Meeting of the Board
16 – 19 March 2021
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Provisional agenda item 14

GCF/B.28/02/Add.15

23 February 2021

Consideration of funding proposals - Addendum XV

Funding proposal package for SAP023

Summary

This addendum contains the following six parts:

a) A funding proposal titled "River Restoration for Climate Change Adaptation (RIOS)";
b) No-objection letter issued by the national designated authority(ies) or focal point(s);
c) Secretariat's assessment;
d) Independent Technical Advisory Panel's assessment;
e) Response from the accredited entity to the independent Technical Advisory Panel's assessment; and
f) Gender documentation.

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Simplified Approval Process
Funding Proposal

Project/Programme title:	River Restoration for Climate Change Adaptation (RIOS).
Country(ies):	Mexico.
National Designated Authority(ies):	Ministry of Finance and Public Credit (SHCP).
Accredited Entity:	Fondo Mexicano para la Conservación de la Naturaleza A.C.
Date of first submission:	*2020/09/21 V.1*
Date of current submission/ version number	*2021/02/16 V.11*
If available, indicate GCF code:	*5daa4257ab532255faf557d1*

GREEN CLIMATE FUND

Contents

Section A **PROJECT / PROGRAMME SUMMARY**
This section highlights some of the project's or programme's information for ease of access and concise explanation of the funding proposal.

Section B **PROJECT / PROGRAMME DETAILS**
This section focuses on describing the context of the project/programme, providing details of the project/programme including components, outputs and activities, and implementation arrangements.

Section C **FINANCING INFORMATION**
This section explains the financial instrument(s) and amount of funding requested from the GCF as well as co-financing leveraged for the project/programme. It also includes justification for requesting GCF funding and exit strategy.

Section D **LOGIC FRAMEWORK, AND MONITORING, REPORTING AND EVALUATION**
This section includes the logic framework for the project/programme in accordance with the GCF Results Management Framework and Performance Measurement Framework, and gives an overview of the monitoring, reporting and evaluation arrangements for the proposed project/programme.

Section E **EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA**
This section provides an overview of the expected alignment of the projects/programme with the GCF investment criteria: impact potential, paradigm shift, sustainable development, needs of recipients, country ownership, and efficiency and effectiveness.

Section F **ANNEXES**
This section provides a list of mandatory documents that should be submitted with the funding proposal as well as optional documents and references as deemed necessary to supplement the information provided in the funding proposal.

Note to accredited entities on the use of the SAP funding proposal template

- The Simplified Approval Process Pilot Scheme (SAP) supports projects and programmes with a GCF contribution of up to USD 10 million with minimal to no environmental and social risks. Projects and programmes are eligible for SAP if they are ready for scaling up and have the potential for transformation, promoting a paradigm shift to low-emission and climate-resilient development.
- This template is for the SAP funding proposals and is different from the funding proposal template under the standard project and programme cycle. Distinctive features of the SAP funding proposal template are:
  - *Simpler documents*: key documents have been simplified, and presented in a single, up-front list;
  - *Fewer pages*: A shorter form with significantly fewer pages. The total length of funding proposals should **not exceed 20 pages,** annexes can be used to provide details as necessary;
  - *Easier form-filling*: fewer questions and clearer guidance allows more concise and succinct responses for each sub-section, avoiding duplication of information.
- Accredited entities can either directly incorporate information into this proposal, or provide summary information in the proposal with cross-reference to other funding proposal documents such as project appraisal document, pre-feasibility studies, term sheet, legal due diligence report, etc.
- Submitted SAP Pilot Scheme funding proposals will be disclosed simultaneously with submission to the Board, subject to the redaction of any information which may not be disclosed pursuant to the GCF Information Disclosure Policy.

Please submit the completed form to:

fundingproposal@gcfund.org

Please use the following name convention for the file name:

"SAP-FP-[Accredited Entity Short Name]-[yymmdd]"

A. PROJECT/PROGRAMME SUMMARY

A.1. Has this FP been submitted as a SAP CN before?			Yes ☒ No ☐		
A.2. Is the Environmental and Social Safeguards Category C or I-3?			Yes ☒ No ☐		
A.3. Project or programme	*Indicate whether this FP refers to a combination of several projects (programme) or one project.* ☒ Project ☐ Programme	**A.4. Public or private sector**	☒ Public sector ☐ Private sector	**A.5. RFP**	Choose an item.

A.6. Result area(s)	*Check the applicable GCF result area(s) that the proposed project/programme targets. Indicate for each checked result area(s) the estimated percentage of GCF budget devoted to it. The summed up percentage should be equal to 100%.* Mitigation: Reduced emissions from: ☐ Energy access and power generation: Enter number % ☐ Low emission transport: Enter number % ☐ Buildings, cities and industries and appliances: Enter number % ☒ Forestry and land use: 10 % Adaptation: Increased resilience of: ☒ Most vulnerable people and communities: 20 % ☐ Health and well-being, and food and water security: Enter number % ☐ Infrastructure and built environment: Enter number % ☒ Ecosystem and ecosystem services: 70 %

***A.a.*[1] Total investment (GCF + co-finance)**	Amount: _10,000,000__ USD	***A.a.1* Total GCF funding requested**	Amount:9,000,000____ USD
***A.b.* Type of financial instrument requested for the GCF funding**	*Mark all that apply.* ☒ Grant ☐ Loan[2] ☐ Equity ☐ Guarantees ☐ Others:		
A.7. Implementation period	5 years		
A.8. Total project/ programme lifespan	20 years	**A.9. Expected date of internal approval**	*12/2/2020*
A.10. Executing Entity information	Additional to the Fondo Mexicano para la Conservación de la Naturaleza A.C (FMCN), two non-profit Regional Funds (RF) will be Executing Entities: Gulf of Mexico Fund, A.C. (FGM) and Fondo Noroeste, A.C. (FONNOR). These RFs have gone through the due diligence evaluation that shows the that they have the capacity to execute the Project.		

A.11. Scalability and potential for transformation (Eligibility for SAP, max. 100 words)

This project focuses on activities in watershed-level connectivity derived from the experience of the GEF-financed "Coastal Basin Conservation in the Context of Climate Change" (C6), project and develops its potential to scale-up. This project is organically designed to scale-up outcomes sequentially, from the implementation of subprojects that will improve adaptive capacity in two watersheds (Component 1), to catalyze private and public climate finance and promote coordination at the regional level (Component 2) to the design of a National River Restoration Strategy with a climatic focus (Component 3).

A.12. Project/Programme rationale, objectives and approach (max. 300 words)

[1] This fields will be automatically calculated in the OSS system.
[2] Senior loans and subordinated loans.

Mexico is highly vulnerable to the effects of climate change, such as the increase in extreme events, which are affecting watersheds (floods, landslides, droughts), and the negative ecological, economic, and social impacts are expected to be exacerbated. The objective of RIOS is to increase adaptive capacity in watersheds vulnerable to climate change through river restoration and connectivity by: (i)conducting restoration, conservation and improved productive activities, implemented by local organizations in the states of Jalisco and Veracruz, (ii)increasing local monitoring capacities to reduce climate vulnerability, (iii)catalyzing public and private climate-smart investments; and (iv)supporting the development of climate policy in a National River Restoration Strategy.

The Project will operate in two regions highly affected by climate change due to the particular geography of the country, between two oceans and with mountain ranges along both coastal regions. The two selected watersheds are Jamapa in the state of Veracruz and Ameca-Mascota in the state of Jalisco. They are part of 16 basins selected in the recently-closed Global Environmental Facility (GEF) "C6 project", implemented between three federal institutions (the National Institute of Ecology and Climate Change, the National Forestry Commission, the National Protected Areas Commission) and FMCN during 2013-2019. The territorial approach of RIOS is based on watersheds, which are territories defined by a system of rivers. This watershed approach allows to work within natural systems and beyond political-administrative units to incorporate the interrelationships among rivers, the local environment, and the social context. The selected watersheds are across different administration units. The Ameca-Mascota watershed runs across the states of Jalisco and Nayarit and the Jamapa watershed across the states of Veracruz and Puebla. Nevertheless, the project´s target sub-basins are located within the same political-administrative unit corresponding to Veracruz and Jalisco.

In the selected coastal watersheds, vegetation that connects mountains to the sea provides important ecosystem services, which are key to address the impacts of climate change, mainly floods and landslides. Those impact exacerbates vulnerabilities in the region, mainly vulnerability of human settlements to flooding and to landslides, and vulnerability of extensive livestock and of fodder production to water stress.

Through a geo-hydrological perspective, RIOS will focus on increasing watershed connectivity through river restoration, which includes restoring soils and forests along rivers and in areas of hydrological importance. These activities will (i) reduce soil erosion to decrease sediments, improve water quality and diminish silting of watercourses; (ii) increase the time that water remains within the basin, decreasing the force and speed of runoff, as well as increasing infiltration; (iii) conserve soil for productive activities; (iv) moderate extreme temperature thanks to vegetation coverage. As a result of these Ecosystem-based adaptation (EbA) actions, RIOS aims to reduce vulnerability to the impacts of climate change, mainly by decreasing exposure to landslides, floods, and drought of humans and human assets. Likewise, the project seeks to increase the adaptive capacity of the population and ecosystem resilience as a key strategy in a country where two-thirds of the territory are mountains and therefore highly sensitive to climate change.

The current COVID-19 crisis poses additional challenges to climate and economic goals, but it is also an opportunity to build more sustainable, creative, inclusive and resilient systems. RIOS Project will support the national post-COVID 19 recovery, by supporting the improvement of livelihoods, mainly of the most vulnerable ones.

B. PROJECT/PROGRAMME DETAILS

B.1. Context and baseline (max. 500 words)

1. Mexico

a) Emissions from, and drivers of, deforestation, land-use, and river degradation

The sixth assessment special report of the Intergovernmental Panel on Climate Change (IPCC, 2018) determined that the observed global mean surface temperature (GMST) was 0.87˚C for the decade 2006-2015, higher than the average over the 1850-1900 period. Thus, the rate of warming in the past 50 years is nearly twice that in the past 100 years, largely attributed to anthropogenic influences due to the increase in greenhouse gas emissions (GHG).

