



**Food and Agriculture Organization
of the United Nations**

**RESILIENT LIVELIHOODS OF VULNERABLE
SMALLHOLDER FARMERS IN THE MAYAN LANDSCAPES
AND THE DRY CORRIDOR OF GUATEMALA
–RELIVE-GUATEMALA–**

**Environmental and Social Management Framework
(Annex 6)**

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Food and Agriculture Organization of the United Nations.

1 PREFACE

- 1 This Environmental and Social Management Framework (ESMF) will be applied to all activities financed by the Green Climate Fund (GCF) for technical and / or financial support of the project, " REsilient LIVELihoods of vulnerable smallholder farmers in the Mayan landscapes and the Dry Corridor of Guatemala" (RELIVE).
- 2 The Project Steering Committee (PSC), the Technical Committee Project Management Unit (PMU) (housed in the FAO Office in Guatemala), is responsible for the general coordination of project activities. The respective Territorial Operating Unit (TOU) is responsible for the daily implementation of the specific subcomponents and ensures compliance with the ESMF, as well as the safeguard of related documents, including maintaining the appropriate documentation on the Project file for possible revision by the GCF.

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4 ABBREVIATIONS

ANACAFÉ:	National Association of Coffee
ASIES:	Association for Social Research and Studies
ASIS:	Agricultural Stress Index System
CADER:	Learning Centers for Rural Development
CICC:	Interagency Climate Change Committee
CNCC:	National Climate Change Council
CNCG:	Climate, Nature and Communities in Guatemala
COCODE:	Community Councils of Urban and Rural Development
CODEDES:	Departmental Development Councils
COMUDE:	Municipal Development Councils
CONADUR:	National Urban and Rural Development Council
CONAP:	National Council of Protected Areas
COREDURS:	Regional Urban and Rural Development Councils
CSO:	Civil Society Organizations
ESMF:	Environmental and Social Management Framework
FA:	Family Agriculture
FAO:	Food and Agriculture Organization of the United Nations
FILAC:	Fund for the Development of Indigenous Peoples of Latin America and the Caribbean
FLACSO:	Latin American School of Social Sciences
FONCC:	National Climate Change Fund
FPIC:	Free, Prior and Informed Consent
GBByCC:	Group on Forests, Biodiversity and Climate Change
GCF:	Green Climate Fund, Green Climate Fund
GIMBOT:	Interagency Coordination Group
GIZ:	The German Society for International Cooperation
ICC:	Private Institute for Climate Change Research
IFC:	International Finance Corporation, International Financial Corporation
IGSS:	Guatemalan Social Security Institute
INAB:	National Institute of Forest
INSIVUMEH:	The National Institute of Seismology, Volcanology, Meteorology and Hydrology of Guatemala
IOM:	International Organization for Migration
IUCN:	The International Union for Conservation of Nature
KOICA:	Korean International Cooperation Agency
LWC:	Local Water Committees
MAGA:	Ministry of Livestock and Agriculture, Ministry of Agriculture and Livestock
MARN:	Ministry of Environment and Natural Resources
MFEWS:	Famine Early Warning System Network
MICIVI:	Ministry of Communications, Infrastructure and Housing
MSPAS:	Ministry of Public Health and Social Welfare
NaP:	National Adaptation Plans
NDA:	National Designated Authority
OCSE-Ambiente:	Sector Coordinating Office on Environmental Statistics
PAFFEC:	2016-2020 Family Agriculture Program for Strengthening the Peasant Economy
PINPEP:	Forest Incentives program for holders of small tracts of land with a forest or agroforestry vocation
PNUD:	United Nations Development Programme
PROBOSQUE:	Law to Promote the Establishment, Recovery, Restoration, Management, Production and Protection of Forests in Guatemala
RELIVE:	REsilient LIVelihoods of vulnerable smallholder farmers in the Mayan landscapes and the Dry Corridor of Guatemala

SCAEI:	Guatemalan Environmental and Economic Accounting System
SDI:	State Density Index
SESAN:	Food and Nutritional Security Secretariat
SGCCC:	Guatemalan Climate Change Science System
SIDA:	Swedish International Development Cooperation Agency
SIGAP:	Guatemalan System of Protected Areas
SINCC:	National System for Information on Climate Change
SIPECIF:	National Forest Fire Prevention and Control System
SMS:	Short Message Service
SNER:	National Rural Extension System
SNICC:	National Climate Change Information System
UG:	Galileo University
UMG:	Mariano Gálvez University
UNDRIP:	United Nations Declaration on the Rights of Indigenous Peoples
URL:	Rafael Landívar University
USAC:	San Carlos University of Guatemala
USAID:	United States Agency for International Development
UVG:	Universidad del Valle
WHO:	World Health Organization, World Health Organization

5 SUMMARY

- 3 An Environmental and Social Management Framework (ESMF) of the project entitled “RELIVE – RESilient LIVELihoods of vulnerable smallholder farmers in the Mayan landscapes and the Dry Corridor of Guatemala” was conducted as part of the requirements of the Green Climate Fund (GCF) for possible funding, and to guarantee that the activities it develops, in partnership with strategic partners of the project and affected beneficiary communities, incorporate measures that may be considered necessary and sufficient to prevent, minimize, reduce and, when applicable, compensate for any adverse impact on persons and the environment.
- 4 The project will support the development of means of subsistence resistant to climate adversity of the most vulnerable population to climate change in rural areas of Guatemala by overcoming technical, financial and institutional barriers that prevent farmers from adopting climate-resilient practices; still, the project has a moderate social and environmental risk classification (FAO, 2018) since, although significant negative impacts are not expected, the activities are located in indigenous territories, which implies a number of important project formulation and development considerations, to prevent affecting their livelihoods, exclusion and inequality, in addition to gender issues.
- 5 FAO Environmental and Social Safeguards and International Financial Corporation (IFC) performance standards were used to guide the study. The ESMF was conducted based on possible favorable and adverse impacts that might be generated by the five adaptation measures identified by the project, including the practices it contains (CATIE, 2018). The biophysical and sociocultural description of the prioritized municipalities also had to be known.
- 6 The project will focus in the region of Guatemala identified as most vulnerable to the impacts of aridity increases and includes 29 prioritized municipalities in the departments of Petén, Alta Verapaz, Baja Verapaz and the eastern part of the country. Project beneficiaries will be small subsistence and below-subsistence farmers, a significantly high percentage of whom are indigenous.
- 7 The project area possesses considerable water resources; however, these are being affected by volume reductions and pollution problems, due to the discharge of untreated waste water or agrochemicals from agriculture and ranching. The predominant life zone is Very Humid Hot Subtropical Forest and Cold Subtropical Forest, followed by Dry Subtropical Forest and Spiny Subtropical Scrubland. Approximately 42% of the area in prioritized municipalities is taken up by agricultural activities with some overuse and only 29% possesses forest cover. Some municipalities only have 5% of forest cover.
- 8 The population is mostly rural in the 29 municipalities that were prioritized. In some municipalities the population is 98% rural, especially in Alta Verapaz and Chiquimula. 7.7% of the national population lives in the department of Alta Verapaz, which ranks third in

Guatemala, whereas Zacapa and Baja Verapaz have the smallest populations at the national level (INE, 2012).

- 9 In all the municipalities the population basically depends on agricultural activities, mainly at the subsistence level, and sometimes they heed to migrate to find job in other places. Women's work is invisible, since they do not receive consistent and direct compensation for their work.
- 10 Reliance on subsistence agricultural activities is partly to blame for the significant levels of food insecurity and poverty seen, especially, in municipalities in the departments of Alta Verapaz, Chiquimula and Zacapa. As for illiteracy rates, the prioritized municipalities follow the national trend. 25% are illiterate and the young population is better educated, although most of them only attend elementary school. As for land tenure, many municipalities do not even have cadastral records, which results in conflicts and insecurity.
- 11 According to the methodology used for conducting this social and environmental impact assessment, knowledge of the activities contemplated in project adaptation measures was the starting point, along with identifying and rating the most significant and frequent impacts that may potentially occur at the different stages of the project.
- 12 The Leopold Matrix was used to identify environmental and sociocultural impacts. Its rows show the biophysical and sociocultural elements that might be affected by setting up and operating a project and the columns show the specific actions included in its implementation (GTZ-IICA, 1996). The checklist of the International Commission on Irrigation and Drainage (ICID) was used to identify the physical and natural elements to be affected by the project.
- 13 Some activities entail a risk of causing negative impacts on some biophysical or socioeconomic elements if the necessary precautions are not taken. These include affecting plants and the physical, chemical and mechanical characteristics of the soil. The activities that might have the greatest negative impact are chemical pesticide and fertilizer application and storage of materials and waste; however, most negative impacts are slight compared with the positive impacts.
- 14 The results of identifying project impacts show that its social and environmental benefits are much greater than its adverse impacts and that these are low in magnitude and moderate; it is recognized, however, that such impacts may accumulate and result in much greater impacts unless they are considered since the beginning of the project planning cycle and prevention and mitigation measures are not incorporated into it.
- 15 The most significant impact is the likelihood of excluding potential beneficiaries from the project because they lack title to the land. Associated to it is the moderate risk of inequity for vulnerable populations, not so much due to land tenure, but because the gender-based approach and relations with indigenous peoples are not considered. This also jeopardizes achieving the overall goal of the project, which is to improve the livelihoods of small farmers who are vulnerable to climate. However, the use of a good methodology for

selecting the persons and families that will benefit from the project might solve these problems.

- 16 Other moderate impacts that should be considered have to do with affecting the incomes and increasing families' vulnerability due to variations in product prices, especially coffee and cacao. Other moderate risks are impacts due to possible soil and water pollution through agrochemicals and different waste products. This environmental social assessment framework was the tool used to determine the mitigation measures and approach to enhance positive impact.
- 17 Taking in consideration that Guatemala is a country with a great ethnic, cultural and linguistic diversity, where Maya, Garífuna, Xinka and mestizo peoples live together, and it is not the exception in the implementation area of the RELIVE Project¹, an important element that have been considered in the ESMF, have been the "Free, Prior and Informed Consent (FPIC)" (see Appendix 7 of the funding proposal for more details), which is a specific right that pertains to indigenous peoples and is recognized in the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). It allows them to give or withhold consent to a project that may affect them or their territories. Once they have given their consent, they can withdraw it at any stage. Furthermore, FPIC enables them to negotiate the conditions under which the project will be designed, implemented, monitored and evaluated. This is also embedded within the universal right to self-determination.
- 18 In the absence of a regulatory framework officially approved by the State of Guatemala for the FPIC procedure, and following the customary practice of self-consultation in indigenous territories, the consent of this particular project was coordinated by the Ministry of Environment and Natural Resources (MARN) in its role of National Designated Authority (NDA) with the support of the implementing partner institutions (Ministry of Agriculture and Livestock (MAGA) and the National Institute of Forest (INAB). This process was also supported by FAO and FILAC (Fund for the Development of Indigenous Peoples of Latin America and the Caribbean) and by the representatives of the indigenous peoples and local communities.
- 19 A total of eight FPIC sessions were carried out (165 representatives of indigenous organizations and 184 persons representing the communities participated (57% Women/43% Men), four of them with the Q'eqchi' population (as the majority group in the prioritized territory), two with the Ch'orti' population, one with Achi population, and one with the Poqomchi population. Each session lasted approximately seven hours. The first activity was a self-presentation of the participants. Then, in a participatory manner, the attendees defined the rules to be observed during the meeting. Subsequently, the team,

¹ The indigenous peoples located in the territory where the project is to be implemented are: Maya Q'eqchi, Maya Poqomchi, Maya Achi, and Maya Ch'orti; where the Q'eqchi population is the majority.

composed by MARN, MAGA, INAB, FILAC and FAO, explained the objectives of the activity and the work methodology. In this introduction, emphasis was placed on the fact that this exercise was carried out as a practice of the rights of indigenous peoples.

- 20 The representatives of the indigenous peoples who participated in the FPIC sessions agreed that there is a real need of the project and are in favor of its development, such as the proposed by FAO and MARN to help strengthening resilience capacity to climate change of vulnerable small farmers in the Mayan landscapes of Petén, Alta and Baja Verapaz, Zacapa and Chiquimula (see Appendix 7 for more details).

6 INTRODUCTION

- 21 Environmental planning considers all the aspects that precede implementation of a project, so that when it is developed, resources are used efficiently, the environment is conserved respecting environmental regulations, but also achieves productive, economic and social goals. Part of the certainty that there will be both positive and negative impacts in any productive activity means that the former should be maximized and the latter should be minimized.
- 22 Environmental planning basically refers to a Environmental and Social Management Framework (ESMF), which consists of implementing environmental and social standards such as those of the United Nations Food and Agriculture Organization (FAO), which seeks to identify, evaluate and manage a project's environmental and social risks, adopt a strategy of mitigation measures and promote sustainable agricultural and food systems (FAO, 2017). Implementing these environmental and social standards or safeguards is part of the requirements established by the Green Climate Fund (GCF) when evaluating proposals submitted to it for funding.
- 23 The purpose of the ESMF is to support environmentally and socially sustainable implementation of the project entitled "RELIVE – RESilient LIVELihoods of vulnerable smallholder farmers in the Mayan landscapes and the Dry Corridor of Guatemala" that will be submitted to the GCF to request funding, ensuring that activities developed in partnership with its strategic partners and affected beneficiary communities incorporate measures deemed necessary and sufficient to avoid, minimize, reduce and, if applicable, compensate for any adverse impact on persons and the environment.
- 24 It also seeks to ensure an adequate information disclosure process regarding the intervention strategy at an accessible place and/or media and in a form and language understood by those potentially affected/beneficiaries, civil society organizations and other key stakeholders.
- 25 To achieve the proposed objectives, the measures and practices the project will develop to improve the system's resilience and improve families' adaptation to the adverse effects of climate change were analyzed.
- 26 This analysis showed that the project has a moderate social and environmental risk classification (FAO, 2018), since, although no significant negative impacts are expected, most activities will take place in indigenous territories, which implies several important considerations for formulating and developing the project, to prevent affecting their livelihoods, exclusion and inequality, in addition to gender issues.
- 27 In this regard, the ESMF was developed based on the possible favorable and adverse impacts of the identified adaptation measures, including the practices they contain (CATIE, 2018). The physical and natural and socio-cultural description of the municipalities

prioritized for the project², had to be known, bearing in mind that, in addition to having a large indigenous population, the country depends in no small measure on rain-fed agriculture, which makes it very sensitive to changes brought about by climate on the rainfall pattern, at the same time as generalized poverty reduces these farmers' capacity to adapt to the drier periods expected in the future.

- 28 That is how the project ESMF made it possible to analyze its impact level (low, moderate, high) and the effects of the actions to be implemented (in environmental and social terms) on vulnerable groups and populations that will be involved.

² This information was obtained from the feasibility study that underpins the proposal.

7 PROJECT DESCRIPTION

- 29 This section provides summarized description of the proposed project. More detailed information is included in SECTION C.5 of the feasibility study of the project (see Annex 2 of the Funding Proposal).

7.1 The Problem at Hand

- 30 Guatemala is highly vulnerable to the effects of climate change. Populations living in poverty and extreme poverty are most affected.
- 31 From 2001 to 2014, the average temperature (1970/2000 being the baseline) increased throughout Guatemala. Temperature projections show a rising trend, with expected increases for the decade of the 2050s between 2.5 and 4.1°C. (MARN, Segunda Comunicación Nacional Sobre Cambio Climático, 2015) (MARN, Second National Climate Change Communication, 2015).
- 32 As a consequence of the above, recent regional climate models suggest increased water shortage in the country's dry regions (East), but they also suggest considerable changes in traditionally humid areas where most of subsistence agriculture is concentrated (including the project area that includes the south of Petén, Alta and Baja Verapaz) (Pons, Brincker, & Castellanos, 2018).
- 33 Climate change is also expected to affect the water cycle in Guatemala, with scenarios showing an increase in climate variability, as well as increasingly frequent dry and very dry years. Historically, Guatemala has been a low water stress country, but currently approximately 45.4% of the country (49,430 sq. km) shows mid to high susceptibility to drought (MARN, 2007).
- 34 Small farmers' vulnerability to drier conditions is high (particularly to drought and midsummer drought) and the main factor that affects their ability to adapt is that they depend to a large extent on rain-fed agriculture. The population in drought-prone areas includes 13% (1,113,000) of the national population, including 387,000 indigenous people (MARN, 2016).

7.1.1 The Climate Problem for Food Security

- 35 In 2014, the World Health Organization (WHO) made projections estimating the number of preschool children with chronic malnutrition at the global level for 2030 and 2050, under two scenarios: one considering climate change and one without considering it. The results showed that for 2030, under the climate change scenario, an increase of 7.5 million preschoolers with chronic malnutrition is expected, in comparison with the scenario without climate change (WHO, cited by INCAP, 2017).
- 36 The 2014 prolonged midsummer drought affected 22 departments and 208 of Guatemala's municipalities. The maize and bean crops of close to 170,000 families suffered damage. Losses of close to 86,900 tons (1.8 million quintals) of maize and 30,400 tons (661,000

quintals) of beans were recorded. These losses affected approximately 80% and 63% of maize and bean subsistence production, respectively, which resulted in economic losses of USD 61 million. The worst impacts were experienced by below-subsistence and subsistence producers, who cultivate an average area of 0.6 ha, with a median of 0.2 ha, to produce basic grains for self-consumption, mainly of maize (94.1% and beans (46.7%) (SESAN, 2014). It is estimated that around 236,000 families experimented total or partial crop losses, which negatively affected their food security. In the specific case of the project area, this weather event affected 40% of the total area used by subsistence and below-subsistence growers (12,090 ha) and caused losses of USD 11.6 million.

- 37 Studies have shown that unless farmers adapt their growing practices, agricultural productivity will decrease as a result of exposure to projected climate conditions: temperature increasers, reduced precipitation and increased duration of the dry season (Lyra et al., 2017). The Guatemalan Second National Communication on Climate Change indicates that small farmers' response capacity is very low, since only 16% of the farmers interviewed have taken specific steps to adapt in spite of average losses of 55% of their production of basic grains during drought periods (MARN, 2015).
- 38 The above threatens the food security of the population in the project area in two ways: the first by affecting family vegetable plots and basic grain production from which families can obtain their food directly, and the second by affecting agro-forestry systems such as coffee and cacao, where productivity drops and hence the income earned by families from these systems, either by selling their products or because they are employed in different production stages, especially in coffee harvesting, since many people migrate to work as day laborers in coffee plantations (this last point is addressed below).

The climate problem faced by coffee growers

- 39 Projections show that due to climate change, traditional coffee-growing regions might disappear, and new growing areas might appear. For example, projections of the effect of climate change on coffee-growing areas in Guatemala indicate that coffee production will move to places with more favorable climate conditions for the crop, located between 800 and 2,500 meters over sea level. On the contrary, current coffee-growing areas located between 400 and 2,000 meters over sea level will lose most of their productive capacity. Generally speaking, a 19% reduction in the area suitable for growing coffee of the Arabica variety is predicted, which represents around 126,050 ha (excluding protected areas), although increases of areas suitable for its production at elevations between 1,500 and 2,000 meters over sea level are predicted (Ovalle-Rivera, Laderach, Bunn, Obersteiner, & Schroth, 2015).
- 40 The incidence of the disease caused by the *Hemileia vastatrix* fungus, known as coffee rust, is one of the worst problems affecting coffee production. This disease has recently experienced a resurgence due to a series of factors. One of them is a reduction in the range of daytime temperatures, considered to be the main cause of the epidemic resurgence of rust in 2011-2012. Measurements conducted in 2012 compared with measurements in previous years in 1,225 plantations in Guatemala (Avelino, 2015) reported changes in the

average temperatures expected (both low and high), of +0,9°C-1,2°C. It is estimated that this temperature variability has reduce the latency period of the disease, creating favorable conditions for the development of the epidemic. According to estimates developed in 2013 in project areas, between 31% and 53% of the planted area was affected by rust, whereas the incidence of rust in September 2017 was 9.5% - 17.5% on average, respectively. Based on the above, it is expected that temperature increases in the RELIVE work area will have a direct impact on crop yields.

- 41 In Project influence area, most growers implement comprehensive measures (including shade management, fertilization and chemical control) for rust control (Chocooj & Morales, 2017), but without appropriate techniques, which does not make it possible to efficiently reduce the damage caused by the disease. Although a specific model for predicting rust damage does not exist, it is known that changing climate conditions and extreme events associated with climate change favor the incidence and severity of rust in coffee plantations, resulting in production losses (Avelino, 2015).
- 42 Coffee production losses affect growers who depend directly on coffee, such as coffee plantation owners, and families that migrate from their homes to coffee-growing areas to work on the coffee harvest. For the producers, revenues are reduced by losses, and since their coffee plantations are not diversified, they incur a high financial risk because they depend on a single product. For laborers, as coffee production decreases, families are no longer hired and they lose an important source of revenues, sometimes the only one available.

7.1.2 The Climate Problem Faced by Cacao Producers

- 43 Most cacao-producing areas in Central America are currently located on the Atlantic slopes, with rainfall of more than 2,000 mm/year (except in El Salvador). At these places, reduced rainfall would not considerably affect cacao yields, since the plant requires about 4-5 mm/day 1,600/1,800 mm/year) to develop and produce (Carr & Lockwood, 2011). However, drier areas would be more conducive to the development of insects that attack cacao, instead of the fungi that attack it with the current humid climate of the Atlantic region of the isthmus. Current physiological models indicate that changes in accumulated rainfall, the pattern of occurrence during the year and temperature changes might explain up to 70% of variations in subsequent harvests (Zuidema, 2005). According to model estimates, the yield of this grain might go down by 15%-35% as a result of less rainfall and higher temperatures.
- 44 On the other hand, temperatures will increase by 2-3oC in almost all cacao-producing regions in Central America; however, direct effects are not expected on the physiology of the plant because cacao resists high temperatures (Abdulai, 2017). However, temperature increases and changes in the rainfall calendar might increase the incidence and severity of pests and diseases, which might in turn reduce yields. Expert agronomists suggest that losses due to moniliasis, “Mazorca Negra” and eventually the arrival of witches ‘broom in

Central America might affect between 30%-60% of regional production (Phillips-Mora, Ortiz, & Aime, 2006).

- 45 The combined effect of reduced yields and increased damage caused by pests and diseases, exacerbated by climate change, will result in a drastic crop reduction, resulting in significant economic losses for rural families. Assuming an average regional yield of 275 kg/ha/year (i.e. without using new varieties and with traditional crop management) growers might lose between 175-200 kg/ha/year. Based on a median price of US\$1.75/kg of cacao, harvest reduction is estimated at US\$300-450/ha/year. Under this scenario, appropriate use of shade, new varieties and integral management of the system might be the simplest solution for dealing with temperature increases, on-site water management and facilitating agro-ecological crop (Harvey, 2014) (Tscharntke, 2011). Field research and simulation exercises indicate that a shade level of 55% is “optimal” for harvesting about 585 kg/ha/year of cacao while carbon is sequestered in the order of 65 Mg/ha-1 (Schroth et al., 2014). However, this shade level must be adjusted to each growing area (Somarriba, 2013).
- 46 Economic losses due to the combined effect of climate change and pests and diseases might be more severe in Guatemalan cacao growing regions. For example, the results of diagnoses conducted in cacao plantations in Alta Verapaz indicate that they were planted between 1985-1990 and it is estimated that the age of 35% of the planted area is advanced (30 years) and most of the hybrid genotypes are susceptible to moniliasis. Among the varieties grown, considerable differences can be detected in the incidence of moniliasis, some incurring losses of more than 70%. In this context, cacao is more vulnerable to changing climate conditions. The use of new disease-resistant genotypes, integral agronomic crop management and nutrient management are the principal means for making cacao growers more resilient (CATIE, 2018a).
- 47 According to Leandro-Muñoz et al. (2017), temperature is the most determining factor for the appearance of moniliasis signs and symptoms. Warm temperatures favor the appearance of symptoms and significantly reduces the latency period of this fungus. Other authors state that changes in rainfall dynamics might favor pathogens that are more dependent upon water, such as the fungus that causes “Mazorca Negra”, cancer of the trunk and other vascular diseases. That is why it is very important for value chain actors to be aware of soil use aptitude change trends to be able to design short, medium and long-term mitigation and adaptation strategies that ensure growers’ livelihoods and sustainable cacao production.

7.1.3 The Climate Problem, Water and Forests

- 48 Climate change in Guatemala will result in increased temperatures and reduced precipitation, which will turn water into a scarce resource in comparison with the current situation. With regard to precipitation, the volume of rain is expected to go from 61,826.61x10⁶ m³ (which is the average value for the period 1997-2000) to 45,840.15 x10⁶ m³, which means a potential reduction of 26% with respect to water recharge. Changes in

water recharge will be mainly due to lower precipitation volumes and increased evapotranspiration.

- 49 At the departmental level, reduced rainfall between 1997-2000 and the decade of 2070 is of the order of 40% for Petén and 31% for Baja Verapaz. The most significant reductions in recharge are seen in Chiquimula (91%), Baja Verapaz (71%) and Petén (74%). All of them are considered for project implementation. Rainfall will drop in the prioritized municipalities during the aforesaid periods by 1% to 53%. There are reductions in water recharge that range between 3% and 100% (for the municipality of Chiquimula).
- 50 In a climate change context, where water will become a scarce resource, forests play a fundamental role. Work done by Bruijnzeel (1988) shows that forests allow more water to infiltrate, which not only feeds water tables, but also increases the water available during the dry season. In a study of paired basins, Álvarez (2010) showed that basins with adequate forest cover management can produce up to 25% more water during the dry season than poorly managed ones. This clearly shows the role and importance of natural forests, especially in high parts of the basins, since their value lies in their function for providing water, particularly during the dry season, since water is a critical factor, especially when strategic aspects that go from productivity (in quality and quantity) to local governance aspects depend on this element.
- 51 A study of the dynamics of forest cover in Guatemala during 1991, 1996 and 2001 and the 2001 Forest Cover Map (INAB, CONAP, & UVG., 2006) showed that each year between 1991/93 and 2001, the country lost an average of 73,148 ha of forest each year, or an annual deforestation rate of 1.43%. This loss is concentrated in the department of Petén, where an annual average of 47,412 ha disappears. In relative terms, however, Chiquimula is the department that lost more forests during the 10 years under study, at an annual rate of 2.46% with respect to the original forest, whereas Petén ranks third, with a deforestation rate of 1.81%, below Jutiapa with 2.17%.

7.2 Location

7.2.1 Methodology Used to Prioritize Work Areas

- 52 The risk index theory and its successful implementation in the region were reviewed to determine the methodology for analyzing climate change risk. The theory suggests that incorporation of multiple indicators that determine the vulnerability of a population or system to the threat of an impact associated with climate change to create a composite index may be useful, provided information is available at the appropriate scale (Cutter, Emrich, & T., 2013). The methodology suggested by the Intergovernmental Panel on Climate Change (IPCC) in the AR5 report on adaptation to climate change was evaluated as part of this diagnosis for estimating climate risk.
- 53 Based on the above explanation, it was decided to build a composite risk index (Cutter, Emrich, & T., 2013) to integrate vulnerability, exposure and climate risk indicators using

the methodology suggested in the fifth evaluation report of the Intergovernmental Panel on Climate Change (IPCC, 2013).

- 54 The IPCC vulnerability as “The propensity or predisposition to be negatively affected. Vulnerability includes a variety of concepts and elements that include sensitivity or susceptibility to harm and the absence of response and adaptation capacity”. This approach contemplates deforestation as municipal territories’ propensity or predisposition for increased aridity. Increased aridity in degraded landscapes can accelerate the desertification process, which has major impacts on agriculture. Similarly, the loss of forest cover not only affects runoff and soil humidity, but also has negative impacts on biodiversity, including the availability of pollinizers critical for agriculture (Hannah L, 2017).

7.2.2 Prioritized Areas

- 55 After applying the selection methodology (see the previous section), a total of 29 municipalities in the departments of Alta Verapaz, Baja Verapaz, Petén and the eastern departments of Zacapa and Chiquimula were selected. The following table shows the list of municipalities by department and region (see Table 1), as well as their location in the country .
- 56 Given that these 29 municipalities comprehend a vast area, a secondary analysis (based on the results in the landscape identified with the climate vulnerability analysis) was developed to prioritize the specific watershed where project actions will be implemented.
- 57 The first step in the prioritization process was the selection of the criteria that will be used. For this purpose, a workshop was conducted with watershed management specialists from INAB, MAGA, and MARN. The criteria identified in this activity were:
- Micro-basins with a deficit water balance by 2050, assuming a minimum per capita availability value of 1,700 m³ per year
 - Micro-basins where the annual agriculture and coffee represents more than 20% of the land use.
 - Micro-basins with deforestation rate higher than the national average (1%).
 - Percentage of the area of each micro-basin under the categories of very high and high importance for hydrological catchment and regulation. Watersheds with a percentage of 75% or more will be prioritized.
 - Micro-basins located in the municipalities with a population return rate of over 140 per 100 thousand inhabitants (IOM range)
 - Micro-basins in which there is a "Very High" prevalence of chronic malnutrition (greater than 48%).
- 58 Once the criteria were selected, the micro-watershed prioritization geospatial model was built and applied, and the results were validated by the participants themselves at a workshop organized by FAO Guatemala. It is worth mentioning that this is a preliminary prioritization that has to be corroborated in the field once the project begins.

Table 1: List of prioritized municipalities

No.	Municipality	Department	Region
1	Chisec	Alta Verapaz	Alta Verapaz
2	Panzós	Alta Verapaz	
3	Santa Catalina la Tinta	Alta Verapaz	
4	Tucurú	Alta Verapaz	
5	Cahabón	Alta Verapaz	
6	Cobán	Alta Verapaz	
7	Fray Bartolomé de las Casas	Alta Verapaz	
8	Lanquín	Alta Verapaz	
9	San Cristóbal Verapaz	Alta Verapaz	
10	San Pedro Carchá	Alta Verapaz	
11	Santa Cruz Verapaz	Alta Verapaz	
12	Senahú	Alta Verapaz	
13	Tamahú	Alta Verapaz	
14	Chahal	Alta Verapaz	
15	Raxruhá	Alta Verapaz	
16	San Juan Chamelco	Alta Verapaz	
17	Tactic	Alta Verapaz	
18	Purulhá	Baja Verapaz	Baja Verapaz
19	Rabinal	Baja Verapaz	
20	San Miguel Chicaj	Baja Verapaz	
21	Jocotán	Chiquimula	Oriente
22	Camotán	Chiquimula	
23	Chiquimula	Chiquimula	
24	Olopa	Chiquimula	
25	San Juan la Ermita	Chiquimula	
26	La Unión	Zacapa	
27	San Luis	Petén	Petén
28	Dolores	Petén	
29	Poptún	Petén	

- 59 The geospatial model ranked the micro-basins in high and low priority for the implementation of project activities. Based on this, 14 micro-basins were selected. The extensions of basic grains, agroforestry systems, coffee, and cocoa that will be implemented by the project in each one of the micro-basins are presented in Table 2.

A.1. Project objective

- 60 The project aims at building the resilience of Guatemala's most vulnerable farmers and their livelihoods against the impacts of climate change. The project will promote drought-resilient crop production systems by adopting a package of proven and validated adaptation measures. It will also be transformative in its focus on promoting women's equitable representation in project activities and enabling women's greater economic empowerment and participation in decision making. This project will address national climate change priorities, and government stakeholders including MARN, MAGA and INAB will have an active role in implementation. The project will focus on the most vulnerable region of Guatemala to the effects of CC, namely the Departments of Petén, Alta Verapaz, Baja Verapaz, Zacapa and Chiquimula. The project has three key outcomes:
- a. Critical production systems sustain productivity under droughts and heatwave, farmers have enhanced, food-secured and adapted livelihoods;
 - b. Water resources at micro-basins are sustainably managed and landscapes are restored to ensure stable supply of water for farming amidst drought conditions; and
 - c. Local and national institutions and governance mechanisms have enhanced capacities to implement adaptation measures to climate change.

7.3 Project Components

- 61 The objectives of the project will be achieved through three interlinked components. The first component will target agricultural climate resilience actions at local level, the second component will ensure access to water resources and management at watershed scale, and the third component will facilitate the necessary enabling conditions:

COMPONENT 1. IMPLEMENTING CLIMATE RESILIENT AGRICULTURAL PRACTICES AND ENHANCING FARMERS' LIVELIHOODS

- 62 Component 1 is designed to promote resilience of agricultural producers at farm level. It will improve the capacity of farmers to reduce drought-related production losses by using climate information and adopting climate resilient agricultural practices. Table 4 lists a set of proposed selection criteria for beneficiaries additional to the general selection criteria. These criteria ensures that the farmers most in need will benefit from the project interventions (see Section C.3 of the Feasibility Study for more information on beneficiary selection).

Table 2: Implementation area by prioritized Micro-basins

No.	Micro-basin	Basic grains (ha)	Agroforestry/forest incentives (ha)	Forest incentives	Coffee (ha)	Cacao (ha)	Total area of implementation (ha)
1	Bolonc6	74	938		0	0	1,012
2	Cahab6n	835	3,822		330	808	5,617
3	Chixoy o Negro	370	1,254		250	320	2,126
4	Grande de Zacapa	102	115		0	0	167
5	Grande o Jocot6n	553	647	282	370	0	1,708
6	Matanzas	53	710		110	40	907
7	Olopa	12	85		60	0	155
8	Polochic	449	2,665		318	110	3,444
9	San Jos6	88	41		0	0	120
10	Santo Tomas	50	28		0	0	70
11	Sarst6n	78	1,955		0	270	2,247
12	Shusho	30	20		0	0	50
13	Shutaque	61	45		0	0	99
14	Zapote	84	437		370	0	883
TOTAL		2,839	12,762	282	1,808	1,548	19239

Output 1.1: Climate and agro-weather information improved and tailored to the needs of vulnerable smallholder farmers to inform adaptation measures

- 63 The project will address the lack of accurate and tailored climate information, while promoting equitable access to climate information needed by smallholder farmers to prevent damage to agricultural production. The activities will focus on improving collection, interpretation and dissemination of reliable downscaled climate information relevant for staple crops (maize and beans) and cash crops (coffee and cocoa). This information will allow farmers to make better decisions and manage climate variability and climate-related shocks for improved food security. For staple crops, the project will work with FAO developed Agricultural Stress Index System (ASIS) and Famine Early Warning System Network (MFEWS) (See Section B.3 of the Feasibility Study). An innovative aspect at regional level is that forecasts will be for the coming three months t, which will allow farmers to select the suitable seed variety and adaptation practices to be used in a timely manner. For coffee, the project will work with the Coffee Cloud application of ANACAFÉ (for more information on this, see section C.6 of Feasibility Study). For cocoa, a specialized tool will be developed to allow farmers to access timely climate information and recommendations for adaptation solutions. Although there are advances in monitoring of climate variability at a local scale, the available equipment is not sufficient to generate the required accurate climate information at a local scale. The project will install 20 hydrometeorological monitoring equipment as part of The National Institute of

Seismology, Volcanology, Meteorology and Hydrology of Guatemala (INSIVUMEH) network system of monitoring stations in targeted areas of the project (for details on the installation sites see section C5 of the Feasibility Study). INSIVUMEH will receive capacity building on the generation of agro-weather information and will continue managing and using the newly installed equipment (with GCF proceeds) after the project ends. This equipment will provide real time climate information needed by farmers. The project will enhance the coordination of agencies engaged in collection and dissemination of climate information. Climate information and agricultural advice will be delivered in local language and in a gender-sensitive manner via SMS (Short Message Service), extension officers and existing local organizations. The use of the information will be encouraged through awareness raising on the importance of the information for adaptation strategies and local agro-ecological centers for climate change adaptation that will provide an experimentation field. All measures will be demonstrated through field visits to share knowledge on how to improve crops under different climate scenarios

- 64 MAGA extension workers will support the design of the agro-meteorological monitoring systems, they will support the provision and collection of information to respond to the needs of stakeholders, provide advice on the format and language employed for information dissemination, and the mechanisms to present information. The Korean International Cooperation Agency (KOICA) will fund the Implementation of 4 agro-ecological centres for climate change adaptation and knowledge generation, from which GIZ will built 3 of them and one (already existing) will be renewed by GIZ., dissemination and use of tailored climate information products and awareness rising on policy instruments in support of agroforestry production, water resource management and production and marketing with a climate change approach. Project activities are designed and will be implemented in accordance with the Gender Action Plan to ensure the adoption gender sensitive approach (see Part II of Annex 8). KOICA will fund the Implementation of 4 agro-ecological centres for climate change adaptation and knowledge generation, from which GIZ will built 3 of them and one (already existing) will be renewed by GIZ. Each of the agro-ecological center will have: 1) a capacity building room where key stakeholders will participate in training processes; and 2) experimental field plots where the climate resilient practices will be tested and validate. The location of the centers (Activity 1.1.4) follows a preliminary scoping that considered the assessment of similar initiatives in the project region, to avoid duplication and to ensure that the project is well represented in the different project districts.
- Activity 1.1.1 Organize workshops for extension technicians and farmers regarding the importance of climate information and use in decision-making
 - Activity 1.1.2 Install 13 hydro-meteorological monitoring equipment for drought to inform climate resilient agricultural management strategies.
 - Activity 1.1.3 Disseminate climate information and response adaptation measures using locally-relevant delivery mechanisms as virtual platforms, electronic means, telecommunication and visits of the extension workers.

