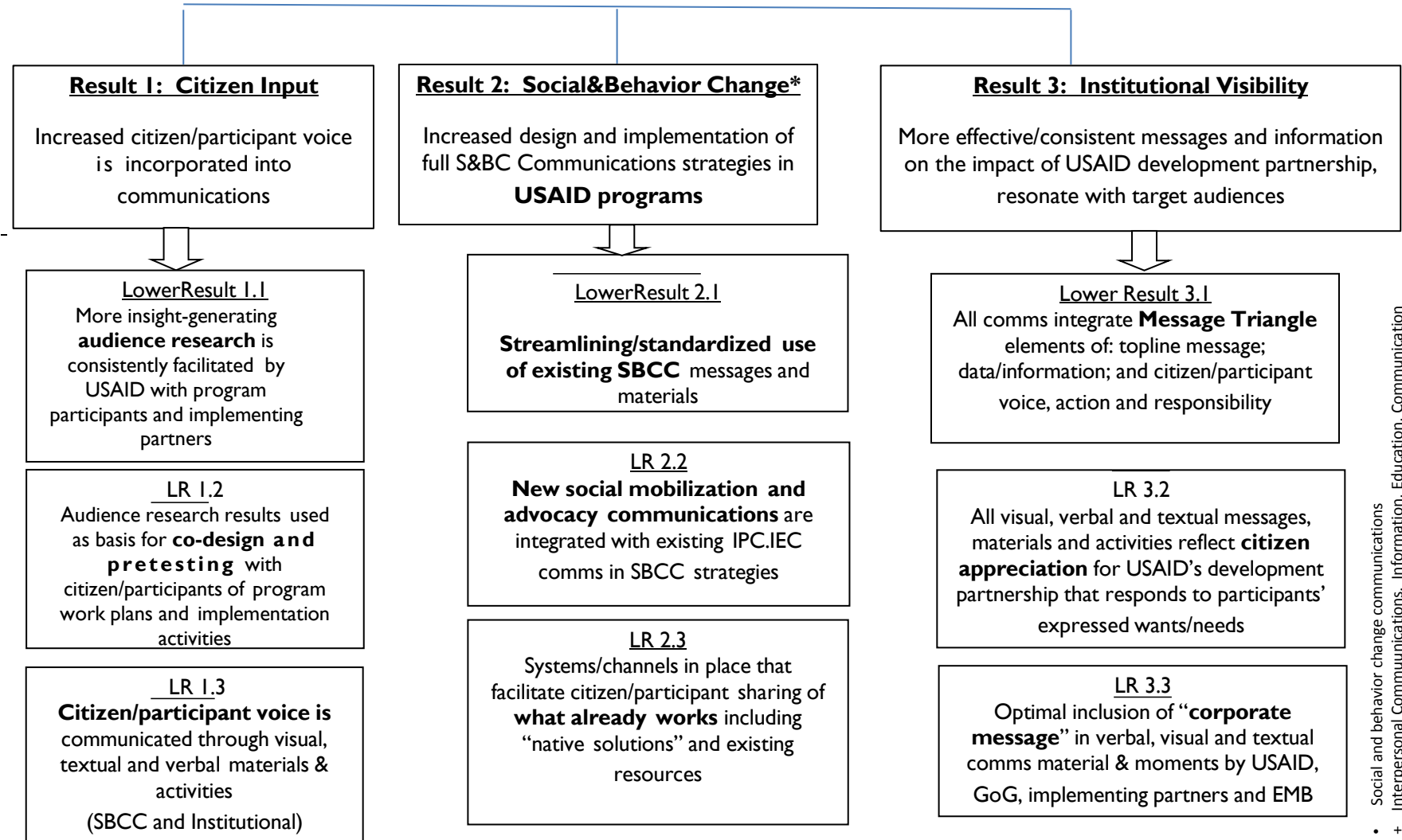
USAID Guatemala Strategic Communications Results Framework

Integrated Communications Objective

Greater social and behavior change among Guatemala target audiences and enhanced awareness and understanding among target audiences of the USAID development partnership with Guatemala.