Climate models project robust differences in regional climate characteristics between present-day and global warming of 1.5°C and 2°C. These differences include increases in mean temperature in most land and ocean regions, hot extremes, heavy precipitation, and the probability of drought and precipitation deficits. Trends in intensity and frequency of some climate and weather extremes have also been detected over time spans during which about 0.5°C of global warming occurred. Climate-related risks for natural and human systems depend on the magnitude and rate of warming, geographic location, levels of development and vulnerability, and on the choices and implementation of adaptation and mitigation options.

Mexico updated its National GHG Inventory in 2015 for the 6th National Communication to the United Nations Framework Convention on Climate (UNFCCC). Direct GHG emissions, without considering absorptions, reached 700 million tons of CO_2 equivalent ($MtCO_2e$) (SEMANRNAT-INECC, 2018; Figure 1), of which vehicle transportation contributes the most (22.8%), followed by electricity generation (20.3%), livestock (10.1%), and waste emissions (6.6%). Between 1990 and 2015, total GHG emissions increased by 57% at an average annual growth rate (AAGR) of 1.8%. However, deceleration has been observed in recent years: from 2005 to 2010 emissions grew 12.9% with an AAGR of 2.5%, whereas from 2010 to 2015 emissions increased by 5% with an AAGR of 0.9%. Emissions per capita were 3.7 metric tons of CO_2eq in 2015, which is below the world average of 4.4 metric tons of CO_2eq.

Based on historical information in Mexico and in the world, and in a scenario of inaction, an increase in the average temperature by 1.0°C could reduce the growth of national GDP per capita between 0.77 and 1.76 percent. Therefore, for 2014-2030, the economic costs of inaction for Mexico would be around 143 billion dollars. However, the implementation of 30 Nationally Determined Contribution (NDC) measures in eight sectors of the economy could be of around 126 billion dollars. This implies that 17 billion dollars could be saved with the implementation of appropriate mitigation and adaptation actions (SEMARNAT and INECC, 2018).

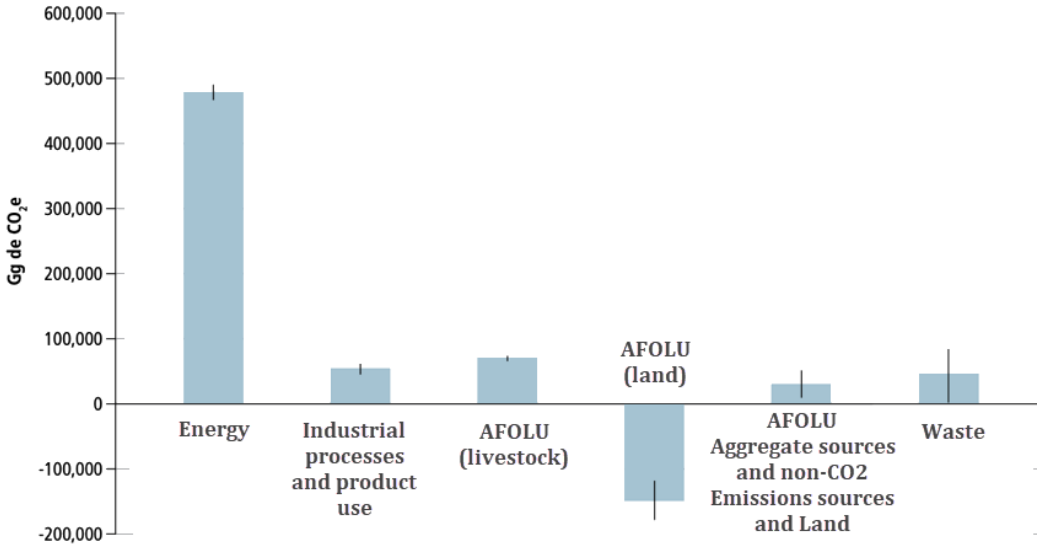


Figure 1. Mexico´s 2015 net emissions by sector (uncertainty depicted as a vertical line in each bar). Source: SEMARNAT and INECC, 2018.

Mexico has 162.1 million hectares of forest covering 82.3% of the country. Over the last decade, an estimated 3.5 to 5.5 million hectares have been lost, contributing to habitat fragmentation, loss of ecosystem services, and forest livelihoods, as well as climate change (Goldstein et al., 2016). The major drivers of deforestation are land-use

change for agriculture and livestock (82%), illegal logging (8%), forest fire and disease (6%), and other causes as hurricanes and natural disasters (2%). In 2015, the Agriculture, Forestry, and Other Land Use (AFOLU) sector presented a balance of -46,286.57 Gg of CO2eq. From these emissions, aggregate sources and non-carbon emission sources corresponded to 31,491.90 Gg of CO2eq (63.19%), followed by livestock with 70,567.60 Gg of CO2eq (4.78%), and Land by -148,346.07 Gg of CO2e (19.46%) (SEMARNAT-INECC, 2018).

Rivers act as a natural source of GHG that can be released from the metabolisms of aquatic organisms. It is estimated that the CO_2 emissions from global streams and rivers are 1.8 ± 0.25 Pg C yr-1, while the size of inland water CH_4 and N_2O evasions were 26.8 Tg C yr-1 and 1.26 Tg N yr-1, respectively (Ho et al., 2020). Anthropogenic activities can largely alter the chemical composition and microbial communities of rivers, consequently affecting their GHG emissions. Ho et al. (2020) observed in Ecuador a clear pattern between water quality and GHG emissions in which the more polluted the sites were, the higher were their emissions. When river water quality deteriorated from acceptable to very heavily polluted, their global warming potential (GWP) increased by ten times. Compared to the average estimated emissions from global streams, rivers with polluted water released almost double the estimated GWP while the proportion increased to ten times for very heavily polluted rivers. Conversely, the GWP of good-water-quality rivers was half of the estimated GWP. Furthermore, surrounding land-use types (i.e., agriculture) significantly affected river emissions. The GWP of the sites close to urban areas was four-time higher than the GWP of the nature sites, while this proportion for the sites close to agricultural areas was double. Dissolved oxygen, ammonium, and flow characteristics were the main important factors on GHG emissions identified. These results highlight the impacts of land-use types on river emissions via water contamination by sewage discharges and surface runoff. Hence, to estimate the emissions from streams, both their quantity and water quality should be included.

In Mexico, over half of the watersheds have degraded rivers, and 68% of riparian corridors in Mexico present a medium, high or very high degradation state (Garrido et al. 2010). This is related to the pressures of land use change caused by the deterioration in territorial suitability for agricultural and livestock activities, caused by climate change; this leads to deterioration of the hydrological cycle and soils. Arévalo-Mejía et al. (2020) used the index of hydrological alteration in rivers (IAHRIS) to identify modifications in the components of their hydrological regimes. They identified 232 undisturbed basins (18% of the country's surface area), 554 altered basins (49% of the country's surface area) and 364 with lack of data (33% of the country's surface area). Furthermore, 70% of rivers suffer from some degree of pollution, especially from sewage discharges from large cities and industries. Of the 14,290 million m^3 per year (453 m^3/s) of wastewater produced, only 48.4% is treated (6,920 million m^3/year, 219.3 m^3/s) (CONAGUA, 2018). The largest flows of municipal wastewater were generated by the State of Mexico, Mexico City, Jalisco, Veracruz, and Nuevo Leon, which together contributed around 40% of the national volume generated. It is estimated that in 2015 the economic cost of pollution caused by untreated wastewater was 57,403 million pesos, equivalent to 0.3% of the gross domestic product (FCEA, 2017). Analysis of CH_4 emissions in 2010 resulted in 68.5% of emissions being contributed by untreated water and its discharge to receiving bodies (Ramírez and Vázquez, 2010).

River restoration has the potential to support ecosystems and communities to better cope with climatic events. River restoration refers to ecological, physical, and management measures and practices aimed at enhancing and rehabilitating the functioning of the river system in support of ecosystem services. Many successful river restoration measures have been reported, which support improvements to ecosystem services (Lago, 2014). Some common goals of river restoration are to improve water quality, re-establish river type-specific habitats and ecosystem functioning, aid in species recoveries, and maintain the provision of ecosystem services (Lago, 2014). Riparian vegetation corridors regulate processes that result in valuable ecosystem services such as uptake, infiltration, and retention of sediments and contaminants from human activities (González et al., 2013). In the face of climate change, riparian ecosystems will be subject to an increase in air and surface water temperatures, alterations in the magnitude and seasonality of precipitation and run-off, and shifts in reproductive phenology and distribution of plants and animals (Seavy et al., 2009).

b) Climate context (historic and projected climate change)

Like other countries, Mexico is already facing the impacts of climate change to which is highly vulnerable. Its geographical location between two oceans, complex topography and hydrological network, and its social and economic characteristics make it particularly fragile to major damage by extreme hydro-meteorological events, such as tropical cyclones, floods, landslides, and droughts to mention a few that have produced high human, economic, and social losses. According to the International Disaster Database, Mexico has registered 259 natural disasters from 1900 to 2017, from which 80% were related to hydro-meteorological phenomena, with impacts that include 11,350 lost lives, 16 million people affected, and costs of around 38,000 million dollars. For Mexico's

Gulf Coast, the economic impact of damages from tropical cyclones is projected to be $80 billion–$103 billion dollars between 2021 and 2025 (Curry et al., 2009). Table 1 shows the hydro-meteorological phenomena impacts in Mexico during 2018.

Table 1. Hydro-meteorological phenomena damages occurred in Mexico in 2018. Source: CENAPRED, 2019.