- Activity 1.1.4 Implement 4 local agro-ecological centers for climate change adaptation for knowledge generation and sharing.

Output 1.2: Adaptation measures adopted to foster the resilience of coffee, cocoa and basic grain production systems

65 The project will promote practices that will reduce farmers' vulnerability to crop losses caused by drought and heatwaves. This will be achieved through the implementation of gender-sensitive agricultural adaptation packages for staple crops (maize and beans) and cash crops (cocoa and coffee), which will bring together climate resilience agricultural practices. Each gender-sensitive agricultural adaptation package is described below listing practices and their expected adaptation results (See Table 3). The proposed practices will be targeted and adjusted as necessary to reflect farm-specific, culturally-relevant and gender-responsive needs and priorities. The project will overcome the limited purchase capacity and high up-front investments for agricultural inputs by the creation of community seed banks and farmer "solidarity networks" such as the so called "chain pass" (pase en cadena). These community-led mechanisms will be managed by women groups to distribute vegetative material in municipal, community and MAGA nurseries will reduce the cost of acquiring seeds, plants and other vegetative materials, thus provide incentives for new farmers to replicate the agricultural adaptation packages. Additionally, savings strategies will be promoted, such as Contingency Funds or Savings Groups, especially for women producers. These strategies contribute to empowering women and making them more resilient in cases where events of climate variability occur that affect productive systems. Project activities will be implemented in accordance with the Gender Action Plan (See Part II of Annex 8).

- Activity 1.2.1 Fund the implementation of the adaptation practices and gender-sensitive technology packages for staple crops, coffee and cocoa in 6,195 family farms.
- Activity 1.2.2 Implement at least 10 trainings to enhance the technical and organizational capacity of 6,195 farmers for climate-risk informed planning and implementation of agricultural adaptation measures at farm level
- Activity 1.2.3 Establish 28 women-led, farm-level seed nurseries for resilient crops and community forest nurseries
- Activity 1.2.4 Extension workers provide technical assistance through regular consultation sessions and field visits to 6,195 small farmers.

Table 3: Description of practices considered in the gender-sensitive agricultural adaptation packages and their adaptation benefits for basic grains, cocoa and coffee production systems

Gender-sensitive agricultural adaptation packages and activities	Adaptation benefits
<p>Gender-sensitive agricultural adaptation packages for staple crops</p> <p>The package includes the provision and use of drought-resilient varieties of maize and beans. This will maintain or increase the productivity of the crops, even during droughts and prolonged heat waves while contributing to food security. The package promotes the adoption of practices at farm-level to improve soil moisture retention capacity using agroecological approaches (for detailed description of the agroecological practices see section C.6 of the Feasibility Study). It promotes agrobiodiversity in family gardens by planting locally accepted species of fruit trees, timber trees and diversification with varieties of roots (see the list of selected tree varieties in Section C.6, Table 32 of the feasibility study). This will create microclimate and help ensure stable yields for food security³.</p>	
Prepare a seeds catalogue at community level and adopt climatically adapted seed varieties in collaboration with farmers and women's groups	<ul style="list-style-type: none"> - Reduced crop failure in the event of rainfall failure during critical growth periods - Reduced harvest failure in the event of excessive rainfall during harvest
Diversify and adopt agrobiodiversity principles to create a favorable microclimate in the agriculture plot	<ul style="list-style-type: none"> - Maintenance of microclimate conditions, resulting in reduced loss of soil moisture - Improved infiltration of runoff, recharging soil moisture reserves and contributing to aquifer recharge and stream flow stabilization at landscape level. - Input of soil organic matter, resulting in increased soil moisture retention.
Improve organic matter content and soil moisture retention capacity	<ul style="list-style-type: none"> - Increases in soil moisture reserves during unseasonal drought periods, associated with increased organic matter content - Reduced evaporative demand from crops - Maintenance of soil cover protects against temperature increases and resulting loss of soil moisture due to evaporation and decomposition of soil organic matter. - Reduction of soil disturbance and maintenance of cover reduces runoff and erosive losses during increasingly intense extreme rainfall events
Post-harvest handling of basic grains	Improved grain storage technology for maize and beans to protect from extreme weather and pests to preserve them for longer periods, thus contributing to food security. The storage technology will be tailored to enhance resilience to climate change e.g. proper ventilation to avoid grain damage from excessive heat and moisture, and associated insects.
<p>Gender-sensitive agricultural adaptation packages for coffee and cocoa productive systems</p> <p>The package promotes gradual renewal of coffee and cocoa productive systems with improved varieties. This is expected to result in an overall improvement of coffee production by 76% in 7 years with new varieties compared to business of usual scenario.⁴ Additionally, other three species will be introduced for shade to increase resilience of coffee and cocoa planting. See list with proposed species for planting in section C.6 of Feasibility Study).</p>	
Establishment of improved coffee and cocoa hybrids tolerant to rust and drought	Improved drought-resilient variety of coffee and cocoa decreasing the impacts from prolonged droughts, pest, diseases and coffee rust. The proposed varieties have already been used and are well accepted in other countries in the region as well as in other Departments in Guatemala (for more information see section C.6 of the Feasibility Study).
Adaptation and diversification of the structure of shade canopy for greater resilience to climate change	<ul style="list-style-type: none"> - Maintenance of microclimate conditions, resulting in reduced losses of soil moisture - Improved infiltration of runoff, recharging soil moisture reserves and contributing to aquifer recharge and stream flow stabilization at landscape level. - Coffee: Density, spatial arrangements and pruning techniques allow for greater aeration in the coffee plantation to counteract temperature increases, and the particular architecture of the coffee plants allows better ventilation into the interior plants, especially in times of heavy rain, so that diseases such as rust cannot thrive. - Cocoa: The shade provides protection to cocoa plants from strong winds. Also, the shade contributes to cycling of nutrients, decrease in runoff (in the agroforestry system, runoff is 3% lower in comparison with full sun systems).⁵ Finally, the arboreal component helps to create favorable microclimate conditions for the growth of the main crop and is unfavorable for the development of diseases.
Management of the nutrient balance of the coffee agroforestry system	Maintaining soil with the necessary nutrient stocks using compost and organic fertilizers will help plants to be less vulnerable to attack by pests and diseases and more likely to withstand extreme weather events. Climate information will inform farmers on the timing and amount of product application.
Management of coffee pests and diseases with emphasis on rust	Increased resilience of coffee towards pests and diseases by climate informed management practices e.g. the early warning for drought will inform farmers when to take specific measures to decrease the risk of pests and diseases.

³ These measures have been proven to be effective in other projects implemented by FAO such as *Prácticas resilientes* and *Mesoamérica sin hambre*.

⁴ Cerda et al., 2017. Primary and Secondary Yield Losses Caused by Pests and Diseases: Assessment and Modelling in Coffee.

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0169133>

⁵ Cerda, R. D. (2014). Contribution of cocoa agroforestry systems to family income and domestic consumption: looking toward intensification. *Agroforestry Systems*, 88(6), 957-981. doi:10.1007/s10457-014-9691-8

Output 1.3: Promotion of the resilience of livelihoods through productive diversification and market access

- 66 The project will promote alternative strategies for income generation to ensure that smallholder farmers create sustainable climate resilient assets as a safety net to avoid food insecurity in periods of crisis and total yield loss due to drought or heatwaves. Key diversification strategies will support climate-resilient value chain development for cocoa and coffee, diversification with family gardens and poultry, enhancement of business skills for better access to the market. Small-scale vegetable production and poultry to ensure greater dietary diversity will provide women with income-generating opportunities. The project will strengthen community-based organisations, such as cooperatives, micro-enterprises, and farmers associations to help linking small-scale rural entrepreneurs with private-sector players along the value chains in the long run.
- 67 Diversification is a climate risk-coping strategy. When smallholder farmers depend on limited number of climate-sensitive activities, this makes them highly vulnerable to climate risks such as prolonged drought. Diversification provides an opportunity for spreading the climate risk across different activities, therefore minimizing overall impacts and providing a safety net in the case of extreme drought. With more diverse production and activities, smallholder farmers will be given more options for coping strategies during prolonged droughts, thus increasing their resilience. The project will collaborate with the Government of Guatemala to link its nationally funded school meals program with the farmers and help catalyze the creation of a market for communities and stimulate local production and purchase. Project activities are designed and will be implemented in accordance with the Gender Action Plan to ensure the adoption gender sensitive approach (See Part II of Annex 8).
- Activity 1.3.1 Promote diversification of productive units in home gardens for 2,500 farm families and install 370 greenhouses micro-tunnel facilities for vegetables and poultry
 - Activity 1.3.2 Organize training for 2,500 farmers to improve technical skills for enhancing coffee and cocoa value chains and to strengthen organizational capacities of producers' associations to access markets infrastructure

COMPONENT 2. Supporting efficient water management for agriculture to reduce the impact of increased water scarcity

- 68 Component 2 is designed to strengthen capacities of local actors to better manage water resources under conditions of projected increase in water scarcity due to CC. Community-led planning of water resource management at micro-basin level will secure water availability needed by smallholder farmers to achieve resilience to drought and heatwaves. The selection criteria for the beneficiaries of the activities in addition to the general criteria is described in Table 5 lists a set of.

Output 2.1: Community-led Water Management Plans developed and implemented at micro-basin level to promote climate resilience and enhance economic productivity

- 69 Activities under this output will address the lack of planning instruments for water resource management at micro-basin level and strengthen local governance. The project will support the creation of Local Water Committees (LWC) at micro-basin level on the basis of existing local organizational structures, engaging other relevant key actors who have a role in water management in the area. The LWC will have the mandate to ensure climate risk-informed integrated water resource management at a micro-basin level and under climate change scenario. Increased water scarcity has resulted in water-related conflicts and the committees will act as platforms for planning, dialogue and conflict resolution. (more information on the key local organizations involved in water management, criteria for selection, are described in section C4 of the Feasibility Study). The LWC will develop climate risk-informed water management plans at micro-basin level, which will guide land restoration and agricultural activities. The project will provide technical assistance in the form of capacity building on climate-informed planning of water resources, strengthening organization capacity and facilitation to coordinate with other regional and local organisations. MARN and INAB subnational representatives will support the development of Local Water Committees. With the support of Ministry of Livestock and Agriculture's (MAGA) extension workers, the technical team of the project will also provide technical assistance on the topics required by the watershed board members, especially on those issues related to development of watershed plans, basin governance and management, water monitoring, climate change monitoring and adaptation. Project technical staff, with MARN's team support, will be in charge of the support for climate risk-informed water management plans. Project activities are designed and will be implemented in accordance with the Gender Action Plan to ensure the adoption gender sensitive approach (See Part II of Annex 8).
- Activity 2.1.1 Establish or strengthen the capacity of 14 Local Water Committees for climate risk-informed integrated water resource management and planning instruments related to public policy on climate change
 - Activity 2.1.2 Provide technical assistance to Local Water Committees to develop and implement 14 climate risk-informed water management plans at micro-basin level which correspond to the project site.

Table 4: List of selection criteria for beneficiary selection under project activities under Output 2.2

Project activity	Criteria for project beneficiary selection
Forest incentives: for forest management for water protection and provision forest management for water production and provision and agroforestry systems.	<p>Small landholders and landowners in the project area with a hectare or less of land for forestry activities in the above-specified incentive modalities and in accordance with the requirements of the current legislation on forest incentives.</p> <ul style="list-style-type: none"> • Forestry Law (Decree 101-96): in its chapters I, Forest Incentives, and II, Incentives for small owners); • For the Forest Incentives program for holders of small tracts of land with a forest or agroforestry vocation (PINPEP): Law on forest incentives for holders of small areas of land suitable for forestry or agroforestry (PINPEP, Decree 51-2010) and its regulations. The criteria includes: <ul style="list-style-type: none"> a) Guatemalan nationality; b) More than 18 years of age; c) Free exercise of civil rights; d) Forestry or agro-forestry land holders; e) The land size eligible for receiving incentives should be between 0. 1ha and 15ha; f) Submitted application to PINPEP Programme⁶; g) Hold of document certifying possession of the land⁷; (h) A copy of the applicant's identity card; i) a forest management plan drawn up by a technician registered with the National Forestry Register (INAB). • For the Law to Promote the Establishment, Recovery, Restoration, Management, Production and Protection of Forests in Guatemala (PROBOSQUE): (Decree 02-2015) and its regulations. The criteria includes:) Submitted application; b) Forest management plan prepared by a technician or professional registered with the National Forestry Registry (INAB); c) Hold of document certifying rights on the land⁸; ⁹; d) copy of the personal identification document.

Output 2.2: Landscapes are climate resilient and sustain critical ecosystems services for water availability in drought periods

70 The activities under this output will focus on watershed restoration as an adaptation strategy to increase forest cover, improve the hydrological cycle and increase the amount of available water. This is critical for agricultural production and underpins food security. The micro-basin water management plans will inform the planning of reforestation activities by prioritizing the key areas with high potential for restoring the hydrological cycle. This prioritization will be carried out together with the Local Water Committees. The project will deliver this output through the forest incentive programs PINPEP and PROBOSQUE. PINPEP and PROBOSQUE incentive programs are managed by INAB and that INAB will provide its co-financing through them.(see Section C.6 in Feasibility Study). The beneficiaries for the forest incentives are identified by FAO (with MAGA support) using the pre-defined general criteria and specific criteria (see Table 5). Once the beneficiaries are identified, FAO supports them with awareness and knowledge of forestry incentive programs (PINPEP and PROBOSQUE) so that the beneficiaries can decide whether or not to apply for incentives from these programs for reforestation projects, agroforestry systems or forest protection. Subsequently, FAO supports the beneficiaries to prepare the required application packages e.g. forest management plans. The beneficiary, with FAO's

⁶ in accordance with the format approved by INAB

⁷ certification issued by the Mayor of the municipality

⁸ certification issued by the Mayor of the municipality

⁹ in the case of owners, certification from the Property Registry, and, in the case of social groups with legal status, occupying land owned by the municipalities, certification of the act in which the Municipal Council agrees that the social group will occupy land owned by that municipality

technical assistance, submits the application for its proposed project to INAB, who evaluates the applications and, if they qualify, INAB approves the incentives and notifies the landholder or owner. Agroforestry systems will be promoted in addition to protection and forest management. As agroforestry systems are a relatively new practice for INAB under PINPEP, technical expertise is limited, which limit the process. The project, via the co-financing of KOICA, will provide technical support to INAB and facilitate the access of smallholder farmers to the incentives, especially for women-owned farms. Project activities are designed and will be implemented in accordance with the Gender Action Plan to ensure the adoption gender sensitive approach (Part II of Annex 8).

- Activity 2.2.1 Technical support to 19,239 smallholder farmers (women in particular) to access forest incentives
- Activity 2.2.2 Training of 90 technicians from extension services, forest regents and INAB
- Activity 2.2.3 Restore 13,000 ha through reforestation and agroforestry
- Activity 2.2.4 INAB evaluates small holder farmers application packages and allocates the required

Output 2.3: Local water collection and irrigation farm systems implemented to secure water supply for resilient livelihoods

71 The project will ensure the reliable supply of water for agricultural needs, even during drought by installing rooftop rainwater harvesting systems and farm-level drip irrigation system for using harvested water. The Local Water Committees will be responsible for the overall management, maintenance and operation of the water harvesting and irrigation systems. As the water harvesting and irrigation systems will be at farm level, it is envisioned that the project will train the farmers on how to repair the irrigation system (for more information see Annex 21 for the O&M). For more significant repairs and maintenance costs, the Local Water Committees will be able to cover them with savings or contingency funds created for this purpose. FAO will support the setting up of such savings mechanisms as it has a long-standing experience. The Water Local Committees will be registered as members of the Community Councils of Urban and Rural Development (COCODE) and will be able to apply for municipal funds to sustain financially the operation of the irrigation system. Technical staff of the project with the support of subnational representatives of MARN will develop the capacity building process of Municipalities, MAGA INAB, and community organizations' technical staff. Project activities are designed and will be implemented in accordance with the Gender Action Plan to ensure the adoption gender sensitive approach (See Part II of Annex 8).

- Activity 2.3.1 Provide trainings to improve technical capacity of 2,500 local officials and members of community organizations on the implementation and maintenance of micro-basin infrastructure

- Activity 2.3.2 Install farm-level drip irrigation system for using harvested water on 250 ha of farm land

COMPONENT 3: IMPROVED ENABLING CONDITIONS FOR CLIMATE RESILIENT LIVELIHOODS

72 Component 3 will focus on strengthening the institutional capacities at all levels for comprehensive and climate risk-informed governance of water resources at a landscape level, by enabling inter-institutional platforms for coordination and enhancing knowledge management. This enabling factors will ensure the effective implementation and long term sustainability of the activities under Components 1 and 2. This component is crucial to achieve replicability and upscaling of resilient agricultural practices at a landscape level and to accomplish the expected paradigm shift.

Output 3.1: Institutional systems strengthened to govern climate resilient initiatives at national and local level

73 The project will improve the comprehensive governance of climate adaptation and water resources by strengthening national and municipal environmental departments, Civil Society Organizations (CSOs), and communities, in order to promote effective water governance via water committees. To enable this, the project will create inter-institutional platforms and regional water roundtables to foster dialogue on climate adaptation and water resource management at the national and local level, through multi-level. MAGA and MARN are the key government institutions with a mandate for water management in the country, therefore they will lead the dialogues to mainstream climate change in water related sectors and territorial planning documents, guiding a common vision for integrated water resource management. In addition, MAGA and MARN will integrate the project's lessons learned and a catalogue with climate resilient agricultural practices in a National Climate Change Adaptation Program. This will ensure the scaling up of such practices at a national level. Project activities are designed and will be implemented in accordance with the Gender Action Plan to ensure the adoption gender sensitive approach (see Part II of Annex 8).

- Activity 3.1.1 Provide training to 100 technicians from 28 municipal environmental units and other local government agencies on climate adaptation planning and climate resilient agricultural solutions
- Activity 3.1.2 Facilitate 4 meetings of 2 water management and climate change thematic roundtables including the participation of MAGA, MARN and other relevant actors to integrate agricultural resilience practices in the national action plan on adaptation to climate change.

Output 3.2: Strengthened knowledge transfer and awareness raising among institutions at national, sub-national and local levels

74 The project will address the need to build the capacity of national, subnational and local institutions on climate change adaptation. At national level, the project will build on advances made by MARN and other organizations on establishing the National System for

Information on Climate Change (SINCC); as well as MAGA's efforts to incorporate the Agricultural sector within the climate change agenda (NaP Agriculture Agenda). The key value added of the project will be to facilitate collaboration between the institutions by establishing dialogues, protocols and information channels to enhance the effective flow of information, between institutions at regional and local levels and farmers. At a subnational and municipal level, the project will work with the National Rural Extension System (SNER) to provide training to its staff on analysis and use of climate information, for planning and development of strategies for resilient agriculture. This will directly enhance the delivery of technical assistance to beneficiaries in the 29 target municipalities. For these trainings, the project will work closely with the existing Learning Centers for Rural Development (CADER), which are field schools that are developed in a farming plot of a farmer in each community and works with around 30 producers to learn management practices. At the local level, the project will ensure that 80 CADER have strengthened capacity to promote climate resilience agricultural practices in local languages, (for more information on CADER see Section A.1.5.2 of the Feasibility Study). Project activities are designed and will be implemented in accordance with the Gender Action Plan to ensure the adoption gender sensitive approach (see Part II of Annex 8).

- Activity 3.2.1 Train and assist 90 staff members from INAB, MAGA and MARN on the management and dissemination of climate information.
- Activity 3.2.2, Train 100 experts at departmental and municipal level and agricultural extension workers and other staff from SNER on climate risk-informed agricultural adaptation strategies.
- Activity 3.2.3 Train 300 community promoters on the use of climate information and planning instruments for agriculture adaptation strategies and strengthen the capacity of 80 CADERs

7.4 Beneficiaries

7.4.1 General Description of the Beneficiaries

75 Project beneficiaries are small maize, bean, coffee, cacao and family vegetable garden farmers.

7.4.2 Estimate of the Number of Beneficiaries

76 The estimate of beneficiaries per activity is based on the number of beneficiaries of adaptation practices related to basic grains, coffee, cocoa, family gardens and forest management.

77 No census provides information regarding the distribution of basic grain farmers by municipality, so it was assumed that 18% of the prioritized farmers live in the working area. This assumption is based on INE (2018) data indicating that this is the percentage of the total Guatemalan population that lives in the departments where the project will be

implemented. MAGA (2017) data indicate that 790,671 farmers are prioritized by the 2016-2020 Family Agriculture Program for Strengthening the Peasant Economy (PAFFEC). Of these, 538,854 live in poverty and extreme poverty. The latter are prioritized for this project.

- 78 Based on the above, in areas prioritized by the RELIVE project there are approximately 96,994 families ($538,854 \times 18\%$). Due to the fact that it is impossible to reach the entire population prioritized by MAGA, and considering project partners' working capacity; after several meetings of the project formulation team (which includes implementing partner technicians), it was decided that 3% of the growers (2,839 families with less than 1 ha of land per family) could be supported.
- 79 MAGA information (2014) indicating that there are 22,503 growers in the project area was used for coffee. After several meetings of the project formulation team and MAGA and FAO crop specialists, it was concluded that the project partners' capacity would make it possible to support 8% of the producers who work in the project area (1,808 families with less than 1 ha of land per family) could be supported.
- 80 The number of beneficiaries (2,548 cacao growers) were reported in the project area by MAGA (2016). As in previous instances, the project formulation team did an analysis of the project implementation team's capacities with the support of MAGA and FAO technicians and concluded that 61% of the producers in the region (approximately 1,548 families with less than 1 ha of land per family) could be supported.
- 81 As for the beneficiaries that will receive forest incentives, an analysis of demand in the region was conducted and it was determined together with INAB technicians that based on regional demand and the amounts available for the counterpart, 19,239 hectares could be supported, of which 18,957 belonged to agroforestry systems, 100 hectares to forests for protecting water sources, and 182 hectares to forest management for production and water (each family possesses a hectare). In this regard, it is worth mentioning that greater weight was given to agroforestry systems for two reasons. The first one is the nature of the project, which focuses on livelihood resilience and not on ecosystems, and the second one that INAB is interested in promoting the modality of agroforestry systems as a goal for the forest incentive program.
- 82 It is also worth considering that of the 18,957 hectares of agroforestry systems that will receive incentives, 6,195 correspond to farmers already accounted for (2,839 to producers of basic grains and family vegetable plots, 1,808 to coffee growers and 1,548 to cacao growers), meaning that 12,762 belong to new producers.

7.4.3 Linkage of Beneficiaries and Activities in the Project Proposal

- 83 Activity 1.1.1 will benefit 6,195 families¹⁰ through the implementation of agro-meteorological monitoring systems for drought, water management and crop pests and prevision of diseases. These beneficiaries are the same included in the agroforestry systems, and the procedure for their estimation was introduced in the last paragraph of the previous section.
- 84 The beneficiaries of activity 1.1.2 (Install 13 hydro-meteorological monitoring equipment for drought to inform climate resilient agricultural management strategies), are the 19,239 small farmers that includes beneficiaries of basic grains, cacao, coffee and forest activities (agroforestry systems, forest protection management, and forest management). The procedure to estimate the number of beneficiaries is presented in section C.3.2.
- 85 Activity 1.1.3 Disseminate climate information and response adaptation measures using locally-relevant delivery mechanisms as virtual platforms, electronic means, telecommunication and visits of the extension workers. This activity will establish three effective delivery mechanisms for the provision of climate that are going to beneficiate the 19,239 farmers indicated in activity 1.1.2.
- 86 Activity 1.1.4 Implement 4 local agro-ecological centers for climate change adaptation for knowledge generation and sharing. This activity will benefit the 19,239 family farms indicated in activity 1.1.2.
- 87 In Activity 1.2.1 (Fund the implementation of the adaptation practices and gender-sensitive technology packages for staple crops, coffee and cocoa in 6,195 family farms), the 6,195 family farms adopting the 8 measures for each agricultural system refers to those that will be implemented by basic grain producers and family vegetable plots (2,839), coffee (1,808) and cacao (1,548). These are the same considered in Activity 1.2.2 (Implement at least 10 trainings to enhance the technical capacity and knowledge of 6,195 family farms for climate-risk informed planning and implementation of agricultural adaptation measures at farm level). This families are the same ones estimated in activity 1.1.1.
- 88 Activity 1.2.2 Implement at least 10 trainings to enhance the technical capacity and knowledge of 6,195 farmers for climate-risk informed planning and implementation of agricultural adaptation measures at farm level. These are the same considered in Activity 1.2.2 (Implement at least 10 trainings to enhance the technical capacity and knowledge of 6,195 family farms for climate-risk informed planning and implementation of agricultural adaptation measures at farm level). Activity 1.2.3 Establish 28 women-led, farm-level seed nurseries for resilient crops. Activity 1.2.4 Extension workers provide technical assistance through regular consultation sessions and field visits to 6,195 small farmers families. These are the same considered in Activity 1.2.2.

¹⁰ The assumption for this estimate is that each family owns 0.885 hectares. Therefore, when the number of hectares calculated in the previous section is multiplied by this figure, the number of families is obtained.

- 89 Beneficiaries of activities 1.3.1 (Promote diversification of productive units in home gardens for 2,500 farm families and install 370 greenhouses micro-tunnel facilities for vegetables and poultry) and 1.3.2 (Organize training for 2,500 farmers on coffee and cocoa, processing and marketing activities). These producers were already accounted in activity 1.2.1.
- 90 Activities 2.1.1 (Establish or strengthen the capacity of 14 Local Water Committees for climate risk-informed integrated water resource management) and 2.1.2 (Provide technical assistance to Local Water Committees to develop and implement 14 climate risk-informed water management plans at micro-basin level which correspond to the project site), will provide benefits for 20,000 inhabitants of 14 basins in the RELIVE area (approximately 15% of the population). This number of beneficiaries has not been accounted in any of the previous activities.
- 91 Beneficiaries of activities 2.2.1 (Technical support to 19,239 smallholder farmers (women in particular) to access forest incentives), 2.2.2 (Training of 90 technicians from extension services, forest regents and INAB), 2.2.3 (Restore 13,000 ha through climate resilient management of forest ecosystems and agroforestry), and Activity 2.2.4 (Evaluate forest management plans and certify their compliance to manage and allocate the necessary funds to reforest and manage 13,000 hectares of plantations and agroforestry systems), are the same ones accounted on activity 1.1.2 (Install 20 hydro-meteorological monitoring equipment for drought to inform climate resilient agricultural management strategies).
- 92 In Activity 2.3.1 (Provide trainings to improve technical capacity of 2,500 local officials and members of community), the 2,500 families trained in efficient water management and use practices, refer to family vegetable plot irrigation system beneficiaries. This group is the same considered in Activity 2.3.2 (Install farm-level drip irrigation system for using harvested water at 250 ha of farm land).
- 93 In component 3 the beneficiaries include staff and technical governmental and representatives of private organizations. The number of beneficiaries was estimated by the governmental staff in charge to develop the proposal. In activity 3.1.1, training will be provided to 100 technicians from 28 municipal environmental units and other local government agencies on climate change and climate resilient agricultural solutions. It was estimated that capacity of six technical staff from private organizations and six technical staff from public institutions will be strengthened in each watershed. Given that the project will work in 14 watersheds, a total of 84 stakeholders will be benefited by the project; the project intends to increase this number to 100. Activity 3.1.2 facilitate 4 meetings of 2 water management and climate change thematic roundtables including the participation of MAGA, MARN and other relevant actors.
- 94 In activity 3.2.1 it was estimated that 30 technical staff per each governmental institution (MARN, MAGA and MARN) will be benefited with training and assistance on the management and dissemination of climate information (making a total of 90 staff members). For activity 3.2.2 it was estimated that six technical staff per watershed will improve their technical capacities. As stated in the previous paragraph the project will work

in 14 watersheds, making a total of 84 beneficiaries. The project intends to increase this number to 100.

95 For activity 3.2.3 a total of 20 technical staff (from local organizations per each watershed) will strength their capacities on the use of climate information and planning for agriculture adaptation strategies. As stated on the previous paragraphs the project will work on 14 watersheds, making a total number of 280 beneficiaries. The project intends to increase the number of total beneficiaries to 300. In addition, in activity 3.2.3, the capacity of 80 CADERS¹¹ will be strengthened.

96 The following table presents the number of beneficiaries per activity, grouped by component and output.

Table 5: Beneficiaries by RELIVE project component, output and activity

Component/Output/Activity	Beneficiary Families	Comments
Component 1. Implementing climate resilient agricultural practices and enhancing farmers' livelihoods		
Output 1.1: Climate and agro-weather information improved and tailored to the needs of vulnerable smallholder farmers to inform adaptation measures		
Activity 1.1.1 Organize workshops for extension technicians and farmers regarding the importance of climate information and use in decision-making	6,195	Includes beneficiaries of basic grains, cacao and coffee.
Activity 1.1.2 Install 13 hydro-meteorological monitoring equipment for drought to inform climate resilient agricultural management strategies.	19,239	Includes beneficiaries of basic grains, cacao, coffee and forest activities (agroforestry systems, forest protection management, and forest management)
Activity 1.1.3 Disseminate climate information and response adaptation measures using locally-relevant delivery mechanisms as virtual platforms, electronic means, telecommunication and visits of the extension workers.	19,239	Includes beneficiaries of basic grains, cacao, coffee and forest activities (agroforestry systems, forest protection management, and forest management)
Activity 1.1.4 Implement 4 local agro-ecological centers for climate change adaptation for knowledge generation and sharing	19,239	Includes beneficiaries of basic grains, cacao, coffee and forest activities (agroforestry systems, forest protection management, and forest management)
Output 1.2: Adaptation measures adopted to foster the resilience of coffee, cocoa and basic grain production systems		
Activity 1.2.1 Fund the implementation of the adaptation practices and gender-sensitive technology packages for staple crops, coffee and cocoa in 6,195 family farms	6,195	Includes beneficiaries of basic grains, cacao and coffee.
Activity 1.2.2 Implement at least 10 trainings to enhance the technical and organizational capacity and knowledge of 6,195 farmers for climate-risk informed planning and implementation of agricultural adaptation measures at farm level	6,195	Includes beneficiaries of basic grains, cacao and coffee.
Activity 1.2.3 Establish 28 women-led, farmer-level seed nurseries for resilient crops and community forest nurseries	280	20 female headed households per watershed.
Activity 1.2.4 Extension workers provide technical assistance through regular consultation sessions and field visits to 6,195 small farmers	6,195	Includes beneficiaries of basic grains, cacao and coffee.

¹¹ Learning Centers for Rural Development (CADER).

Component/Output/Activity	Beneficiary Families	Comments
Output 1.3: Promotion of the resilience of livelihoods through productive diversification and market access		
Activity 1.3.1 Promote diversification of productive units in home gardens for 2,500 farm families and install 370 greenhouses micro-tunnel facilities for vegetables and poultry	2,500	Includes coffee beneficiaries.
Activity 1.3.2 Organize training for 2,500 farmers improve technical skills for enhancing coffee and cocoa value chains and to strengthen organizational capacities of producers' associations to access markets	2,500	Includes coffee and cacao beneficiaries.
Component 2. Supporting efficient water management for agriculture to reduce the impact of increased water security		
Output 2.1: Community-led Water Management Plans developed and implemented at micro-basin level to promote climate resilience and enhance economic productivity		
Activity 2.1.1 Establish or strengthen the capacity of 14 Local Water Committees for climate risk-informed integrated water resource management and planning instruments related to public policy on climate change	20,000	25% of the population in 14 watersheds.
Activity 2.1.2 Provide technical assistance to Local Water Committees to develop and implement 14 climate risk-informed water management plans at micro-basin level which correspond to the project site.	20,000	25% of the population of 14 watersheds.
Output 2.2: Landscapes are climate resilient and sustain critical ecosystems services for water availability in drought periods		
Activity 2.2.1 Technical support to 19,239 smallholder farmers (women in particular) to access forest incentives	19,239	Includes the beneficiaries in field practices related to basic grains, cacao, coffee, forests and agroforestry systems.
Activity 2.2.2 Training of 90 technicians from extension services, forest regents and INAB	90	INAB technical staff and extension agents.
Activity 2.2.3 Restore 13,000 ha through reforestation and agroforestry	19,239	Includes the beneficiaries of field practices related to basic grains, cacao, coffee, forests and agroforestry systems.
Activity 2.2.4 Evaluate forest management plans and certify their compliance to manage and allocate the necessary funds to reforest and manage 13,000 hectares of plantations and agroforestry systems	19,239	Includes the beneficiaries of field practices related to basic grains, cacao, coffee, forests and agroforestry systems.
Output 2.3: Local water collection and irrigation farm systems implemented to secure water supply for resilient livelihoods		
Activity 2.3.1 Provide trainings to improve technical capacity of 2,500 local officials and members of community organizations on the implementation and maintenance of micro-basin infrastructure	2,500	Includes beneficiaries of basic grains, cacao and coffee.
Activity 2.3.2 Install farm-level drip irrigation system for using harvested water at 250 ha of farm land	2,500	Includes beneficiaries of family gardens.
Component 3. Improved enabling conditions for climate resilient livelihoods		
Output 3.1: Institutional systems strengthened to govern climate resilient initiatives at national and local level		
Activity 3.1.1 Provide training of 100 technicians from 28 municipal environmental units and other local governance agencies on climate adaptation planning and climate resilient agricultural solutions	100	Technical staff from private organizations participating in Local Water Committees.
Activity 3.1.2 Facilitate 4 meetings of 2 water management and climate change thematic roundtables including the participation of	100	Technical staff from public institutions participating in Local Water Committees.

Component/Output/Activity	Beneficiary Families	Comments
MAGA, MARN and other relevant actors to integrate agricultural resilience practices in the national action plan on adaptation to climate change.		
Output 3.2: Strengthened knowledge transfer and awareness raising among institutions at national, sub-national and local levels		
Activity 3.2.1 Train and assist 90 staff members from INAB, MAGA and MARN on the management and dissemination of climate information.	90	Technical staff: 30 MARN, 30 MAGA, 30 INAB
Activity 3.2.2, Train 100 at departmental and municipal level and agricultural extension workers and other staff from SNER on climate risk-informed agricultural adaptation strategies.	100	Coordinators and extension services workers.
Activity 3.2.3 Train 300 community promoters on the use of climate information and planning instruments for agriculture adaptation strategies and strengthen the capacity of 80 CADERS	300	Technical staff from local organizations.

7.4.4 Criteria for selecting beneficiaries when implementing the project

- 97 Project beneficiaries, understood as farmers with whom the project will work directly in prioritized areas (methodology described in the previous section) will be selected according to the following criteria:
- 98 Basic grains and family gardens: As indicated above, beneficiaries in this group are among PAFEC beneficiaries, so selection criteria will be based on those defined by this program as described below:
- They live in extreme poverty¹² and their production is below subsistence, which limits their access to financial resources for implementing climate change adaptation measures.
 - They practice Family Agriculture (FA)**. In accordance with the delimitation established by PAFEC 2016-2020 of what is and is not FA¹³.
 - They possess up to 1 ha of available land** for farming activities (own or rented; they can prove it).
 - They sow maize and/or beans and possess family gardens**: these crops are prioritized for this project. Families must have a family garden established on the family plot, since the project will invest in their diversification and improvement.