Assumptions:

- Budget sufficient for needed reach and frequency of messages via paid campaign
- Staffing sufficient to plan, execute, and monitor and evaluate comms #
- Partners under existing contracts willing to change/augment activities



FAIR Climate Risk Assessment Summary

This Activity includes a combination of agricultural productivity, income generation, and market access interventions, as well as capacity building and climate smart agriculture interventions. Of these, the most significant risks include agricultural productivity and market access interventions, both of which received a “Moderate” Climate Risk Rating. These interventions include agricultural production (and natural resource impacts associated with this process), as well as the development of small-scale productive infrastructure. Several mitigation measures have already been identified in the Environmental Assessment for the Rural Value Chains Project (the LAC-EA-16-03), which will also be addressed by this Activity. Further, this Activity includes one result dedicated to climate smart and nutrition sensitive agriculture practices. Tasks associated with this result will include the design and dissemination of climate-smart agriculture practices to address a range of climate stressors, depending on the site – drought, frost, intense precipitation, an increase in pests, and soil degradation. This result will also include watershed management interventions at the community level. It was deemed appropriate to accept these climate risks, as agricultural production and market access interventions are crucial to income generation efforts. Climate Risk Management will be continued through climate smart agriculture practices and watershed management specifically associated with the Activity, as well as coordination with other USAID projects working on climate adaptation in the Western Highlands.

Based on the assessment of the Activity using the CRM tool, it was determined that the Climate Risk is Moderate for the agriculture production and access to markets actions of the Activity and low risk for the last 2 actions as per the following Summary Table.

Climate Risk Management Summary Table

CLIMATE RISKS, OPPORTUNITIES, AND ACTIONS

1.1: Tasks / Defined or Anticipated Tasks or Interventions	1.2: Time-frame	1.3: Geography	2: Climate Risks	3: Adaptive Capacity	4: Climate Risk Rating	5: Opportunities	6.1: Climate Risk Management Options	6.2: How Climate Risks are Addressed in the Activity	7: Next Steps for Activity Implementation	8: Accepted Climate Risks
1. Agricultural productivity improved and income generation alternatives diversified	5 years	Five Departments of the Western Highlands (Applicants to propose specific municipalities)	Droughts, frosts, intense precipitation, increase in pests and soil degradation may impact the productivity of selected crops, which would have a negative impact on income generated. <i>Many of these risks have already been identified and</i>	Information Capacity: Several activities have dedicated resources to increase capacity to collect, analyze and use climate information across a range of stakeholders (GOG, municipalities, and communities). Process is ongoing. Social and Institutional Capacity: The Coffee Network, which analyzes and	Moderate	Existing climate early warning systems can be expanded to incorporate activity sites. Several mitigation measures were identified and implemented by the Rural Value Chains Project. These can be built on. Guatemala's Climate Change Law (Decree 7-2013) expresses commitment to address climate vulnerability. 20 Western Highlands Municipal Adaptation Plans designed with support from the CNCG Program and Nexos Locales.	Attempt to incorporate activity sites into existing climate early warning systems. <i>See mitigation measures identified in EA for additional information.</i>	One result is specifically dedicated to addressing climate vulnerabilities and adopting climate smart agricultural practices. This Activity will also incorporate watershed management efforts, and support more efficient use of water resources across multiple	The Program Description specifically notes that this activity will coordinate with other USAID projects working on climate adaptation to improve results. This demonstrates a commitment to addressing and mitigating climate vulnerabilities. Implementing Partner will be informed of the CRM during Post Award	Moderate risk accepted and addressed by the Activity.

1.1: Tasks / Defined or Anticipated Tasks or Interventions	1.2: Time-frame	1.3: Geography	2: Climate Risks	3: Adaptive Capacity	4: Climate Risk Rating	5: Opportunities	6.1: Climate Risk Management Options	6.2: How Climate Risks are Addressed in the Activity	7: Next Steps for Activity Implementation	8: Accepted Climate Risks
			<i>addressed within the LAC-EA-16-03.</i>	processes information on climate conditions to aid in decision-making and preventative measures. Western Highlands Climate Network, currently under design and supported by the CNCG Program. Human Capacity: Communities and associations are trained through a variety of formats on climate impacts and adaptation measures.				stakeholders.	meeting and then CRM Mitigation measures go into EMMP.	