Phenomenon	Casualties	Population affected (persons)	Homes damaged	Schools damaged	Hospitals damaged	Economic units affected	Total damages (million dollars)	Percentage from total disasters
Hydro-meteorological	108	702,554	72,863	1,217	21	1,604	667	84.4

Climate trends in Mexico indicate that the average, mean annual maximum, and minimum temperatures have increased by 0.21°C per decade between 1970-2015, the annual average of hots days and hot nights have augmented 9.9% and 5.6% respectively between 1960-2003, the mean annual rainfall has increased 7 mm per decade over 1960-2015, the proportion of rainfall that occurred in heavy events have augmented by 1.2% per decade on average from 1960-2003, coastal areas have experienced an estimated 1.8 to 2.4 mm per year increase in mean sea level over 1955 to 2003, and the frequency and intensity of major hurricanes (categories 3, 4, and 5) have boosted from 1970-2009 (USAID, 2017). Accordingly, the economic impacts associated with the rise in extreme events have augmented from an annual average of 730 million pesos in 1980-1998 to 23,383.09 million for 1999-2015 (CENAPRED, 2016).

One of the main effects of climate change in Mexico is expected to be alteration of the regional thermo-hydrological cycle, accompanied by changes in runoff, as well as in water availability and storage (Mendoza et al., 1997). Núñez-González (2020) found that precipitation in Mexico in the period 1960-2010 has decreased in most of the territory, showing a seasonal distribution, concerning the annual total, of 7.1% in spring, 54% in summer, 29.3% in autumn, and 8.8% in winter. The central and coastal regions of the Gulf of Mexico (rainy areas) have shown a significant decrease of 1% of total annual precipitation. National Institute of Ecology and Climate Change studies report, based on the results of the regionalized climate change scenarios for Mexico, that a reduction in the average natural availability of water would be expected, which would be affected by greater evapotranspiration, as well as by the decrease of its quality.

This geographic vulnerability is intensified by the degree of exposure of the population, infrastructure, and productive activities in Mexico. In rural areas, extreme temperatures and erratic rainfall drastically affect agricultural productivity, including both crops and livestock. Since 1990, agriculture has accounted for 80% of weather-related financial losses in the country (USAID, 2017). Coastal tourism, an important economic sector for Mexico, is also at risk. One of the biggest insurance losses in Latin American history was Hurricane Wilma in 2005, which damaged 287 hotels and eroded the beaches in Cancun, resulting in $1.8 billion in costs (SEGOB-CENAPRED, 2006).

According to the INECC (2016), 480 municipalities from 13 states of Mexico are the most vulnerable to climate change, which represents 20% of the total municipalities at the national level. In Veracruz, 29% of its 212 municipalities hold a high degree of vulnerability to climate change, while 10% of the 125 existing municipalities in Jalisco are considered the most exposed.

RIOS will work in two watersheds strongly affected by climate change: in the Pacific Ocean within the Mascota-Ameca watershed located in Jalisco and in the Gulf of Mexico within the Jamapa watershed situated in Veracruz (Figure 2). Both were part of the 16 basins selected in the project "Coastal Basin Conservation in the Context of Climate Change" (C6) run from 2013 to 2019 by three federal institutions (the National Institute of Ecology and Climate Change, the National Forestry Commission, and the National Commission for Protected Areas) and FMCN, which was financed by the Global Environment Facility (GEF). These watersheds were selected through a multi-criteria analysis based on the following principles:

1. **High environmental sensitivity and exposure to extreme rain events.** These watersheds are characterized by a high altitudinal gradient (the Jamapa watershed holds the highest mountain in Mexico and reaches the ocean), which results in pronounced slopes and rapid response rivers. Therefore, they are

highly sensitive to the loss of vegetation cover, resulting in an increase in runoff, soil erosion, and a decrease of infiltration.

2. **High present and future vulnerability to the effects of climate change.** According to the National Atlas of Vulnerability to Climate Change (ANVCC) (INECC, 2019), all the municipalities in the watersheds have at least one of the vulnerabilities evaluated, classified as very high or high, and under the Global Circulation Models (GCMs) the vulnerability will increase in the future.
3. **High social reliance on ecosystem services**. Both watersheds provide ecosystem services to large human settlements located in the lower part of the basins and support important productive activities in the agricultural, industrial, tourism, and commercial sectors. Downstream cities consist of one of the main touristic centers in Mexico (Puerto Vallarta in Jalisco) and the principal commercial maritime area (Puerto Veracruz, in Veracruz).
4. **Existent knowledge and experience**. The two watersheds developed Integrated Watershed Action Plans (IWAP) during the C6 project, which were widely consulted with key stakeholders and identified areas and activities required to conserve and restore ecosystem services (soil retention and water yield). The IWAPs will be updated under the co-financed project CONECTA.
5. **Strong local capacities**. The C6 project supported the creation and strengthening of two regional funds by FMCN. They have been key in developing the social fabric of these watersheds through linking networks of civil society organizations with local governments and academia.

For further information on the methodology for selecting the project´s target areas, refer to Chapter 1 of the Pre-feasibility study.

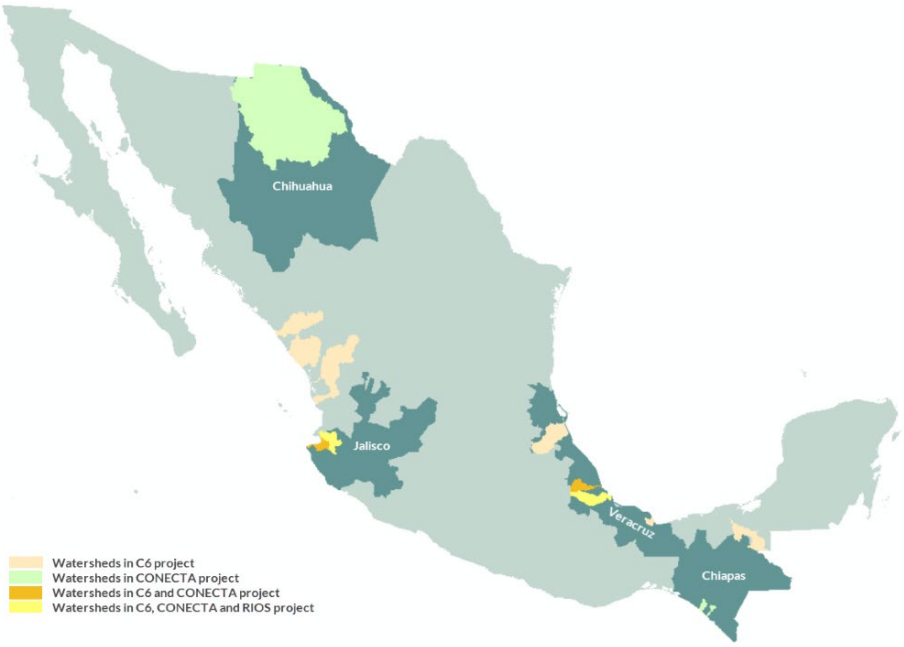


Figure 2. Location of RIOS target watersheds, showing the geographical overlaps with the C6 and CONECTA projects. Source: own elaboration.

2. The Ameca-Mascota watershed and the Talpa-Mascota sub-basin in Jalisco

a) Emissions from deforestation and degradation

In 2014, Jalisco emitted 28,447 Gg of CO_2e (SEMADET, 2018; Table 2). These emissions come mainly from transport, industry, and commercial and residential sectors. The Agriculture, Forestry, and Other Land Use (AFOLU) total emissions (including stays) equaled 5,465 Gg of CO_2e. The main source of emissions of the AFOLU category was livestock, which contributed 65% (3,571 Gg CO_2e) and, in second place, aggregate sources and sources of NO-CO_2 emissions on earth with 26% (1,437 Gg CO_2e). The livestock emissions were mainly derived from pigs and cattle (95% of the enteric fermentation subcategory).

Table 2. GHG emissions in Jalisco by type of gas source in CO_2 eq in2014. Source: SEMADET, 2018.

Gg CO_2e			
CO_2	**CH_4**	**N_2O**	**Total emissions**
18,898.44	7,029.72	2,519.00	28,447.28

Jalisco ranks second nationally in loss of forest area. From 1993-2012, 522,031 hectares were lost while over 493,000 hectares were degraded (CONAFOR, 2016). In the coastal basins of Jalisco, deforestation and degradation reached their highest between 1993 and 2002, when 240,910 hectares of temperate forests and tropical forests were deforested, of which 60% (146,000 ha) were tropical forests (CONAFOR, 2016). From the deforested area, 65% (156,591.50 ha) was secondary vegetation, so deforestation in tropical forests occurs mainly on degraded vegetation. Deforestation in temperate forests comprised a total of 94,430 hectares; 60.9% (57,464 ha) were primary forests and 39.1% (36,966 ha) secondary forests. Most temperate forest loss involved deciduous oak forests.

Jalisco is highly vulnerable to the impacts of climate change. Its extension of 351 km of coastline on the Pacific Ocean exposes it every year from May to November to tropical storms and hurricanes. Tropical cyclones have caused unprecedented flooding in Jalisco since 1970 (SEMADET, 2018; Figure 3). Landslides are also frequent. There are records of at least 92 historical events of mass removal processes, mostly caused by the intensity and duration of heavy rainfall associated with extraordinary weather events (Muñiz-Jauregui & Hernández-Madrigal, 2012). Jalisco is also struggling with the temperatures throughout its territory. Phenomena such as El Niño or the Southern Oscillation (ENSO) are part of the natural variability, which causes fires and droughts (Cerano-Paredes et al., 2015).