¹² Poor: the part of the population that does not reach the minimum income to cover a basket that meets their food and non-food needs. Extreme poor: those who are unable to cover the cost of minimal food consumption.

¹³ Limited Access to productive land and capital resources; Predominant use of family labor. The head of the household takes part directly in the productive process; in other words, although there may be some division of labor, the head of the household does not act exclusively as manager, but is one of the workers in the household; agricultural/forestry/fishing aqua cultural activity is the household's main source of income, and may be complemented by other non-agricultural activities performed inside or outside the family unit (services related to rural tourism, environmental benefits, production of crafts, salt agro industries, occasional jobs, etc.).

- e. Household with 4 or more members.
- f. Children under 7 with some degree of malnutrition.
- g. Availability and interest of all household members.
- h. Female headed households will be prioritized.

99 Seed nurseries: the selection criteria are the following:

- a. Families living in extreme poverty¹⁴ and their production is below subsistence, which limits their access to financial resources for implementing climate change adaptation measures.
- b. **They sow maize and/or beans and possess family gardens:** these crops are prioritized for this project. Families must have a family garden established on the family plot, since the project will invest in their diversification and improvement.
- c. Household with 4 or more members.
- d. Children under 7 with some degree of malnutrition.
- e. Availability and interest of all household members.
- f. Female headed households.

Table 6: Distribution of agricultural households prioritized by the PAFEC

Incidence of poverty	Below subsistence	Subsistence	Surplus	Total
Extreme poverty	22,054	82,764	28,109	132,927
Not extreme poverty	63,710	254,608	87,609	405,927
Total prioritized population	(85,764)	(337,372)	(115,718)	(538,854)
Not poor	20,071	175,920	55,700	251,691
Total	105,856	513,395	171,420	790,671

Source: PAFEC 2016-2020

100 Coffee: Selection criteria for beneficiaries of practices to improve coffee resilience are the same used for basic grains and family gardens presented above (except for criterion 4), but they must also:

- a. **Possess up to 1 ha of available land** for the farming activity (own or rented; they can prove it)
- b. They produce coffee using shade.

101 Cacao: the same criteria as for coffee will be used for cacao.

¹⁴ Poor: the part of the population that does not reach the minimum income to cover a basket that meets their food and non-food needs. Extreme poor: those who are unable to cover the cost of minimal food consumption.

102 Forest incentives: for forest management for protection and provision of water, forest management for production and provision of water and agroforestry systems.

103 The criteria to select small landholders and landowners in the project to implement forest management activities are the ones established in the current legislation on forest incentives¹⁵ & 16. These criteria are the following:

- Have Guatemalan nationality;
- Be of legal age;
- Be in free exercise of his or her civil rights;
- Land owner of an area of less than 1 hectare and more than 0.1 hectare;
- Have proof of title of property or possession;

104 Also regulations in incentive legislation indicates that the following categories are not eligible on receiving forest incentives:

- Land, where the ownership is the result of an invasion or other form of usurpation of property
- Lands already receiving funds from other financial mechanisms granted by the state;
- Land, which in the past has benefited from INAB forestry incentives;
- Landholders who have been found guilty of violations of forest legislation.
- Lands on which forest cover has been removed without authorization, from the date on which Decree No. 51-2010 of the Congress of the Republic, the Forestry Incentives for Holders of Small Areas of Forestry or Agro-Forestry Land, came into force.

105 Other criteria that will be used to prioritize the beneficiaries are:

- Landholders living in extreme poverty;
- Household with 4 or more members;
- Children under 7 with some degree of malnutrition;
- Availability and interest of all household members;
- Female headed households will be prioritized.

¹⁵ Law on forest incentives for holders of small areas of land suitable for forestry or agroforestry (PINPEP, Decree 51-2010) and its regulations;

¹⁶ Resolution No. JD 04.28.2015. Minutes of the Meeting of the Board of Directors of the National Institute of Forests No. JD.28.2015. dated August 12, 2015. Approval of amendments to the regulations of the Law on Forestry Incentives for Holders of Small Extensions of Forest or Agroforestry Vocation Land -PINPEP-. Chapter III. Eligibility requirements and impediments to qualify for the program. Article 20. Eligibility requirements.

8 ENVIRONMENTAL AND SOCIAL BASELINE

8.1 Environmental Aspects

- 106 A summary of the physical and natural characteristics of the 29 municipalities covered by the project is shown in Table 7, which indicates the main watershed, the most important water resources, physiographic region according to Holdridge (1967)¹⁷, area covered by agricultural activities and plant cover, land use intensity and existence of protected areas.
- 107 The project area has considerable water resources; however, these are being affected by lower volumes and pollution problems due to untreated waste water discharge or agrochemicals from agriculture and ranching. The predominant life zone corresponds to very humid hot subtropical forest and cold subtropical forest, followed by dry subtropical forest and spiny subtropical scrubland. Approximately 42% of the area of prioritized municipalities is used for agricultural activities with a certain degree of overuse; only 29% possesses forest cover, and there are even municipalities that have less than 5% of forests. There is a total of 40 protected areas (Table 8).

¹⁷ Holdridge, L. R. 1967. Life Zone Ecology. Tropical Science Center. San José, Costa Rica. (Traducción del inglés por Humberto Jiménez Saa: «Ecología Basada en Zonas de Vida», 1a. ed. San José, Costa Rica: IICA, 1982).

Table 7. Summary of the physical and natural characteristics of prioritized municipalities.

Municipality / Department	Watershed	Water resources	Physiographic region	Life zone (Holdridge 1967)	Agricultural area/ forest cover	Land adequate use	Land Over-utilized	Land Under-utilized	Protected areas and %
Cahabón, Alta Verapaz	Cahabón River basin	3 tributaries of Cahabón River Actelá River provides water for consumption and irrigation to the municipal capital. A large part of water resources are being highly polluted by the discharge of water and fertilizers.	High sedimentary lands characterized by undulating topography and hills with steep slopes.	Very humid subtropical forest. The “Very humid subtropical cold” life zone is located to the northeast	41.77% of the territory of Cahabón is devoted to agricultural activities. Cover forest 23,484.51 hectares (approximately 30.8% of the territory)	56.78%	33.85%	8.53%	None.
Chahal, Alta Verapaz	Sarstún River basin	4 main rivers (Chiyú or Senimalayú, Chahal, Semanzana and Gracias a Dios) For human consumption and for agriculture and ranching activities. Many of them are polluted by the population.	High sedimentary lands characterized by undulating topography and hills with steep slopes.	Very humid warm subtropical forest in the north	27.46% of the territory of Chahal is used for agricultural activities. 18276.48 hectares of forest cover (UVG, INAB, CONAP and URL 2012). This represents 39.69% of the territory.	62.78%	12.08%	23.58%	(Las Conchas). 2 municipal forest reserves (San Lucas Secanté, San Agustín Chahal) and a natural recreational park (Las Conchas).
Chisec, Alta Verapaz	Lower part of the Negro or Chixoy river basin	8 rivers, 1 brook, 10 streams and 8 gorges. Agricultural activities, human consumption, fishing, recreation, laundry and waterways for transporting goods and persons. Other important bodies of water for the municipality are the twin lagoons of Sepalau, which are a tourist attraction and provide	High sedimentary lands characterized by undulating topography and hills with steep slopes.	Very humid warm subtropical northern forest	34.98% of the territory of Chisec is used for agricultural activities. Forest cover 45,686.7 hectares (41,59%)	52.79%	10.38%	34.88%	None

Municipality / Department	Watershed	Water resources	Physiographic region	Life zone (Holdridge 1967)	Agricultural area/ forest cover	Land adequate use	Land Over-utilized	Land Under-utilized	Protected areas and %
		water for the neighboring communities.							
Cobán, Alta Verapaz	Cahabón River basin	48 rivers, 7 lagoons, 11 creeks and 7 gorges Water for agricultural activities, human consumption, fishing, recreation, laundry and waterways for transporting goods and persons.	High sedimentary lands characterized by undulating topography and hills with steep slopes.	Very humid subtropical warm northern forest and to a lesser extent subtropical rainforest, very humid subtropical cold forest and temperate humid subtropical forest.	26.09% of the territory of Cobán is used for agricultural activities. Forest cover 105,790.77 hectares (46,69%)	64%	10%	24%	Las Victorias N.P., Lachuá Lagoon. 0.42% is a protected area 4 private natural reserves: Catalj, Chajumpec, Entre Ríos and Orquigonia conservation center.
Fray Bartolomé De Las Casas, Alta Verapaz	La Pasión river basin and part of the southeastern region of the municipality belongs to the Sarstún river basin.	13 rivers, of which the most important ones are Chajmaic, Sebol and Santa Isabel or Cancuen, which belong to the La Pasión river basin, whereas the basin of Sarstún river is the Chiyú river. Water for local populations for self-consumption, agriculture, fishing and recreation.	High sedimentary lands characterized by undulating topography and hills with steep slopes and a small region that belongs to Cinturón Plegado del Lacandón.	Very humid subtropical warm northern forest.	37.06% of the territory of Fray Bartolomé de las Casas is used for agriculture. Forest cover 45,297.99 hectares (37,34%)	47.03	8.57%	41.09%	None. 0.56% protected forest lands.
San Agustín Lanquín, Alta Verapaz	Lower part of the Cahabón river basin	5 main rivers in the municipality: Cahabón, Lanquín, Chiacte, Chianay and Chajmala, 4 gorges, 8 streams, 7 springs.	High sedimentary lands characterized by undulating topography and hills with steep slopes and a small region that belongs to Cinturón Plegado del Lacandón.	Very humid subtropical forest. The very humid subtropical cold life zone lies to the northeast.	52.11% of the territory of Lanquín is used for agricultural activities. Forest cover 5,163.66 hectares (21,87%)	51.72%	42.06%	4.99%	Grutas de Lanquín N.P.; Semuc Champey Natural Monument. 5.43% is a protected forest area and 2.49% a protected area.

Municipality / Department	Watershed	Water resources	Physiographic region	Life zone (Holdridge 1967)	Agricultural area/ forest cover	Land adequate use	Land Over-utilized	Land Under-utilized	Protected areas and %
Panzós, Alta Verapaz	Polochic river basin	Used by the community for different activities such as human consumption, agriculture, fishing, recreation, and waterways for transporting goods and persons.	Izabal depression located in a valley. Lake Izabal is located in the region. Another part of the municipality is in high sedimentary lands.	Very humid subtropical forest.	46.92% of the territory of Panzós is used for agricultural activities. Forest cover of 20,345.85 hectares (27,91%)	55.77%	15.39%	18.,26%	0.56% is protection forest areas and 2.45% is a protected area.
Raxruhá, Alta Verapaz	The lower part of the Negro or Chixoy river basin.	Sebol, San Simón, Candelaria, La Pasión and San Pablo rivers. These provide water for agriculture, human consumption, fishing, recreation, laundry and some are used as waterways for transporting goods and persons.	High sedimentary lands characterized by undulating topography and hills with steep slopes.	Very humid subtropical forest	53.77% of the territory of Raxruhá is used for agricultural activities. Forest cover of 19,506.06 hectares (32,37%)	45.02%	7.77%	46%	None.
San Cristóbal Verapaz, Alta Verapaz	Cahabón river basin	5 rivers, 17 gorges, 1 lagoon. Chicoj lagoon, on the outskirts of the municipal capital, is in an advanced state of eutrophication due to the large amount of pollution poured into its waters.	High sedimentary lands characterized by undulating topography and hills with steep slopes.	Very humid subtropical cold forest and a small area of humid subtropical temperate forest. Forest cover of 15,537.15 hectares (40,44%).	38.35% of the territory of San Cristóbal Verapaz is used for agriculture.	64.39%	26.16%	7.27%	Anexo del Capuchino private natural reserve 6.94% of protection forest lands..
San Juan Chamelco, Alta Verapaz	Upper part of the Polochic and Cahabón river basins	9 rivers, 10 gorge and 3 streams. These resources are used for self-consumption, fishing, agriculture, forestry and recreation	High sedimentary lands characterized by undulating topography and hills with steep slopes.	Very humid subtropical cold forest and low subtropical mountain rainforest. Natural coniferous forests.	34.76% of the territory of San Juan Chamelco is used for agriculture. Forest cover: 4,744.08 hectares (25.39%).	63.16%	26.56%	9.20%	2 private natural reserves: Chicacnab and Xucaneb
San Pedro Carchá, Alta Verapaz	Cahabón river basin	26 rivers, 5 gorges and 13 streams.	High sedimentary lands characterized by undulating topography	Very humid subtropical warm northern forest, very	43.30% of the territory of San	64.98%	28.04%	6.48%	3 private natural reserves": Kanti

Municipality / Department	Watershed	Water resources	Physiographic region	Life zone (Holdridge 1967)	Agricultural area/ forest cover	Land adequate use	Land Over-utilized	Land Under-utilized	Protected areas and %
		These bodies of water supply local communities for self-consumption, fishing, agriculture and recreation. Many communities do not have these resources, so during the rainy season they collect rainwater for use in their daily activities.	and hills with steep slopes.	humid subtropical cold forest and a small area of low mountain subtropical rainforest.	Pedro Carchá is used for agriculture. Coverage: 31,844.16 hectares (24.24%)				Shul, Chinajux and Sechinaux
Santa Catalina La Tinta, Alta Verapaz	Polochic river basin	52 rivers, 2 streams, 22 gorges and 2 lagoons. Used for self-consumption, fishing, agriculture and recreation. They are abundant enough to be used for hydroelectric power.	High sedimentary lands characterized by undulating topography and hills with steep slopes.	Very humid, subtropical warm northern forest. A smaller area of very humid subtropical cold forest and low subtropical mountain rainforest.	45.10% of the territory of Santa Catalina la Tinta is used for agriculture.	60.10%	29.80%	7.65%	None. 0.32% is protection forest land and 0.92% is a protected area.
Santa Cruz Verapaz, Alta Verapaz	Cahabón river basin	6 rivers: Carchelá, Chirripitán, Chixoy, Quililá and Squijá; 2 streams: La Cueva and La Isla and 10 gorges. 17 springs. These springs provide water for 50% of populated areas and local communities obtain water from other sources. 5 of these springs are privately owned, so they only benefit a small number of people. These bodies of water are a resource for local communities and used for self-consumption, fishing, agriculture...	High sedimentary lands characterized by undulating topography and hills with steep slopes.	Very humid cold subtropical forest and a small area of the municipality with humid subtropical e=temperate forest.	40.84% of the territory of Santa Cruz Verapaz is used for agriculture. Forest cover: 3,030.39 hectares (38,85%).	53.14%	11.52%	33.62%	None. 1.18% of protection forest lands.
Senahú, Alta Verapaz	Lower part of the Cahabón river basin	37 rivers, 44 streams and 39 gorges. 4 springs supply local communities; only one is on private property. Used for	High sedimentary lands characterized by undulating topography and hills with steep slopes.	Very humid subtropical warm northern forest. A smaller area consists of low subtropical	57.95% of the territory of Senahú is used for agriculture.	48.45%	45.53%	5.56%	None. 1.82% of protection forest lands and 0.01%

Municipality / Department	Watershed	Water resources	Physiographic region	Life zone (Holdridge 1967)	Agricultural area/ forest cover	Land adequate use	Land Over-utilized	Land Under-utilized	Protected areas and %
		agriculture, human consumption, fishing, recreation and laundry. The municipality has a water network with a considerable volume that may be used for producing hydroelectric power.		mountain rainforest and subtropical rainforest.	Forest cover: 16,468.92 hectares (23.35%).				of protected areas.
Tactic, Alta Verapaz	Cahabón and Polochic river basins	Polochic, Pantup, Chamché y Cahabón rivers. The latter is the one most used for agricultural activities but is also one of the most polluted. 7 springs that supply the local communities, of which only one is located on private property for agricultural activities, human consumption, recreation and laundry.	High sedimentary lands characterized by undulating topography and hills with steep slopes.	Very humid subtropical forest with a small part of humid subtropical temperate forest.	38.49% of the territory of Tactic is used for agriculture. Forest cover: 2,848.56 hectares (24.48%).	60.44%	25.95%	11.87%	None. 2.49% protection forest lands.
Tamahú, Alta Verapaz	Polochic river basin.	1 river, 3 streams and 16 gorges. 13 springs	High sedimentary lands characterized by undulating topography and hills with steep slopes	Low subtropical mountain rainforest and very humid cold subtropical forest.	42.25% of the territory of Tamahú is used for agricultural activities. Forest cover: 2,286.36 hectares (32,72%)	71.60%a	21.56%	6.66%	Private natural reserve of San Andrés Rocja 1.13% as protection forest lands.
San Miguel Tucurú, Alta Verapaz	Cahabón river basin	4 rivers, 21 streams and 19 gorges. 7 springs that supply some communities with water, although not all of them have this resource.	High sedimentary lands characterized by undulating topography and hills with steep slopes. A small area to the east of the municipality belongs to the physiographic	Very humid, subtropical warm northern forest. Part consists of low subtropical mountain rainforest.	66.11% of the territory of Tucurú is used for agriculture. Forest cover: 5,754.51 hectares (26,28%)	53.16%	33.36%	12.94%	Private natural reserve of Chelemha. 1.08% as protection forest lands.

Municipality / Department	Watershed	Water resources	Physiographic region	Life zone (Holdridge 1967)	Agricultural area/ forest cover	Land adequate use	Land Over-utilized	Land Under-utilized	Protected areas and %
			region of the "Izabal depression" where Lake Izabal is located.						
Purulhá, Baja Verapaz	Matanzas river basin	53 water sources, of which 32 are watersheds, 3 are wells and 18 are gorges or rivers. These resources provide water for the local population and are used for self-consumption, agriculture fishing and recreation.			33.81% of the territory of Purulhá is used for agricultural activities. Forest cover 20,913.03 hectares (40.47%).	70.37%	23.66%	5.22%	9 Private natural reserves totaling 1.916,23 ha. 4,96% as protection forest lands and 0.45% are protected areas.
Rabinal, Baja Verapaz	Chixoy river basin	18 rivers, 5 springs that supply some communities. These resources provide water for local populations and are used for self-consumption, agriculture, fishing and recreation.			22.52% of the territory of Rabinal is used for agriculture. Forest cover: 10,391 hectares (33,34%)	70.67%	21.53%	5.91%	None. 3.30% are protection forest lands.
San Miguel Chicaj, Baja Verapaz	Salinas and Motagua river basins	5 rivers, 6 gorges These resources provide water for local communities and are used for self-consumption, agriculture, fishing and recreation.			33.81% of the territory of San Miguel Chicaj is used for agricultural activities. Forest cover 5,033.52 hectares (15.40%).	55.04%	40.61%	1.88%	Cumbre Laguna Seca regional municipal park 5.00% are protection forest lands
Camotán, Chiquimula	Motagua river basin	4 rivers and 32 gorges. These resources provide water for local communities and are used for self-consumption, agriculture, fishing and recreation.	"Crystalline Highlands" is located between two fault systems in constant evolution and a small area is located in the volcanic highlands, characterized by the presence of numerous	Humid subtropical forest and a small area of dry subtropical forest.	50.11% of the territory of Camotán is used for agricultural activities.	44.90%	39.08%	14.50%	None. 5.95% are forest protection lands.

Municipality / Department	Watershed	Water resources	Physiographic region	Life zone (Holdridge 1967)	Agricultural area/ forest cover	Land adequate use	Land Over-utilized	Land Under-utilized	Protected areas and %
			volcanic cones and up to 40% slopes and valleys consisting of ash.		Forest cover 2,769.03 hectares (12.02%).				
Chiquimula, Chiquimula	Rio Grande de Zacapa and Motagua river basins.	6 rivers, 2 streams and 49 gorges. 93 water sources, most of which are managed by persons who recognize them as personal property and do not know that the law allows water sources to be used collectively.	“Crystalline Highlands” is located between two fault systems in constant evolution and a small area is located in the volcanic highlands, characterized by the presence of numerous volcanic cones and up to 40% slopes and valleys consisting of ash.	Humid subtropical forest and a small area of dry subtropical forest.	33.81% of the territory of Chiquimula is used for agricultural activities. Forest cover 1,945.80 hectares (5,53%).	59.69%	28.92%	6.98%	Trifnio-Fraternidad Biosphere Reserve and Ipala Volcano and Lake Multiple Use Area. 1.49% are forest protection lands.
Jocotán, Chiquimula	Grande de river basin	5 rivers and 30 gorges. These resources provide water for local communities and are used for self-consumption, agriculture, fishing and recreation.	“Crystalline Highlands” is located between two fault systems in constant evolution and a small area is located in the volcanic highlands, characterized by the presence of numerous volcanic cones and up to 40% slopes and valleys consisting of ash.	Humid subtropical forest, dry subtropical forest and spiny subtropical scrubland.	48.81% of the territory of Jocotán is used for agricultural activities. Forest cover 1,189.80 hectares (4.74%).	44,19%	53,11%	1,46%	None 11.49% are forest protection lands.
Olopa, Chiquimula	Grande and river basins.	6 rivers, 16 gorges and 2 lagoons. These resources provide water for local communities and are used for self-consumption, agriculture, fishing and recreation.	Volcanic highlands characterized by the presence of numerous volcanic cones with up to 40% slopes and some valleys made mainly of ash.	Humid subtropical forest (warm)	49.58% of the territory of Olopa is used for agricultural activities. Forest cover 3,006.18 hectares (26.82%).	81.98%	15.52%	.09%	None 0.02% as protection forest areas and 0.22% thereof as protected areas.
San Juan La Ermita, Chiquimula	Rio Grande de Zacapa river basin	2 rivers and 17 gorges It has the largest number of water sources in the dept. of	Volcanic highlands characterized by the presence of numerous	Temperate humid forest	42 42.97% of the territory of San Juan	50.89%	45.01%	2.86%	None

Municipality / Department	Watershed	Water resources	Physiographic region	Life zone (Holdridge 1967)	Agricultural area/ forest cover	Land adequate use	Land Over-utilized	Land Under-utilized	Protected areas and %
		Chiquimula, which has one of the lowest forest covers, which are water recharge areas.	volcanic cones with up to 40% slopes and some valleys made mainly of ash.	and dry subtropical forest.	la Ermita is used for agricultural activities. Forest cover 473.31 hectares (5.88%).				12.05% as protection forest areas
Dolores, Petén	Cuenca Hídrica I, Cuenca Hídrica II	8 main rivers: Salsipuedes, Mopán, Sacul, Chiquibul, Machaquilá, Poxté and San Juan. The volume of Mopán river has decreased due to low precipitation, deforestation and weather events that cause climate change. These resources provide water and are used for self-consumption, agriculture, fishing and recreation.	Cinturón Plegado del Lacandón is the result of short-interval and high frequency folding. A smaller area consists of the "Maya Mountains" and interior lowlands of Petén.	Humid warm subtropical forest; only 3.36% is very humid subtropical forest.	36.54% of the territory of Dolores is used for agricultural activities. Forest cover 67,029.48 hectares (48%).	57.19%	27.54%	10.65%	6.72% as protection forest areas. 3 municipal regional Parks, 2 private natural 1 biosphere reserve, Chiquibul Maya mountains, and 1 wildlife sanctuary, Machaquilá.
Poptún, Petén	La Pasión river basin	8 rivers, 4 creeks, 1 gorge provide water and are used for self-consumption, agriculture, fishing, recreation and laundry.	Cinturón Plegado del Lacandón is the result of short-interval and high frequency folding. A smaller area consists of the "Maya Mountains" and interior lowlands of Petén.	Humid warm subtropical forest	41.16% of the territory of Poptún is used for agricultural activities. Forest cover 69,177.33 hectares (41%).	60,27%	21,22%	16,07%	1 biosphere reserve, Chiquibul Maya mountains. 2 wildlife sanctuaries, Machaquilá. and Xutilhá. La Enea Municipal Regional Park.
San Luis, Petén		23 rivers, 1 stream, 1 creek and 8 gorges. These bodies of water have reduced flow and are polluted by solid waste.	Cinturón Plegado del Lacandón is the result of short-interval and high frequency folding. A smaller area consists of the "Maya Mountains" and interior lowlands of Petén.	Very humid hot subtropical forest	36.54% % of the territory of is used for agricultural activities. Forest cover 96,601.59 hectares (40,52%)	71.88%	13.09%	11.76%	Mayan mountains Chiquibul, 2 wildlife refuges, Machaquilá. Y Xutilhá. 0.03% as protection forest areas and 1.84%

Municipality / Department	Watershed	Water resources	Physiographic region	Life zone (Holdridge 1967)	Agricultural area/ forest cover	Land adequate use	Land Over-utilized	Land Under-utilized	Protected areas and %
									as protected areas.
La Unión, Zacapa	Motagua River basin	A significant cloud forest area that is a key point for municipal water recharge and adjacent areas contribute a considerable number of water sources in the region for human consumption and at a smaller scale for agriculture and ranching.	Volcanic highlands characterized by the presence of numerous volcanic cones with slopes of up to 40%, as well as some valleys made up mainly of ash.	Subtropical humid temperate forest; only 0.07% is subtropical dry forest.	51.71% of the territory of La Unión is used for agricultural activities. Forest cover: 7,360.65 ha. (34,31%)	53.84%	10.69%	34.94%	La Unión regional municipal park. 11.31% with production forestry lands and 0.76% as protected areas.

Source: Prepared in-house based on CATIE (2018), CONAP (2018) and UVG (2018).

Table 8. Identification of protected natural areas in selected provinces of the project implementation.

Management category	Total area (ha)
Type I – National Park	
Las Victorias	14.392,47
Laguna Lachuá	
Grutas de Lanquín	
Type II – Natural Monument	
Semuc Champey	1.837,55
Type III – Wildlife Sanctuary	
Machaquilá	102.538,00
Xutilhá	
Type IV -Multiple use area	
Volcán y Laguna de Ipala	2.012,00
Type V – Municipal Forest Reserve	
San Lucas Secanté	158,5
San Agustín Chahal	
Type VI – Municipal Natural Recreational Park	
Las Conchas	38,28
Type VII – Municipal Regional Park	
La Unión	4.103,24
La Enea	
Cumbre Laguna Seca	
Sacul-Ha	
El Vivero	
Ixlut	
Type VIII – Private Natural Reserve	
Catalji	6.320,41
Chajumpec	
Entre Ríos	
Centro de Conservación Orguigonia	
El Anexo del Capuchino	
Chicachab	
Xucaneb	
Kantil Shul	
Chinajux y Sechinaux	
San Andrés Rocja	
Los Lagartos	
Chelemha	
Cerro Verde	
El Ciruelo	
Montebello	
Raam Tzul	
Santa Rosa and Llano Largo	
Biotopín	
Peña del Angel	
Río Colorado	
Suhin	
X´bien Tzul	
Type VI – Biosphere Reserve	
Trifinio-Fraternidad	145.799,45
Chiquibul Maya mountains	

Source: prepared in-house based on CONAP, 2018

8.2 Social Aspects

108 This section contains a brief description of the socioeconomic conditions in the municipalities selected for program implementation. To describe them, the municipalities were grouped under the department they belong to.

8.2.1 Alta Verapaz

109 This department is divided into 17 municipalities with an approximate population of 814,300 (INE, 2002), of which 90% are indigenous. Most speak Q'eqchi' and Poqomchi' is spoken in southern municipalities bordering Baja Verapaz.

110 The municipalities that will probably be involved in the project are the departmental capital and largest city, Cobán, as well as the prioritized municipalities in this region: Chisec, Panzós, Santa Catalina la Tinta, Tukurú, Cahabón, Cobán, Fray Bartolomé de las Casas, Lanquín, San Cristóbal Verapaz, San Pedro Carchá, Santa Cruz Verapaz, Senahú, Tamahú, Chahal, Raxruhá, San Juan Chamelco and Tactic.

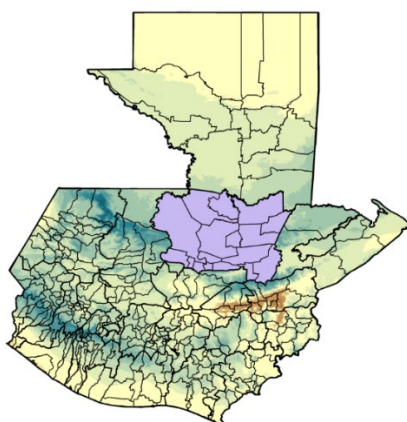


Figure 1. Municipalities selected in the Department of Alta Verapaz.

8.2.2 Baja Verapaz

111 There are eight municipalities in this department. It has approximately 80,207 inhabitants (INE, 2002). 56% of the population is indigenous. The Achí language is spoken in the municipalities of San Miguel Chicaj and Rabinal; and Poqomchi' in a strip to the north of these municipalities close to Alta Verapaz. Poqomchi' and Q'eqchi' are spoken in Purulhá, and Spanish in certain regions in the south of the municipality.

112 The largest city in this region is Salamá, municipal capital of the department of Baja Verapaz. The prioritized municipalities in this region are Purulhá, Rabinal and San Miguel Chicaj.

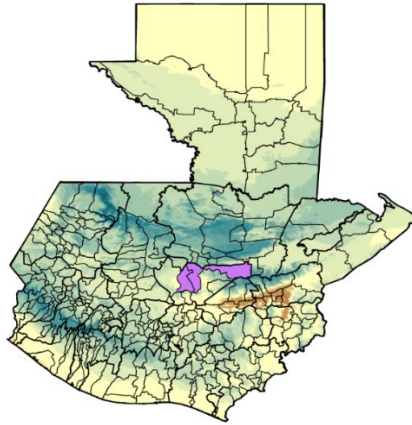


Figure 2. Municipalities selected in Baja Verapaz.

8.2.3 Petén

113 The department of Petén has 14 municipalities, and around 101,558 inhabitants (INE, 2002), of which 33% are indigenous. Q'eqchi' is spoken in the three selected municipalities, but Mopán is also spoken in the center-east of the municipality of San Luis and Spanish is spoken in the northern half of the municipality of Dolores. The largest city in this region is Poptún. The selected municipalities are Poptún, San Luis and Dolores.



Figure 3. Selected municipalities in the department of Peten.

8.2.4 Zacapa

114 Zacapa has 10 municipalities and a population of 199,583 (INE, 2002), of which only 1% is indigenous. The project will be carried out in the municipalities with the highest rates of indigenous population. Ch'orti' and Spanish are spoken. The largest city is Zacapa, and the project will only work in one municipality, La Unión.

8.2.5 Chiquimula

115 Chiquimula has 11 municipalities and 300,323 inhabitants (INE, 2002), of which 7% are indigenous. Like in Zacapa, the project will focus on the municipalities with the highest rates of indigenous population. The languages spoken in this department are Ch'orti' and Spanish. The largest city is the departmental capital, Chiquimula. The selected municipalities are Chiquimula, Olopa, Camotán, Jocotán and San Juan La Ermita.

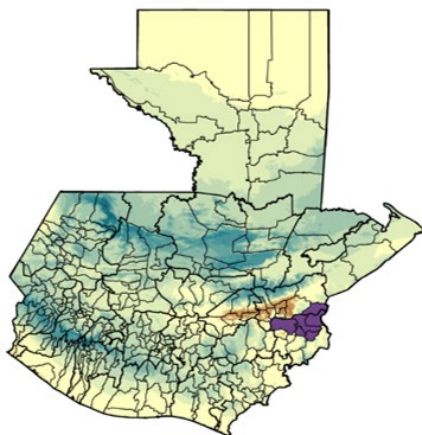


Figure 4. Selected municipalities in the department of Zacapa and Chiquimula.

Table 9. Main socioeconomic indicators of the municipalities prioritized for the project.

No.	Department / Municipality	Population					% Poverty (Rural population)		Socioeconomic context				Malnutrition (2016)		
		Total	% women	% men	% indigenous population	Indigenous group (majority)	General	Extreme poverty	PEA TOTAL (%)	PEA women (%)	PEA men (%)	Main economic activity	Chronic (Cases)	Acute (Cases)	Mortality (Cases)
1	Alta Verapaz														
1.1	Chahal	32,138	51	49	94	Q'eqchi	48	12	31	10	90	Agriculture	73	28	1
1.2	Chisec	96,287	52	48	91	Q'eqchi	97	65	34	15	85	Subsistence agriculture Unskilled labor	619	72	3
1.3	Cobán	289,421	50	50	93	Q'eqchi	79	26	31	ND*	ND*	ND*	939	93	2
1.4	Fray Bartolomé de las Casas	75,850	50	50	95	Q'eqchi	85	40	38	10	90	Agriculture	47	134	2
1.5	Lanquín	29,419	50	49	99	Q'eqchi	85	29	35	6	94	ND*	390	18	0
1.6	Panzós	67,340	50	50	98	Q'eqchi	97	76	33	12	88	Agriculture	390	72	2
1.7	Raxuhá	39,796	51	49	85	Q'eqchi	87	37	24				73	26	2
1.8	San Cristóbal Verapaz	70,528	51	49	99	Poqomchi	87	53	35	20	80	Agriculture	524	151	1
1.9	San Juan Chamelco	69,175	51	49	98	Q'eqchi	41	3	44	39	61	Subsistence agriculture Textile manufacturing	784	15	1
1.10	San Pedro Carchá	264,679	50	50	99	Q'eqchi	89	46	40	12	82	Agriculture Unskilled labor	273	56	2
1.11	Santa Catalina la Tinta	45,222	50	50	97	Q'eqchi	96	61	34	ND*	ND*	Agriculture (large plantations and subsistence)	138	42	0
1.12	Santa Cruz Verapaz	50,299	51	49	96	Poqomchi	81	37	25	ND*	ND*	Private initiative	601	18	1
1.13	Santa María Cahabón	69,349	50	50	98	Q'eqchi	80	26	ND*	ND*	ND*	ND*	52	26	2
1.14	Senahú	73,237	ND*	ND*	99	Q'eqchi	86	28	31	38	62	Agriculture (migratory)	1	28	1
1.15	Tactic	41,281	52	48	87	Poqomchi	40	10	45	36	64	ND*	2	24	1
1.16	Tamahú	24,697	50	50	99	Poqomchi	80	50	28	17	83	Skilled labor Agriculture	58	61	1
1.17	Tucurú	49,011	50	50	97	Q'eqchi	95	65	29	14	86	Subsistence agriculture	1	28	1
2	Baja Verapaz														
2.1	Purulhá	64,476	50	50	92	Q'eqchi Poqomchi	97	71	ND*	ND*	ND*	ND*	1	53	1
2.2	Rabinal	39,386	53	47	82	Achi	68	ND*	ND*	ND*	ND*	ND*	ND*	17	1

No.	Department / Municipality	Population					% Poverty (Rural population)		Socioeconomic context				Malnutrition (2016)		
		Total	% women	% men	% indigenous population	Indigenous group (majority)	General	Extreme poverty	PEA TOTAL (%)	PEA women (%)	PEA men (%)	Main economic activity	Chronic (Cases)	Acute (Cases)	Mortality (Cases)
2.3	San Miguel Chicaj	31,190	52	48	93	Achi	77	25	13	ND*	ND*	Agriculture	1	28	1
3	Petén														
3.1	Dolores	56,676	50	50	15	Q'eqchi	54	13	39	ND*	ND*	Agriculture	94	20	ND*
3.2	Poptún	79,311	50	50	35	Q'eqchi	49	12	36	ND*	ND*	Agriculture services, livestock, commerce	188	77	1
3.3	San Luis	88,848	50	50	60	Q'eqchi	86	45	39	ND*	ND*	Agriculture Hunting Silviculture Fishing	59	73	1
4	Zacapa														
4.1	La Unión	35,284	50	50	1	Ch'orti	74	ND*	33	12	88	Agriculture (coffee labor)	389	58	1
5	Chiquimula														
5.1	Camotán	48,435	ND*	ND*	69	Ch'orti	86	41	ND*	ND*	ND*	Agriculture (basic grains, coffee and vegetable production)	ND*	143	1
5.2	Chiquimula	87,882	53	47	3	Varios	86	35	33	32	68		1	95	2
5.3	Jocotán	53,960	ND*	ND*	81	ND*	94	60	22	ND*	ND*	Survival agriculture	ND*	142	2
5.4	Olopa	29,113	51	49	65	Ch'orti	85	ND*	ND*	ND*	ND*	Subsistence agriculture Informal commerce Unskilled labor	ND*	16	2
5.5	San Juan La Ermita	20,000	ND*	ND*	9	Ch'orti	87	40	42	ND*	ND*	Agriculture Construction work Mineral mining and processing	ND*	39	ND*

Source: developed in-house with INE data.