1.1: Tasks / Defined or Anticipated Tasks or Interventions	1.2: Time-frame	1.3: Geography	2: Climate Risks	3: Adaptive Capacity	4: Climate Risk Rating	5: Opportunities	6.1: Climate Risk Management Options	6.2: How Climate Risks are Addressed in the Activity	7: Next Steps for Activity Implementation	8: Accepted Climate Risks
				Financial Capacity: Organizations and municipalities are being trained to include budget allocations to implement mitigation and adaptation measures.						
2. Access to markets expanded	5 years	Five Departments of the Western Highlands (Applicants to propose specific municipalities)	Droughts, frosts, intense precipitation, increase in pests and soil degradation may impact the productivity of selected crops, which would	<i>See above</i>	Moderate	<i>See above</i>	<i>See above</i>	<i>See above</i> An additional strategy has been ongoing communication with the private sector so that they understand the risks and vulnerabilities inherent	<i>See above</i>	Moderate risk accepted and addressed by the Activity.

1.1: Tasks / Defined or Anticipated Tasks or Interventions	1.2: Time-frame	1.3: Geography	2: Climate Risks	3: Adaptive Capacity	4: Climate Risk Rating	5: Opportunities	6.1: Climate Risk Management Options	6.2: How Climate Risks are Addressed in the Activity	7: Next Steps for Activity Implementation	8: Accepted Climate Risks
			have a negative impact on income generated. The development of small-scale productive infrastructure (cold storage, drip irrigation, packing sheds).					to the production of specific crops.		
3. Resilience increased through climate smart and nutrition sensitive agriculture practices	5 years	Five Departments of the Western Highlands (Applicants to propose specific municipalities)	<i>Non-applicable</i> This activity is designed specifically to analyze and address climate	<i>See above</i>	Low	<i>See above</i>	<i>Rated "Low Risk." No Climate Risk Management Options required</i>	This activity will improve watershed management at the community level, and support the adoption by small-scale farmers and	<i>See above</i>	Low inherent risk accepted and addressed by the Activity.

1.1: Tasks / Defined or Anticipated Tasks or Interventions	1.2: Time-frame	1.3: Geography	2: Climate Risks	3: Adaptive Capacity	4: Climate Risk Rating	5: Opportunities	6.1: Climate Risk Management Options	6.2: How Climate Risks are Addressed in the Activity	7: Next Steps for Activity Implementation	8: Accepted Climate Risks
			risks.					producer organizations of targeted methods to improve the efficient use and quality of water. Municipal-level engagement will be also sought.		
4. Agriculture and food security enabling environment strengthened	5 years	Five Departments of the Western Highlands (Applicants to propose specific municipalities)	<i>Non-applicable</i> These are capacity-building activities for institutions that work on agriculture (training, workshops, studies, analyses, policies etc.)	<i>Non-applicable</i>	Low	Because this activity will work closely with the Ministry of Agriculture, there is the potential to influence policies in favor of climate adaptation.	<i>Non-applicable</i>	<i>Non-applicable</i>	The Program Description specifically notes that this activity will coordinate with other USAID projects working on climate adaptation to improve results. This demonstrates a commitment	Low inherent risk accepted and addressed by the Activity.

1.1: Tasks / Defined or Anticipated Tasks or Interventions	1.2: Time- frame	1.3: Geography	2: Climate Risks	3: Adaptive Capacity	4: Climate Risk Rating	5: Opportunities	6.1: Climate Risk Manageme nt Options	6.2: How Climate Risks are Address ed in the Activity	7: Next Steps for Activity Implemen tation	8: Accepted Climate Risks
									to addressing and mitigating climate vulnerabilitie s.	

Regina Soto 12.08.16

Regina Soto
Mission Environmental Officer