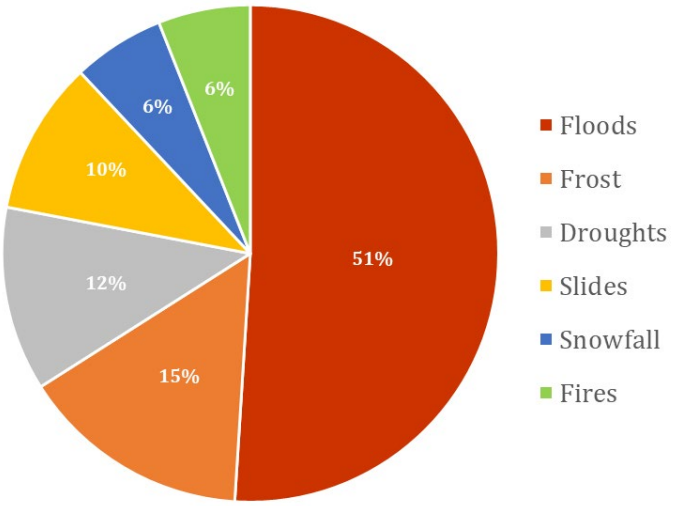


Figure 3. Most frequent climate-related phenomena in Jalisco since 1970. Source: SEMADET, 2018.

b) Status of ecosystem and ecosystem services

The Ameca-Mascota watershed is located on the slope of the tropical Pacific Ocean, within the physiographic province of the Sierra Madre del Sur and the municipalities of Mascota and Talpa de Allende in Jalisco. It covers an area of about 274,229 hectares, dominated by mountains with an altitude gradient between 0 and 2,700 meters above sea level (Figure 4) and in which coniferous forests (35%), broadleaf forests (24%), deciduous and sub-deciduous forests (22%), cropland, pasture, and grassland areas (19%), as well as human settlements (1%), share the landscape (INEGI, 2014). The region is considered a priority terrestrial site for the conservation of ecosystem services (in particular, hydrological services) and biodiversity according to the National Commission for the Knowledge and Use of Biodiversity (CONABIO) due to its ecosystem diversity and species richness.

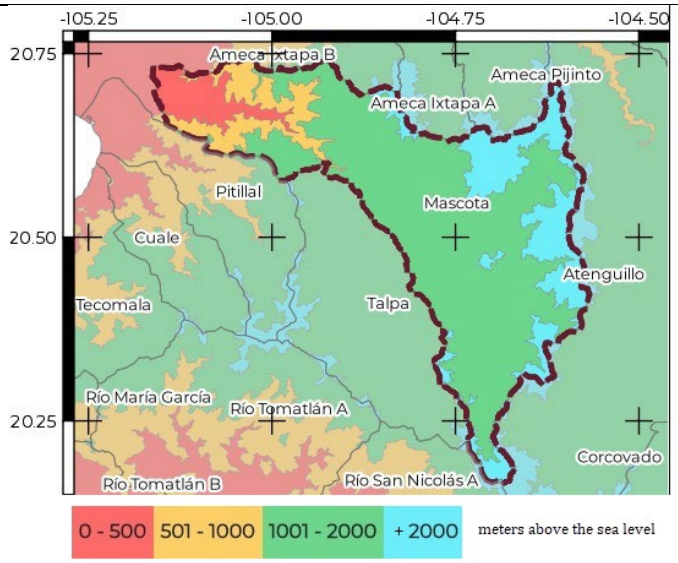


Figure 4. Altitudinal gradient in the Ameca-Mascota watershed. Source: INECC, 2019.

The main riverbed in the basin extends 143 km, from the source of the Mascota River to its connection with the Ameca River on the border of the municipality of Puerto Vallarta, for its subsequent discharge into the sea. The annual average temperature is 19.7°C, ranging between 9.1°C and 31.6°C. The annual average precipitation is 1,220 mm, with July, August, and September being the months that concentrate most of the yearly precipitation. The National Water Commission (CONAGUA) estimates that the average annual natural runoff is 408.78 Mm^3 per year, from an average annual volume of rainfall of 3,633.6 Mm^3, a runoff coefficient of 10 to 20%, and an estimated surplus of 471.7 Mm^3, consequently the hydrological balance is favorable (SEMADET, 2016).

According to the Official Journal of the Federation (DOF, 2018), the Ameca-Mascota watershed has an annual volume of extraction of 385.2 Mm^3 under concession, an annual volume of recharge of 119.9 Mm^3, and availability of 1,962.28 Mm^3 per year. Around 67% of the volume of surface water in the concession is for agricultural use (Table 3).

Table 3. Different water uses identified for four watersheds in the region, in which the Ameca-Mascota watershed is located.

Source	Use	Volume (m^3)
Surface water	Agricultural and ranching use	37,269,101
	Urban public use	17,152,578
	Services use	1,202,665
Ground water	Agricultural and ranching use	11,578,866
	Urban public use	45,982,402
	Industrial use	362,471
	Services use	11,855,083

The Ameca-Mascota watershed is divided into 34 interconnected sub-basins, of which 16 are emitting, 17 are receiving-emitting and one is drainage or outlet (IWAP Vallarta Region, 2018). The emitting basins are those located in the upper parts, where the first mountain runoff is formed. The receptor-emitting basins are those that connect the headwater areas with the middle and lower parts of the basin, where the economic activities with the highest water demand are located. The drainage or outlet is where the river meets the sea. This classification makes it possible to identify the relationship between them.

Among the 34 sub-basins is the Talpa-Mascota sub-basin (Figure 5), where RIOS activities will be carried out. It has a total surface area of 22,702 hectares and is located in the municipalities of Mascota (33%) and Talpa de Allende (67%). The sub-basin is mainly covered by natural vegetation with 7,872 ha of forests and 5,798 ha of

secondary vegetation, followed by agriculture (5,702 ha) and grasslands (2,938 ha). The main features for the Talpa-Mascota sub-basin are described in Table 4.

Figure 5. Talpa-Mascota sub-basin (green outline and stripes) within the Ameca-Mascota watershed (yellow contour). Source: own elaboration.

Table 4. Main features of the Talpa-Mascota sub-basin. Source: INEGI-Water Flow Simulator of Watersheds (SIATL), CONAGUA-National Water Information System (SINA), DOF, 2016, and DOF, 2020.

Characteristics	Talpa-Mascota sub-basin
Type	Exoreic
Total Discharge (Main Drain)	1
Maximum elevation (m)	2,740
Minimum elevation (m)	860
Average slope (%)	48.4
Main current length (m)	62,559
Main Current Slope (%)	2.156
Main current sinuosity	1.352
Average length of surface flow (km)	0.075
Drainage density	3.3461
Coefficient of compactness	1.5988
Average annual volume availability of surface water (hm^3)	10.065
Average annual volume of natural runoff (hm^3)	70.826
Average annual volume of runoff from the upstream basin (hm^3)	0
Number of surface water extraction titles currently registered in the REPDA	38
Annual volume of surface water extraction through titles currently registered in the REPDA (hm^3)	0.348
Number of groundwater extraction titles currently registered in the REPDA	64

Annual volume of groundwater extraction through titles currently registered in the REPDA (hm^3)	58
Annual volume corresponding to reserves, ecological flow, and regulated areas (hm^3)	0
Annual volume of returns (hm^3)	0.131
Annual volume of imports (hm^3)	0
Annual volume of exports (hm^3)	0
Average annual volume of storage variation in reservoirs (hm^3)	0
Average annual volume of runoff from the basin downstream (hm^3)	70.153
Current annual volume committed downstream (hm^3)	60.088

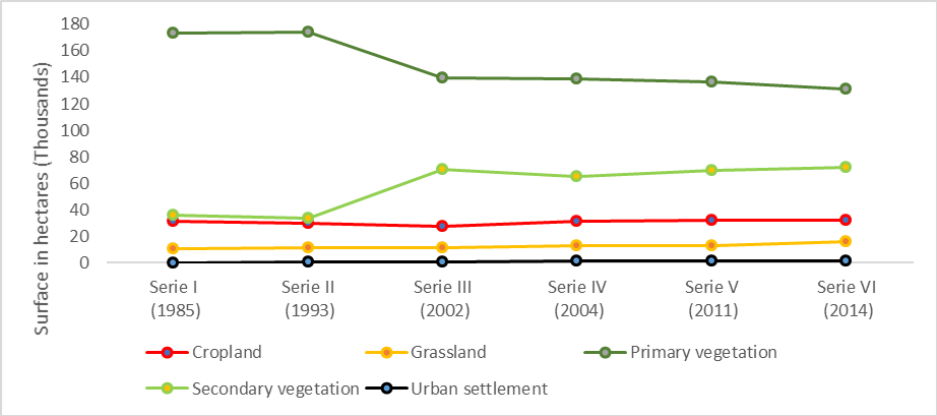
Agricultural activities cluster in three main valleys. One in the upper part around the town of Talpa de Allende, one in the middle part in the municipalities of Mascota and San Sebastian del Oeste, and the other in the delta of the Ameca River, where the national irrigation district 043 (DNR 043) is located. This district provides water for about 42,000 hectares and 7,000 users (Téllez and Delgado, 2011), demanding around 69% of the total concession volume of surface water and nearly 21% of the groundwater. The main products grown are corn, wheat, beans, coffee, sorghum, guava, alfalfa, barley, potato, peas, green bell pepper, avocado, peach, lime, lemon, and chickpeas, corn, and oat for fodder