* Undetermined information

9 ANALYSIS OF NATIONAL POLITICAL/STRATEGIC AND LEGAL/REGULATORY FRAMEWORKS.

9.1 Guatemalan Legal / political framework

116 The political/strategic and legal/regulatory framework presented below is binding in environmental, forest and diversity terms, social development, food security and sovereignty and climate change. It has also been prioritized based on recognition of the persistence of conditions of social, environmental and economic vulnerability experienced by most of the population.

Table 10. Legal/political framework on the environment, forests and biodiversity related to the project

Link age topic	Name of the policy	Description	Project articulation
Environment, forests and biodiversity	Law Promoting the Establishment, Recovery, Restoration, Management, Production and Protection of Forests in Guatemala (PROBOSQUE) (Decree 2-2015)	Aiming to recover the country's forest cover, to strengthen social organization, to restore degraded woodlands, to ensure livelihoods for food and energy security and to reduce the effects of climate change, the State will grant forest incentives in the form of cash payments to implement reforestation or natural forest management projects according to a management plan for projects such as natural forests for protecting against climate change; natural forests for forestry production; industrial and energy plantations; forest systems in agricultural and ranching landscapes; forest restoration; headwaters; coastal areas and water sources.	The project is aligned with the objectives of the law with regard to forest restoration for community development by: <ul style="list-style-type: none"> • Promoting forest diversification in lands suitable for agriculture and livestock and restoring degraded forest lands through agro-forestry systems, forest plantations and other modalities that help provide firewood and timber in rural areas and recover the productive and protective base in degraded forest lands. • Helping to ensure livelihoods, food security, energy security and mitigation and reduction of natural disaster risks associated with the effects of climate variability and change and protecting the rural infrastructure of the Guatemalan population by promoting activities for forest establishment, recovery, restoration, management, production and protection.
	Environmental Protection and Improvement Law (Decree 68-86)	This law stipulates that the State, municipalities and the inhabitants of the national territory will foster social, economic, scientific and technological development to prevent environmental pollution and preserve a balanced environment. Therefore, plants, animals, the soil, the subsoil and water should be used and utilized rationally.	The project is aligned with the specific objectives of the Law (Art. 12): <ul style="list-style-type: none"> (c) Gearing educational, environmental and cultural systems towards the training of human resources qualified in environmental sciences and education at all levels to create environmental awareness among the entire population; (e) Creating all kinds of incentives and stimuli to promote programs and initiatives for environmental protection, improvement and restoration; (f) Comprehensive use and rational management of water basins and systems; (h) Saving and restoring bodies of water that are threatened or in danger of extinction.
	Forestry Law (Decree 101-96)	The set of laws that declares reforestation and forest conservation as a matter of national urgency and social interest for the country, promoting forest development and sustainable management of forest resources.	The project contributes to the specific objectives of this Law: <ul style="list-style-type: none"> (d) Supporting, promoting and encouraging public and private investment in forestry activities to increase production, marketing, diversification, industrialization and conservation of forest resources. (f) Promoting a better standard of living for communities by increasing the supply of forest goods and services to meet the need for firewood, housing, rural infrastructure and food.
	Law on Forest Incentives for Holders of Small Parcels of Land suitable for Forestry or Agro-forestry (PINPEP by its Spanish acronym) (Decree 51-2010).	The purpose of this law is the creation of the forest incentive program for owners of small plots of land suitable for forestry or agro-forestry.	The project contributes to the objectives of this law: <ul style="list-style-type: none"> (c) Promoting gender equity, prioritizing the participation of groups of women in the management of natural forests, establishing and maintaining forest plantation and agro-forestry systems. (d) Generating employment in rural areas by establishing and maintaining natural forest management projects, forest plantations and agro-forestry systems.
	National Strategy to Address Deforestation and Forest Degradation (ENDDBG by its Spanish acronym) (REDD+ (in progress))	The main objective of this strategy is to coordinate forest governance to create or implement the main existing public policy instruments that make it possible to incorporate different actors and social and productive processes in reversing the causes of deforestation and forest degradation through actions to recover and protect the country's forest cover.	The project contributes to the options and actions/activities of this strategy in terms of regulatory harmonization; land management; institutional strengthening; strengthening incentive programs (especially PINPEP); goods and services; activities compatible with sustainable protection and management of forest systems (means of subsistence); and wood energy strategy.

Table 11. Legal / political framework on development linked to the project

Linkage topic	Name of the policy	Description	Project articulation
Social development	K'atun National Development Plan: Our Guatemala 2032 (2016)	The K'atun Plan is the national long-term development policy that articulates policies, plans, programs, projects and investments; in other words, the development management cycle. The Plan is the tool that guides interventions that the private sector, other civil society organizations and international donors may establish for the purpose of contributing to development.	<p>The Plan defines priority topics, including natural resources, to which this project will contribute in support of partial achievement of some of the goals:</p> <ul style="list-style-type: none"> • Priority: climate change <ul style="list-style-type: none"> ○ Goal 1: improved adaptation capacity and resilience of the population and ecosystems to climate change. • Priority: Conservation and sustainable use of forests and biodiversity for climate change adaptation and mitigation. <ul style="list-style-type: none"> ○ Goal 1: 32% of the land surface is covered with forests that generate economic and environmental assets for the population. ○ Goal 2: By 2032, at least 29% of the country's territory is covered with natural forests and forest cover has increased by 3% through environmental restoration on lands that are suitable for forest protection and conservation. • Priority: Sustainable management of water resources for achieving social, economic and environmental objectives. <ul style="list-style-type: none"> ○ Goal 2: 100% of the areas considered very suitable for water regulation and catchment are protected and sustainably managed using a water basin and/or land management approach with Maya, Xinka, Garifuna, age and gender relevance according to the social context. ○ Goal 3: At least 10 billion cubic meters of water are being stored in ponds and reservoirs. ○ Goal 4: At least 50% of lands having a very high and high potential for irrigation possess efficient irrigation systems to improve agricultural productivity. • Priority: Improved agricultural methods and family agriculture with Maya, Xinka, Garifuna, age and gender relevance. <ul style="list-style-type: none"> ○ Goal 1: 100% of farming households living in below-subsistence conditions and 50% of households living in subsistence conditions have seen improvements in their agricultural productivity levels through implementation of family agriculture and better agricultural methods. • Priority: Land management for sustainable use of natural resources, agricultural production and adaptation to climate change and mitigation of its effects. • Priority: agricultural production for food security.
	Comprehensive National Rural Development Policy (PNDRI by its Spanish acronym)	The overall purpose of the PNDRI is the progressive and permanent improvement of people's quality of life in general; of inhabitants of rural areas through equitable access to and sustainable use of productive resources, means of production, natural assets and environmental services, to achieve comprehensive and sustainable human development in rural areas.	<p>The project, seeking to help reduce food insecurity and unforeseen impacts on agricultural production, especially on the main crops on which food security is based, addresses three of the sector policies proposed by the PNDRI:</p> <ul style="list-style-type: none"> • Agricultural, livestock, forest and hydrobiological policy: implementing sustainable and culturally relevant production models to achieve the full human development of the subjects of the Comprehensive National Rural Development Policy and Law. • Socio-environmental policy: promoting environmental sustainability of integrated rural development and the public character of all natural assets and environmental services, as well as protecting and improving the environment, promoting a comprehensive environmental management and land management model that also preserves the rights of indigenous and farmer communities, as well as the required consultations and the studies on environmental impact and cultural relevance. • Policy to reduce vulnerability and manage risks: mitigate and reduce social, economic and environmental vulnerability in rural and suburban areas.

Table 12. Legal / political food and nutritional security framework linked to the project

Linkage topics	Name of the policy	Description	Articulation of the project
Food and nutritional security	National Food and Nutritional Security Policy (PNSAN) by its Spanish acronym)	The purpose of this policy is to offer a coordinated and articulated, efficient and permanent strategic framework among the public sector, civil society and international cooperation agencies that can ensure food and nutritional security, understood as people's right to physical and economic access at all times to sufficient safe and nutritive food to meet their nutritional needs in accordance with their cultural values and with gender equity, to enable them to lead active and healthy lives and thus contribute to sustainable human development and Guatemala's economic and social development.	The project will support the following strategies included in the PNSAN: (i) promotion of sustainable production systems, and (ii) prioritization of populations and geographic areas. It is also in line with the crosscutting issues included in the policy, such as: (i) the environment; (ii) prioritizing the vulnerable population, defined as the population that has limited response capacity to a natural event or cause that places it at risk; (iii) vulnerability to disasters; (iv) Safe water or water suitable for human consumption and use in food production.
	2016-2020 Strategic Food and Nutritional Security Plan (PESAN by its Spanish acronym)	The 2016-2020 PESAN follows three different approaches. One of them refers to risk management and adaptation to climate change. Its importance lies in the fact that the 2016-2020 PESAN considers three strategic objectives leading to consolidation of the necessary political frameworks that express food and nutrition security and institution building to address the structural and situational determinants of food and nutritional insecurity. The crosscutting issues of this plan include: the right to food and nutrition, transparency and accountability, cultural relevance, gender equity and the environment and natural resources. Their contents have been included in each of the three strategic objectives as crosscutting issues.	In this sense, the project is aligned with the following strategic lines of this plan: <ul style="list-style-type: none"> • Planning, developing and monitoring actions to build resilience to food and nutritional insecurity (INSAN by its Spanish acronym) in the territories. • Integration and linkage of community structures to improve their response to adverse events with regard to food and nutritional security (SAN by its Spanish acronym). • Activation of emergency funds to operationalize the plans.
	Family agriculture program to strengthen peasant economies (PAFFEC by its Spanish acronym) 2016-2020	The PAFFEC seeks to contribute to the national effort led by the Government of the Republic to eradicate hunger and malnutrition as essential conditions to overcome the country's lag in rural development (MAGA, 2017).	The project will contribute to the strategic pillar "Sustainable increase of farmers family production for SAN", which includes actions to consolidate productive systems and crop diversification.
	National Rural Extension System (SNER by its Spanish acronym)	The SNER is a set of public, private and international cooperation components that directly or indirectly contribute to improving national agricultural development. The system is formed by professional service providers and rural families who interact jointly to strengthen the productive, as well as the food, economic and socio-environmental capacities of the rural population using informal education processes (Urarte, 2011).	The project will propose actions directly linked to this system, specifically to strengthen capacities in prioritized areas.

Table 13. Legal / political climate change framework linked to the project

Linkage topic	Name of the policy	Description	Project articulation
Climate change	Framework law to regulate vulnerability reduction, mandatory adaptation to the effects of climate change and mitigation of greenhouse gases (Decree 7-2013)	The purpose of this law is to establish the necessary regulations to prevent, plan and respond in an urgent, appropriate, coordinated and sustained manner to the impacts of climate change on the country (Art. 1) so that the State may adopt practices that promote conditions to reduce vulnerability, improve the capacity for adaptation and make it possible to develop proposals for mitigating the effects of climate change due to greenhouse gas emissions (Art. 2).	The project will contribute with inputs, actions and instruments that support compliance with the following articles of the Framework Law: Article 15: Institutional strategic plans for reducing vulnerability, climate change adaptation and mitigation. Article 16: Appropriate productive practices for adaptation to climate change. Article 17: Soil protection; and Article 20: Reducing emissions by changing land uses.
	National Climate Change Policy (PNCC by its Spanish acronym)	The purpose of this policy is for the State of Guatemala, through the central Government, municipalities, organized civil society and citizens in general to adopt risk prevention, vulnerability reduction and improved climate change adaptation practices and contribute to reducing greenhouse gas emissions in the territory, to help improve its inhabitants' quality of life and strengthen their capacity for advocacy in international climate change negotiations.	The project will contribute to the following advocacy areas of the National Climate Change Policy: appropriate production practices, reduction of vulnerability and improved adaptation to climate change in key sectors of society: agriculture, livestock and food security; forest resources; comprehensive management of water resources; ecosystem conservation and management.
	National Climate Change Action Plan (PANCC by its Spanish acronym)	The overall purpose of the PANCC is to define in a clear and orderly manner the main actions and guidelines Government institutions and other sectors of the State should follow to contribute effectively to reducing the vulnerability present in most of the national territory; to improve the country's capacity for adaptation and reduce greenhouse gases in view of the threat posed by climate change and variability. It should be noted that the PANCC covers the main aspects of climate change: climate science, adaptation and mitigation. They define the goals and the responsible and jointly responsible actors by topic, including academia and civil society.	The project will support achieving some of the goals established in the plan, which include adaptation and mitigation actions together with the leading public institutions on agriculture, livestock and food security, forest resources, ecosystems, comprehensive management of water resources and land use. En los mecanismos planteados en el NDC del país, el proyecto contribuirá específicamente a la continuidad de la implementación y cumplimiento de instrumentos de política de gestión forestal en la que resaltan: Recuperación, Restauración, Manejo, Producción y Protección de Bosques de Guatemala - PROBOSQUE, Decreto 02-2015-, el Programa de Incentivos Forestales - PINFOR- y Programa de Incentivos Forestales para Poseedores de Pequeñas Extensiones de Tierra de Vocación Forestal o Agroforestal –PINPEP-, Estrategia Nacional de Restauración del Paisaje Forestal, la Estrategia de Vínculo entre Bosque Industria y Mercado y la Estrategia Nacional para el Combate de la Tala Ilegal.
	National Determined and Contemplated Contributions (NDCs)	Guatemala submitted to the UNFCCC its “Nationally Contemplated and Determined Contribution” (NDC). In accordance with the principle of common but differentiated responsibilities and its current capacities, it aims to achieve 11.2% reduction of its total GHEs in base year 2005 projected to 2030 in a trend scenario (BAU). It also plans a more ambitious reduction of up to 22.6% of its total GHGs for base year 2005 projected to 2030, on the condition that technical and financial support is provided through new and additional public and private international resources to achieve this ambitious goal.	Within the contemplated mechanisms in the NDC, the project will contribute specifically to the continued implementation and compliance with forest management policy instruments, specifically: forest recovery, restoration, management, production and protection in Guatemala (PROBOSQUE, Decree 02-2015), the Forest Incentive Program (PINFOR) and the Forest Incentive Program for small holders of land suitable for forestry or agro-Forestry (PINPEP, the National Strategy for Restoration of the Forest Landscape, the Strategy to link Forests, Industry and Market and the National Strategy for the fight against Illegal Logging.

9.2 Institutional framework

9.2.1 General Institutional Framework related to the Project

- 117 The response of the institutional subsystem has been insufficient and, in certain cases, absent. This is evidenced by the scarce resources allocated for the protection and sustainability of the natural subsystem. In fact, an analysis of expenditures by purpose and function shows that the allocation for environmental protection and risk management are among those that receive fewer resources. For the period 2010-2013, the average investment in issues related to environmental protection only reached 1% of the country's total budget (560.5 million quetzals) (CONADUR, 2014). (All Spanish acronyms are expressed in Spanish).
- 118 It should be noted that education, health, agriculture and food security, disaster risk reduction and others are directly related to the adaptation to climate change. Institutional strengthening in these areas and its linkage with climate change should therefore be a priority for the State.
- 119 As for the State's institutional density, the 2009/2010 Human Development Report, states that there is a stronger presence in education and health at the municipal level (CONADUR, 2014). The Human Development report uses the State Density Index (SDI) as a quantitative tool to measure (with 2008-2010 data) how agencies, bureaucracy and resources are distributed in the municipal sphere. This index considers three components: education, health and others (which encompasses all the other State functions).
- 120 The Climate Change Framework Law stipulates that, based on the National Plan of Action for Climate Change Adaptation and Mitigation, the relevant public institutions should have in place institutional strategic plans, which should be reviewed and updated periodically (article 15). It adds that priority should be given to developing strategic and operational plans, at least within the following institutions, according to the issues specified on adaptation matters (Torselli, Morataya & Coyoy, 2016):
- (a) **Human Health.** The Ministry of Public Health and Social Welfare (MSPAS) and the Guatemalan Social Security Institute (IGSS) should consider climate change in their plans to improve prevention and reduce vector-borne diseases that might increase due to climate variability, considering at least acute respiratory infections and diarrheal diseases.
 - (b) **Food Security.** MAGA and the Food and Nutritional Security Secretariat (SESAN) should develop plans to ensure that the Guatemalan agricultural sector adapts to climate variability and the impacts of climate change taking into account the scenarios and effects of increased global temperatures. They should prioritize actions that have a direct effect on food production, especially for self-consumption and subsistence in prioritized areas.

- (c) **Forest Resources, Ecosystems and Protected Areas.** The National Forestry Institute (INAB), the National Council of Protected Areas (CONAP), the National Forest Fire Prevention and Control System (SIPECIF) and MARN, as required, shall develop local, regional and national plans to prevent and combat forest fires, for efficient management of the units that are part of the Guatemalan System of Protected Areas (SIGAP), ecological corridors and forest ecosystems, to improve their resilience to climate variability and climate change and ensure preservation of ecological processes and natural goods and services.
- (d) **Infrastructure.** The Ministry of Communications, Infrastructure and Housing (MICIVI), other relevant public institutions and municipalities should adopt infrastructure design and construction standards that take into account climate variability and change considering the characteristics of the country's different regions.
- 121 The current challenge is the approval of the regulations needed to operationalize the National Climate Change Fund (FONCC), which would ensure that resources and State budget allocations are available to finance risk management, vulnerability reduction, mandatory adaptation and required mitigation plans, programs and projects.
- 122 Generally speaking, the adaptation actions that the project will propose have well-founded legal and regulatory backing that will contribute to meet the goals established by the same institutions by linking their Climate Change Directions and Units, and strengthening interagency relations.
- 123 Tables Table 14, Table 15 and Table 16 include an analysis of strengths and weaknesses of the main instruments linked to the project's actions:

Table 14. Strengths and weaknesses analysis of National Forestry Institute legal instruments linked to the project

Instrument	Strengths	Weaknesses
Law on Forest Incentives for Small Holders of Lands Suitable for forestry or agro-forestry (PINPEP) (Dec. 51-2010)	<p>It is part of State forestry policies (maintaining and increasing forest cover)</p> <p>Recognizes holders of small plots of land suitable for forestry and agro-forestry (includes different modalities)</p>	<p>Limited institutional capacity to respond to PINPEP users.</p> <p>The landholders must have financial resources to finance a forestry regent and a forest management plan. Scarce legal and technical State support.</p>
Law for Promotion of Establishment, Recovery, Restoration, Management, Production and Protection of Forests in Guatemala (PROBOSQUE) (Dec. 2-2015)	<p>Provides continuity to 18 years of PINFOR</p> <p>Experience and critical mass already established, with different modalities to be promoted.</p> <p>Identification of alternative financial sources</p> <p>Different spaces/fora for interagency dialogue.</p> <ul style="list-style-type: none"> • Forest consultation working groups • Firewood working group • Working group on control and prevention of illegal logging. • Working group on food and nutritional security. • Working group on restoration of the forest landscape. <p>During the time PROBOSQUE has been operating, most of the funds of this incentive program (as well as PINFOR funding) have not reached vulnerable small farmers. The reason is because this type of farmers cannot meet the requirements established by INAB, even though the National Forestry Service authorities have shown great interest in to include them as beneficiaries of the program (especially those working with agroforestry systems). Although this might seem a weakness, in this particular case this should be considered a strength, since project activities will ensure funds from this Government Program reach a group that otherwise would not be included as beneficiaries.</p> <p>Another aspect included in the project framework is that activities will ensure incentives to support climate change adaptation practices.</p> <p>Based on this information it can be said that PROBOSQUE (and PINPEP) funding meets the additionality criteria of GCF, because without the project, funds will not reach the vulnerable small farmers, and the funding will not be used for climate change adaptation purposes.</p>	<p>Lacks a structure for channeling financial resources.</p> <p>Exceeds institutional capacity for addressing growing demand for forest incentive projects.</p> <p>Scarce review and update of regulatory instruments for ongoing improvement of institutional services.</p> <p>Insufficient disclosure and promotion of access, operation, benefits and monitoring mechanisms.</p> <p>Poor access to information on weather conditions and early warning systems.</p>
National Strategy for the Restoration of the Forest Landscape, 2015-2045	<p>Inter-sector approach</p> <p>Working group on restoration of the forest landscape</p> <p>Provides discussion spaces, such as:</p> <p>Interagency coordination group</p> <p>Links with other national/international strategies: (a) Biodiversity; (b) Low-emission development; (c) REDD+ (under preparation)</p> <p>Coordination with MAGA:</p> <ul style="list-style-type: none"> • VISAN (Vice Ministry for Food and Nutritional Security) • Productive reconversion bureau • Bureau for natural resources and agro-tourism • PAFFEC • SNER 	<p>Lack of official baseline information that responds to the goals established for each pillar.</p> <p>Scarce information to the general public on the strategy, in terms of how to participate according to specific interests or sector activity.</p> <p>Incipient knowledge among the population on the notion of restoration of the forest landscape.</p> <p>Absence of communication channels between the central government and municipal, departmental and regional GCI delegations.</p>

Table 15. Analysis of the strengths and weaknesses of MARN legal instruments linked to the project

Instrument	Strengths	Weaknesses
(Decree 7-2013) Framework Law on Regulation of Vulnerability Reduction, Mandatory Adaptation to the Effects of Climate Change and Greenhouse Gas Mitigation (LMCC) (Decree 7-2013)	National reference for the United Nations Framework Convention on Climate Change (UNFCCC). Linkage with national policies and strategies. Inter-sector approach to address the impacts of climate change, reduction of vulnerability and improvement of adaptation capacities. Creation of the National Climate Change Council. Development of the PANCC.	Lacks structure for channeling national and international financial resources. Absence of official records for monitoring GHG emissions. Incipient knowledge of emission compensation mechanisms. Incipient development of tools for classifying spending on climate change (mitigation and adaptation actions). Little dissemination and promotion of social participation, monitoring, evaluation and auditing. Some of the regulations of the law have not been developed and approved.
National Plan of Action on Climate Change (PANCC)	Defines and organizes the main actions and guidelines resulting from the LMCC. Linkage with other national plans and policies. Guides the development of institutional strategic plans. Coordination with SEGEPLAN.	Absence of budgetary quantification with regard to losses, damages and sector investments. The link between MEM and MSPAS needs to be improved. Poor development of MARN's institutional capacities.

Table 16. Analysis of Strengths and Weaknesses of MAGA legal instruments related to the project

Instrument	Strengths	Weaknesses
PAFFEC (Family Agriculture Program for Strengthening Peasant Economy)	Linked to national policies: (a) Comprehensive rural development, assisting prioritized subjects*; (b) Food and nutritional security; (c) Climate change. Linked to INAB through PINPEP and PROBOSQUE.	Absence of a single register of beneficiary families. Social programs are still viewed from the standpoint of welfare and patronage.
2013-2030 Irrigation Policy	Recognizes the vital and strategic importance of access to irrigation for food and nutritional security and to boost small and medium farmers' agriculture.	Little participation in developing the process. Discussion and validation processes are absent. Institutional void due to the lack of a general water law or specific laws governing water use for agriculture.
National Rural Extension System (SNER)	Facilitates implementation of MAGA's institutional mandate and helps to boost farmer economy, considered as a priority subject* for the PNDR.	Insufficient staff and resources for Rural Learning and Development Centers (CADER) Unstable working conditions for extension agents/ rural promoters. Limited mobility in the territories; lack of inputs, materials and equipment. No articulation between extension agents and/or promoters from other government agencies. Deficient use of installed technical capacities.

Source: Author's analysis

9.2.2 The National Development Council System

- 124 Pursuant to the Law on Urban and Rural Development Councils (2002), the Development Council System is the main space for the Maya, Xinka, Garifuna and non-indigenous population to participate in public management to carry out the democratic development planning process, taking into account principles of national, multi-ethnic, multicultural and multilingual characteristics of the Guatemalan nation. Its purpose is to organize and coordinate public administration by formulating development policies, budgetary plans and programs and promoting interagency, public and private coordination.
- 125 The Development Council System is organized by several levels:
- (a) The national level, with the National Urban and Rural Development Council (CONADUR);
 - (b) The regional level, with Regional Urban and Rural Development Councils (COREDURs)
 - (c) The departmental level, with Departmental Development Councils (CODEDEs)
 - (d) The municipal level, with Municipal Development Councils (COMUDEs)
 - (e) The community level, with Community Development Councils (COCODEs)
- 126 The composition and functions of each of the levels are regulated by the Law. There are also special levels or types of Development councils. These are:
- **Second-Tier Community Development Councils** (Article 15). These councils are set up by the coordinating bodies of the COCODEs in municipalities that have more than 20 Community Development Councils.
 - **Indigenous Advisory Councils** (Article 23). These are set up at community level to advise the coordinating body of the Community Development Council and the Municipal Development Council where there is at least one indigenous community. They are created by authorities recognized by indigenous communities themselves according to their own principles, values, rules and procedures.
- 127 Development Councils may appoint any working committees they deem necessary, and the Regional, Departmental and Municipal levels have a technical unit that advises and follows up the implementation of policies, plans, programs and projects.
- 128 As for consultation with indigenous peoples, Article 26 of the Law stipulates that “Until a law governing consultation with indigenous peoples is enacted, the Maya, Xinka and Garifuna peoples should be consulted through their representatives on development councils on development measures promoted by the Executive Power that directly affect them”.

9.3 Other Initiatives and Projects linked to Climate Change in Guatemala

- 129 This section contains a summary of national initiatives and projects linked to climate change adaptation and variability, stressing the links between these and the RELIVE project in order to establish synergies to complement, strengthen and/or scale up project outcomes, or implement actions based on the outcomes and lessons learned from finalized projects.

130 More than fifteen projects that are currently or recently implemented are listed, which have a direct relationship with adaptation to climate change, on which the RELIVE project can build or create synergies. Table 17 explains the most relevant details.

A.1.Main Projects currently Implemented by FAO

131 FAO has a long track record in the design and management of projects related to its duties and mission, with a follow-up and evaluation system that makes it possible to state that its performance has been satisfactory in managing financial resources as well as in achieving the results proposed in each initiative. These tasks are performed in cooperation with local partners in implementation countries, including government institutions, national and international organizations and local organizations, according to the needs and requirements of actions to be implemented. Table 18 below contains a summary of projects implemented by FAO in recent years, which shows the experience in different places, objectives/topics and budget management.

Table 17. Initiatives or Projects Related to the RELIVE Project

No.	Initiative / Project	Description	Implementation Period	Amount US\$	Relationship with the RELIVE Project
1	NAP-Agriculture (Integrating Agriculture into National Adaptation Plans)	<ul style="list-style-type: none"> Strengthen matters related to irrigation, adaptation to climate change in the country's agricultural sector and strengthening institutional capacities by developing or updating policy and planning instruments at the national, sector and local levels, to assist the Ministry of Agriculture, Livestock and Food (MAGA). Beneficiaries: SNER extension agents and local farmers' associations in the project area. FAO coordinates, UNDP collaborates in the implementation, MAGA is a partner. Funding source: BMU¹⁸. 	Globally launched in 2015. Launched in Guatemala in 2018.	260,000	Both projects work on adaptation measures related to agriculture and water management and since both projects coincide in part of the geographical area (Zacapa and Chiquimula), coordinated and complementary actions that enhance the outcomes of both projects will be undertaken.
2	Adaptation to Climate Change in the Dry Corridor of Guatemala	<ul style="list-style-type: none"> Its objective is to improve productive systems and sustainable water, soil and forest management as a measure of adaptation to the negative effects of climate change in the communities of the dry corridor. Actions are aimed to reduce deforestation, introduce climate change strategies, increase basic grain yields through irrigation and women's participation in agricultural and forest production. Funding source: KFW. 	Beginning: 2016 End: 2022.	10.1 million	Themes (adaptation to climate change) and part of the geographic area (Baja Verapaz and Zacapa) in common and complementary approaches may lead to synergies in common territorial areas. Depending on time periods, the RELIVE project might be able to implement them based on results and lessons learned, especially with regard to component 1 and outcomes 1.2 and 1.3.
3	Debt Swaps for Adaptation to Climate Change	<ul style="list-style-type: none"> Its objective is to increase the resilience of communities and productive landscapes in the municipalities of Zacualpa, San Pedro Jocopilas, San Andrés Sajcabajá, Sacapulas, San Bartolomé Jocotenango and Canillá, in the department of Quiché. The specific objectives seek to provide access to water for households and for farming, soil protection practices, forest conservation in water recharge areas, improving productivity, market access and productive linkages. Funding source: KFW. 	6 years (dates not specified)	11.2 million	The same topics in adaptation: Access to water and improved productivity; different geographic area. The temporality may be the same, facilitating exchanges among project implementers/ technicians and beneficiaries (producers) to share experiences and lessons learned.
5	Project on Productive Landscapes Resilient to Climate Change and Strengthened Socioeconomic Networks in Guatemala	<ul style="list-style-type: none"> Objective: to increase the resilience to climate of productive landscapes and of socioeconomic systems in the target municipalities threatened by the impacts of climate change and variability, particularly increasingly frequent and intense hydrometeorological phenomena. Strengthen institutional and political capacity for planning, management of ecosystems for resilience, increase the capacity of community associations to reduce risks of socioeconomic and ecosystem losses, establishment of an information system. Geographic area: 12 municipalities, 7 in Sololá, 5 in Suchitepéquez. Funding source: Adaptation Fund. 	July 2015 – July 2019	5 million	The same topics are shared by the projects, although the geographic implementation areas are different. The RELIVE project may be implemented using the project's recommendations and lessons learned.

¹⁸Banco Alemán de Ambiente, Conservación de la Naturaleza y Seguridad Nuclear. German Bank for the Environment, Conservation of Nature and Nuclear Safety.

6	Rural Development and Climate Change Adaptation, Phase II, ADAPTATE II	<ul style="list-style-type: none"> • Its objective has been to help reduce the population's and ecosystems' vulnerability to climate change in the Dry Corridor through management of environmental goods and services. • It promoted the coordinated actions among authorities, community representatives and civil society in environmental management processes, municipal and community measures for managing natural resources, new technical solutions in value chains to improve resource use efficiency and increase resources. • Funding source: GIZ 	2016-2018 (now closing)	2.5 million	This Project was developed in the departments of Baja Verapaz and El Progreso. Some municipalities in Baja Verapaz are being considered in the RELIVE project; therefore, the geographic area and vulnerability reduction topics are the same, although each project follows a different approach. This is one of the projects that will serve as the basis for development the Koica project, which will be the counterpart of the RELIVE project, and thus offers recommendations and lessons learned for implementation.
7	Joint Comprehensive Cuilco River, San Marcos Rural Development Program	<ul style="list-style-type: none"> • The objective of this project is the strengthening of the integrated rural development in prioritized municipalities to reduce the inhabitants' health and community habitat vulnerabilities and enhance the population's and the territories' productive opportunities. • Financial source: Swedish government <ul style="list-style-type: none"> • Executing entities the United Nations Development Programme (PNUD) (leader), FAO and the World Health Organization (WHO). • Funding source: Swedish International Development Cooperation Agency – SIDA. 	2015-2018	4.5 million	This project, located in a different territorial area, is being closed. However, it conducted actions geared toward improving adaptation capacities with particular emphasis on food security and water management for household use and its outcomes and experiences might be useful for implementing the RELIVE project.
8	Ixil Rural Development Program	<ul style="list-style-type: none"> • Its outcomes focus on below-subsistence and subsistence families that were victims of the internal armed conflict, as well as community organizations able to improve their habitat conditions, development management, governance of renewable natural resources and entrepreneurial abilities. • Local governments and sector institutions in the Ixil region have developed capacities to achieve peaceful and inclusive governance processes that focus on rights and a culture of resilience. • Financial source: Swedish government • Executing entities PNUD (leader), FAO y OMS. • Funding source: Swedish International Development Cooperation Agency - Sida–. 	2015-2018	5.36 million	This project is also being closed. It is located in a different territorial area but it conducted actions geared toward improving adaptation capacities with particular emphasis on food security and water management for household use and its outcomes and experiences might be useful for implementing the RELIVE project.
9	Building Livelihood Resilience to Climate Change in the High Basins of the Guatemalan Highlands	<ul style="list-style-type: none"> • Its main objective is to reduce the impacts of climate change on the water cycle in selected water basins by scaling up ecosystem-based adaptation actions (EbAs). These actions will help improve water recharge and production and the population's and ecosystems' resilience to climate change. • The project will focus on three areas: (1) integrated and climatically intelligent basin management adapted to the local context of the Highlands; (2) financing for climate action in basins by the communities through the channeling of resources towards priority areas; and (3) climate information provided to farmers and other stakeholders. <ul style="list-style-type: none"> • Funding sources: Green Climate Fund and Koica. Implementing partner: The International Union for Conservation of Nature (IUCN). 	7 years; about to begin.	37.7 million (22 GCF, 4.6 KOICA, 11 Government of Guatemala)	It is related to the RELIVE project since it focuses on adaptation and basin management, although the approach and the area are different. The project in question focuses on restoration of the forest landscape as a means for ecosystem adaptation and improvement of vulnerable populations' means of subsistence in the action area. The RELIVE project focuses thematically on adaptation through resilient agriculture for food security for vulnerable populations and might be able to use some of the inputs generated by this project. Their implementation might coincide at some point, so the technical teams and producers who benefit from each project might

					be able to share experiences and lessons.
10	Climate, Nature and Communities in Guatemala (CNCG)	<ul style="list-style-type: none"> Its purpose is conservation of Guatemala's natural assets and support national efforts to reduce the negative effects of climate change and promote the sustainable development of communities that depend on forests. The project worked through five components; one focuses on climate change adaptation in the western region of the country using three strategies: (1) Greater access to climate information; (2) Improved organization or governance to address the issue; and (3) better agricultural practices. <ul style="list-style-type: none"> Funding sources: the United States Agency for International Development (USAID); a Rainforest Alliance-led consortium. 	2013-2018	25 million	Although this project's area of action is different, the RELIVE project can build on the Climate, Nature and Communities in Guatemala (CNCG) project's experience and lessons learned, since they established a climate change information system in the western region and worked on agricultural practices adapted to the climate.
11	Buena Milpa (Good Maize)	<ul style="list-style-type: none"> Its objective is to reduce poverty, food insecurity and malnutrition while improving the sustainability and resilience of systems based on maize cultivation, reducing environmental degradation and improving means of subsistence. It focuses on improving crops and provides soil management, seed selection and grain storage training. Financial sources: USAID, CIMMYT¹⁹ partner. Partners: MAGA and ICTA. 	2011-2019	3.63 million	This project has developed information, learning and best practices for improving maize growing capacity for adaptation through food security. This information and experiences may be used to implement the RELIVE project with regard to maize-related practices.
12	Más Frijol (More Beans)	<ul style="list-style-type: none"> Its objective has been to improve the nutrition of families in the Western Highlands of Guatemala by improving bean productivity using different practices and nutrition information. Financial source: USAID. Implemented by the University of Michigan with ICTA and the Health Ministry. 	2014-2019	3.55 million	As in the previous case, the experience and information from this project might be useful in implementing the RELIVE project with regard to bean growing.
13	Más Riego (More Irrigation)	<ul style="list-style-type: none"> Its overall objective is to improve nutrition and household income, as it expands the number of small owners' commercial enterprises that serve small farmers' families. It promotes drip irrigation and agricultural conservation practices, linking vegetable production and resilience to climate change by protecting water sources, harvesting rainwater and conserving soils. Financial source: USAID. 	2015-2019	3 million	As in the previous case, the experience and information from this project might be useful in implementing the RELIVE project with regard to water management.
14	Sustainable Economic Observatory	<ul style="list-style-type: none"> It will establish a sustainable economy observatory (research center/think tank) to strengthen the participation and contributions of civil society, the public and private sectors and other stakeholders in discussion, analysis, design and implementation of effective policies and programs and the national and local level. It focuses on rural development and food security, growth of the agricultural sector, the environment, including resilience to climate change, biodiversity, competitiveness and enabling environments for business. Financial source: USAID. Implemented by the Universidad del Valle (UVG). 	2016-2021	8.99 million	The information gathered by the Observatory might be utilized by the RELIVE project. There might also be synergies in joint development of information.