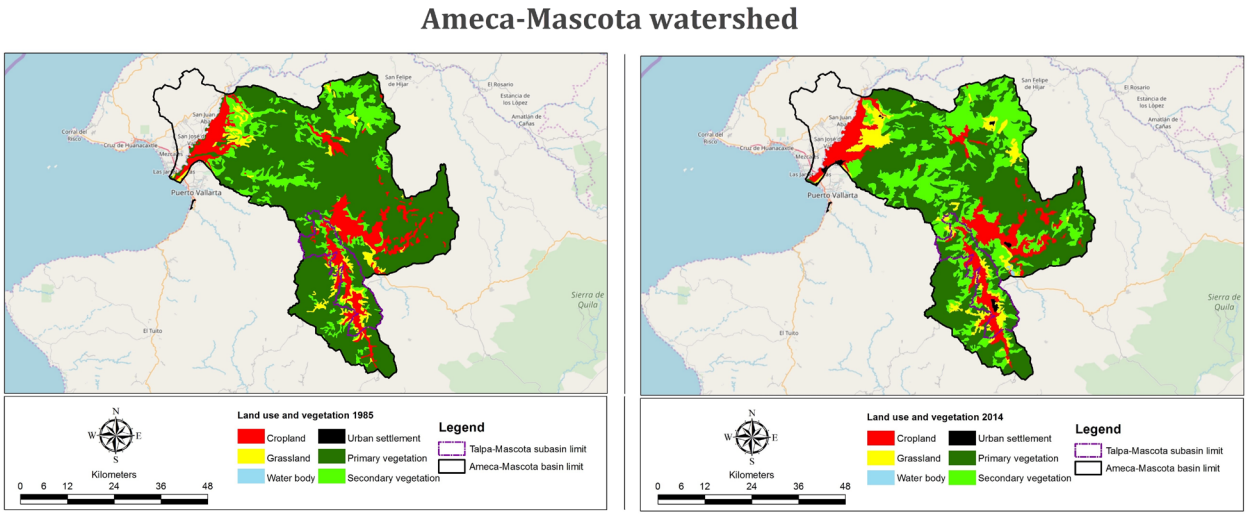
In the upper part of the watershed within the mountainous areas, forestry activities predominate within pine, oak, and fir forests through small-scale community-based forestry enterprises. The potential in this sector is quite important, especially in terms of the volume of extraction and the number of operating sawmills for the transformation of the raw material lumber. In the middle part of the basin, there is significant extensive livestock farming, while in the lower and coastal areas, tourism is developed, in particular at Puerto Vallarta, which receives more than four million tourists per year with an average consumption of water of approximately 500 liters/day/tourist (SECTUR, 2015). Hence, Puerto Vallarta´s total water demand is 61 Mm3/year (CONAGUA, 2014), of which 74% comes from underground sources and 26% from surface sources.

There are three wastewater treatment plants located in the Mascota, San Sebastian del Oeste, and Talpa de Allende municipalities. The most outstanding hydraulic work in the basin is the Corrinchis dam, located in the municipality of Mascota, with a capacity of 40,500,000 m^3 that irrigates a surface of approximately 4,000 hectares (SPP, 1981). In the upper part of the Ameca-Mascota watershed, there is a dam located on the Mascota River, upstream of the target sub-basin. It has a total capacity of 29 million m3 and a useful capacity of 16.5 million m3. It is mainly used for flood control and the irrigation of 2,500 hectares of crops during the dry season (SINA, sf). In the lower basin, there is a water board to protect population centers and the agricultural fields of the irrigation district 043.The total population in the Ameca-Mascota watershed encompasses 28,655 inhabitants distributed in 3,120 km^2, about nine inhabitants/km^2, which will be part of the indirect beneficiaries of the project. Over 37% of the population is considered economically active, mainly dedicated to primary activities, mainly agriculture and livestock, and tertiary sector activities such as tourism (INEGI, 2010). In the municipalities, there are 33 ejidos and agrarian communities, in which only 10.8% of the total watershed´s population has social property rights owning 139,180 hectares of land (INEGI, 2007). Poverty remains a feature of the social landscape of this watershed. Around 51% of the population lives in poverty, and about 54% has an income below the threshold of well-being (CONEVAL, 2010). The Talpa-Mascota sub-basin comprises a total population of 10,851 inhabitants distributed in 30 localities, which will be the direct beneficiaries of the RIOS project. 39% comprise the economically active population occupied in agriculture and traditional and nature-based tourism. Religious tourism in the municipality of Talpa is another significant business activity, with around 3,000,000 visitors per year. Further information on the watershed´s population can be found in Chapter 1 of the Pre-feasibility study.

The Ameca-Mascota watershed has been historically affected by deforestation and forest degradation due to land-use change for agriculture. Between 1985-2014, 35,715 hectares of primary forest were lost (Figure 6). The annual rate of land-use change between 1993 and 2011 was 0.28%. 87% of the decline occurred between 1993 and 2002, when secondary vegetation area increased. Although the primary vegetation coverage remained stable from 2004-2011, a slight decrease occurred in 2011-2014. While forested areas diminished, the surface occupied by urban

settlements increased from none to 1,150 hectares (1985-2014), as well as grasslands areas from 10,630 hectares in 1980 to 15,460 hectares in 2014, which represents an increase of 45%. In the Talpa-Mascota sub-basin, the process of fragmentation of primary vegetation is notorious.





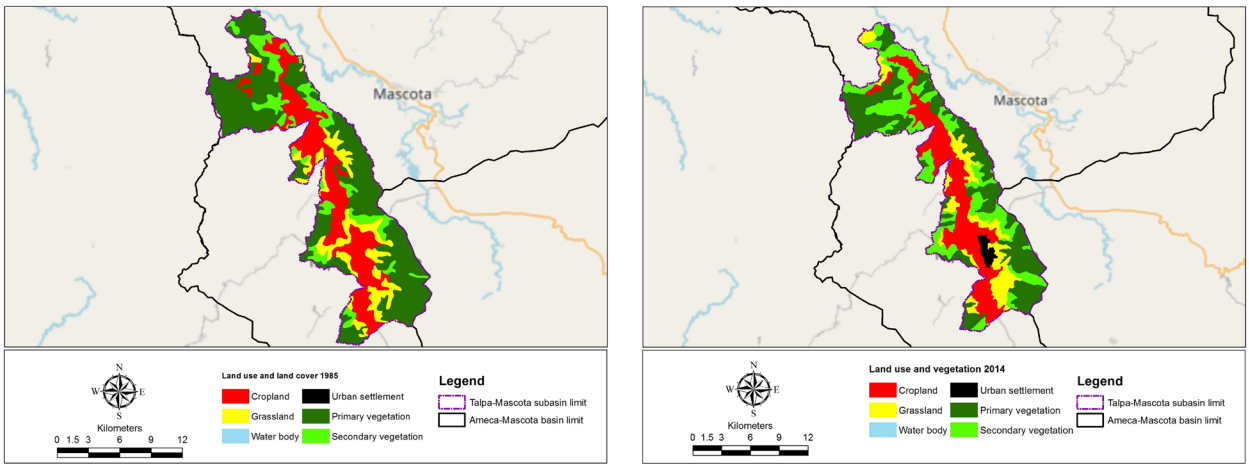


Figure 6. Land-use change in the Ameca-Mascota watershed and Talpa-Mascota sub-basin. Source: own elaboration using data from INEGI´s Land-use and vegetation chart Series I (1985), II (1993), III (2002), IV (2004), V (2011), and VI (2014).

The traditional hillside agricultural systems have been transformed toward more extensive farming practices, reducing the fallow period, and increasing the use of agrochemicals, soil degradation, and wildfires. The expansion

of livestock has also been a significant cause of land-use change and degradation of forests in the last 40 years. The bovine production system is extensive. During the rainy season, ranchers rely on fodder obtained from free grazing in the diverse ecosystems. During the dry season, an essential part of the forage used to cover the cattle nutritional deficiencies is obtained from food supplement and induced pastures established in the production units by removing tropical deciduous and broad-leaved forests. The inadequate management of rangelands and cattle, combined with a strong water deficit of more than six months, declines the productivity and produces soil compaction. Other factors that encourage deforestation and forest degradation in the area are the lack of competitiveness of sustainable forestry activities; illegal logging; deficiency of local technical accompaniment; insufficient planning instruments to align public and private investments; frequency and intensity of extreme hydro-meteorological events; weakened territorial governance, among others. River degradation processes associated with land-use change, loss of vegetation, erosive processes, and pollution are present throughout the entire Ameca-Mascota watershed, including the Talpa-Mascota sub-basin, being greater in the lower parts of the watersheds. Nevertheless, the potential for erosion occurs mostly in the middle and upper areas. Detailed information on the degradation conditions in the targeted watershed can be found in Chapter 1 of the Pre-feasibility study.

c) Climate context (historic and projected climate change)

According to SEMADET´s analysis (2018), the Ameca-Mascota watershed and the Talpa-Mascota sub-basin, where RIOS activities will be carried out, are located within the Hydrological Region 14-C Ameca-Ixtapa. This region is considered as highly vulnerable to climate change based on the results of the scenarios according to the exposure, potential impacts, and climate agenda, including changes in the RCP 8.5 scenario and variables such as deforestation, urban sprawl, pollution, disease vector-transmitted, migration, and marginalization. The RCP 8.5 scenario in the near future showed that the maximum temperature will reach 34°C in locations such as Bonus Vallarta, Los Socorros, Los Guayabos, and Ixtapa. In the same way, the high parts of the basin will present a marked difference compared to the middle and low basin, since they can reach 20°C to 10°C. The minimum temperature will reach between 8 and 9°C in Zacamecate, Juanacatlán Grande, Juanacatlán Chico, El Cabrito, and Ixtololo. The precipitation will present a decrease of up to 44% in localities like Salvador Callejas, El Guayabo, Getsemaní, and El Palmar de Rivera.

According to the National Atlas of Vulnerability to Climate Change (ANVCC) (INECC, 2019), climate change scenarios in the near future project a temperature increase that ranges from 0.5 to 4.5C, and precipitation around +20mm change. Under this scenario, the Ameca-Mascota watershed presents vulnerability of human settlements to flooding (vhsf) and landslides (vhsl), extensive livestock farming exposed to flooding (velff) and water stress (elfws), and forage production exposed to water stress (fpws) (INECC, 2018) (Figure 7). Climate change projections show that all these vulnerabilities will increase for 2030. Chapter 1 of the Pre-Feasibility study describes details of the climate change vulnerability assessment in the region.

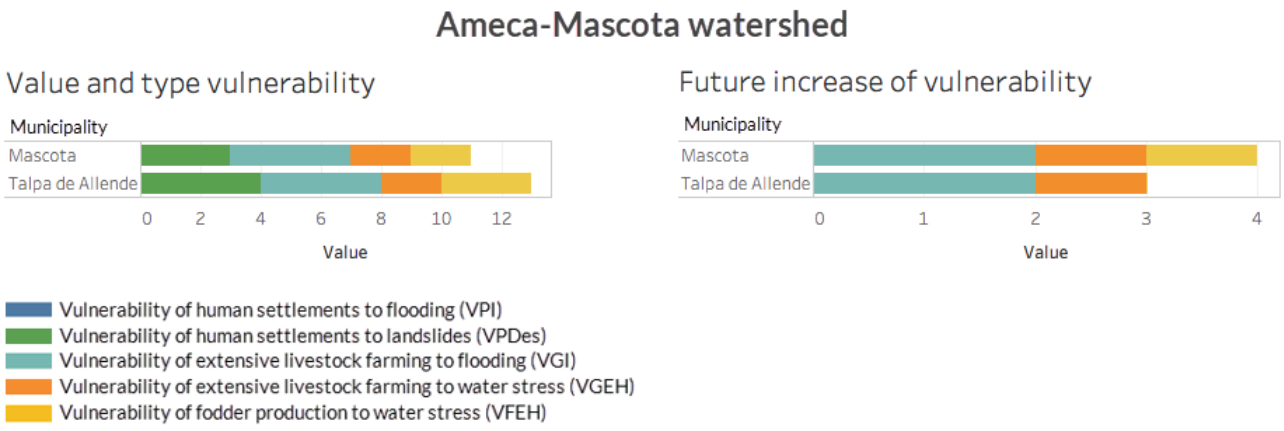


Figure 7. Number (value) and variety (type) of current vulnerabilities (left) identified in the Ameca-Mascota´s municipalities and their future projection (right) according to the four global circulation models (GCM: CNRMC-M5, GFDL-CM3, HADGEM2-ES, and MPI-ESM-LR, RCP 8.5) for the period 2015-2039, measured according to INECC´s vulnerability index. Source: INNEC, 2018.

We analyzed National Meteorological Service (SMN's) stations in the project area. SMN daily climatological network is composed of 5,238 stations distributed throughout the country. These stations record daily values of maximum and minimum temperature and precipitation. We identified twenty stations in the area of influence of the project basins, ten in each region. Of these, the three stations with the best data were selected for each region.

Stations selected for detailed analysis for the Ameca-Mascota watershed

Station	Location	Altitude (masl)
14096 Mascota (SMN)	20.50° Lat. -104.78 Lon.	1230
14044 El Bramador	20.31° Lat. -105.04 Lon.	1074
14081 La Desembocada	20.72° Lat. -105.20 Lon.	19

The observed data the three stations comprised around 30 years of data for each station. The main parameters analyzed with observed data were:

Average temperature. The average temperature is one of the most-cited indicators of global climate. The global surface temperature is based on air temperature data over land and sea-surface temperatures. An increase in seasonal temperature increases seasonal water stress. The water demand also increases during periods of hot weather, causing a reduced water supply and pressure in many areas. This stress damages crops and livestock which reduces the livelihoods of local communities.

High and low temperatures. One-way climate changes can be assessed is by measuring the frequency of events considered "extreme" (among the minimum and maximum of temperature). Many extreme temperature conditions are becoming more common. The rise in water temperature during heat waves also contributes to the degradation of water quality and negatively impacts water ecosystems. The extreme temperatures (both high and low) damages crops and livestock which reduces the livelihoods of local communities.

Average precipitation. A decrease in rainfall augments the risk of more frequent, intense, and prolonged droughts under climate change. In this scenario, evaporation exceeds water absorption and soil moisture reduces, affecting areas dependent on rain-fed agriculture and causing decreased crop production and livestock to perish. Thus, a reduction in food supply or income and water quantity and quality is expected to occur. An increase in precipitation mainly upstream affects the speed of runoff, increasing soil erosion, loosing soil nutrients and generating flooding downstream.

Extreme precipitation. Extreme precipitation is expected to intensify with global warming over large parts of the globe as the concentration of atmospheric water vapor that supplies the water for precipitation increases in proportion to the saturation concentrations at a rate of about 6–7% per degree rise in temperature. The most immediate impact of heavy precipitation is the prospect of flooding. Heavy rainfall also increases the risk of landslides, when above-normal rain raises the water table and saturates the ground, causing slopes to lose their stability. Excessive rainfall can also degrade water quality, dragging the soil, sediments, and pollutants like pesticides, nitrogen, and phosphorus, which end up in lakes and streams, damaging aquatic ecosystems and lowering water quality for human uses.

Hurricanes. Hurricanes are a natural part of our climate system. However, an increase in hurricane activity and intensity may have catastrophic human and ecosystem outcomes. In the future, there may not necessarily be more hurricanes, but there will likely be more intense hurricanes that carry higher wind speeds and more precipitation as a result of global warming. Hurricanes usually cause heavy storms, unleashing severe landslides, floods, and a range of post-hurricane ecological consequences, threatening infrastructure, undermining energy systems, water and sewer systems, transportation, and posing a significant risk to public health and human lives.

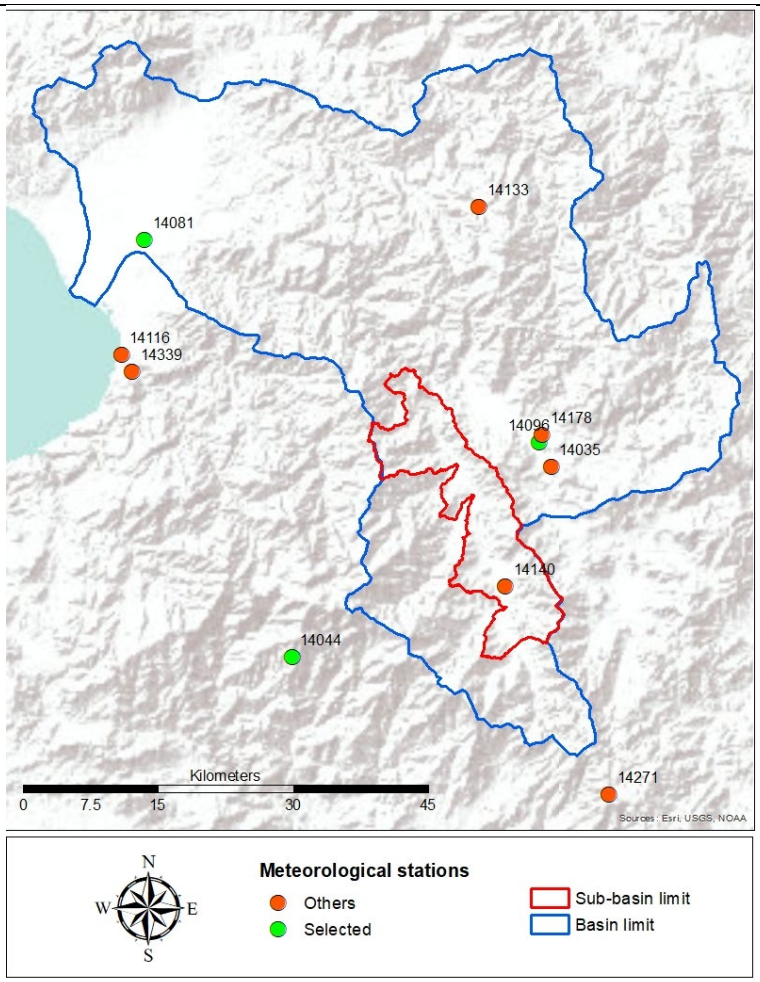


Figure 8. Distribution of meteorological stations in the municipalities with influence in the Ameca-Mascota watershed.

The main observed trends in Ameca spring-summer (SS) and autumn-winter (AW) are (see Chapter 1 PFS for a calculations):

Basin/part of the basin	Mean temperature SS and AW		Max temperature (SS) Min temperature (AW)		Mean precipitation SS and AW		Extreme precipitation (days 95% higher precipitation)	Hurricanes
Ameca								
Higher - Mascota	0 (+)	-	+	-	+	+	+	Increase in magnitude and number of events
Middle – Bramador	+	+	+	-	+	-		
Lower – Desembocada	+	+	+	-	+	-		

The increase in maximum and extreme temperatures and the decrease of precipitation could intensify the evapotranspiration and have a negative effect on infiltration, augmenting water stress in the vegetation, which in turn could produce changes in the floristic composition and affect climate-dependent ecosystems. Álvarez-Pérez et al. (2020) found that in the protected area La Primavera and its influence area, where vegetation (pine, oak, and tropical deciduous forests) and climatic conditions are similar to those of the Talpa-Mascota sub-basin, of the total average rainwater (904.3 mm/year) that falls in the area, 4.6% drains, 62.1% evaporates, and 33.3% infiltrate. In the RCP 4.5 scenario, the average annual precipitation will decrease to 871 mm by 2050, where 10.6% runoff, 63.8% evapotranspiration, and 25.6% infiltration are expected. In the RCP 8.5 scenario, runoff will reach 10.1%,

evapotranspiration 64.6%, and 25.3% infiltration. Infiltration is up to 28.1% higher in areas with more than 75% of forest cover.

In the study "Impacts of climate change on Mexican soils" published by PNUD-INECC (2016), the Potential Evapotranspiration (PET) was estimated using the Penman's method modified by Monteith (Sys et al., 1991). Databases of average monthly temperature, cloudiness to estimate hours of sunshine, relative humidity, and wind speed, which define the PET, were generated in each Area of Climate Influence (AIC). To define the average annual isotherms, the method described by Gómez et al. (2008) was used, generating simple linear regression models for the different areas of thermal variation in the country, based on the analysis of temperature behavior related to the height of the terrain, as temperature variation and altitudinal range are influenced by the geographic position and humidity conditions of the different regions of the country. The results of this evaluation showed that in the Ameca-Mascota watershed, an increase in potential evapotranspiration is expected in the future (Figure 9).