¹⁹ International Research Center for the Improvement of Maize and Wheat.

15	Feed Guatemala's Future. Project on innovative solutions for agricultural value chains.	<ul style="list-style-type: none"> The objective of this activity is to increase agricultural revenues, improve resilience and improve nutritional outcomes for small farmers and their families in five departments of the Western Highlands. Provide technical assistance to improved agricultural and post-harvest practices, improve productivity, promote adoption of climatically intelligent practices. Financial source: USAID. Implementing partner: Agropecuaria Popoyán, S.A. 	2017-2022	36.21 million	If there is coincidence in time, learning synergies and experience sharing between both projects might be possible. RELIVE might be able to use the experiences and lessons learned to implement its actions.
16	Feeding Guatemala's Future. Coffee Value Chain Project	<ul style="list-style-type: none"> The objective is to reduce poverty by increasing agricultural revenues and improving small farmers' and their families' resilience in the Western Highlands as nutritional outcomes improve. Financial source: USAID. 	2017-2022	19 million	Geographic areas are different, but topics are the same, since the RELIVE project considers that coffee is one of the crops where practices should be promoted as a means of adaptation. Therefore, if there is coincidence in time, learning synergies and experience sharing between both projects might be possible. RELIVE might be able to use the experiences and lessons learned to implement its actions.
17	Improving water quality in the Mam territory and institutional strengthening of MANCUERNA ²⁰ .	<ul style="list-style-type: none"> Helps prevent chronic malnutrition by proving safe water and basic sanitation services in MANCUERNA partner municipalities. Financial source: USAID. Implementing partner: MANCUERNA. 	2017-2020	3 million	Geographic areas are different, but water management topics for food security and climate change adaptation are the same. RELIVE might be able to learn from the experience and information gained by this project.
18	Recovery of the Natural Capital of the Dry Corridor and Climate Adaptation by its Population	<ul style="list-style-type: none"> The project's objective was to recover natural resources at the micro basin level to strengthen families', communities' and local governments' resilience and improve their capacities to produce nourishing foods during droughts. It was carried out in the municipalities of Jocotán, Camotán, Olopa and San Juan Ermita in Chiquimula. The actions implemented include forest protection and restoration with access to forest incentives, creation of seed banks, basin management, family vegetable gardens and poultry. . 	2013-2015	11 million	Geographic areas and topics are the same. Lessons learned from this project will be used in RELIVE components 1 and 2.

²⁰ Mancomunidad de la Cuenca del Río Naranjo. Naranjo River Basin Community.

Table 18. Projects Implemented by FAO

No.	Project Name	Start Date	End Date	Total Budget (US\$)
1	Immediate technical assistance to strengthen preparation for emergencies against highly pathogenic avian influence (HPAI) (regional activities)	01/10/2014	31/12/2019	17,276,801
2	Sustained humanitarian assistance to persons seriously affected by drought in rural areas of Somalia	01/01/2018	31/03/2019	13,250,000
3	Sustained cash assistance to prevent famine and respond to drought in rural areas of Somalia	01/04/2018	30/06/2019	45,000,000
4	Emergency Livelihood Response Program (ELRP) 2015-2016	17/11/2015	31/12/2018	20,174,701
5	Sustainable Agriculture for Economic Resilience project (SAFER) in South Sudan	04/08/2017	03/08/2020	37,807,562
6	Emergency Livelihood Response Program in South Sudan, 2018-2020	01/03/2018	31/12/2020	24,475,118
7	Emergency agricultural livelihood support to the most vulnerable households in Yemen	11/05/2018	30/04/2019	20,565,000
8	Restoring and promoting sustainable livelihoods based on agriculture for food security, employment and improved nutrition in the state of Borneo	01/02/2018	31/01/2021	13,867,621
9	Promoting value chains, Western Afghanistan	19/09/2017	19/09/2020	19,000,000
10	Information on nutrition, food security and resilience for decision making (INFORMADO)	01/05/2015	30/04/2019	22,123,894
11	Program of agencies headquartered in Rome to strengthen livelihood resilience in prolonged crisis situations	23/12/2016	31/12/2021	16,671,422
12	Control of trans border cattle diseases (foot-and-mouth disease and Peste des Petits Ruminants)	03/04/2017	30/04/2019	25,417,807
13	Famine prevention and response to drought in Somalia	16/01/2017	14/03/2018	14,841,672
14	Increasing vulnerable farmers' resilience in the south of Haiti by improving landscape management (R2R)	N/D	N/D	17,000,000
15	Forest resistance in Armenia, improving rural green growth and adaptation through mitigation	01/02/2019	01/03/2027	4,575,424
16	Public-social-private associations for climate-resistant agriculture	N/D	N/D	25,000,000
17	Increased climate resistance of rural households and communities through productive landscape restoration in selected localities in the Republic of Cuba (IRES-Cuba)	01/07/2019	01/07/2025	30,000,000
18	Carbon sequestration through climate inversion in forests and grasslands (CS- FOR)	01/12/2018	30/11/2026	29,985,011
19	Building a resistant Churia region in Nepal (BRCRN)	01/07/2019	30/06/2026	40,711,091
20	Transformation of the Indus River Basin with climate-resistant agriculture and climatically intelligent water management	01/10/2018	30/09/2024	49,881,329
21	Poverty, Reforestation, Energy and Climate Change Project – PROEZA Project	02/04/2018	31/08/2023	25,060,373
22	Climate-resilient fishery initiatives for improved livelihoods			15,310,000
23	Improved climate resilience measures in agricultural ecosystems of the dry corridor in El Salvador (RECLIMA)	01/01/2019	31/12/2023	38,717,581
24	REDD+ Results-Based Payments	N/D	N/D	60,000,000
25	Preservation and restoration of ecosystem services focusing on water safety for CC	N/D	N/D	50,000,000
26	Support for implementation of the NDC in the land and forest use sector.	N/D	N/D	90,000,000
27	Extending climate change adaptation in agriculture in the Philippines	N/D	N/D	48,500,000

No.	Project Name	Start Date	End Date	Total Budget (US\$)
28	Strengthening subsistence systems in communities in the main watershed of Zone 3	N/D	N/D	52,086,726
29	Improving climate resilience in steppes and dry forests of the Algerian Green Dam	N/D	N/D	43,000,000
30	Nexus water, energy and food focus to address the impacts of climate change in central Tunisia	N/D	N/D	28,000,000
31	Program for global eradication of Peste des Petits Ruminants (PPR-GEP)	N/D	N/D	50,000,000
32	Strengthening small farmers', ranchers', fishermen's and forest communities' resilience	N/D	N/D	30,000,000
33	Climate mitigation and adaptation program to increase ecosystems' and communities resilience	N/D	N/D	60,000,000
34	Ouéme climate resilience initiative	N/D	N/D	50,000,000
35	Public-private partnerships for climate-resistant agriculture	N/D	N/D	25,000,000
36	Increasing climate resilience of rural households and communities through productive landscape restoration in selected localities of the Republic of Cuba (IRES-Cuba)	01/07/2019	01/07/2025	30,000,000
37	Creating food system resilience in prolonged crises (FNS-REPRO)	N/D	N/D	27,303,750
38	Ensuring resistance to CC in Maya landscapes of Petén, the Verapaces and the Dry Corridor	N/D	N/D	30,000,000
39	Umbrella program: sustainable management of fall armyworm (FAW) in Africa	18/10/2017	31/10/2022	113,794,500

132 Table 19 shows projects implemented by FAO in Guatemala in close coordination with government agencies that will partner with the RELIVE project. It is worth stating that the relationship between FAO and INAB, MARN and MAGA dates back many years. It highlights the implementation of projects with the forestry service in the 70s and 80s even before INAB (Decree No. 101-96, Forestry Law, 1996) was established.

9.4 Status of Climate Information

133 Monitoring, analysis and evaluation of the effects of climate variability and change are extremely important issues in Guatemala, since the country's economy depends to a large extent on the natural capital and environmental services, where sensitive sectors to such climate variations and changes are found. These include agriculture, coastal resources, water resources, infrastructure and others. Therefore, evaluating and monitoring vulnerability and the adaptation to natural disasters, as well as the analysis of measures to mitigate and adapt to the effects of climate variability represent one of the main points for the development of political agendas.

134 In this regard, climate information was developed in Guatemala after the creation of the National Seismology, Volcanology, Meteorology and Hydrology Institute (INSIVUMEH) in 1976. This is the official agency that generates information on surveillance of the main systems associated with atmospheric, geophysical and hydrological sciences at the national

level; coordinates actions with the private sector and academia and acts as the government's technical advisor on natural disasters.

Table 19: Projects Implemented by FAO Earlier with Partners in this Project

No.	Project Name	Country Partner	Implementation Period	Budget (USD)
1	Organization of Forestry Cooperatives	INAB	1977-1978	61,000
2	Support to the Evaluation of Forest Resources in the East	INAB	1985-1986	74,960
3	Support to the Government in implementing the National Forestry Institute	INAB	1998-1999	245,500
4	Support to the National Forestry Program	INAB/MARN	2002-2015	36,610,273
5	Support the development of a regional cooperation strategy for the prevention, control and fight of forest fires	INAB	2004-2006	243,927
6	Support to the National REDD+ Action	MARN/INAB/MAGA	2011-2018	47,864,408
7	Promoting sustainable forest management in small forest producers: building on the Von Carlowitz legacy	INAB	2013-2016	1,193,377
8	Forest and Farm Facility	INAB-MAGA	2013-2018	15,380,008
9	Restoration of degraded lands	INAB	2014-2018	1,329,089
10	Implementation of the Forest Landscape Restoration Mechanism (FLR)	INAB	2014-2020	3,380,102
11	FAO Forest Law Enforcement, Governance and Trade Program-Phase III	INAB	2015-2018	14,905,508
12	FAO Forest Law Enforcement, Governance and Trade Program-Phase III	INAB	2016-2020	36,882,353
13	ATLAS project 00103787 - Baby 03	MARN-INAB-MAGA	2016-2020	9,707,099
14	FMM support to SO 3 - OO 301 (MTP 2014-2017) Strengthening forest and agricultural producers through Forestry and Agricultural Support	INAB-MAGA	2017-2018	758,853
15	Adaptation of rural communities to climate change and variability to improve their resilience and livelihoods in Guatemala	MARN	2018-2021	5,000,000

Source: In-house development with FAO information.

135 Later, the Framework Law for Regulating Vulnerability Reduction, Mandatory Adaptation to the Effects of Climate Change and Greenhouse Gas Mitigation (Decree 7-2013) created the National Climate Change Information System (SNICC) and placed it under the Ministry of the Environment and Natural Resources (MARN). In general, this Law establishes the mandates and guidelines for designing, developing and implementing policy tools on the matter and assigns powers that go beyond those of the Ministry of the Environment and Natural Resources to other governmental and non-governmental sectors; establishes the guiding principles and guidelines for public action on climate change (National Climate Change Plan of Action) (PANCC), 2016). It also stipulates that all public and private entities must provide information related to climate change, emissions and greenhouse gas emission reduction, climate change vulnerability and adaptation needed for the national communications that the country must provide.

136 INSIVUMEH has a network of meteorological and hydrological stations in different points of the country. However, according to the World Meteorological Organization (WMO) criteria, these are not enough (Alfaro & Gómez, 2019). Synergies have therefore been created with other government, private and civil society institutions that have their own climate monitoring stations to develop and model information. These include the National Coffee Association (ANACAFÉ), the Private Institute for Climate Change Research (ICC), the Authority for Sustainable Management of the Lake Amatitlán basin, several universities

and others. However, the country does not have the appropriate number of meteorological stations to address the problem of climate change.

- 137 Coordination platforms for developing and analyzing climate change-related information have been created in the country. These support decision-making and include the Interagency Climate Change Committee (CICC), the National Climate Change Council (CNCC), the Group on Forests, Biodiversity and Climate Change (GBByCC), Interagency Coordination Group (GCI), Interagency Forest and Land Use Monitoring Group (GIMBOT), National Climate Change Working Group (MNCC), Sector Coordinating Office on Environmental Statistics (OCSE-Ambiente), Guatemalan Environmental and Economic Accounting System (SCAEI), Guatemalan Climate Change Science System (SGCCC), etc. (Verweij & Winograd, 2018).
- 138 As part of the platforms for coordinating information generation and climate variability and change analysis, SGCCC is the agency in charge of reviewing and generating scientific information and sharing it with political decision makers with regard to the main components of climate change, which are: climate science, adaptation and vulnerability, GHG mitigation and inventories. It also supports interagency coordination and integration of scientific aspects into the operational framework of the National Climate Change Council. The SGCCC is made up of the Association for Social Research and Studies (ASIES), the Latin American School of Social Sciences (FLACSO), the National Seismology, Volcanology, Meteorology and Hydrology Institute (INSIVUMEH), the Private Institute for Climate Change Research (ICC), the Ministry of the Environment and Natural Resources (MARN), Universidad del Valle de Guatemala University (UVG), San Carlos University of Guatemala (USAC), Galileo University (UG), Mariano Gálvez University (UMG) and Rafael Landívar University (URL) (Guatemalan Climate System of Climate Change Sciences).
- 139 On the other hand, according to a diagnosis of the status of climate change information management in Guatemala (Bouroncle, Medellín & Winograd, 2018), there are more than fourteen systems in the country, including platforms and geoportals, for dissemination of climate change MRV information, managed by different institutions, with different objectives, backgrounds and responsibilities in informing, monitoring, verification and decision making. This has led to many uncoordinated initiatives and projects and a proliferation of these information systems, which might also lead to duplication of efforts and poor use of human, technological and financial resources. At the same time, many of these initiatives cease to be utilized at the short term, due to the high cost of maintaining them, the absence of financial and human capacities for updating them and changes in political and institutional priorities. Furthermore, none of these initiatives provides information in an appropriate language, format and time to small farmers to be able to react as speedily as climate change requires.
- 140 Given the number of initiatives in the country that develop and disseminate information, it is important that there is coordination among institutions and/or platforms, as well as interactions among them for better use of each of their capacities and functionalities, optimizing resources, avoiding duplication of efforts and providing greater added value to

all the initiatives and information developed. In view of these limitations, attention should be focused on the use of national financial resources, definition of roles to prevent duplications, improving the efficiency for the procurement, adoption and processing of information (including consultancies), sound use of local human resources such as technicians of Environmental Management Units (UGAs) and staff training based on the knowledge and experience generated by the institutions themselves (Bouroncle, Medellín & Winograd, 2018). As well as enhancing the existing initiatives to ensure that information exits the scientific sphere and reaches small farmers who need it in the field to support the resilience of their crops and livelihoods.

9.5 Applicable Environmental and Social Safeguard Policies

- 141 The project entitled “RELIVE – REsilient LIVELihoods of vulnerable smallholder farmers in the Mayan landscapes and the Dry Corridor of Guatemala” should be the object of an environmental and social assessment based on FAO and GCF environmental and social safeguards, which are described briefly below.

9.5.1 FAO Safeguards

- 142 FAO has a set of environmental and social environmental and social risk management safeguards in its strategies, policies and projects on the ground. These guidelines aid in identifying and early and systematically assessing environmental and social risks and their integration into the project cycle (design and implementation). FAO’s social and environmental standards are applicable in the following areas:

- ESS 1: Natural resource management
- ESS 2: Biodiversity, Ecosystems and Natural Habitats
- ESS 3: Plant genetic resources for food and agriculture
- ESS 4: Animal genetic resources for food and agriculture
- ESS 5: Pest and pesticide management
- ESS 6: Involuntary resettlement and displacement
- ESS 7: Decent work
- ESS 8: Gender equality
- ESS 9: Indigenous peoples and cultural heritage

9.5.2 GCF Safeguards (International Finance Corporation, IFC)

- 143 The GCF uses the International Finance Corporation (IFC) (part of the World Bank Group) performance standards. The list of standards appears below:
- Performance Standard 1: Environmental and social impact assessment and management
 - Performance Standard 2: Work and working conditions
 - Performance Standard 3: Efficiency in use of resources and pollution prevention

Performance Standard 4: Community health and safety

Performance Standard 5: Land acquisition and involuntary resettlement

Performance Standard 6: Conservation of biodiversity and sustainable management of live natural resources

Performance Standard 7: Indigenous peoples

Performance Standard 8: Cultural heritage

9.5.3 FAO Standards vs. IFC Performance Standards

144 Table 20 shows the relationship between the 9 FAO standards or norms and the IFC performance standards. Basically these two sets of standards complement each other and in many cases the guidelines are the same; in this regard, the FAO standards were used to guide the project social and environmental assessment.

Table 20. Comparison of FAO vs IFC Standards

FAO Standards	IFC (GCF) Performance Standards
ESS 1: Natural resource management	PS 1: Environmental and social impact assessment and management
ESS 2: Biodiversity, Ecosystems and Natural Habitats	PS 6: Conservation of biodiversity and sustainable management of natural resources
ESS 3: Plant genetic resources for food and agriculture	
ESS 4: Animal genetic resources for food and agriculture	
ESS 5: Pest and pesticide management	PS 3: Efficiency of resources and pollution prevention
ESS 6: Involuntary resettlement and displacement	PS 5: Acquisition of land and involuntary resettlement
ESS 7: Decent work	PS 2: Work and working conditions
	PS 4: Community health and safety
ESS 8: Gender equality	PS 1: Risk and environmental and social impact assessment and management (partially)
ESS 9: Indigenous peoples and cultural heritage	PS 7: Indigenous peoples
	PS 8: Cultural heritage

Source: Prepared in-house.

The standards triggered for the project are presented in Appendix 6.3.

9.6 Summary of Objectives and Principles for Implementation of the Gender Action Plan

145 To safeguard against issues of gender equality (ESS8) and to ensure mainstreaming of gender throughout the project design, a Gender Action Plan was prepared for the project. Specifically, the plan ensures adequate inclusion and promotion of women throughout the project's activities and helps in preventing missed opportunities.

146 The objective of the Gender Action Plan is to establish clear targets, in a time-bound framework, to ensure the inclusion of women in the project and operationalization of the GCF Gender Policy. The GCF Gender Policy is meant to ensure that the project adopts a gender-sensitive approach so that the GCF-funded project will efficiently contribute to

gender equality and achieve greater and more sustainable climate change results, outcomes and impacts.

- 147 The principles that govern the Gender Action Plan are in accordance with ESS8 – Gender Equality, as well as the GCF’s guidance on Gender Action Plans, vis-à-vis their Gender Policy.
- 148 The reduction of existing gender equity gaps is focused on a fair and equitable treatment of access to information and training, and a preferential access to productive resources and jobs generated by the project, from the recognition of the disadvantageous position in which there are women.
- 149 The Gender Analysis and Gender Action Plan for this project are provided as separate, stand-alone documents, submitted in complement to this ESMF (for further details see annex 8 of the Funding Proposal). FAO, as executing entity, would be responsible for implementation, compliance, and reporting as well as the Guatemala government.

9.7 Summary of the framework for Developing the Plan for Indigenous Peoples

- 150 To date the project has already consulted with the Indigenous Peoples using the appropriate procedures and through their representative institutions, and obtained their free, prior and informed consent (FPIC)²¹. Therefore, based on the list of participants at different consultations, a series of events for disseminating the assessed project impacts and measures identified to prevent or mitigate them were the most appropriate ones, or the study must otherwise be extended to include other potential impacts and measures, trying to ensure that they are culturally appropriate and gender and generationally inclusive solutions, providing assistance and opportunities to options favored by the communities involved.
- 151 The information gathered at dissemination events and complementary information obtained from the FPIC will be used to develop a plan of action that will describe the measures to be implemented to avoid or minimize negative impacts or improve positive impacts and how and when they will be implemented, as well as identifying and describing the measures that will be adopted to ensure continuation of natural resource management by the community.
- 152 This plan will also describe the complaint mechanism adapted to indigenous communities, as well as the monitoring and evaluation mechanism, which will identify those responsible for internal and external monitoring and evaluation, participation, if applicable, of the indigenous community and how the outcomes will be disseminated.
- 153 According with the GCF Operational Guidelines: Indigenous Peoples Policy (IPP22), the plan should at least include:

²¹ For further details see Annex 7 of the Funding proposal(Summary of Stakeholder Consultations and Participation Plan).

²² -Available at: <https://www.greenclimate.fund/document/operational-guidelines-indigenous-peoples-policy>

- a. The types of subprojects likely to be proposed for financing under the project;
- b. The potential positive and adverse impacts of such programmes or subprojects on indigenous peoples;
- c. A plan for carrying out the assessment for such programmes or subprojects;
- d. A framework for ensuring the meaningful consultation tailored to indigenous peoples and, in the specified circumstances, a framework for ensuring their FPIC;
- e. Institutional arrangements, including capacity-building where necessary, for screening project-supported activities, evaluating their effects on indigenous peoples, preparing IPPs and addressing any grievances;
- f. Monitoring and reporting arrangements, including mechanisms and benchmarks appropriate to the project;

10 STAKEHOLDER ENGAGEMENT

10.1 Stakeholder consultation and participation, including indigenous peoples

154 This information is shown in Annex 7 (Summary of the consultations and stakeholder participation plan) of the Funding proposal.

10.2 Disclosure

155 According to GCF and FAO policies on access to information, all safeguard instruments under this project, including the ESMF and Gender Action Plan must be disclosed online in the English and local language (Castilian Spanish, in the case of Guatemala) at least 30 days prior to GCF Board meeting and approval of the project. Access to the documents must be possible for any locals (i.e. it must be disclosed locally in an accessible place) in a form and language understandable to key stakeholders. Such disclosure of relevant project information helps stakeholders effectively participate. FAO is committed to disclosing information in a timely manner and in a way that is accessible and culturally appropriate, placing due attention to the specific needs of community groups which may be affected by project implementation (e.g. literacy, gender, differences in language or accessibility of technical information or connectivity).

156 For moderate risk projects like this one, FAO releases the applicable information as early as possible, and no later than 30 days prior to project approval. The 30 day period commences only when all relevant information requested from the project has been provided and is available to the public. FAO undertakes disclosure for all moderate risk projects, using a disclosure portal to publicly disclose all of the projects' documentation related to environmental and social safeguards (e.g. Environmental and Social Management Frameworks, Gender Action Plans, Indigenous Peoples Plans, and other relevant documents). The website is: <http://www.fao.org/environmental-social-standards/disclosure-portal/en/>.

- 157 In order to ensure the widest dissemination and disclosure of project information, including any details related to applicable environmental and social safeguards, local and accessible disclosure tools including audiovisual materials (e.g. flyers, brochures, community radio broadcasts) will be utilized in addition to the standard portal disclosure tool. Furthermore, particular attention will be paid to farmers, indigenous peoples, illiterate or technological illiterate people, people with hearing or visual disabilities, those with limited or no access to internet and other groups with special needs. The dissemination of information among these groups will be carried out with the project counterparts and relevant local actors.
- 158 In relation to each Category B sub-activity to be funded under the Project, FAO shall disclose fit-for-purpose environmental and social impact assessment, the Environmental and Social Management Plan (ESMP), Social Inclusion Management Plan, and as appropriate any other associated information required to be disclosed in accordance with the GCF Information Disclosure Policy (Project Disclosure Package). FAO shall disclose the sub-activity safeguards information at least 30 calendar days prior to commencing execution of any sub-activities that have been categorized as Category B, in English and in the local language (if not English), on its website and in locations convenient to affected peoples, and provide the Project Disclosure Package to the GCF Secretariat for further distribution to the Board and Active Observers and for posting on the GCF website. Within 180 days of the GCF Board approval of the Project, FAO and GCF Secretariat shall agree on a process to enable communication of any comments to FAO, including from the GCF Board members and Active Observers, on Category B subactivities relating to the Project Disclosure Package, and to take account of such comments in the finalization of such documents.

10.3 Complaint and Grievance Mechanism

- 159 The grievance redress mechanism (GRM) is an integral project management element that intends to seek feedback from beneficiaries and resolve complaints on project activities and performance. The mechanism is based on FAO requirements and most importantly, it is based on existing, community-specific grievance redress mechanisms preferred by the local beneficiaries.

10.3.1.1 FAO's Approach to the GRM:

- 160 FAO is committed to ensuring that its programs are implemented in accordance with the Organization's environmental and social obligations. In order to better achieve these goals, and to ensure that beneficiaries of FAO programs have access to an effective and timely mechanism to address their concerns about non-compliance with these obligations, the Organization, in order to supplement measures for receiving, reviewing and acting as appropriate on these concerns at the program management level, has entrusted the Office of the Inspector-General with the mandate to independently review the complaints that cannot be resolved at that level.

- 161 FAO will facilitate the resolution of concerns of beneficiaries of FAO programs regarding alleged or potential violations of FAO's social and environmental commitments. For this purpose, concerns may be communicated in accordance with the eligibility criteria of the Guidelines for Compliance Reviews Following Complaints Related to the Organization's Environmental and Social Standards²⁷, which applies to all FAO programs and projects (Guidelines for Compliance Reviews Following Complaints Related to the Organization's Environmental and Social Standards).
- 162 Concerns must be addressed at the closest appropriate level, i.e. at the project management/technical level, and if necessary at the Regional Office level. If a concern or grievance cannot be resolved through consultations and measures at the project management level, a complaint requesting a Compliance Review may be filed with the Office of the Inspector-General (OIG) in accordance with the Guidelines. Program and project managers will have the responsibility to address concerns brought to the attention of the focal point.
- 163 The principles to be followed during the complaint resolution process include impartiality, respect for human rights, including those pertaining to Indigenous peoples, compliance of national norms, coherence with the norms, equality, transparency, honesty, and mutual respect

10.3.1.2 Project-level grievance mechanism

- 164 The project will establish a grievance mechanism at field level to receive complaints. Contact information and information on the process to file a complaint will be disclosed in all meetings, workshops and other related events throughout the life of the project. In addition, it is expected that all awareness-raising material distributed will include the necessary information regarding the contacts and the process for filing grievances.
- 165 The project will also be responsible for documenting and reporting as part of the safeguards performance monitoring on any grievances received and how they were addressed.
- 166 The mechanism includes the following stages:
- The complainant files a complaint through one of the channels of the grievance mechanism. This will be sent to the National Operations Officer to assess whether the complaint is eligible. The confidentiality of the complaint must be preserved during the process.
 - The Project Team (PT) will address eligible complaints and the National Operations Officer will be responsible for recording the grievance and how it has been addressed if a resolution was agreed
 - If the situation is too complex, or the complainer does not accept the resolution, the complaint must be sent to a higher level, until a solution or acceptance is reached.

- For every complaint received, a written proof will be sent within ten (10) working days; afterwards, a resolution proposal will be made within thirty (30) working days.
- In compliance with the resolution, the person in charge of dealing with the complaint, may interact with the complainant, or may call for interviews and meetings, to better understand the reasons.
- All complaints received, their response and resolutions, must be duly registered.

10.3.1.3 Internal process

- 167 Project Team. The complaint could come in writing or orally to the Project Team directly or through the provincial focal points. At this level, received complaints will be registered, investigated and solved by the coordinator.
- 168 FAO Representative. If the complaint has not been solved and could not be solved by the Coordinator, then the assistance of the FAO Representative is requested.
- 169 FAO Regional Office for Latin American and the Caribbean. The FAO Representative will request, as necessary the advice of the Regional Office to resolve a grievance, or will transfer the resolution of the grievance entirely to the regional office, if the problem is highly complex.
- 170 The FAO Regional Representative will request only on very specific situations or complex problems the assistance on the FAO Inspector General who pursues its own procedures to solve the problem.

10.3.1.4 Resolution

- 171 Upon acceptance a solution by the complainer, a document with the agreement should be signed with the agreement.

Local Level	National Operations Officer – FAO Guatemala Territorial Operating Unit las Verapaces: to be designed Territorial Operating Unit Sur de Petén: to be designed Territorial Operating Unit Eastern Dry Corridor: to be designed
FAO representation	Must respond within 5 working days, in consultation with Project Team. Mr. Diego Recalde FAO-GT@fao.org , Diego.Recalde@fao.org
Regional FAO Office for Latin America and the Caribbean	Must respond within 5 working days in consultation with FAO's Representation.

	Mr. Julio Berdegue RLC-ADG@fao.org , Julio.Berdegue@fao.org
Office of the Inspector General (OIG)	To report possible fraud and bad behavior by fax, confidential: (+39) 06 570 55550 By e-mail: Investigations-hotline@fao.org By confidential hotline: (+ 39) 06 570 52333

11 EXPECTED PROJECT IMPACTS

11.1 Risk Classification

172 The assessment classified project risk as moderate (see appendix 6.3), although large-scale, significant or irreversible environmental impacts are not expected. The potential impacts identified are mainly impacts associated with activities that include community participation, especially of indigenous communities, on a purely voluntary and on-demand basis, which can be mitigated effectively and are addressed through the project's selection criteria and social and environmental plan of action.

11.2 Summary of the Project's Environmental and Sociocultural Impacts

11.2.1 Identification of the Project's Environmental and Sociocultural Impacts

173 The methodology for conducting this project social and environmental impact assessment was divided into several stages:

- Identifying social and environmental impacts using the Leopold matrix
- Assessing positive and negative impacts
- Developing the social and environmental plan of action

174 In accordance with this methodology, the environmental assessment started out by determining the activities contemplated in the project adaptation measures (chapter 2), along with characterizing the environment and environmental diagnosis in which it will be developed, as described in chapter 3. The most important and most frequent impacts that might potentially occur in the different stages of the project (setup and operation) were identified and rated based on this information.

175 The Leopold Matrix was used to identify environmental and sociocultural impacts. Its rows show the biophysical and sociocultural elements that might be affected during setup and operation of a project and the columns show the specific actions for its implementation (GTZ-IICA, 1996). The International Commission on Irrigation and Drainage (ICID) checklist was used to identify the biophysical and sociocultural elements that might be affected.

176 To develop the Leopold matrix, the first step was identifying the existing interactions, including all the activities contemplated in the five adaptation measures proposed for the project. Different environmental and social factors that might be significantly affected by

these activities were considered for each action. Each box contains two values resulting from crossing project activities with environmental and sociocultural factors.

- **Magnitude:** this is the first numerical data and represents the rating or intensity of the impact.
- **Importance:** this is the second numerical data and represents the relative weight of the potential impact; in other words it represents the relevance of the impact over the quality of the environment and the territorial area affected.

177 Both criteria are rated from 1 to 10, from low to high depending on the dimension of the impact itself, using a positive sign (+) for positive impacts and a (-) for negative impacts. Where a quadrant does not contain a value, it means that there is no relationship between the activities and environmental or social factors. The following table shows the rating guide used to rate intensity and importance criteria in this study.

Table 21. Guide for rating magnitude and importance criteria used in the Leopold Matrix

Magnitude			Importance		
Intensity	Effect	Rating	Duration	Influence	Rating
Low	Low	1	Temporary	Specific	1
	Medium	2	Medium		2
	High	3	Permanent		3
Medium	Low	4	Temporary	Local	4
	Medium	5	Medium		5
	High	6	Permanent		6
High	Low	7	Temporary	Regional	7
	Medium	8	Medium		8
	High	9	Permanent		9
Very High	High	10	Permanent	National	10

Source: Conesa, 2009.

178 As can be seen, magnitude and importance data are independent; however, the way each proposed action affects the analyzed environmental parameters may be visualized through negative and positive parameters for each column and row in the matrix. Finally, to obtain the value of the affected action or environmental element you simply multiply the value of the magnitude times the importance of each average obtained previously. The Leopold matrix for the project “RELIVE – RESilient LIVELihoods of vulnerable smallholder farmers in the Mayan landscapes and the Dry Corridor of Guatemala” is shown in Table 22.

179 Although environmental impacts are identified and rated qualitatively through the Leopold Matrix, an effort was made to minimize the natural subjectivity of this type of study by interpreting and analyzing the results. Therefore, once the Leopold Matrix was completed, the following step consisted of rating and interpreting the numbers used.

- 180 Environmental impacts appear through positive or negative alteration of the biotic, abiotic and social components of the environment. Table 23 shows the biophysical and sociocultural elements that will be positively impacted by project actions, stressing the benefits for indigenous peoples, improved agricultural productivity, influence on the microclimate and nutritional and food security elements. These elements are the result of proposed activity, especially the introduction of new, more productive crop varieties resilient to climate change, planting scattered trees in plantations or agroforestry systems and other agricultural and cultural practices (Table 24).
- 181 It is worth stressing that the impacts identified in the Leopold Matrix may be classified as low, moderate, high or very high based on the result of multiplying the average magnitude by the average importance of project activities and of biophysical and sociocultural elements. The elements can range from -100 to 100, depending on whether they are negative or positive; however, those elements with an absolute value from 1 to 25 can be classified as low; impacts that go from 26 to 50 as moderate, those between 51 and 80 as high, and those above 80 as very high impacts.