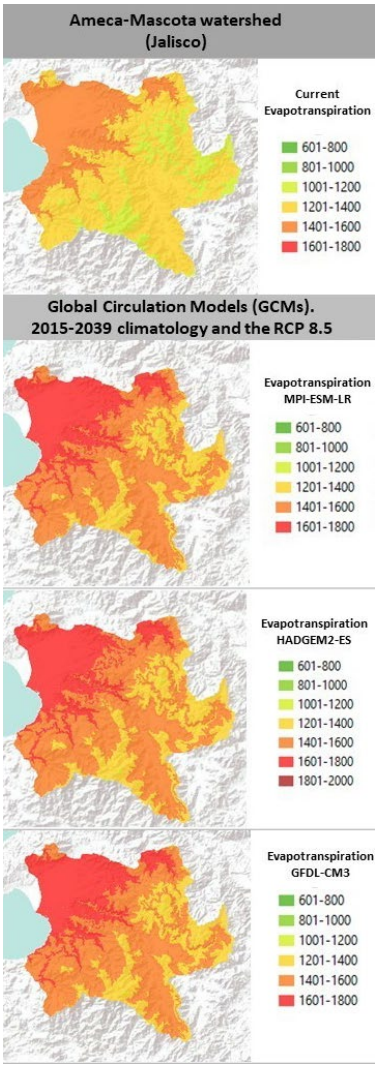


Figure 9. Behavior of potential soil evapotranspiration for the Ameca-Mascota basin under the global circulation models. Source: PNUD-INECC, 2016.

The UNAM´s Institute of Geography and INECC (PNUD-INECC, 2016) analyzed the impact of climate change in different bioclimatic zones of Mexico, based on sampling data from the National Forest and Soil Inventory and 19 bioclimatic variables. They modeled the current distribution of five vegetation groups and the climate projections using three General Circulation Models GCM for the period 2075-2099 and radiative forcing of 8.5 w/m2. For the Ameca-Mascota watershed, they found that the bioclimatic conditions at the end of the century will favor the development of dry and broadleaf forests while affecting the distribution of coniferous forests and rainforests (Figure 10). Hence, only 33% and 44% of the current area of coniferous forests will conserve their bioclimatic

conditions under climate change scenarios, and between 51% and 60% of the current area of broadleaf forests will change their bioclimatic conditions favoring their growth.

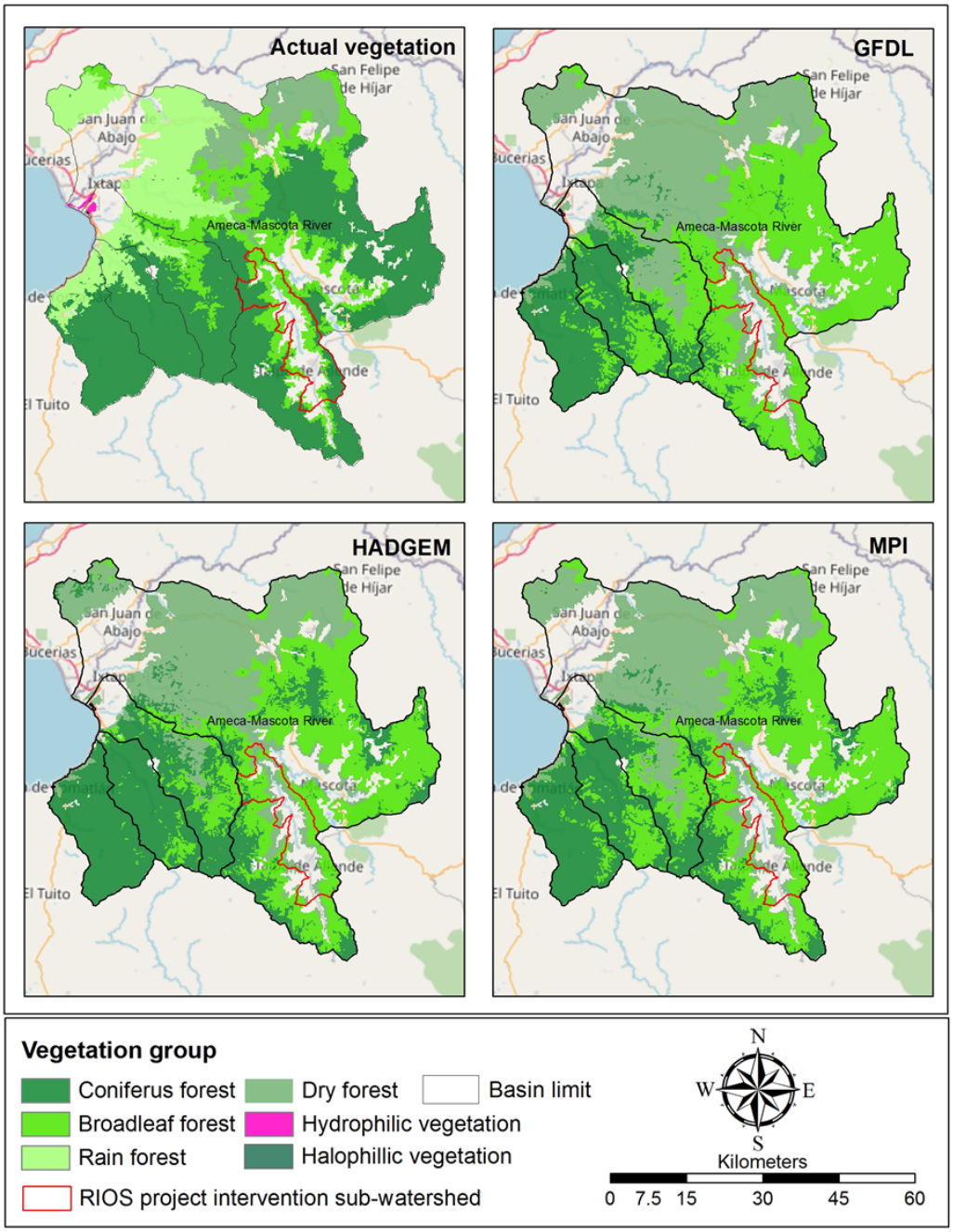


Figure 10. Changes in bioclimatic conditions and distribution of vegetation under climate change scenarios for the Ameca-Mascota watershed and other important basins in the region. Source: PNUD-INECC, 2016.

Besides, data indicate that the Ameca-Mascota watershed possesses one of the highest frequency of tropical storms and hurricanes in the whole state, whose torrential rains lead the river levels to rise, causing flooding, soil erosion, and landslides. For example, in the Bahía Banderas region, 70,121 hectares (4.3% of the total territory) have been identified as presenting high susceptibility to landslides, endangering 227 rural communities and 35 urban localities (Rivera et al., 2020). Muñiz-Jauregui and Hernández-Madrigal (2012) identify that 68.9% of the surface of the mountain system that surrounds Puerto Vallarta presents a medium to very high susceptibility to mass removal events. The instability of slopes is caused by lithology, cleared areas, slopes on roads, distance to geological

faults and fractures, insolation, water flow concentration, and the presence of human settlements (Muñiz-Jauregui, 2009).

From 1999 to 2018, 46 disaster declarations were issued. The cost for the attention of these declarations was 383 million pesos (around USD$20 million), provided by the National Center for the Prevention of Disasters (CENAPRED) and the Natural Disasters Fund (FONDEN) to shield the economic and social losses. Table 5 shows the damages caused from 2000-2015 by hydro-meteorological events in the region.

Table 5. Hydro-meteorological phenomena damages occurred in the Ameca-Mascota watershed from 2000-2015. Source: INECC, 2019.

Phenomenon	Population affected (persons)	Homes damaged	Schools damaged	Hospitals damaged	Crops and pastures ruined (ha)	Total damages (million dollars)	Percentage from total disasters
Hydrometeorological	291,357	3,350	227	24	21,216	20.2	95

3. The Jamapa watershed and the Jam28-Ixcatla, Jam31-Tlamatoca, and Jam33-Matlaluca-Medellín sub-basins in Veracruz

a) Emissions from deforestation and degradation

In 2008, Veracruz emitted over 51,557,361 Gg of CO_2e (Welsh et al., 2015; Table 6). The sector that contributed the most were energy, livestock production, and the oil and gas industry.

Table 6. GHG emissions in Veracruz by type of gas source in CO_2e in 2008. Source: Welsh et al., 2015.

Gg CO_2e			
CO_2	CH_4	N_2O	Total emissions
50,773,741	604,652	178,968	51,557,361

Veracruz is located in the eastern part of Mexico. The state is exceptionally vulnerable to climate change impacts, particularly to extreme hydro-meteorological phenomena due to its geographical location along the Gulf of Mexico. It has large altitude variations: lands near the coast are flat and low, but, as distance increases from the coast, it rises up above 3,000 meters over sea level. These altitude differences produce a great diversity of climates, although about 84% of the state has a warm, humid, and sub-humid climate. These conditions are favorable for agriculture, especially for coffee plantations. Still, most of the agricultural and livestock production systems are highly vulnerable to the impacts of climate change, since they are based on monoculture and extensive cattle raising.

Veracruz is an area of high rainfall, with the largest volume of surface water discharged into the sea by its rivers. Nevertheless, currently, Veracruz has less average precipitation than two decades ago (PECCUV, 2019). In the mountains, more rain falls in a shorter time, producing strong runoffs that drag the soil and form rivers of mud, leaving the soils in the upper basin unprotected and diminishing water quality. In 2013, the Federal Government issued a statement of natural disaster for thirteen municipalities due to the occurrence of landslides, since the damages reported from mass removal processes in Veracruz increased almost five times over the previous year (PECCUV, 2019). In the lower parts of the basins, droughts have accentuated and are frequent. The cold fronts and heat waves are more pronounced and long-lasting. On the coast, there has been a rise in the sea level of about nine centimeters in 50 years (PECCUV, 2019).

Climate change scenarios for Veracruz predict a thermal increase between 1.5°C and 2°C for 2030 (PECCUV, 2019). By 2050, projections estimate an increase in the average temperature of 2°C and a decrease in precipitation of around 5%, exacerbating low water availability during the dry season and the intensity of floods in the rainy season.

b) Status of ecosystem and ecosystem services

The Jamapa watershed is located in the mountains of the Sierra Madre Oriental and runs toward the Gulf of Mexico, covering an area of 3,918 km^2 and within 31 municipalities in Veracruz. Its altitude gradient is between 0 and 5,670 meters above sea level (Figure 11), along which natural vegetation of 19 different kinds of plant associations locate. The most widespread is the secondary vegetation of low deciduous forest, pine forest, and mountain cloud forest (14%), followed by cropland (57%), livestock (25%), as well as urban areas and human settlements (1%) (INEGI, 2014).