Table 22. Leopold Matrix Adapted to Project Activities

			ACTIVIDADES O ACCIONES QUE SE EJECUTAN EN LA OBRA CON INCIDENCIA AMBIENTAL																						
			ACTIVITIES OR ACTIONS IMPLEMENTED AT WORKS WITH ENVIRONMENTAL EFFECTS																						
		Introduction of new crop	Biological pest and disease	Application of chemical	Soil cover alteration	Agricultural work (reduced	Localized irrigation	Water harvesting systems	Water storage systems	Tree planting (dispersed and	Use of climate information	Managing stubble and not burning	Extension services	Infiltration ditch construction	Communal nurseries	Forestry management	Controlled burning	PVC water canal construction	Metal silo installation	Waste and garbage elimination	Hazardous material	Storage of waste materials	AVERAGE NEGATIVE IMPACTS	AVERAGE POSITIVE IMPACTS	
ENVIRONMENTAL ELEMENTS TO BE AFFECTED	Affect soil physical, chemical and mechanical characteristics	+8/8		-4/6	+4/8	+5/8	-2/2			+8/6		+6/8	+5/8	+2/5		+5/5	+5/5		-2/3				2,8/3,3	5,3/6,7	
	Affect surface water	+5/6			+5/6	+4/6	-2/2	-2/2	-2/2	+4/6		+4/6		-4/3	-1/2	+8/6		-2/2					2,4/2,4	4,4/6,0	
	Affect surface water quality		+4/2	-3/5			-2/2					+4/4			+2/5	-2/4			-2/2	-1/1		2,0/2,8	3,3/3,6		
	Affect air quality		+4/2	-3/4	+3/3					+8/8		+8/5					-3/3	-1/2		-4/5			2,8/3,5	5,8/4,5	
	Affect climate (micro, macro)	+6/8			+5/8		+5/6			+7/10		+5/5				+4/4	-4/2					4,0/2,0	5,3/6,8		
	Soil erosion	+4/2			+6/8	+2/10	-3/2	+2/5		+8/10		+6/10	+2/3	-1/3		+5/5	-2/2		-2/2	-2/4			2,0/2,6	4,6/7,0	
	Soil salinization			-1/3	+5/5		-2/4																1,5/3,5	5,0/5,0	
	Affect plant life	-2/4		-4/6	+6/8			+2/4		+6/10	+2/5	+4/8			6/8	+8/8	-4/3						3,3/4,3	4,9/7,3	
	Affect crops	+10/10	+5/8	+8/8	+6/8		+4/10	+2/10		+6/10	+4/6	+5/10	+2/6	+5/8		+2/2								4,9/8,0	
	Affect landscapes	+8/2		+4/5	+5/5		+2/2			+8/10	+2/4	+2/4			+4/2	+8/8	-1/1			-2/2			1,5/1,5	4,6/4,7	

			ACTIVIDADES O ACCIONES QUE SE EJECUTAN EN LA OBRA CON INCIDENCIA AMBIENTAL																						
			ACTIVITIES OR ACTIONS IMPLEMENTED AT WORKS WITH ENVIRONMENTAL EFFECTS																						
			Introduction of new crop	Biological pest and disease	Application of chemical	Soil cover alteration	Agricultural work (reduced)	Localized irrigation	Water harvesting systems	Water storage systems	Tree planting (dispersed and	Use of climate information	Managing stubble and not burning	Extension services	Infiltration ditch construction	Communal nurseries	Forestry management	Controlled burning	PVC water canal construction	Metal silo installation	Waste and garbage elimination	Hazardous material	Storage of waste materials	AVERAGE NEGATIVE IMPACTS	AVERAGE POSITIVE IMPACTS
	Affect beneficial insects			-2/6					+4/8						+8/5					-1/2			1,5/4	6,0/6,5	
	Modify ecosystems	+2/4			+5/5		+2/4			+8/8		+5/6			+4/6	+8/8		+2/2		-2/2	-2/2		2/2	4,9/5,4	
	Accumulation of waste or materials			-2/6																-4/5	-4/6	3,3/5,7			
	Affect protected areas and buffer zones			-2/2						-2/2						+4/5							2,0/2,0	4,0/5,0	
	Affect employment	+4/4	+2/4			-2/5				+3/4			+6/8	+2/6	+4/6	+5/5	+4/4	+2/2	+2/2				2,0/5,0	3,4/4,5	
	Affect health and safety		+2/4	-4/5					-2/1								-3/4			-2/4	-2/4	-2/4	2,4/3,6	2,0/4,0	
	Modify life patterns	+4/6								+5/4			+4/5		+4/6									4,3/5,3	
	Migration	+4/4								+2/5			+4/5		+4/6				+2/4					3,2/4,8	
	Nutritional security	+8/10								+5/8					+8/10				+2/4					5,4/7,6	
	Food security	+8/10						+2/2	+5/8			+4/5			+8/10				+4/8					5,0/7,0	
	Affect indigenous peoples	+8/8		-2/5				+4/5		+5/8					+8/10								2,0/5,0	6,3/8,5	

[illegible]

Table 23. Biophysical or sociocultural elements affected positively by the project

	Biophysical or sociocultural elements	Rating	Grade	How much affected
1	Affect indigenous peoples	6,3/8,5	53,55	Highly
2	Food security	5,4/7,6	41,00	Moderately
3	Affect crops	4,9/8,0	39,44	Moderately
4	Affect beneficial insects	6,0/6,5	39,00	Moderately
5	Affect microclimate	5,3/6,8	36,42	Moderately
6	Affect plant life	4,9/7,3	35,77	Moderately
7	Nutritional security	5,3/6,7	35,51	Moderately
8	Affect soil physical, chemical and mechanical characteristics	5,0/7,0	35,00	Moderately
9	Soil erosion	4,6/7,0	31,85	Moderately
10	Affect surface water	4,4/6,0	26,4	Moderately
11	Modify ecosystems	4,9/5,4	26,33	Moderately
12	Soil salinization	5,0/5,0	25,0	Scarcely
13	Affect air quality	5,8/4,5	22,88	Scarcely
14	Modify life patterns	4,3/5,3	22,79	Scarcely
15	Affect landscapes	4,6/4,7	21,47	Scarcely
16	Affect protected areas	4,0/5,0	20,0	Scarcely
17	Migration	3,2/4,8	16,32	Scarcely
18	Affect employment	3,4/4,5	15,30	Scarcely
19	Affect surface water quality	3,3/3,6	12,1	Scarcely
20	Affect health and safety	2,0/4,0	8,00	Scarcely

Table 24. Project activities that have potentially positive impacts

	Activities	Rating	Grade	How much affected
1	Introduction of new crop varieties	6,8/8,0	54,4	Highly
2	Planting trees (scattered and agroforestry systems)	5,8/7,5	43,52	Moderately
3	Application of chemical pesticides and fertilizers	5,3/7,0	37,1	Moderately
4	Soil cover alteration	5,0/7,2	36,0	Moderately
R5	Communal nurseries	5,2/6,9	35,88	Moderately
6	Metal silo installation	5,2/6,9	35,88	Moderately
7	Forestry management	5,9/5,8	34,22	Moderately
8	Managing stubble and not burning	4,9/6,4	31,36	Moderately
9	Agricultural work (reduced tillage)	3,7/8,0	29,6	Moderately
10	Extension services	4,3/5,8	24,94	Moderately
11	Localized irrigation	3,3/5,5	18,15	Scarcely
12	Use of climate information systems	3,3/4,7	15,51	Scarcely
13	Controlled burning	3,7/3,7	13,69	Scarcely
14	Biological pest and disease control	3,4/4,0	13,6	Scarcely
15	Water harvesting systems	2,0/6,3	12,60	Scarcely
16	Infiltration ditch construction	2,0/5,7	11,4	Scarcely
17	Water storage systems	2,0/2,0	4,00	Scarcely
18	PVC water canal construction	2,0/2,0	4,00	Scarcely

182 Some activities represent a risk of negative impacts on some biophysical or socioeconomic elements if the necessary precautions are not taken. Table 25 identifies the elements that might be impacted negatively by waste accumulation and those that might affect plants and soil physical, chemical and mechanical characteristics. The activities (Table 26) that

might have the worst negative impact include chemical pesticides and fertilizers and storage of materials and waste; however, negative impacts are mostly slight compared with positive impacts.

Table 25. Biophysical and social aspects negatively affected by the Project.

	Biophysical or sociocultural elements	Rating	Grade	How much affected
1	Accumulation of waste or materials	3,3/5,7	19,0	Scarcely
2	Affect plant life	3,3/4,3	14,19	Scarcely
3	Affect employment	2,0/5,0	10,0	Scarcely
4	Affect indigenous peoples	2,0/5,0	10,0	Scarcely
5	Affect air quality	2,8/3,5	9,62	Scarcely
6	Affect soil physical, chemical and mechanical characteristics	2,8/3,3	9,24	Scarcely
7	Affect health and safety	2,4/3,6	8,64	Scarcely
8	Affect the climate	4,0/2,0	8,00	Scarcely
9	Affect beneficial insects	1,5/4,0	6,00	Scarcely
10	Affect surface water	2,4/2,4	5,76	Scarcely
11	Affect surface water quality	2,0/2,8	5,60	Scarcely
12	Soil salinization	1,5/3,5	5,25	Scarcely
13	Soil erosion	2,0/2,6	5,20	Scarcely
14	Modify ecosystems	2,0/2,0	4,0	Scarcely
15	Affect natural protected areas and areas of influence	2,0/2,0	4,00	Scarcely
16	Affect landscapes	1,5/1,5	2,25	Scarcely

Table 26. Project activities with a negative potential impact.

	Activities	Rating	Grade	How much affected
1	Application of chemical pesticides and fertilizers	3,4/5,9	20,06	Scarcely
2	Storage of waste materials	3,0/5,0	15,00	Scarcely
5	Agricultural work (reduced tillage)	2,0/5,0	10,0	Scarcely
6	Introduction of new crop varieties	2,0/4,0	8,0	Scarcely
3	Infiltration ditch construction	2,5/3,0	7,5	Scarcely
4	Waste and garbage elimination	2,3/3,2	7,36	Scarcely
9	Controlled burning	2,2/2,7	5,94	Scarcely
10	Hazardous material management	2,0/2,8	5,60	Scarcely
8	Localized irrigation	2,2/2,4	5,28	Scarcely
7	Metal silo installation	2,0/2,5	5,0	Scarcely
11	Water harvesting systems	2,0/2,0	4,00	Scarcely
12	Water storage systems	2,0/2,0	4,00	Scarcely
13	Tree planting (scattered and agroforestry systems)	2,0/2,0	4,00	Scarcely
15	PVC water canal construction	1,5/2,0	3,00	Scarcely
16	Communal nurseries	1,0/2,0	2,00	Scarcely

11.2.2 Description of positive project impacts

183 Table 27 shows a detailed description of the positive impacts that will be generated by project activities. Bear in mind that the project contemplates the five following adaptation measures:

1. Basic grain (maize and bean) production based on drought-resistant and open pollination varieties, supported by using climate information in diversified systems (M1).
2. Increasing coffee growers' resilience by establishing or renewing agroforestry systems adapted to the climate conditions and risks projected for the region (M2).
3. Increasing cacao farm resilience by renewing/establishing agroforestry systems with system diversification and structure innovations and agronomical agroforestry management adapted to the climate conditions and risks projected for the region (M3).
4. Promoting and developing diversified family gardens adapted to the climate conditions and risks projected for the prioritized municipalities (M4).
5. Efficient water management for agricultural use to reduce the impact of increased water scarcity (M5).

Table 27. Description of positive project impacts

POSITIVE IMPACTS	JUSTIFICATION OF THE IMPACT OF EACH ADAPTATION MEASURE				
	M1	M2	M3	M4	M5
Climate change adaptation	Introducing climate change resilient, open pollination species with cultural management practices and scattered tree planting.	Using hybrid coffee varieties with high production, disease and climate variation tolerance characteristics will increase yields by up to 50% depending on the material.	Introducing good quality, productive cacao clones resistant to moniliasis and mazorca negra, along with using shade trees.	Sustainable diversification and intensification of vegetable garden production, including vines, roots and tubers, poultry and other minor species adaptable to climate changes also contributes to water conservation by using alternative water sources for agriculture and livestock.	Forest maintenance and promotion will generate ecosystem services that will favor community livelihoods and capital, allowing them to improve their resilience to climate change effects such as drought and aridity.
Increased production efficiency and yields per unit.	Increased basic grain yields.		Current yields are expected to triple at least.	Total production may be multiplied three to fivefold (300 to 500%) through more efficient use of the available garden space.	
Improved incomes and reduced production costs.	More income by increasing production. 25% reduction in the labor used for weed control and 20% of the labor used for applying fertilizers and herbicides. Future lumber sales. Using open pollination seeds reduces reliance on seed sellers and saves money.	More income by increasing production. Additional income by diversifying crops with products such as fruit, lumber or firewood.	More income by increasing production. Shade canopy species, including timber or fruit trees that provide tangible benefits for farmers' families.	Multiple crops used in family gardens attract fewer pests and hence fewer diseases than single crops, which reduces family garden production costs for agrochemicals and irrigation. Growing shorter cycle varieties helps increase incomes and reduce vulnerability to exceptional weather events.	Forest maintenance will increase water availability, which will in turn (indirectly) increase crop yields and economic activity diversification and hence family incomes.
Increased soil humidity and fertility	Stubble management (Kuxurum system) and planting scattered trees favors nutrient recycling.	Improving agroforestry coffee systems increases nutrient recycling.	Species to be promoted as permanent shade are classified as: fruit, nitrogen fixing or service and timber trees; they contribute fallen leaves and nutrients to the soil.	Herbaceous plant cover (fruit and timber species) protect the soil from erosion and water loss and favor nutrient recycling and nitrogen fixation.	Forests may reduce runoff, improve moisture infiltration and retention and incorporate organic matter into the soil.
Reducing soil erosion	Shade trees reduce wind velocity and surface runoff. Fallen leaves contribute organic matter that improves soil structure against erosion.				
Reducing surface runoff	Trees help regularize water flow and balance in the system. Through soil coverage, trees help reduce runoff and increase water infiltration and aquifer recharge.				
Rational water use for agriculture.	Planting drought-resistant species reduces the need for irrigation. Water harvesting systems provide alternative sources for times during productive cycles when good water supply is required.				
Reducing soil and water pollution.	Improving soil fertility by increasing nutrient recycling will reduce fertilizer use. Biological pest control along with agricultural extension services may reduce pesticide use and hence soil and water pollution. Improved pest control through knowledge of climate threats that favor their proliferation, leading to lower pesticide use.				

POSITIVE IMPACTS	JUSTIFICATION OF THE IMPACT OF EACH ADAPTATION MEASURE				
	M1	M2	M3	M4	M5
Greenhouse gas mitigation.	Scattered trees capture CO ₂ .	It has been estimated that close to 19.5 tons of carbon can be captured in Guatemala for each hectare of agroforestry coffee plantation, thus preventing 71.5 tons of CO ₂ emissions.	The total carbon is estimated at 117 ± 47 Mg ha ⁻¹ . Of this total 42% is in the soil and the remaining 58% in the shade canopy.	Reducing fertilizer use helps reduce nutrient accumulation in bodies of water and hence eutrophication that increase GHG emissions.	Forests are capable of capturing CO ₂ from the atmosphere and therefore reduce GHG concentrations and compensate other activities that generate these pollutants.
Less pressure on natural resources (forests).	Pruning tree branches for firewood without having to look for it in forests.	Shaded coffee trees contribute between 35 and 45% of the posts, firewood and timber families need.	Cacao trees contribute firewood families need.		Forest management will reduce the risk of forest fires, illegal logging and hunting.
Landscape restoration and improved biological connectivity.	Increased tree cover improves the agroecosystem and contributes to biological connectivity in productive landscapes.	A variety of shade species associated with cacao and coffee crops will improve landscape restoration and ecosystem services. Increased tree coverage in the plantation improves the agroecosystem and contributes to biological connectivity in productive landscapes.		Family vegetable gardens have been a sanctuary for agrobiodiversity.	This measure will contribute to biodiversity (plant and animal) conservation and the potential establishment of biological corridors, since it will also reduce the risk of changes in soil use.
Improves the provision of ecosystem services.				Water harvesting rehabilitates the landscape and maintains agricultural production during prolonged dry periods, in addition to helping mitigate flood events.	The supply of environmental services inside and outside the watershed (water for various uses; recreation, forest and agricultural services).
The adverse effects of climate change on ecosystems and biodiversity are expected to go down thanks to greater knowledge of climate threats.					
Improves the microclimate.	Introducing scattered trees may reduce temperatures and generate microclimates that are more resilient for other species. Shade trees generate a suitable microclimate for coffee and cacao plantations, where the average temperature may drop by 2 and 5°C.				
Improved nutritional levels and food security for the population.	Contributes fruit trees and stability to basic grain production.	Incorporating fruit trees into SAF improves the availability of varied foods throughout the year. Family incomes may increase significantly by marketing products and reducing the need for food purchases for self-consumption.		Important production system for ensuring the food and nutrition security (SAN) of the rural population, especially farmers belonging to below-subsistence and subsistence socioeconomic levels, because they grow vegetables, basic grains, fruit trees and medicinal plants, raise backyard poultry for family consumption and sometimes to improve family income.	Indirect yield improvement and diversification of activities and products will contribute to food security.
Gender relations.	Women and children no longer must go looking for firewood.	Women are empowered by deciding how much is used for family consumption and how much is sold.		Family gardens are meeting points for several generations of the same family, which contributes to their integration	

POSITIVE IMPACTS	JUSTIFICATION OF THE IMPACT OF EACH ADAPTATION MEASURE				
	M1	M2	M3	M4	M5
				and community relations to transmit theoretical and practical knowledge and for preservation of traditional knowledge and indigenous culture. It is inclusive, since men, women and young people participate actively, consolidating respect for different cultures and family traditions.	
Increased family resilience.	Post-harvest management practices.	Reduces family dependence on a single crop. Preserves livelihoods and reduces rural population migration. Manufacturing silos for storing seeds will allow beneficiaries to produce and store garden seeds, which provides fresh seeds for future, healthy crops adapted to the local climate.			

11.3 Rating negative impacts

184 The results of identifying project impacts show that it will have much greater social and environmental benefits than adverse impacts and that the latter will be moderate and low in magnitude, it is acknowledged, however, that such impacts may aggregate into much greater impacts if they are not considered since the project planning cycle and prevention and mitigation measures are not incorporated into them.

185 The negative social and environmental impacts generated by project activities were rated in accordance with the following criteria and grade scale (Table 28) to have a better idea of their magnitude:

Table 28. Criteria for rating environmental impacts

Criterion	Grade	Score
Type of impact: describes how the impact is produced (cause-effect relationship).	Direct: take place at the same time and place, are obvious and generally quantifiable.	6
	Indirect: secondary effects that may occur at other places or times.	3
Duration: refers to the behavior over time of the expected environmental impacts.	Permanent: if they culminate long-term.	6
	Medium: if they have medium-term duration.	3
	Short: if they are short-term and cease almost immediately.	1
Intensity: magnitude of the impact; represents its "amount and intensity" (Affected hectares? Number of species threatened? Volumes of pollutants, percentage, etc.?)	High	6
	Medium	3
	Low	1
Reversibility: possibility, difficulty or impossibility of returning to the situation prior to the action.	Irreversible	6
	Partial	3
	Reversible	1
Occurrence: likelihood that the impact actually occurs.	High	6
	Medium	3
	Low	1

186 A summarized description of each negative effect is shown below in a descriptive table:

Impact number: 1		Impact name: Exclusion of potential beneficiaries due to lack of title to land.		
Adaptation measure: All				
Type:	Duration:	Intensity:	Reversibility:	Likelihood:
Direct (x)	Permanent ()	High ()	Reversible ()	High ()
Indirect ()	Medium (X)	Medium ()	Partial (x)	Medium (x)
	Short ()	Low (X)	Irreversible ()	Low ()
6 points	3 points	1 point	3 point	3 points
Final grade: 16 points				
Brief explanation				
<p>Adaptation measures are intended for peasant farmers or families classified as: (i) below subsistence, mainly indigenous farmers living in extreme poverty, with little access to land, who take temporary jobs as a survival strategy, and (ii) subsistence, farmers who produce mainly for self-consumption with some contribution to the internal market, with little access to capital and basic services.</p> <p>Due to the investment level required for implementing some of the practices included in adaptation measures, project beneficiaries must show that they have title to the land; however, data show that 62% of basic grain producers own the land (CATIE, 2018) and the rest lease it. This might exclude a considerable percentage of the target population the project seeks to assist, which is the most vulnerable population to climate change.</p> <p>There might also be gender inequality if women are not considered as rights holders in all the activities developed by the project, bearing in mind that in Guatemala most basic grain growers' households are headed by men. As for the division of labor, men are responsible for preparing the land and planting, and women are more involved in harvest, post-harvest and food processing activities.</p> <p>Another cause might be lack of interest or motivation for small farmers to participate in the project.</p>				

Impact number: 2		Impact name: Inequity and exclusion of vulnerable populations (women, young people and indigenous communities)		
Adaptation measure: all				
Type:	Duration:	Intensity:	Reversibility:	Likelihood:
Direct ()	Permanent ()	High ()	Reversible ()	High ()
Indirect (x)	Medium (X)	Medium (x)	Partial (x)	Medium (x)
	Short ()	Low ()	Irreversible ()	Low ()
3 points	3 points	3 points	3 points	3 points
Final grade: 15 points				
Brief explanation				
There may be social impacts if there is inequality in project input and resource delivery, when the specific needs of women, men and the indigenous population are not considered.				
Possible gender discrimination that limits women’s and young people’s participation in the different training processes, such as proper pesticide management, post-harvest management, family gardens and others.				
Possible gender inequalities may arise if women and men are not given equal employment opportunities, for example for training programs, climate information interpretation and other project activities.				

Impact number: 3		Impact name: Risk of sanctions due to failure to comply with labor standards.		
Adaptation measure: all				
Type:	Duration:	Intensity:	Reversibility:	Likelihood:
Direct ()	Permanent ()	High ()	Reversible (x)	High ()
Indirect (x)	Medium ()	Medium ()	Partial (..)	Medium ()
	Short (x)	Low (x)	Irreversible ()	Low (x)
3 points	1 point	1 points	1 point	1 point
Final grade: 7 points				
Brief explanation				
There is a risk of sanctions against the project for hiring people from the communities without complying with labor laws.				
Risk of children under 18 working at farms or family gardens.				

Impact number: 4		Impact name: Short-term initial reduction of family income.		
Adaptation measure: all				
Type: Direct (x) Indirect ()	Duration: Permanent () Medium () Short (x)	Intensity: High () Medium () Low (x)	Reversibility: Reversible (x) Partial (..) Irreversible ()	Likelihood: High () Medium (x) Low ()
6 points	1 point	1 point	1 point	3 point
Final grade: 12 points				
Brief explanation				
The likely negative social effects of implementing the new agricultural practices by adopting new technologies, renewing coffee and cacao plantations and others might represent a short-term reduction (and therefore produce lower short-term income). However, at medium term, the impact will be reversed as new plantations start producing and producing greater yields.				

Impact number: 5		Impact name: Increased social vulnerability related to food security among families due to crop losses.		
Adaptation measure: all				
Type: Direct () Indirect (x)	Duration: Permanent () Medium (x) Short ()	Intensity: High () Medium (x) Low ()	Reversibility: Reversible (x) Partial (..) Irreversible ()	Likelihood: High () Medium (x) Low ()
3 points	3 points	3 points	1 point	3 points
Final grade: 13 points				
Brief explanation				
An incorrect interpretation of agroclimatic information would result in crop losses. Lack of access to cellular telephony would be an obstacle for obtaining precise agroclimatic information and selecting the basic grain varieties that are best suited for climate conditions.				
The lack of culturally appropriate technical assistance, in other words in the language of each indigenous people to meet the specific needs of indigenous peoples might be a limitation for proper implementation of the identified adaptation measures.				

Impact number: 6		Impact name: Soil and water pollution through improper use of fertilizers.		
Adaptation measure: All				
Type:	Duration:	Intensity:	Reversibility:	Likelihood:
Direct ()	Permanent ()	High ()	Reversible ()	High ()
Indirect (x)	Medium (x)	Medium (x)	Partial (..x.)	Medium (x)
	Short ()	Low ()	Irreversible ()	Low ()
3 points	3 points	3 points	3 point	3 points
Final grade: 15 points				
Brief explanation				
Although the project does not contemplate the use of large amounts of chemical fertilizers, but rather the use of organic fertilizers and other amendments, fertilizer application will be required in certain cases, such as cacao, which is not traditionally fertilized. This can pollute the soils and eventually water on the application method and field drainage water management.				
Soil and water pollution by increased manure from ranching activities.				

Impact number: 7		Impact name: Soil and water pollution due to improper use of pesticides.		
Adaptation measure: All				
Type:	Duration:	Intensity:	Reversibility:	Likelihood:
Direct ()	Permanent ()	High ()	Reversible ()	High ()
Indirect (x)	Medium (x)	Medium (x)	Partial (.x.)	Medium (x)
	Short ()	Low ()	Irreversible ()	Low ()
3 points	3 points	3 points	3 points	3 points
Final grade: 15 points				
Brief explanation				
Chemicals used for agricultural production might generate undesired effects on the physicochemical composition of the soil; and in the case of sloping lands, the slopes might favor their transportation to bodies of water through surface runoff.				
Water sources might be polluted if agrochemicals are used near rivers.				

Impact number: 8		Impact name: Soil and water pollution due to inadequate management of hazardous wastes and other wastes.		
Adaptation measure: All				
Type: Direct () Indirect (x)	Duration: Permanent () Medium (x) Short ()	Intensity: High () Medium (x) Low ()	Reversibility: Reversible () Partial (.x.) Irreversible ()	Likelihood: High () Medium (x) Low ()
3 points	3 points	3 points	3 points	3 points
Final grade: 15 points				
Brief explanation				
The use of agrochemicals (including fertilizers and pesticides) generates empty containers, many of which constitute hazardous waste. Poor waste management might pollute soils and water. Soil and water pollution due to improper disposal of bags and containers dumped into rivers.				
Impact number: 9		Impact name: Workers' and communities' health might be affected by improper management of agrochemicals and their waste.		
Adaptation measure: All				
Type: Direct () Indirect (x)	Duration: Permanent () Medium () Short (x)	Intensity: High () Medium () Low (x)	Reversibility: Reversible () Partial (.x.) Irreversible ()	Likelihood: High () Medium (x) Low ()

3 points	1 point	1 point	3 points	3 points
Final grade: 11				
Brief explanation Health risks for workers and neighboring communities due to intensive and improper use, storage and application of pesticides or other chemicals.				

Impact number: 10		Impact name: Protected areas and influence zones affected.		
Adaptation measure: All				
Type:	Duration:	Intensity:	Reversibility:	Likelihood:
Direct ()	Permanent ()	High ()	Reversible ()	High ()
Indirect (x)	Medium (x)	Medium ()	Partial (..x.)	Medium (x)
	Short ()	Low (x)	Irreversible ()	Low (x)
3 points	3 points	1 point	3 points	1 point
Final grade: 11 points				
Brief explanation				
Although activities are not planned within protected areas in the project region or its influence areas, the reality is that there are 40 protected areas that might be indirectly affected by project activities, such as pesticide use, effects on water flows and others.				
In addition, there are certain conflicts regarding land property regulation in protected areas. The project must therefore take special care when selecting beneficiaries.				

Impact number: 11		Impact name: Reduction of jobs due to reduced demand for labor for fertilization and pesticide application.		
Adaptation measure: all				
Type:	Duration:	Intensity:	Reversibility:	Likelihood:
Direct ()	Permanent ()	High ()	Reversible (x)	High ()
Indirect (x)	Medium ()	Medium ()	Partial (..)	Medium ()
	Short (x)	Low (1)	Irreversible ()	Low (x)
3 points	1 point	1 point	1 point	1 point
Final grade: 7 points				
Brief explanation				
Introducing varieties that are climate change resistant and less susceptible to certain diseases, as well as using certain agricultural practices results in reduced agrochemical use; however, this also entails reduced demand for labor for pest and disease control and people who engage exclusively in these activities might become temporarily unemployed. Fortunately, the project contemplates new activities where those who are affected may work.				

Impact number: 12		Impact name: Genetic erosion of open pollination seeds.		
Adaptation measure: M1				
Type:	Duration:	Intensity:	Reversibility:	Likelihood:
Direct ()	Permanent ()	High ()	Reversible ()	High ()
Indirect (x)	Medium (x)	Medium (x)	Partial (.x.)	Medium (x)
	Short ()	Low ()	Irreversible ()	Low ()
3 points	3 points	3 points	3 points	3 point
Final grade: 15 points				
Brief explanation				
The existence of areas near the project where commercial hybrids are used, especially of basic grains such as maize and beans, might result in undesired crosses, reducing open pollination hybrids’ adaptive capacity and hence reducing yields.				

Impact number: 13		Impact name: Environmental pollution by the discarded materials from the greenhouses built.		
Adaptation measure: M5				
Type:	Duration:	Intensity:	Reversibility:	Likelihood:
Direct ()	Permanent ()	High ()	Reversible ()	High ()
Indirect (x)	Medium (x)	Medium ()	Partial (.x.)	Medium ()
	Short (x)	Low (x)	Irreversible ()	Low (x)
3 point	1 point	1 point	3 points	1 point
Final grade: 9 points				
Brief explanation				
Greenhouses should receive regular maintenance. Therefore, management and final disposal of discarded materials such as plastics used as covers and other installations, as well as the treatment of hoses, substrate containers and other facilities and tutoring material at the end of their useful life should be considered.				

Impact number: 14		Impact name: Proliferation of pests and diseases due to poor water storage conditions.		
Adaptation measure: M5				
Type:	Duration:	Intensity:	Reversibility:	Likelihood:
Direct ()	Permanent ()	High ()	Reversible (x)	High ()
Indirect (x)	Medium ()	Medium ()	Partial (..)	Medium (x)
	Short (x)	Low (x)	Irreversible ()	Low ()
3 points	1 point	1 point	1 point	3 points
Final grade: 9 points				
Brief explanation				
Small water storage structures may have potentially adverse socio-environmental impacts, by triggering disease outbreaks due to the proliferation of insect larvae that transmit diseases such as dengue chikungunya, among others.				
Pollution due to fecal coliforms and small dead animals trapped in storage facilities may occur.				

Impact number: 15		Impact name: Seed losses due to poor storage conditions in silos.		
Adaptation measure: M1				
Type:	Duration:	Intensity:	Reversibility:	Likelihood:
Direct ()	Permanent ()	High ()	Reversible (x)	High ()
Indirect (x)	Medium (x)	Medium ()	Partial (..)	Medium (x)
	Short ()	Low (x)	Irreversible ()	Low ()
3 points	3 points	1 point	1 point	3 points
Final grade: 11 points				
Brief explanation				
Lack of silo maintenance and lack of quality control of seeds to be stored in them may result in infestation of complete seed lots by pests such as beetles or weevils, proliferation of fungi or loss of seed viability. Factors such as excessive humidity or extreme temperatures may damage seeds stored in the silos.				

Impact number: 16		Impact name: Loss of income due to variations in coffee and cacao prices and their production costs.		
Adaptation measure: M2 y M3				
Type: Direct () Indirect (x)	Duration: Permanent () Medium (x) Short ()	Intensity: High () Medium (x) Low ()	Reversibility: Reversible () Partial (.x.) Irreversible ()	Likelihood: High () Medium (x) Low ()
3 points	3 points	3 points	3 points	3 points
Final grade: 15 points				
Brief explanation Coffee and cacao are commodities or agricultural products that depend in no small measure on prices that are fixed at the international level. A drop in the prices of these two products might have negative consequences for growers' economy and raise the prices of inputs used in productive processes.				

Impact number: 17		Impact name: Ecosystem services are affected by poor agricultural planning and production.		
Adaptation measure: all				
Type: Direct () Indirect (x)	Duration: Permanent () Medium (x) Short ()	Intensity: High () Medium () Low (x)	Reversibility: Reversible (x) Partial (..) Irreversible ()	Likelihood: High () Medium () Low (x)
3 points	3 points	1 point	1 point	1 point
Final grade: 9 points				
Brief explanation				
Poor agricultural planning and production may impact ecosystems or the services they provide. The vegetation might be affected by agrochemical use and landscape changes. The environment might be affected by cleaning, soil preparation, planting, pruning, thinning and harvesting of forest and non-forest products.				

Impact number: 18		Impact name: Loss of crops and planted trees by fires during the summer.		
Adaptation measure: all				
Type: Direct () Indirect (x)	Duration: Permanent () Medium () Short (x)	Intensity: High () Medium (x) Low ()	Reversibility: Reversible (x) Partial (..) Irreversible ()	Likelihood: High () Medium (x) Low ()
3 points	1 point	3 points	1 point	3 points
Final grade: 11 points				
Brief explanation Fires are one of the greatest hazards for stability and conservation of agricultural and agroforestry systems, especially in the dry corridor of Guatemala and with greater incidence of the effects of climate change.				

Impact number: 19		Impact name: Risk of waterborne diseases due to rooftop rainwater harvesting systems.		
Adaptation measure: all				
Type: Direct () Indirect (x)	Duration: Permanent () Medium () Short (x)	Intensity: High () Medium (x) Low ()	Reversibility: Reversible (x) Partial (..) Irreversible ()	Likelihood: High () Medium (x) Low ()
3 points	1 point	3 points	1 point	3 points
Final grade: 11 points				
Brief explanation If no mitigation measures are taken, the water storage tanks can become in a reservoir for mosquitoes spreading. In the region, mosquitoes are vectors for diseases such as Dengue, Malaria, or Chikungunya.				

- 187 Based on the above score and grade, the impacts graded with 30 to 40 points are classified as high impact; those with 23 to 15 points are moderate and impacts with 14 to 7 points are classified as low-impact. The Table 29 shows that the project will not have high impacts; some will be moderate, and most are classified as low.
- 188 The most significant impact has to do with the likelihood of exclusion from the project of potential beneficiaries due to lack of title to the land; associated with this impact there is also a moderate risk of inequity among vulnerable populations, not so much due to land title issues, but due to failure to consider the gender-based approach and relations with indigenous peoples. This also compromises achievement of the overall project goal, which is improving the livelihoods of small farmers vulnerable to climate; however, a good design of the methodology for selecting persons and families that will benefit from the project might solve these problems.

Table 29. Classification of negative project impacts

Impact name	Rating final	Classification
Exclusion of potential beneficiaries due to lack of title to land.	16 points	Moderate impacts
Inequity and exclusion of vulnerable populations (women, young people and indigenous communities)	15 points	
Genetic erosion of open pollination seeds.	15 points	
Soil and water pollution due to improper fertilizer use.	15 points	
Soil and water pollution due to improper use of pesticides.	15 points	
Soil and water pollution due to production and improper management of hazardous and other waste.	15 points	
Short-term reduction of crop yields and lower income for beneficiaries.	14 points	Low impacts
Increased social vulnerability related to food security among families due to crop losses	13 points	
Initial, short-term reduction of family incomes	12 points	
Workers' and communities' health is affected by improper management of agrochemicals and their waste.	11points	
Protected areas and influence zones affected.	11 points	
Loss of crops and planted trees by fire during the summer.	11 points	
Loss of seeds due to poor storage conditions in silos.	11 points	
Environmental pollution y discarded materials at greenhouses that are built	9 points	
Proliferation of pests and diseases due to poor water storage conditions.	9 points	
Ecosystem services affected by poor agricultural planning and production.	9 points	
Job losses due to reduced demand for labor for fertilizer and pesticide application.	7 points	
Risk of sanctions due to failure to comply with labor laws.	7 points	

189 Other moderate impacts that should be addressed are that incomes might be affected, and family vulnerability might increase due to reduced crop yields or variations in product prices, mainly of coffee and cacao. The occurrence of impacts due to possible soil and water pollution caused by agrochemicals and waste products.

190 This environmental assessment was the tool used to determine the actions or measures to be implemented in the social and environmental plan of action of the project introduced in the following chapter.

12 MITIGATION MEASURES & APPROACH TO ENHANCE POSITIVE IMPACTS

191 This section describes the preventive, control or mitigation and/or corrective measures of each of the impacts identified.

12.1 Determining preventive, control or mitigation and/or corrective measures of each of the impacts identified.

192 The different prevention or mitigation measures based on the assessed social and environmental impacts are described below.

Impact number: 1	Impact name: Exclusion of possible beneficiaries due to lack of title to the land.
Prevention or mitigation measures <ul style="list-style-type: none"> Review the legal land tenure framework to identify gaps for promoting sustainable agricultural practices and climate change adaptation. Establish a working group on land tenure to recommend tenure solutions for sustainable agricultural practices and climate change adaptation. With the approval of the Project Coordinating Committee, conduct community assemblies to define project beneficiaries and when people do not have land tenure, request the approval of the assembly for granting the benefit based on its knowledge of the possible beneficiary. It may also seek support from the Land Fund and local growers' associations and NGOs working on regularization and inclusion issues. The community organization should also ensure women's participation when they own the land or are heads of households. The project should consider women as rights holders, ensuring their inclusion and access to all project resources. 	
Period or frequency for implementation of the measures	At the beginning of the project.

Impact number: 2	Impact name: Inequity and exclusion of vulnerable populations (women, young people and indigenous communities)
Prevention or mitigation measures <ul style="list-style-type: none"> Through and gender-sensitive project consultations to understand farmers' interests and challenges, associative processes should be strengthened, and women's young people's and indigenous populations' leadership should be promoted to ensure quality representation in project activities. Community assemblies should be convened to define prioritized adaptation measures by farmers and the tree species that will be used in the communities, which should meet the specific needs of women, men and indigenous populations. The participation of women and young people should be ensured in all educational and capacity building processes. Associative processes should be strengthened, and women's, young people's and indigenous peoples' leadership should be promoted to ensure quality representation in project activities. Generating opportunities for hiring women, young and indigenous people should be established as a project standard. Community organization for distributing project inputs and materials must ensure women's participation and access to these resources. The Project Implementation Unit must establish a mechanism for participative monitoring, input delivery and assessment, with the active participation of women's organizations. 	
Period or frequency for implementation of the measures	At the beginning of the project and ongoing monitoring throughout the life of the project

Impact number: 3	Impact name: Risks due to failure to observe labor laws.
Prevention or mitigation measures <ul style="list-style-type: none"> • The Project Implementing Unit and other implementing partners are not allowed to hire any person without social security or supplementary legal benefit. • All the personnel hired will respect labor laws, work schedules and just wages that offer equal opportunities for women and men, especially equal pay for equal work. • As part of the project training program, rules related to labor legislation, the national policy on women and rules for eliminating discrimination and violence against women should be disclosed. • The use of child labor in project activities should be avoided; however, it should be handled with great care, since it is a custom deeply rooted in peoples' traditions and is important labor in below-subsistence families. • Child labor should be monitored in each project implementation area and when it takes place, a socioeconomic analysis of its causes should be conducted. • Child protection laws should be disclosed to prevent the use of child labor in project activities. • The Project Implementing Unit should have a surveillance and control mechanism to prevent children under 18 from working and not attending school. 	
Period or frequency for implementation of the measures	Whenever it is necessary to hire people, directly or indirectly, for the project.

Impact number: 4	Impact name: Initial short-term reduction of family income.
Prevention or mitigation measures <ul style="list-style-type: none"> • Training on good agricultural production and forest management practices through different teaching strategies such as field trips, demonstration parcels, field schools and others. • Timely and appropriate technical assistance for small farmers. 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

Impact number: 5	Impact name: Increased social vulnerability related to food security among families due to crop losses.
Prevention or mitigation measures <ul style="list-style-type: none"> • The project should have a technical capacity building program focusing on appropriate management of agroclimatic information that includes broad participation of vulnerable populations, especially indigenous communities in their native languages. • Encourage diversity of the crops and practices contemplated in each of the adaptation measures, since this reduces the risk of affecting the incomes of families that depend on a single agricultural or livestock item. • Create synergies with the academic sector and SESAN to monitor the food and nutrition security indices of families benefiting from the project. • Timely dissemination of information and ongoing training for project users. 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

Impact number: 6	Impact name: Soil and water pollution through improper use of fertilizers.
Prevention or mitigation measures <ul style="list-style-type: none"> • Localized application of fertilizers to the soil is recommended to mitigate soil and water pollution. • Combining synthetic fertilization with applications of organic fertilizer, incorporating readily accessible materials for farmers, such as poultry manure, manure or compost. • Controlling water supply for irrigation as applicable. • Promoting the use of more environmentally-friendly fertilizers such as Bayfolan suelo azul or YaraMila Hydran and micronutrient mixtures (ulexite + zinc sulfate + copper sulfate + manganese sulfate). • Fertilizer dosage and frequency should be in accordance with plant phenology and parcel soil analysis and follow FAO best practices. • The fertilizer application schedule will also be designed in accordance with weather forecasts for the area, to take better advantage of their efficiency. • Give training to the extension agents on the use of chemical and organic fertilizers, who will later train the group of local promoters and hundreds of beneficiary families. 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

Impact number: 7	Impact name: Soil and water pollution through improper pesticide use.
Prevention or mitigation measures <ul style="list-style-type: none"> • The project training and technical assistance program must promote comprehensive pest management and proper pesticide use. • The project implementing unit must select the most appropriate pesticides, excluding those on the list of forbidden products of the Stockholm Convention on Persistent Organic Pollutants (POCs) and in the framework of the FAO International Code of Conduct for pesticide management. • The use and application of pesticides at the various production units should be monitored and forbidden products should be seized. • The best practices for agrochemical use, storage and application should be implemented. • Creating awareness and a training program on proper pesticide use and management in accordance with legal provisions. • Promoting triple washing and best practices for chemical application and storage and container handling. 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

Impact number: 8	Impact name: Soil and water pollution through generation and improper handling of hazardous and other waste.
Prevention or mitigation measures <ul style="list-style-type: none"> • Creating awareness and a training program on proper handling of empty agrochemical containers in accordance with the law. • Using best practices for agrochemical container handling such as triple washing, container destruction, storage and disposal. • Container collection agreements should be entered into with the companies that sell such products. • Monitoring handling of pesticide containers and other waste products at the different production units. 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

Impact number: 9	Impact name: Workers' and communities' health is affected by improper handling of agrochemicals and their waste.
Prevention or mitigation measures <ul style="list-style-type: none"> • Providing training on the use of appropriate equipment and clothing for safe pesticide use. • Agrochemicals should be applied using the available climate information, avoiding strong winds that scatter the pollutants in the air and allow them to reach neighboring populations. • Selecting appropriate pesticides, excluding those on the list of forbidden products of the Stockholm Convention on Persistent Organic Pollutants (POCs) and in the framework of the FAO International Code of Conduct for pesticide management. • The project must promote the application of organic products and the MIP. • Using the best practices for agrochemical use, storage and application. • Creating awareness and a training program on proper pesticide use and management in accordance with legal provisions. • Creating awareness and a training program on proper pesticide container handling in accordance with legal provisions. • Promoting triple washing and clothing for farmers for chemical application and storage and container handling. 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

Impact number: 10	Impact name: Protected Natural Areas and Buffer Zones Affected.
Prevention or mitigation measures <ul style="list-style-type: none"> • When consultation processes take place, the Project Implementing Unit must identify farms in or near protected areas and exclude them from the project. • The Project Implementing Unit shall consider declared protected areas and their management plans when implementing the measures. • When a protected area is nearby, the use of non-native tree species and basic grain planting practices should be avoided. • The Project Technical Committee shall be in constant communication with CONAP to monitor the protected areas closest to project implementation areas. • Measures implemented near protected areas should improve the livelihoods of populations in buffer zones and water catchment areas to prevent natural resource depredation. 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

Impact number: 11	Impact name: Job loss due to reduced demand for labor for fertilizer and pesticide application.
Prevention or mitigation measures <ul style="list-style-type: none"> • The Project Implementing Unit shall encourage people who work on pest and disease control to engage in other activities such as tree planting and maintenance, family garden maintenance or even training activities. • Diversifying agricultural production will allow greater inclusion of family members in different productive activities. 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

Impact number: 12	Impact name: Genetic erosion of open pollination seeds.
Prevention or mitigation measures <ul style="list-style-type: none"> • The Project Implementing Unit and the Project Technical Committee must ensure that local seed producers' associations, preferably those made up of indigenous people, participate in the project for them to implement best open pollination seed collection and conservation practices. • Planting seed crops a good distance from other varieties and crops of the same family should be promoted at field level and through training processes to ensure seed purity. • For crops that are easily crossed, such as maize, growing only one variety every season is recommended; and that variety should preferably be located 600 meters away from other maize varieties. • Storing seeds from at least five plants and preferably more (in the case of maize at least 50 plants are needed). • Over time, seeds stored systematically will be better acclimated to local conditions and genetically better adapted to the area; this is a benefit of storing seeds carefully. • The Project Implementing Unit, associated with partner institutions, should monitor growing fields and seed storage sites to ensure their purity. 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

Impact number: 13	Impact name: Environmental pollution by discarded materials at greenhouses that are built.
Prevention or mitigation measures <ul style="list-style-type: none"> • Beneficiaries should receive training on proper greenhouse and waste material management before delivering the necessary greenhouses and equipment to prevent them from being burned or improperly disposed of. • These measures should go hand in hand with constant monitoring of the status of the greenhouses and management of the waste they produce. 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

Impact number: 14	Impact name: Proliferation of pests and diseases due to poor water storage conditions.
Prevention or mitigation measures <ul style="list-style-type: none"> • The Project Implementing Unit must ensure that storage tanks are installed far from septic tanks and animal facilities. • When plastic or cement tanks are used, ensure that they are kept closed. • Avoid drinking untreated water. Boil it first if it is for human consumption. • In places where water storage systems are important, local water boards can be trained in building, operating and maintaining such systems. The benefits of these schemes will provide effective management incentives. 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

Impact number: 15	Impact name: Seed losses due to poor storage conditions in silos.
Prevention or mitigation measures <ul style="list-style-type: none"> Inspecting silos periodically, at least once a month, to determine the temperature, humidity and whether they have been affected by a pest or disease. Inspecting and selecting grains is a key step in ensuring safe storage. Proper grain conservation in the silo depends on it. Cleaning the silos to remove bacteriological agents harmful to health that may be present, such as animal excrement, dead animal remains and others. Training local seed producers' associations in plant health management of seed production and storage. 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

Impact number: 16	Impact name: Loss of income due to variations of coffee and cacao prices and their production costs.
Prevention or mitigation measures <ul style="list-style-type: none"> The Project Implementing Unit must promote and strengthen coffee and cacao value chains to try to ensure stable markets for selling these products independently from price variations that may exist. Diversification strategies or farm adaptation measures proposed by the project will give farmers greater resilience against coffee and cacao price and cost fluctuations, since they will not have to depend on a single product. 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

Impact number: 17	Impact name: Ecosystem services affected by poor agricultural planning and production.
Prevention or mitigation measures <ul style="list-style-type: none"> The Project Implementing Unit must ensure that environmental criteria are used when formulating farm plans. The Project Implementing Unit, jointly with farmers, must ensure the maintenance and survival of planted tree species for a given period. Timely and appropriate training on good forest management practices and technical assistance should be provided to project beneficiaries. 14 climate risk-informed water management plans at micro-basin level" will be prepared 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

Impact number: 18	Impact name: Loss of crops and planted trees to fires during the summer.
Prevention or mitigation measures <ul style="list-style-type: none"> Developing fire prevention plans with community participation, since they will be the main landscape management actors and directly affected by fires that threaten their livelihoods. They may also be implicated in some of the causes of fires. Training and counseling farmers to control the accumulation of combustible vegetation exposed to high temperatures such as firewood, the product of pruning, agricultural waste and flammable materials such as paper paint, oils, lubricants and/or fuels. Whenever possible, keeping fences, firewalls and facilities vegetation-free. 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

Impact number: 19	Impact name: Risk of waterborne diseases due to rooftop rainwater harvesting systems.
Prevention or mitigation measures <ul style="list-style-type: none"> Use cement or plastic caps to prevent mosquitoes from laying their eggs in the water. 	
Period or frequency for implementation of the measures	Continuous during the entire life of the project.

12.2 Budget

Costs of the implementation of preventive, control or mitigation and/or corrective measures of each of the impacts identified are included as part of the implementation activities of the project. Therefore they are part of the overall project costs presented in Annex 4 (Budget) of the Funding Proposal.

Table 30 presents the costs of implementing preventive, control or mitigation and/or corrective measures.

Table 30. Costs of the implementation of preventive, control or mitigation and/or corrective measures of each of the impacts identified.

ACTIVITY	Cost
Exclusion of possible beneficiaries due to lack of title to the land.	13,000
Review the legal land tenure framework to identify gaps for promoting sustainable agricultural practices and climate change adaptation.	2,000
Establish a working group on land tenure to recommend tenure solutions for sustainable agricultural practices and climate change adaptation.	4,000
With the approval of the Project Coordinating Committee, conduct community assemblies to define project beneficiaries and when people do not have land tenure, request the approval of the assembly for granting the benefit based on its knowledge of the possible beneficiary. It may also seek support from the Land Fund and local growers' associations and NGOs working on regularization and inclusion issues.	5,000
The community organization should also ensure women's participation when they own the land or are heads of households.	2,000
The project should consider women as rights holders, ensuring their inclusion and access to all project resources.	
Impact name: Inequity and exclusion of vulnerable populations (women, young people and indigenous communities)	60,000
Through and gender-sensitive project consultations to understand farmers' interests and challenges, associative processes should be strengthened, and women's young people's and indigenous populations' leadership should be promoted to ensure quality representation in project activities.	30,000
Community assemblies should be convened to define prioritized adaptation measures by farmers and the tree species that will be used in the communities, which should meet the specific needs of women, men and indigenous populations.	5,000
The participation of women and young people should be ensured in all educational and capacity building processes.	5,000
Associative processes should be strengthened, and women's, young people's and indigenous peoples' leadership should be promoted to ensure quality representation in project activities.	5,000
Generating opportunities for hiring women, young and indigenous people should be established as a project standard.	
Community organization for distributing project inputs and materials must ensure women's participation and access to these resources.	
The Project Implementation Unit must establish a mechanism for participative monitoring, input delivery and assessment, with the active participation of women's organizations.	15,000
Impact name: Risks due to failure to observe labor laws.	85,000
The Project Implementing Unit and other implementing partners are not allowed to hire any person without social security or supplementary legal benefit.	
All the personnel hired will respect labor laws, work schedules and just wages that offer equal opportunities for women and men, especially equal pay for equal work.	
As part of the project training program, rules related to labor legislation, the national policy on women and rules for eliminating discrimination and violence against women should be disclosed.	10,000
The use of child labor in project activities should be avoided; however, it should be handled with great care, since it is a custom deeply rooted in peoples' traditions and is important labor in below-subsistence families.	

ACTIVITY	Cost
Child labor should be monitored in each project implementation area and when it takes place, a socioeconomic analysis of its causes should be conducted.	30,000
Child protection laws should be disclosed to prevent the use of child labor in project activities.	5,000
The Project Implementing Unit should have a surveillance and control mechanism to prevent children under 18 from working and not attending school.	40,000
Impact name: Initial short-term reduction of family income.	90,000
Training on good agricultural production and forest management practices through different teaching strategies such as field trips, demonstration parcels, field schools and others.	60,000
Timely and appropriate technical assistance for small farmers.	30,000
These actions may be leveraged by the National Rural Extension Service (SNER).	
Impact name: Increased social vulnerability related to food security among families due to crop losses.	
The project should have a technical capacity building program focusing on appropriate management of agroclimatic information that includes broad participation of vulnerable populations, especially indigenous communities in their native languages.	140,000
Encourage diversity of the crops and practices contemplated in each of the adaptation measures, since this reduces the risk of affecting the incomes of families that depend on a single agricultural or livestock item.	40,000
Create synergies with the academic sector and SESAN to monitor the food and nutrition security indices of families benefiting from the project.	50,000
Timely dissemination of information and ongoing training for project users.	50,000
Impact name: Soil and water pollution through improper use of fertilizers.	230,000
Localized application of fertilizers to the soil is recommended to mitigate soil and water pollution.	50,000
Combining synthetic fertilization with applications of organic fertilizer, incorporating readily accessible materials for farmers, such as poultry manure, manure or compost.	100,000
Controlling water supply for irrigation as applicable.	
Promoting the use of more environmentally-friendly fertilizers such as Bayfolan suelo azul or YaraMila Hydran and micronutrient mixtures (ulexite + zinc sulfate + copper sulfate + manganese sulfate).	10,000
Fertilizer dosage and frequency should be in accordance with plant phenology and parcel soil analysis and follow FAO best practices.	10,000
The fertilizer application schedule will also be designed in accordance with weather forecasts for the area, to take better advantage of their efficiency.	10,000
Give training to the extension agents on the use of chemical and organic fertilizers, who will later train the group of local promoters and hundreds of beneficiary families.	50,000
Impact name: Soil and water pollution through improper pesticide use.	180,000
The project training and technical assistance program must promote comprehensive pest management and proper pesticide use.	30,000
The project implementing unit must select the most appropriate pesticides, excluding those on the list of forbidden products of the Stockholm Convention on Persistent Organic Pollutants (POCs) and in the framework of the FAO International Code of Conduct for pesticide management.	10,000
The use and application of pesticides at the various production units should be monitored and forbidden products should be seized.	50,000
The best practices for agrochemical use, storage and application should be implemented.	70,000
Creating awareness and a training program on proper pesticide use and management in accordance with legal provisions.	10,000
Promoting triple washing and best practices for chemical application and storage and container handling.	10,000
Impact name: Soil and water pollution through generation and improper handling of hazardous and other waste.	121,000
Creating awareness and a training program on proper handling of empty agrochemical containers in accordance with the law.	10,000
Using best practices for agrochemical container handling such as triple washing, container destruction, storage and disposal.	50,000
Container collection agreements should be entered into with the companies that sell such products.	1,000
Monitoring handling of pesticide containers and other waste products at the different production units.	60,000
Impact name: Workers' and communities' health is affected by improper handling of agrochemicals and their waste.	47,000
Providing training on the use of appropriate equipment and clothing for safe pesticide use.	2,000
Agrochemicals should be applied using the available climate information, avoiding strong winds that scatter the pollutants in the air and allow them to reach neighboring populations.	5,000
Selecting appropriate pesticides, excluding those on the list of forbidden products of the Stockholm Convention on Persistent Organic Pollutants (POCs) and in the framework of the FAO International Code of Conduct for pesticide management.	5,000

ACTIVITY	Cost
The project must promote the application of organic products and the MIP.	
Using the best practices for agrochemical use, storage and application.	15,000
Creating awareness and a training program on proper pesticide use and management in accordance with legal provisions.	5,000
Creating awareness and a training program on proper pesticide container handling in accordance with legal provisions.	5,000
Promoting triple washing and clothing for farmers for chemical application and storage and container handling.	10,000
Impact name: Protected Natural Areas and Buffer Zones Affected.	50,000
When consultation processes take place, the Project Implementing Unit must identify farms in or near protected areas and exclude them from the project, unless their incorporation is strategically required for landscape restoration purposes through tree planting on the farm.	10,000
The Project Implementing Unit shall consider declared protected areas and their management plans when implementing the measures.	
When a protected area is nearby, the use of non-native tree species and basic grain planting practices should be avoided.	
The Project Technical Committee shall be in constant communication with CONAP to monitor the protected areas closest to project implementation areas.	
Measures implemented near protected areas should improve the livelihoods of populations in buffer zones and water catchment areas to prevent natural resource depredation.	40,000
Impact name: Job loss due to reduced demand for labor for fertilizer and pesticide application.	10,000
The Project Implementing Unit shall encourage people who work on pest and disease control to engage in other activities such as tree planting and maintenance, family garden maintenance or even training activities.	10,000
Diversifying agricultural production will allow greater inclusion of family members in different productive activities.	
Impact name: Genetic erosion of open pollination seeds.	190,000
The Project Implementing Unit and the Project Technical Committee must ensure that local seed producers' associations, preferably those made up of indigenous people, participate in the project for them to implement best open pollination seed collection and conservation practices.	30,000
Planting seed crops a good distance from other varieties and crops of the same family should be promoted at field level and through training processes to ensure seed purity.	20,000
For crops that are easily crossed, such as maize, growing only one variety every season is recommended; and that variety should preferably be located 600 meters away from other maize varieties.	20,000
Storing seeds from at least five plants and preferably more (in the case of maize at least 50 plants are needed).	100,000
Over time, seeds stored systematically will be better acclimated to local conditions and genetically better adapted to the area; this is a benefit of storing seeds carefully.	
The Project Implementing Unit, associated with partner institutions, should monitor growing fields and seed storage sites to ensure their purity.	20,000
Impact name: Environmental pollution by discarded materials at greenhouses that are built.	20,000
Beneficiaries should receive training on proper greenhouse and waste material management before delivering the necessary greenhouses and equipment to prevent them from being burned or improperly disposed of.	10,000
These measures should go hand in hand with constant monitoring of the status of the greenhouses and management of the waste they produce.	10,000
Impact name: Proliferation of pests and diseases due to poor water storage conditions.	30,000
The Project Implementing Unit must ensure that storage tanks are installed far from septic tanks and animal facilities.	5,000
When plastic or cement tanks are used, ensure that they are kept closed.	
Avoid drinking untreated water. Boil it first if it is for human consumption.	
In places where water storage systems are important, local water boards can be trained in building, operating and maintaining such systems. The benefits of these schemes will provide effective management incentives.	25,000
Impact name: Seed losses due to poor storage conditions in silos.	5,000
Inspecting silos periodically, at least once a month, to determine the temperature, humidity and whether they have been affected by a pest or disease.	
Inspecting and selecting grains is a key step in ensuring safe storage. Proper grain conservation in the silo depends on it.	
Cleaning the silos to remove bacteriological agents harmful to health that may be present, such as animal excrement, dead animal remains and others.	
Training local seed producers' associations in plant health management of seed production and storage.	5,000
Impact name: Loss of income due to variations of coffee and cacao prices and their production costs.	400,000
The Project Implementing Unit must promote and strengthen coffee and cacao value chains to try to ensure stable markets for selling these products independently from price variations that may exist.	400,000
Diversification strategies or farm adaptation measures proposed by the project will give farmers greater resilience against coffee and cacao price and cost fluctuations, since they will not have to depend on a single product.	
Impact name: Ecosystem services affected by poor agricultural planning and production.	140,000

ACTIVITY	Cost
The Project Implementing Unit must ensure that environmental criteria are used when formulating farm plans.	
The Project Implementing Unit, jointly with farmers, must ensure the maintenance and survival of planted tree species for a given period.	80,000
Timely and appropriate training on good forest management practices and technical assistance should be provided to project beneficiaries.	60,000
Impact name: Loss of crops and planted trees to fires during the summer.	170,000
Developing fire prevention plans with community participation since they will be the main landscape management actors and directly affected by fires that threaten their livelihoods. They may also be implicated in some of the causes of fires.	80,000
Training and counseling farmers to control the accumulation of combustible vegetation exposed to high temperatures such as firewood the product of pruning agricultural waste and flammable materials such as paper paint oils lubricants and/or fuels.	10,000
Whenever possible keeping fences firewalls and facilities vegetation-free.	80,000
Total	1,981,000

13 PRINCIPLES AND PROCEDURES TO MITIGATE IMPACTS FOR IMPLEMENTATION

193 This ESMF, along with the Gender Action Plan, is not being used solely as a compliance process. It goes beyond compliance and takes a proactive approach in design. Similarly, the grievance redress mechanism (GRM) included in this document is not just about being a last-resort mechanism. Rather, the GRM is about creating a project culture of transparency with built-in feedback systems. The ESMF, the Gender Action Plan and the Framework for Developing the Plan for Indigenous Peoples are taken as positive aspects that help the project implementation units in identifying and developing activities for greater environmental and social co-benefits. In order to ensure that the environmental and social issues are addressed properly in accordance and in compliance with the FAO and GCF Policies, all project activities shall undergo screening, assessment, review, and clearance process before execution of the project activities.

194 This chapter describes the process for ensuring that environmental and social concerns are adequately addressed through the institutional arrangements and procedures used by the project for managing the identification, preparation, approval, and implementation of sub-activities.

13.1 Step 1: Defining Sub-Activities

195 By design, the project is expected to have far greater environmental benefits than adverse environmental impacts. The potential adverse environmental impacts from the project are likely to be very small and limited. However, it is recognized that such impacts can accrue into larger impacts if they are not identified early during the planning cycle and their mitigation measures integrated into the project planning and implementation.

196 Given that the activities to be implemented in each site will be the same in nature and scale across the implementation area, it is proposed that screening for potential risks is undertaken at sub-activity level. Sub-activities constitute a valid tool to identify expected impacts and mitigation and monitoring measures.

197 In this context, sub-activities will be identified during the inception phase in Year 1. For each sub-activity, implementing sites will be identified along with activities, including capacity building/training and stakeholder engagement information specific to each site.

13.2 Step 2: Environmental and Social Risk Screening of Sub-Activities

198 FAO's environmental and social screening checklist (Appendix 6.3) will determine if a sub-activity will require an Environmental and Social Management Plan (ESMP). While the nature, magnitude, reversibility, and location of impacts are main elements in the screening of sub-activities, expert judgment will be a main factor in deciding whether an ESMP is required for a sub-activity or not.

199 For a sub-activity that requires an ESMP, the proposal must include a set of mitigation measures with monitoring and institutional arrangements to be taken during the implementation phase to correctly manage any potential adverse environmental and social impacts that may have been identified.

200 FAO will undertake environmental and social screening following FAO's Environmental and Social Screening Checklist. Once the implementation sites and beneficiaries are determined, a screening checklist will be completed per sub-activity and signed off by the National consultant specialist in Monitoring and Evaluation at the Project Management Unit (PMU). The s Monitoring and Evaluation specialists will add results of the screenings checklists. This document will be sent to ESM unit in FAO for endorsement.

201 Screening of sub-activities involve:

- Checking that the activities involved are permissible (as per the legal and regulatory requirements of the project);
- Determining the level of environmental assessment required based on the level of expected impacts.

202 The E&S screening checklist will result in the following screening outcomes: (i) determine the category for further assessment; and (ii) determine which environmental assessment instrument to be applied.

203 Pre-implementation safeguards documents (one per sub-activity) will be prepared by the Monitoring an Evaluation specialist in the PMU prior to the implementation of activities and sent to ESM Unit in FAO Headquarters for endorsement.

204 The documents will outline the following information relative to each sub-activity:

- a. Description of the activities to be carried out in all sites
- b. Description of each implementing site:
 - Geography and specificities in terms of activities
 - Beneficiaries and stakeholders
 - Map of the site

- c. Description of the stakeholder engagement process that was carried out in the inception phase and the stakeholder engagement plan to be carried during implementation
- d. Breakdown of information by site about the grievance mechanism and disclosure
- e. Aggregated results of the environmental and social screening checklists per sub-activity signed off by the Monitoring and Evaluation Specialist in the Management Unit.
- f. Where applicable, Environmental and Social Management Plans identifying mitigation measures, indicators, responsibilities and timeframe. The ESMP will be added to the monitoring plan to ensure safeguards performance is regularly reported upon along with stakeholder engagement monitoring per site.

13.3 Step 3: Environmental and Social Risk Management (Monitoring and Reporting)

205 Sub-activities classified as medium risk based on the environmental and social risks identified during the screening process will then be required to develop ESMPs that include information on the mitigation actions, the indicators and timeframe where the completion of such mitigation actions are expected.

206 While the nature, magnitude, reversibility, and location of impacts are main elements in the screening of sub-activities, expert judgment will be a main factor in deciding whether an ESMP is required for a sub-activity or not.

207 The ESMP should include:

- Mitigation Measures: Based on the environmental and social impacts identified from the checklist, the ESMP should describe with technical details each mitigation measure, together with designs, equipment descriptions and operating procedures as appropriate.
- Monitoring: Environmental and social monitoring during the implementation of the sub-activities, in order to measure the success of the mitigation measures. Specifically, the monitoring section of the ESMP provides:
 - A specific description and technical details of monitoring measures that include the parameters to be measured, the methods to be used, sampling locations, frequency of measurements, detection limits (where appropriate), and definition of thresholds that will signal the need for corrective actions.
 - Monitoring and reporting procedures to ensure early detection of conditions that necessitate particular mitigation measures and to furnish information on the progress and results of mitigation, e.g. by annual audits and surveys to monitor overall effectiveness of this ESMP.
- Institutional Arrangements: The ESMP should also provide a specific description of institutional arrangements, i.e. who is responsible for carrying out the mitigating and monitoring measures (for operation, supervision, enforcement, monitoring of implementation, remedial action, financing, reporting and staff training). Additionally, the ESMP should include an estimate of the costs of the measures and activities

recommended so that the necessary funds are included. The mitigation and monitoring measures recommended in the ESMP should be developed in consultation with all affected groups to incorporate their concerns and views in the design of the ESMP.

- 208 Once the ESM unit in FAO Headquarters endorses the pre-implementation documents with ESMPs, the Monitoring and Evaluation specialist will ensure ESMPs are included and reported upon, along with stakeholder engagement in the context of the monitoring plan.
- 209 In this context, field staff will be responsible for monitoring the progress, as relevant, in the monitoring plan, as well as to identify any potential risks that may emerge through the implementation phase. This information will be compiled in progress reports and templates will include a section on E&S risk management, where the above information will be reported.
- 210 Information from progress reports will be received by the Monitoring and Evaluation specialist in the PMU who will compile the information received in the progress reports, as well as that related to grievances to feed in a semi-annual report on Environmental and Social Safeguards Performance to be endorsed by the ESM unit in FAO.

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15 Appendixes

Appendix 6.1. Exclusion List of the RELIVE Project

The following practices and activities will not be supported by the project:

1. Land management practices that cause degradation (biological or physical) of the soil and water.
2. Development of large irrigation schemes and construction of new reservoirs.
3. Use of wastewater.
4. Actions that represent significant increase in GHG emissions.
5. Use of genetically modified organisms, or the supply or use of modern biotechnologies or their products in crops.
6. Introduction of crops and varieties that previously did not grow in the implementation areas, including seed import/transfer
7. Development of forest plantations.
8. Actions resulting in loss of biodiversity, alteration of the functioning of ecosystems, and introduction of new invasive alien species.
9. Actions within the protected areas or in their buffer zones.
10. Activities that affect gene flows and biological corridors.
11. Collection of wild genetic resources.
12. Landscape model(s) requiring high levels of (mainly) agrochemical inputs.
13. Anything in violation of the Pesticide Code of Conduct.
14. Procurement and/or use of highly hazardous pesticides or those that are not nationally validated or that are internationally regulated, especially by FAO and environmental conventions.
15. Activities that do not consider gender aspects or contribute to exacerbating any inequality or gender gap that may exist.
16. Changes in land tenure or displacement (permanent or temporary) of people from their homes or places of work and subsistence, or restrict their access to them.
17. Child Labor.
18. Activities in areas with cultural, historical or transcendent values for individuals and communities.

Appendix 6.2: Chance find procedures

- 211 The following “chance find” procedures must be included in all third-party contracts (e.g. Letters of Agreement), in instances where the contracted party is assisting with implementation of the project.
- 212 If the Contractor discovers archeological sites, historical sites, remains and objects, including graveyards and/or individual graves during project implementation, the Contractor shall:
- Stop the activities in the area of the chance find;
 - Delineate the discovered site or area;
 - Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the National Culture Ministry take over;
 - Notify the supervisory Safeguards Specialist within the UNGP who, in turn, will notify the responsible local and provincial authorities immediately (within 24 hours or less);
 - Responsible local and/or provincial authorities would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed by government approved archeologists. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values;
 - Decisions on how to handle the finding shall be taken by the responsible local and provincial authorities. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage;
 - Implementation for the authority decision concerning the management of the finding shall be communicated in writing by relevant local authorities; and
 - Project activities could resume only after permission is given from the responsible local or provincial authorities concerning safeguard of the heritage.
- 213 Note that the reporting of chance finds only occurs when an item/area/etc. of cultural significance is found, and is only carried out insofar as what is detailed above (i.e. reporting the find, reporting how the item/area will be treated moving forward). Reporting begins with the local level implementer (e.g. staff tasked to the implement the project within a village) notifying the Monitoring and evaluation Specialist, after which, the Safeguards Specialist guides the process according to the instructions above (e.g. notifying the relevant government authorities).

Appendix 6.3: Environmental and Social Screening Form

214 Every sub-activity will must undergo an initial screening, utilizing FAO's Safeguards Screening Checklist, found at the end of this annex. Based on the screening, sub-activities will be categorized as low, moderate, or high risk. Based on the screening, sub-activities will either be approved for implementation, or will be amended to meet the requirements detailed within this ESMF (specifically, all sub-activities must have low-to-moderate impact; high risk sub-activities will not be allowed under the project, nor will sub-activities which involve elements listed in the Appendix 6.1 Exclusion List of the RELIVE Project.

Guidance and Examples for Sub-Activity Categorization

215 Categorization: To ensure that the extent of the review is commensurate with the nature of risk, categorization is a useful step in procedures where based on basic information about a project such as sector and scale, the level of environmental and social (E&S) risk the project could pose is determined. This also enables the UNGP Safeguards Specialist to determine the extent and sophistication of the E&S review required. Categorization may be low, moderate or high. For the purposes of this project, all sub-activities are expected to be Category B (Medium) or Category C (Low) risk.

High Risk (Category A) Sub-Activity

216 The location of the farmers/project enterprise or activity may be:

- In regions where there are conflicts in natural resources allocation;
- Near watercourses, aquifer recharges areas or in reservoirs used for potable water supply; or in or close to lands or waters containing valuable resources.

Examples of sensitivity issues are those where the sub-activity can:

- Cause adverse global or regional environmental impacts;
- Lead to toxic waste disposal.

Examples where the nature of the sub-activity may:

- Cause irreversible degradation or unsustainable exploitation of natural resources; or
- Pose serious risks of significant harm to human health and safety.

Examples of the magnitude of the sub-activity where:

- A high amount of scarce resources may be put at risk;
- The timing and duration of the negative impacts are long; or
- The cumulative effects of many similar, but individually small transactions together lead to serious impacts.

217 Category A sub-activities are perceived to have significant adverse environmental and/or social impacts, and are not permitted to form part of the target portfolio.

Medium Risk (Category B) Sub-Activity

218 Transactions with a limited number of potentially adverse environmental or social impacts that are generally site-specific, largely reversible, and readily addressed through mitigation

measures that reduce the risk to moderate or low levels are normally classified as Category B. The following characteristics indicate a Category B:

- Environmental and social risks for the most part are mostly limited to and readily mitigated through application of good practice as described in relevant Environmental, Health and Safety Guidelines;

Low Risk (Category C) Sub-Activity

219 Sub-activity proposals that are perceived to have minimal or no adverse environmental or social impacts are classified as Category C, and no further environmental or social assessment work needs to be done after initial screening and categorization.

Environmental and Social Risk Identification – Screening Checklist

TRIGGER QUESTIONS:

	Question	YES	NO
1	Would this project: <ul style="list-style-type: none"> • result in the degradation (biological or physical) of soils or undermine sustainable land management practices; or • include the development of a large irrigation scheme, dam construction, use of waste water or affect the quality of water; or • reduce the adaptive capacity to climate change or increase GHG emissions significantly; or • result in any changes to existing tenure rights²³ (formal and informal²⁴) of individuals, communities or others to land, fishery and forest resources? 		✓
2	Would this project be executed in or around protected areas or natural habitats, decrease the biodiversity or alter the ecosystem functionality, use alien species, or use genetic resources?		✓
3	Would this project: <ul style="list-style-type: none"> • Introduce crops and varieties previously not grown, and/or; • Provide seeds/planting material for cultivation, and/or; • Involve the importing or transfer of seeds and or planting material for cultivation <u>or</u> research and development; • Supply or use modern biotechnologies or their products in crop production, and/or • Establish or manage planted forests? 	✓	
4	Would this project introduce non-native or non-locally adapted species, breeds, genotypes or other genetic material to an area or production system, or modify in any way the surrounding habitat or production system used by existing genetic resources?		✓
5	Would this project:	✓	

²³ Tenure rights are rights to own, use or benefit from natural resources such as land, water bodies or forests

²⁴ Socially or traditionally recognized tenure rights that are not defined in law may still be considered to be 'legitimate tenure rights'.

	Question	YES	NO
	<ul style="list-style-type: none"> result in the direct or indirect procurement, supply or use of pesticides²⁵: <ul style="list-style-type: none"> on crops, livestock, aquaculture, forestry, household; or as seed/crop treatment in field or storage; or through input supply programmes including voucher schemes; or for small demonstration and research purposes; or for strategic stocks (locust) and emergencies; or causing adverse effects to health and/or environment; or result in an increased use of pesticides in the project area as a result of production intensification; or result in the management or disposal of pesticide waste and pesticide contaminated materials; or result in violations of the Code of Conduct? 		
6	Would this project permanently or temporarily remove people from their homes or means of production/livelihood or restrict their access to their means of livelihood?		✓
7	Would this project affect the current or future employment situation of the rural poor, and in particular the labour productivity, employability, labour conditions and rights at work of self-employed rural producers and other rural workers?		✓
8	Could this project risk overlooking existing gender inequalities in access to productive resources, goods, services, markets, decent employment and decision-making? For example, by not addressing existing discrimination against women and girls, or by not taking into account the different needs of men and women.		✓
9	<p>Would this project:</p> <ul style="list-style-type: none"> have Indigenous peoples* living outside the project area¹ where activities will take place; or have Indigenous peoples living in the project area where activities will take place; or adversely or seriously effect on Indigenous peoples' rights, lands, natural resources, territories, livelihoods, knowledge, social fabric, traditions, governance systems, and culture or heritage (physical² and non-physical or intangible³) inside and/or outside the project area; or be located in an area where cultural resources exist? <p>* FAO considers the following criteria to identify Indigenous peoples: priority in time with respect to occupation and use of a specific territory; the voluntary perpetuation of cultural distinctiveness (e.g. languages, laws and institutions); self-identification; an experience of subjugation, marginalization, dispossession, exclusion or discrimination (whether or not these conditions persist).</p> <p>¹The phrase "Outside the project area" should be read taking into consideration the likelihood of project activities to influence the livelihoods, land access and/or rights of Indigenous Peoples' irrespective of physical distance. In example: If an Indigenous community is living 100 km away from a project area where fishing activities will affect the river yield which is also accessed by this community, then the user should answer "YES" to the question.</p>	✓	

²⁵ Pesticide means any substance, or mixture of substances of chemical or biological ingredients intended for repelling, destroying or controlling any pest, or regulating plant growth.

	Question	YES	NO
	<p>²Physical defined as movable or immovable objects, sites, structures, group of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic or other cultural significance located in urban or rural settings, ground, underground or underwater.</p> <p>³Non-physical or intangible defined as "the practices, representations, expressions, knowledge and skills as well as the instruments, objects, artifacts and cultural spaces associated therewith that communities, groups, and in some cases individuals, recognize as part of their spiritual and/or cultural heritage"</p>		

Second Level Questions

Safeguards listed here are those designated as applicable to this project.

SAFEGUARD 1 NATURAL RESOURCES MANAGEMENT

Question	Management of soil and land resources	No	Yes	Comments
1.1	Would this project result in the degradation (biological or physical) of soils	LOW RISK	MODERATE RISK Demonstrate how the project applies and adheres to the principles of the World Soil Charter	LOW RISK Land preparation will follow the principles of conservation agriculture with minimum or null impact and a strict selection of implements. Agroecological actions are foreseen for the improvement of soils, including the use of organic fertilizers and measures to protect against erosion.
1.2	Would this project undermine sustainable land management practices?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	LOW RISK: better practices will be introduced and promoted

	Management of water resources and small dams	No	Yes	Comments
1.3	Would this project develop an irrigation scheme that is more than 20 hectares or withdraws more than 1000 m3/day of water?	LOW RISK	MODERATE RISK Specify the following information: a) implementation of appropriate efficiency principles and options to enhance productivity, b) technically feasible water conservation measures, c) alternative water supplies, d) resource contamination mitigation or/and avoidance, e) potential impact on water users downstream, f) water use offsets and demand management options to maintain total	LOW RISK: The project will not develop irrigation schemes that are more than 20 Ha or withdraws more than 1000 m3/day of water.

	Management of water resources and small dams	No	Yes	Comments
			<p>demand for water resources within the available supply.</p> <p>g) The ICID-checklist will be included, as well as appropriate action within the project to mitigate identified potential negative impacts.</p> <p>h) Projects aiming at improving water efficiency will carry out thorough water accounting in order to avoid possible negative impacts such as waterlogging, salinity or reduction of water availability downstream.</p>	
1.4	Would this project develop an irrigation scheme that is more than 100 hectares or withdraws more than 5000 m3/day of water?	LOW RISK	<p>HIGH RISK</p> <p>A full environmental and social impact assessment is required.</p> <p>Please contact the ESM unit for further guidance.</p>	LOW RISK: The development of new Irrigation schemes that is more than 100 ha or withdraws more than 1000 m3/day of water are not included.
1.5	Would this project aim at improving an irrigation scheme (without expansion)?	LOW RISK	<p>MODERATE RISK</p> <p>The ICID-checklist will be included, as well as appropriate action within the project to mitigate identified potential negative impacts. Projects aiming at improving water efficiency will carry out thorough water accounting in order to avoid possible negative impacts such as waterlogging, salinity or reduction of water availability downstream.</p>	LOW RISK: The project will ensure the reliable supply of water for agricultural needs, even during drought by installing only rooftop rainwater harvesting systems and farm-level drip irrigation system for using harvested water at really small scale.
1.6	Would this project affect the quality of water either by the release of pollutants or by its use, thus affecting its characteristics (such as temperature, pH, DO, TSS or any other)?	LOW RISK	<p>HIGH RISK</p> <p>A full environmental and social impact assessment is required.</p> <p>Please contact the ESM unit for further guidance.</p>	LOW RISK: no significant effects on water quality are expected as a result of the limited application of organic fertilizers, Maintaining soil with the necessary nutrient stocks using compost and organic fertilizers will help plants to be less vulnerable to attack by pests and diseases and more likely to withstand extreme weather events.

	Management of water resources and small dams	No	Yes	Comments
1.7	Would this project include the usage of wastewater?	LOW RISK	MODERATE RISK Demonstrate how the project applies and adheres to applicable national guidelines or, if not available, the WHO/FAO/UNEP Guidelines on Safe Usage of Waste Water in Agriculture	LOW RISK: The use of wastewater was not included
1.8	Would this project involve the construction or financing of a dam that is more than 15 m. in height?	LOW RISK	CANNOT PROCEED	LOW RISK: Dams construction was not included.
1.9	Would this project involve the construction or financing of a dam that is more than 5 m. in height?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	LOW RISK: Dams construction was not included.

	Tenure	No	Yes	Comments
1.10	Would this project permanently or temporarily remove people from their homes or means of production/livelihood or restrict their access to their means of livelihood?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	LOW RISK: No
1.11	Would this project permanently or temporarily deny or restrict access to natural resources to which they have rights of access or use	LOW RISK	PROCEED TO NEXT Q	LOW RISK: No
1.11.1	Would the denial or restriction of access be voluntary and with the agreement of the affected people?	CANNOT PROCEED	MODERATE RISK Demonstrate how the project applies and adheres to the principles/framework of the Voluntary Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT)	No
1.12	Would the project bring about consolidation or adjustment of tenure rights?	LOW RISK	PROCEED TO NEXT Q	LOW RISK: No
1.12.1	Would the consolidation or adjustment of tenure rights be voluntary and with the agreement of the affected people?	CANNOT PROCEED	MODERATE RISK Demonstrate how the project applies and adheres to the principles/framework of the Voluntary	No

			Guidelines on the Responsible Governance of Tenure of Land, Fisheries and Forests in the Context of National Food Security (VGGT)	
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	Climate	No	Yes	Comments
1.13	Would this project result in a reduction of the adaptive capacity to climate change for any stakeholders in the project area?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	LOW RISK:
1.14	Would this project result in a reduction of resilience against extreme weather events?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	LOW RISK:
1.15	Would this project result in a net increase of GHG emissions beyond those expected from increased production?	LOW RISK	PROCEED TO NEXT Q	LOW RISK:
1.15.1	Is the expected increase below the level specified by FAO guidance or national policy/law (whichever is more stringent)?	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	LOW RISK	LOW RISK:
1.15.2	Is the expected increase above the level specified by FAO guidance or national policy/law (whichever is more stringent)?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	LOW RISK:

SAFEGUARD 2 BIODIVERSITY, ECOSYSTEMS AND NATURAL HABITATS

	Protected areas, buffer zones or natural habitats	No	Yes	Comments
2.1	Would this project be implemented within a legally designated protected area or its buffer zone?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	LOW RISK: Protected and buffer areas are no included in the project implementation

	Biodiversity Conservation	No	Yes	Comments
2.2	Would this project change a natural ecosystem to an agricultural/aquacultural/forestry production unit with a reduced diversity of flora and fauna?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	LOW RISK:
2.3	Would this project increase the current impact on the surrounding environment for example by using more water, chemicals or machinery than previously?	LOW RISK	MODERATE RISK Demonstrate in the project document what measures will be taken to minimize adverse impacts on the environment and ensure that implementation of these measures is reported in the risk log during progress reports.	LOW RISK:

	Use of alien species	No	Yes	Comments
2.4	Would this project use an alien species which has exhibited an invasive* behavior in the country or in other parts of the world or a species with unknown behavior? *An invasive alien species is defined by the Convention on Biological Diversity as “ an alien species whose introduction and/or spread threaten biological diversity” ²⁶	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	LOW RISK: Non alien species are included.

²⁶ see <https://www.cbd.int/invasive/terms.shtml>.

	Access and benefit sharing for genetic resources	No	Yes	Comments
2.5	Would this project involve access to genetic resources for their utilization and/or access to traditional knowledge associated with genetic resources that is held by indigenous, local communities and/or farmers?	LOW RISK	<p>MODERATE RISK</p> <p>Ensure that the following issues are considered and appropriate action is taken. The issues identified and the action taken to address them must be included in the project document and reported on in progress reports.</p> <p>For plant genetic resources for food and agriculture (PGRFA) falling under the Multilateral System of Access and Benefit-sharing (MLS) of the International Treaty on Plant Genetic Resources for Food and Agriculture (Treaty), ensure that Standard Material Transfer Agreement (SMTA) has been signed and comply with SMTA provisions.</p> <p>For genetic resources, other than PGRFA falling under the MLS of the Treaty:</p> <ol style="list-style-type: none"> 1. Ensure that, subject to domestic access and benefit-sharing legislation or other regulatory requirements, prior informed consent has been granted by the country providing the genetic resources that is the country of origin of the resources or that has acquired the resources in accordance with the Convention on Biological Diversity, unless otherwise determined by that country; and 2. Ensure that benefits arising from the utilization of the genetic resources as well as subsequent applications and commercialization are shared in a fair and equitable way with the country providing the genetic resources that is the country of origin of the resources or that has acquired the resources in accordance with the Convention on Biological Diversity; and 3. Ensure that, in accordance with domestic law, prior informed consent or approval and involvements of indigenous and local communities is obtained for access to genetic resources where the indigenous and local communities have the established right to grant such resources; and 	LOW RISK:

	Access and benefit sharing for genetic resources	No	Yes	Comments
			<p>4. Ensure that, in accordance with domestic legislation regarding the established rights of these indigenous and local communities over the genetic resources, are shared in a fair and equitable way with the communities concerned, based on mutually agreed terms.</p> <p>For traditional knowledge associated with genetic resources that is held by indigenous and local communities:</p> <p>1. Ensure, in accordance with applicable domestic law, that knowledge is accessed with the prior and informed consent or approval and involvement of these indigenous and local communities, and that mutually agreed terms have been established; and</p> <p>2. Ensure that, in accordance with domestic law, benefits arising from the utilization of traditional knowledge associated with genetic resources are shared, upon mutually agreed terms, in a fair and equitable way with indigenous and local communities holding such knowledge.</p> <p>Ensure that the project is aligned with the Elements to Facilitate Domestic Implementation of Access and Benefit Sharing for Different Subsectors of Genetic Resources for Food and Agriculture when it is the case</p>	

SAFEGUARD 3 PLANT GENETIC RESOURCES FOR FOOD AND AGRICULTURE

	Introduce new crops and varieties	No	Yes	Comments
3.1	Would this project Introduce crops and varieties previously not grown?	LOW RISK	MODERATE RISK <ul style="list-style-type: none"> Follow appropriate phytosanitary protocols in accordance with IPPC Take measures to ensure that displaced varieties and/or crops, if any, are included in the national or international <i>ex situ</i> conservation programmes 	LOW RISK
	Provision of seeds and planting materials	No	Yes	Comments
3.2	Would this project provide seeds/planting material for cultivation?	LOW RISK	PROCEED TO NEXT Q	LOW RISK
3.2.1	Would this project involve the importing or transfer of seeds and/or planting materials for cultivation?	LOW RISK	MODERATE RISK <ul style="list-style-type: none"> Avoid undermining local seed & planting material production and supply systems through the use of seed voucher schemes, for instance Ensure that the seeds and planting materials are from locally adapted crops and varieties that are accepted by farmers and consumers Ensure that the seeds and planting materials are free from pests and diseases according to agreed norms, especially the IPPC Internal clearance from AGPMG is required for all procurement of seeds and planting materials. Clearance from AGPMC is required for chemical treatment of seeds and planting materials Clarify that the seed or planting material can be legally used in the country to which it is being imported Clarify whether seed saving is permitted under the country's existing laws and/or regulations and advise the counterparts accordingly. Ensure, according to applicable national laws and/or regulations, that farmers' rights to 	MODERATE RISK <p>The project will not import nor transfer seeds from other regions of the country but will provide them for cultivation from seed farms and local seed sources identified, based on the species and varieties already existing in the region. Seed farms will contribute to better management, better selection and quality and therefore better indicators of germination and productive yields. The species to be planted are known and managed by the producers; there is no rejection towards any.</p>

			PGRFA and over associated traditional knowledge are respected in the access to PGRFA and the sharing of the benefits accruing from their use. Refer to ESS9: Indigenous peoples and cultural heritage.	
3.2.2	Would this project involve the importing or transfer of seeds and/or planting materials for research and development?	LOW RISK	MODERATE RISK Ensure compliance with Access and Benefit Sharing norms as stipulated in the International Treaty on Plant Genetic Resources for Food and Agriculture and the Nagoya Protocol of the Convention on Biodiversity as may be applicable. Refer also to ESS2: Biodiversity, Ecosystems and Natural Habitats.	LOW RISK: The project will manage just local seeds, for strictly productive purposes and from local seed farms

	Modern biotechnologies and the deployment of their products in crop production	No	Yes	Comments
3.3	Would this project supply or use modern plant biotechnologies and their products?	LOW RISK	MODERATE RISK <ul style="list-style-type: none"> Adhere to the Cartagena Protocol on Biosafety of the Convention on Biological Diversity to ensure the safe handling, transport and use of Living Modified Organisms (LMOs) resulting from modern biotechnology that may have adverse effects on biological diversity, taking also into account risks to human health. Adhere to biosafety requirements in the handling of Genetically Modified Organisms (GMOs) or Living Modified Organisms (LMOs) according to national legislation or²⁷ Take measures to prevent gene flow from the introduced varieties to existing ones and/or wild relatives 	LOW RISK: The project will not import nor transfer seeds for research and development.

²⁷Food and Agriculture Organization of the United Nations. 2011. Biosafety Resource Book. Rome, <http://www.fao.org/docrep/014/i1905e/i1905e00.htm>

	Planted forests	No	Yes	Comments
3.4	Would this project establish or manage planted forests?	LOW RISK	MODERATE RISK <ul style="list-style-type: none"> • Adhere to existing national forest policies, forest programmes or equivalent strategies. • The observance of principles 9, 10, 11 and 12 of the Voluntary Guidelines on Planted Forests suffice for indigenous forests but must be read in full compliance with ESS 9- Indigenous People and Cultural Heritage. • Planners and managers must incorporate conservation of biological diversity as fundamental in their planning, management, utilization and monitoring of planted forest resources. • In order to reduce the environmental risk, incidence and impact of abiotic and biotic damaging agents and to maintain and improve planted forest health and productivity, FAO will work together with stakeholders to develop and derive appropriate and efficient response options in planted forest management. 	MODERATE RISK: The project will establish agroforestry systems, and some forest plantations, using native species presented in the implementation area, and taking in consideration recommendations under this category.

SAFEGUARD 4 ANIMAL (LIVESTOCK AND AQUATIC) GENETIC RESOURCES FOR FOOD AND AGRICULTURE

	Introduce new species/breeds and change in the production system of locally adapted breeds	No	Yes	Comments
4.1	Would this project introduce non-native or non-locally adapted species, breeds, genotypes or other genetic material to an area or production system?	LOW RISK	PROCEED TO NEXT Q	LOW RISK:
4.1.1	Would this project foresee an increase in production by at least 30% (due to the introduction) relative to currently available locally adapted breeds and can monitor production performance?	CANNOT PROCEED	LOW RISK	LOW RISK:

	Introduce new species/breeds and change in the production system of locally adapted breeds	No	Yes	Comments
4.1	altered organisms, e.g. through selective breeding, chromosome set Altered organisms, e.g. through selective breeding, chromosome set manipulation, hybridization, genome editing or gene transfer and/or introduce or use experimental genetic technologies, e.g. genetic engineering and gene transfer, or the products of those technologies?		Please contact the ESM unit for further guidance.	
4.2	Would this project introduce a non-native or non-locally adapted species or breed for the first time into a country or production system?	LOW RISK	MODERATE RISK A genetic impact assessment should be conducted prior to granting permission to import (cover the animal identification, performance recording and capacity development that allow monitoring of the introduced species/ breeds' productivity, health and economic sustainability over several production cycles) <ul style="list-style-type: none"> http://www.fao.org/docrep/012/i0970e/i0970e00.htm ftp://ftp.fao.org/docrep/fao/012/i0970e/i0970e03.pdf 	LOW RISK:
4.3	Would this project introduce a non-native or non-locally adapted species or breed, independent	LOW RISK	MODERATE RISK <ul style="list-style-type: none"> If the project imports or promotes species/breeds with higher performance than locally adapted ones, ensure: feed resources, health management, farm management capacity, input supply and farmer organization to allow 	LOW RISK:

	Introduce new species/breeds and change in the production system of locally adapted breeds	No	Yes	Comments
	whether it already exists in the country?		<p>the new species/breeds to express their genetic potential</p> <ul style="list-style-type: none"> Follow the OIE terrestrial or aquatic code to ensure the introduced species/breed does not carry different diseases than the local ones Include a health risk assessment and farmer/veterinary capacity development in the project to ensure the introduced species/breed do not have different susceptibility to local diseases including ecto-and endo-parasites than the locally adapted/native species/breeds. 	
4.4	Would this project ensure there is no spread of the introduced genetic material into other production systems (i.e. indiscriminate crossbreeding with locally adapted species/breeds)?	MODERATE RISK Introduce a) animal identification and recording mechanism in the project and b) develop new or amend existing livestock policy and National Strategy and Action Plan for AnGR	LOW RISK	LOW RISK:

	Collection of wild genetic resources for farming systems	No	Yes	Comments
4.5	Would this project collect living material from the wild, e.g. for breeding, or juveniles and eggs for on-growing?	LOW RISK	MODERATE RISK Guidance to be provided	LOW RISK:

	Modification of habitats		No	Yes	Comments
4.6	Would this project modify the surrounding habitat or production system used by existing genetic resources?		LOW RISK	MODERATE RISK Guidance to be provided	LOW RISK:
4.7	Would this project be located in or near an internationally recognized conservation area e.g. Ramsar or World Heritage Site, or other nationally important habitat, e.g. national park or high nature value farmland?		LOW RISK	MODERATE RISK Guidance to be provided	LOW RISK:
4.8	AQGR	Would this project block or create migration routes for aquatic species?	LOW RISK	MODERATE RISK Guidance to be provided	LOW RISK:
4.9		Would this project change the water quality and quantity in the project area or areas connected to it?	LOW RISK	MODERATE RISK Guidance to be provided	LOW RISK:
4.10	Would this project cause major habitat / production system changes that promote new or unknown chances for gene flow, e.g. connecting geographically distinct ecosystems or water bodies; or would it disrupt habitats or migration routes and the genetic structure of valuable or locally adapted species/stocks/breeds?		LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	LOW RISK:

4.11	Would this project involve the intensification of production systems that leads to land- use changes (e.g. deforestation), higher nutrient inputs leading to soil or water pollution, changes of water regimes (drainage, irrigation)?	LOW RISK	MODERATE RISK Guidance to be provided	LOW RISK:
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SAFEGUARD 5 PEST AND PESTICIDES MANAGEMENT

	Supply of pesticides by FAO	No	Yes	Comments
5.1	Would this project procure, supply and/or result in the use of pesticides on crops, livestock, aquaculture or forestry?	LOW RISK	MODERATE RISK <ul style="list-style-type: none"> • Preference must always be given to sustainable pest management approaches such as Integrated Pest Management (IPM), the use of ecological pest management approaches and the use of mechanical/cultural/physical or biological pest control tools in favour of synthetic chemicals; and preventive measures and monitoring, • When no viable alternative to the use of chemical pesticides exists, the selection and procurement of pesticides is subject to an internal clearance procedure http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/E_SS5_pesticide_checklist.pdf • The criteria specified in FAO's ESM Guidelines under ESS 5 must be adhered to and should be included or referenced in the project document. • If large volumes (above 1,000 litres of kg) of pesticides will be supplied or used throughout the duration of the project, a Pest Management Plan must be prepared to demonstrate how IPM will be promoted to reduce reliance on pesticides, and what measures will be taken to minimize risks of pesticide use. • It must be clarified, which person(s) within (executing) involved institution/s, will be responsible and liable for the proper storage, transport, distribution and use of 	MODERATE RISK : <ul style="list-style-type: none"> •The project will promote the sustainable pest management approaches such as integrated Pest Management (IPM), the use of ecological pest management approaches and the use of mechanical/cultural/physical or biological pest control tools in favour of synthetic chemicals, and preventive measures and monitoring, however in some few cases the use of pesticides with low impact will be carried out in a restricted manner, and only in the areas that require it. The use of highly hazardous herbicides will also be avoided. •The project training and technical assistance program must promote comprehensive pest management and proper pesticide use. •The project implementing unit must select the most appropriate pesticides, excluding those on the list of forbidden products of the Stockholm Convention on Persistent Organic Pollutants (POCs) and in the framework of the FAO

	Supply of pesticides by FAO	No	Yes	Comments
			the products concerned in compliance with the requirements.	<p>International Code of Conduct for pesticide management.</p> <ul style="list-style-type: none"> •The use and application of pesticides at the various production units should be monitored and forbidden products should be seized. •The best practices for agrochemical use, storage and application should be implemented. •Creating awareness and a training program on proper pesticide use and management in accordance with legal provisions. •Promoting triple washing and best practices for chemical application and storage and container handling.
5.2	Would this project provide seeds or other materials treated with pesticides (in the field and/or in storage)?	LOW RISK	<p>MODERATE RISK</p> <p>The use of chemical pesticides for seed treatment or storage of harvested produce is subject to an internal clearance procedure [http://www.fao.org/fileadmin/templates/agphome/documents/Pests_Pesticides/Code/E_SS5_pesticide_checklist.pdf]. The criteria specified in FAO's ESM Guidelines under ESS5 for both pesticide supply and seed treatment must be adhered to and should be included or referenced in the project document.</p>	LOW RISK The project will not used pesticides treated seeds.
5.3	Would this project provide inputs to farmers directly or through voucher schemes?	LOW RISK	<p>MODERATE RISK</p> <ul style="list-style-type: none"> • FAO projects must not be responsible for exposing people or the environment to risks from pesticides. The types and quantities of pesticides and the associated application and protective equipment that users of a voucher scheme are provided with must always comply with the conditions laid out in ESS5 and be subject to the internal clearance procedure [link]. These must be included or referenced in the project document. • Preference must always be given to sustainable pest management approaches such as Integrated Pest Management (IPM), the use of ecological pest management approaches and the use of mechanical or 	LOW RISK

	Supply of pesticides by FAO	No	Yes	Comments
			biological pest control tools in favour of synthetic chemicals	
5.4	Would this project lead to increased use of pesticides through intensification or expansion of production?	LOW RISK	MODERATE RISK Encourage stakeholders to develop a Pest Management Plan to demonstrate how IPM will be promoted to reduce reliance on pesticides, and what measures will be taken to minimize risks of pesticide use. This should be part of the sustainability plan for the project to prevent or mitigate other adverse environmental and social impacts resulting from production intensification.	LOW RISK
5.5	Would this project manage or dispose of waste pesticides, obsolete pesticides or pesticide contaminated waste materials?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	LOW RISK

SAFEGUARD 6 INVOLUNTARY RESETTLEMENT AND DISPLACEMENT

		No	Yes	Comments
6.1	<p>Would this removal* be voluntary?</p> <p>*temporary or permanent removal of people from their homes or means of production/livelihood or restrict their access to their means of livelihoods</p>	CANNOT PROCEED	<p>HIGH RISK</p> <p>A full environmental and social impact assessment is required.</p> <p>Please contact the ESM unit for further guidance.</p>	LOW RISK

SAFEGUARD 7 DECENT WORK

		No	Yes	Comments
7.1	Would this project displace jobs? (e.g. because of sectoral restructuring or occupational shifts)	LOW RISK	<p>HIGH RISK</p> <p>A full environmental and social impact assessment is required.</p> <p>Please contact the ESM unit for further guidance.</p>	LOW RISK
7.2	Would this project operate in sectors or value chains that are dominated by subsistence producers and other vulnerable informal agricultural workers, and more generally characterized by high levels “working poverty”?	LOW RISK	<p>MODERATE RISK</p> <p>Take action to anticipate the likely risk of perpetuating poverty and inequality in socially unsustainable agriculture and food systems. Decent work and productive employment should appear among the priorities of the project or, alternatively, the project should establish synergies with specific employment and social protection programmes e.g. favouring access to some social protection scheme or form of social insurance. Specific measures and mechanisms should be introduced to empower in particular the most vulnerable /disadvantaged categories of rural workers such as small-</p>	LOW RISK

		No	Yes	Comments
			scale producers, contributing family workers, subsistence farmers, agricultural informal wage workers, with a special attention to women and youth who are predominantly found in these employment statuses. An age- and gender-sensitive social value chain analysis or livelihoods/employment assessment is needed for large-scale projects.	
7.3	Would this project operate in situations where youth work mostly as unpaid contributing family workers, lack access to decent jobs and are increasingly abandoning agriculture and rural areas?	LOW RISK	<p>MODERATE RISK</p> <p>Take action to anticipate likely risk of unsustainably ageing agriculture and food systems by integrating specific measures to support youth empowerment and employment in agriculture. A youth livelihoods/employment assessment is needed.</p> <p>Complementary measures should be included aiming at training youth, engaging them and their associations in the value chain, facilitating their access to productive resources, credit and markets, and stimulating youth- friendly business development services.</p>	LOW RISK
7.4	Would this project operate in situations where major gender inequality in the labour market prevails? (e.g. where women tend to work predominantly as unpaid contributing family members or subsistence farmers, have lower skills and qualifications, lower productivity and wages, less representation and voice in producers' and workers' organizations, more precarious contracts and higher informality rates, etc.)	LOW RISK	<p>MODERATE RISK</p> <p>Take action to anticipate likely risk of socially unsustainable agriculture and food systems by integrating specific measures to reduce gender inequalities and promote rural women's social and economic empowerment. A specific social value chain analysis or livelihoods/employment assessment is needed for large-scale projects.</p> <p>Facilitation should be provided for women of all ages to access productive resources (including land), credit, markets and marketing channels, education and TVET, technology, collective action or mentorship. Provisions for maternity protection, including child care facilities, should be foreseen to favour women participation and anticipate potential negative effects on child labour, increased workloads for women, and health related risks for pregnant and breastfeeding women.</p>	LOW RISK

		No	Yes	Comments
7.5	Would this project operate in areas or value chains with presence of labour migrants or that could potentially attract labour migrants?	LOW RISK	MODERATE RISK Take action to anticipate potential discrimination against migrant workers, and to ensure their rights are adequately protected, with specific attention to different groups like youth, women and men.	LOW RISK
		No	Yes	Comments
7.6	Would this project directly employ workers?	LOW RISK	MODERATE RISK FAO projects will supposedly guarantee employees' rights as per UN/FAO standards as regards information on workers' rights, regularity of payments, etc. Decisions relating to the recruitment of project workers are supposed to follow standard UN practices and therefore not be made on the basis of personal characteristics unrelated to inherent job requirements. The employment of project workers will be based on the principle of equal opportunity and fair treatment, and there will be no discrimination with respect to any aspects of the employment relationship, such as recruitment and hiring, compensation (including wages and benefits), working conditions and terms of employment, access to training, job assignment, promotion, termination of employment or retirement, etc.	LOW RISK
7.7	Would this project involve sub-contracting?	LOW RISK	MODERATE RISK Take action to anticipate likely risk of perpetuating inequality and labour rights violations by introducing complementary measures. FAO projects involving sub-contracting should promote, to the extent possible, subcontracting to local entrepreneurs – particularly to rural women and youth – to maximize employment creation under decent working conditions. Also, FAO should monitor and eventually support contractors to fulfil the standards of performance and quality, taking into account national and international social and labour standards.	LOW RISK

		No	Yes	Comments
7.8	Would this project operate in a sector, area or value chain where producers and other agricultural workers are typically exposed to significant occupational and safety risks ²⁸ ?	LOW RISK	<p>MODERATE RISK</p> <p>Take action to anticipate likely OSH risks by introducing complementary provisions on OSH within the project. Project should ensure all workers' safety and health by adopting minimum OSH measures and contributing to improve capacities and mechanisms in place for OSH in informal agriculture and related occupations. For example, by undertaking a simple health and safety risk assessment, and supporting implementation of the identified risk control measures. Awareness raising and capacity development activities on the needed gender-responsive OSH measures should be included in project design to ensure workers' safety and health, including for informal workers. Complementary measures can include measures to reduce risks and protect workers, as well as children working or playing on the farm, such as alternatives to pesticides, improved handling and storage of pesticides, etc.</p> <p>Specific provisions for OSH for pregnant and breastfeeding women should be introduced. FAO will undertake periodic inspections and a multistakeholder mechanism for monitoring should be put in place.</p>	LOW RISK
7.9	Would this project provide or promote technologies or practices that pose occupational safety and health (OSH) risks for farmers, other rural workers or rural populations in general?	LOW RISK	<p>HIGH RISK</p> <p>A full environmental and social impact assessment is required.</p> <p>Please contact the ESM unit for further guidance.</p>	LOW RISK

²⁸Major OSH risks in agriculture include: dangerous machinery and tools; hazardous chemicals; toxic or allergenic agents; carcinogenic substances or agents; parasitic diseases; transmissible animal diseases; confined spaces; ergonomic hazards; extreme temperatures; and contact with dangerous and poisonous animals, reptiles and insects.

		No	Yes	Comments
7.10	Would this project foresee that children <u>below</u> the nationally-defined minimum employment age (usually 14 or 15 years old) will be involved in project-supported activities?	LOW RISK	CANNOT PROCEED	LOW RISK
7.11	Would this project foresee that children <u>above</u> the nationally-defined minimum employment age (usually 14 or 15 years old), but under the age of 18 will be involved in project-supported activities?	LOW RISK	<p>MODERATE RISK</p> <p>Take action to anticipate likely risk of engaging young people aged 14-17 in child labour²⁹ by changing design or introducing complementary measures.</p> <p>For children of 14 to 17 years, the possibility to complement education with skills-training and work is certainly important for facilitating their integration in the rural labour market. Yet, children under the age of 18 should not be engaged in work-related activities in connection with the project in a manner that is likely to be hazardous or interfere with their compulsory child's education or be harmful to the child's health, safety or morals. Where children under the age of 18 may be engaged in work-related activities in connection with the project, an appropriate risk assessment will be conducted, together with regular monitoring of health, working conditions and hours of work, in addition to the other requirement of this ESS. Specific protection measures should be undertaken to prevent any form of sexual harassment or exploitation at work place (including on the way to and from), particularly those more vulnerable, i.e. girls.</p>	LOW RISK
7.12	Would this project operate in a value chain where there have been reports of child labour?	LOW RISK	<p>HIGH RISK</p> <p>A full environmental and social impact assessment is required.</p>	LOW RISK

²⁹Child labour is defined as work that is inappropriate for a child's age, affects children's education, or is likely to harm their health, safety or morals. Child labour refers to working children below the nationally-defined minimum employment age, or children of any age engaging in hazardous work. Hazardous work is work that is likely to harm the health, safety or morals of a child. This work is dangerous or occurs under unhealthy conditions that could result in a child being killed, or injured and/or made ill as a consequence of poor health and safety standards and working arrangements. Some injuries or ill health may result in permanent disability. Countries that have ratified ILO Convention No.182 are obligated to develop National lists of hazardous child labour under Article 4.

		No	Yes	Comments
			Please contact the ESM unit for further guidance.	
7.13	Would this project operate in a value chain or sector where there have been reports of forced labour ³⁰ ?	LOW RISK	HIGH RISK A full environmental and social impact assessment is required. Please contact the ESM unit for further guidance.	LOW RISK

SAFEGUARD 8 GENDER EQUALITY

		No	Yes	Comments
8.1	Could this project risk reinforcing existing gender-based discrimination, by not taking into account the specific needs and priorities of women and girls?	LOW RISK	MODERATE RISK Take action to anticipate likely risk of perpetuating or reinforcing inequality by conducting a gender analysis to identify specific measures to avoid doing harm, provide equal opportunities to men and women, and promote the empowerment of women and girls.	LOW RISK
8.2	Could this project not target the different needs and priorities of women and men in terms of access to services, assets, resources, markets, and decent employment and decision-making?	LOW RISK	MODERATE RISK Take action to anticipate likely risk of socially unsustainable agriculture practices and food systems by conducting a gender analysis to identify the specific needs and priorities of men and women, and the constraints they may face to fully participate in or benefit from project activities, and design specific measures to ensure women and men have equitable access to productive resources and inputs.	LOW RISK

³⁰Forced labour is employed, consists of any work or service not voluntarily performed that is exacted from an individual under threat of force or penalty. It includes men, women and children in situations of debt bondage, suffering slavery-like conditions or who have been trafficked. "In many countries, agricultural work is largely informal, and legal protection of workers is weak. In South Asia, there is still evidence of bonded labour in agriculture, resulting in labour arrangements where landless workers are trapped into exploitative and coercive working conditions in exchange for a loan. The low wages associated with high interest rates make it quite difficult for whole families to escape this vicious circle. In Africa, the traditional forms of "vestiges of slavery" are still prevalent in some countries, leading to situations where whole families (adults and children, men and women) are forced to work the fields of landowners in exchange for food and housing. In Latin America, the case of workers recruited in poor areas and sent to work on plantations or in logging camps has been widely documented by national inspection services and other actors." (ILO, Profits and poverty: the economics of forced labour / International Labour Office. - Geneva: ILO, 2014)

SAFEGUARD 9 INDIGENOUS PEOPLES AND CULTURAL HERITAGE

		No	Yes	Comments
9.1	Are there <i>indigenous peoples</i> * living <i>outside the project area</i> ** where activities will take place? ³¹ ?	LOW RISK	GO TO NEXT QUESTION	LOW RISK
	9.1.1 Do the project activities influence the Indigenous Peoples living outside the project area?	LOW RISK	MODERATE RISK A Free, Prior and Informed Consent Process is required Project activities should outline actions to address and mitigate any potential impact Please contact the ESM/OPCA unit for further guidance.	LOW RISK
9.2	Are there indigenous peoples living in the project area where activities will take place?	LOW RISK	MODERATE RISK A Free Prior and Informed Consent process is required. If the project is for indigenous peoples , an Indigenous Peoples' Plan is required in addition to the Free Prior and Informed Consent process. Please contact the ESM/OPCA unit for further guidance. In cases where the project is for both, indigenous and non-indigenous peoples , an Indigenous Peoples' Plan will be required only if a substantial number of beneficiaries are Indigenous Peoples. project activities should outline actions to address and mitigate any potential impact. Please contact ESM/OPCA unit for further guidance. A Free, Prior and Informed Consent Process is required	MODERATE RISK A Free prior and informed consent process was carried out, see Annex 7 of the FP
9.3	Would this project adversely or seriously affect on indigenous peoples' rights, lands, natural	LOW RISK	HIGH RISK A full environmental and social impact assessment is required.	LOW RISK

*FAO considers the following criteria to identify indigenous peoples: priority in time with respect to occupation and use of a specific territory; the voluntary perpetuation of cultural distinctiveness (e.g. languages, laws and institutions); self-identification; an experience of subjugation, marginalization, dispossession, exclusion or discrimination (whether or not these conditions persist).

** The phrase "Outside the project area" should be read taking into consideration the likelihood of project activities to influence the livelihoods, land access and/or rights of Indigenous Peoples' irrespective of physical distance. In example: If an indigenous community is living 100 km away from a project area where fishing activities will affect the river yield which is also accessed by this community, then the user should answer "YES" to the question

		No	Yes	Comments
	<p>resources, territories, livelihoods, knowledge, social fabric, traditions, governance systems, and culture or heritage (<i>physical*</i> and <i>non-physical or intangible**</i>) inside and/or outside the project area?</p> <p><i>*Physical defined as movable or immovable objects, sites, structures, group of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic or other cultural significance located in urban or rural settings, ground, underground or underwater.</i></p> <p><i>**Non-physical or intangible defined as "the practices, representations, expressions, knowledge and skills as well as the instruments, objects, artifacts and cultural spaces associated therewith that communities, groups, and in some cases individuals, recognize as part of their spiritual and/or cultural heritage"</i></p>		Please contact the ESM unit for further guidance.	
9.4	Would this project be located in an area where cultural resources exist?	LOW RISK	<p>MODERATE RISK</p> <p>To preserve cultural resources (when existing in the project area) and to avoid their destruction or damage, due diligence must be undertaken to:</p> <p>a) Verify that provisions of the normative framework, which is usually under the oversight of a national institution responsible for protection of</p>	LOW RISK

		No	Yes	Comments
			<p>historical and archaeological sites/intangible cultural heritage; and b) through collaboration and communication with indigenous peoples' own governance institutions/leadership, verifying the probability of the existence of sites/ intangible cultural heritage that are significant to indigenous peoples.</p> <p>In cases where there is a high chance of encountering physical cultural resources, the bidding documents and contract for any civil works must refer to the need to include recovery of "chance findings" in line with national procedures and rules.</p>	