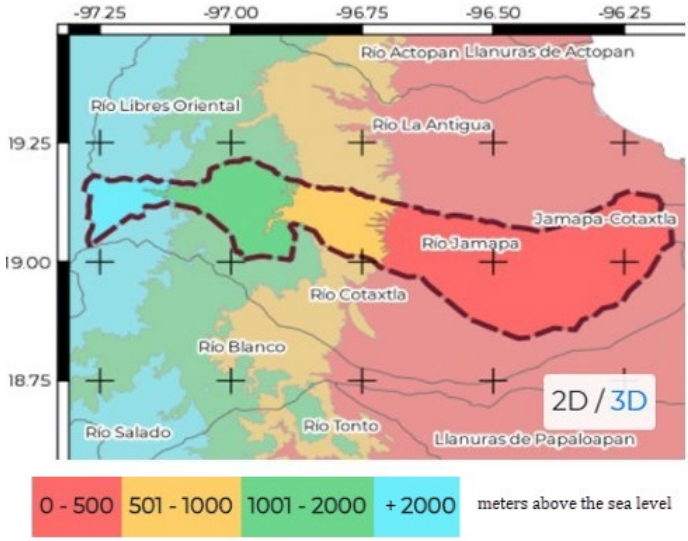


Figure 11. Altitudinal gradient in the Jamapa watershed. Source: INECC, 2019.

The watershed consists of two main watercourses, the Jamapa River in the northern section of the basin and the Cotaxtla River in the southern section. Both rivers are fed by meltwater from the highest mountain in Mexico, the Pico de Orizaba, and join 20 km before their mouth in the Gulf of Mexico. The annual average temperature is 22.9°C, ranging between 4.9°C and 26.4°C. The average yearly rainfall is 1,541 mm (CONAGUA, 2014), with the highest rainfall occurring from June to September. CONAGUA estimates that the mean annual natural surface runoff is 2,136 Mm^3 per year and a runoff coefficient of 10 to 20% (DOF, 2016).

According to the Public Registry of Water Rights (REPDA; CONAGUA, 2014), the Jamapa watershed has an annual volume of extraction of 880 Mm^3, mainly 88.1% under concession for agricultural use (Table 7), and an annual volume of recharge of 594 Mm^3. Thus, the basin is considered as having water availability since it is estimated that 1,849 Mm^3/year reaches the sea. 170 Mm^3 are considered to be a committed natural discharge and 185 Mm^3 are extracted. Although the basin has water availability, the Cotaxtla aquifer is considered unavailable, with a deficit of 14.41 Mm^3/year (CONAGUA,2018).

Table 7. Annual volume of surface water granted per use in the Jamapa watershed. Source: INECC-FGM, 2018.

Use	Agricultural	Industrial	Public-Urban	Livestock	Other	Services	Domestic
Volume (m^3/year)	21,005,717	14,714,459	12,738,577	957,366	24,178	9,422	9,042

The Jamapa watershed is divided into 38 sub-basins, among which three priority sub-basins have been selected for RIOS as the project´s target areas: Jam28-Ixcatla, Jam31-Tlamatoca, and Jam33-Matlaluca-Medellín (Figure 12). The sub-basins have a total surface area of 36,309 hectares, mainly covered by agriculture (24,256 ha), followed by grasslands (9,179 ha), and natural vegetation of secondary rainforest (790 ha) and cloud and oak-pine forests (252 ha). For further information on the methodology for selecting the project´s target sub-basins, refer to Chapter 1 of the Pre-feasibility study. The main features for the Jamapa watershed are described in Table 8.

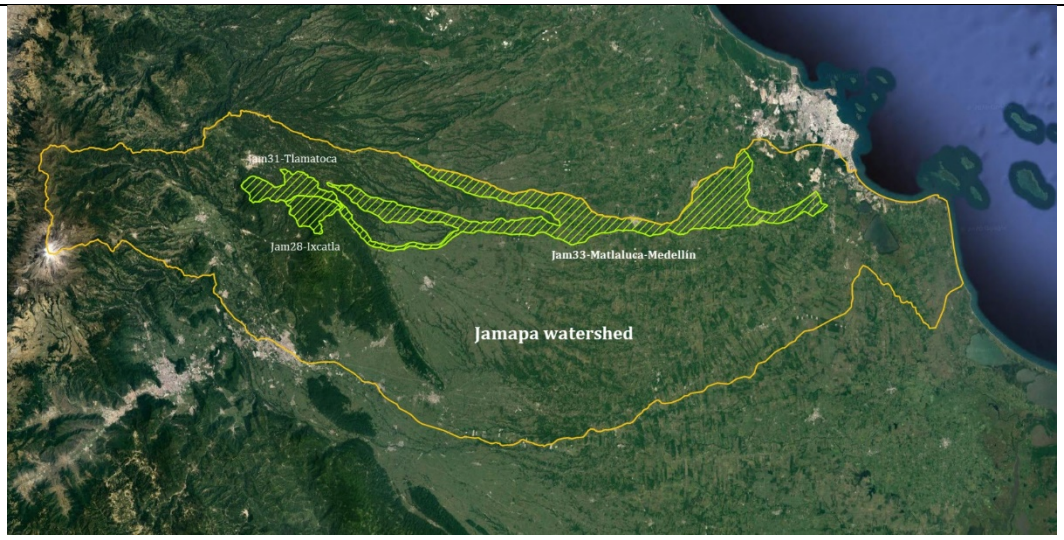


Figure 72. Jamapa sub-basins (green outline and stripes) within the Jamapa watershed (yellow contour). Source: own elaboration.

Table 8. Main features of the Jamapa watershed. Source: INEGI-Water Flow Simulator of Watersheds (SIATL), CONAGUA-National Water Information System (SINA), DOF, 2016, and DOF, 2020.

Characteristics	Jamapa Watershed
Type	Exoreic
Total Discharge (Main Drain)	7
Maximum elevation (m)	5,600
Minimum elevation (m)	0
Average slope (%)	16.81
Main current length (m)	214,509
Main Current Slope (%)	2.05
Main current sinuosity	1.744
Average length of surface flow (km)	0.177
Drainage density	1.4137
Coefficient of compactness	2.4166
Average annual volume availability of surface water (hm^3)	137.5
Average annual volume of natural runoff (hm^3)	588.9
Average annual volume of runoff from the upstream basin (hm^3)	0
Number of surface water extraction titles currently registered in the REPDA	1,066
Annual volume of surface water extraction through titles currently registered in the REPDA (hm^3)	178.3
Number of groundwater extraction titles currently registered in the REPDA	3,031
Annual volume of groundwater extraction through titles currently registered in the REPDA (hm^3)	115.60
Annual volume corresponding to reserves, ecological flow, and regulated areas (hm^3)	107.6

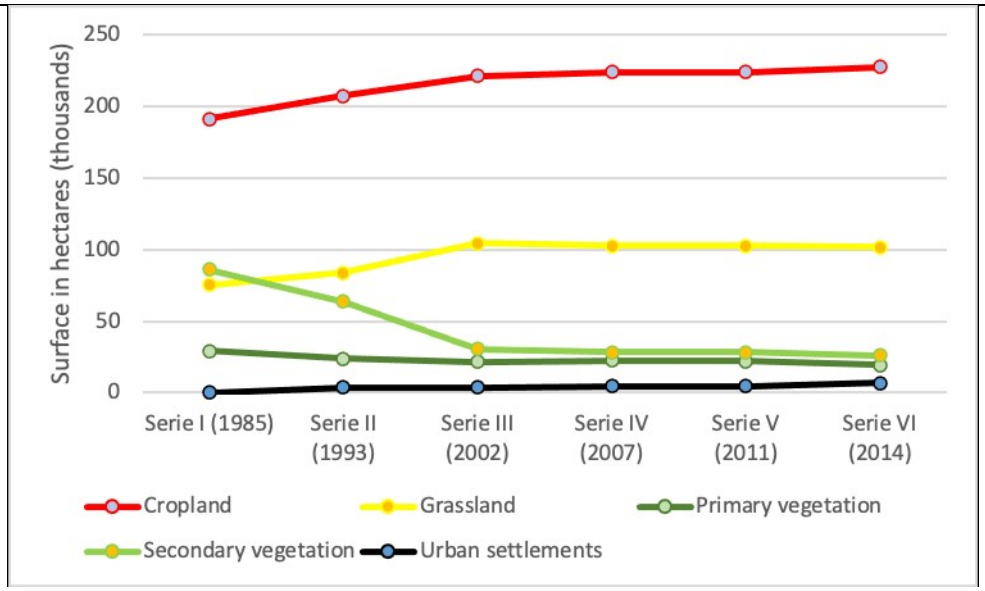
Annual volume of returns (hm^3)	107.6
Annual volume of imports (hm^3)	0
Annual volume of exports (hm^3)	0
Average annual volume of storage variation in reservoirs (hm^3)	0
Average annual volume of runoff from the basin downstream (hm^3)	518.1
Current annual volume committed downstream (hm^3)	380.6

The upper part of the Jamapa watershed is characterized by its well-conserved natural vegetation, which provides essential environmental services, in particular hydrological services, for 29 urban settlements and more than 1,600 rural communities (INECC-FGM, 2018). Agricultural activities dominate the middle part, including rain-fed crops of coffee, corn, sugarcane, bean, chayote, avocado, and fruit trees (e.g., mango, banana, and citrus fruits), as well as extensive livestock. Small, extensive, and inefficient family production-units, that mainly serve local markets or for own consumption, keep further expanding into the upper watershed, exacerbating environmental degradation. The lower part of the watershed supports urban, industrial, commercial, and tourist activities. It is where the metropolitan area of Veracruz is located, including its port, which has the greatest maritime commercial activity in the country and where land-use has been modified to urban and commercial use (INECC-FGM, 2018).

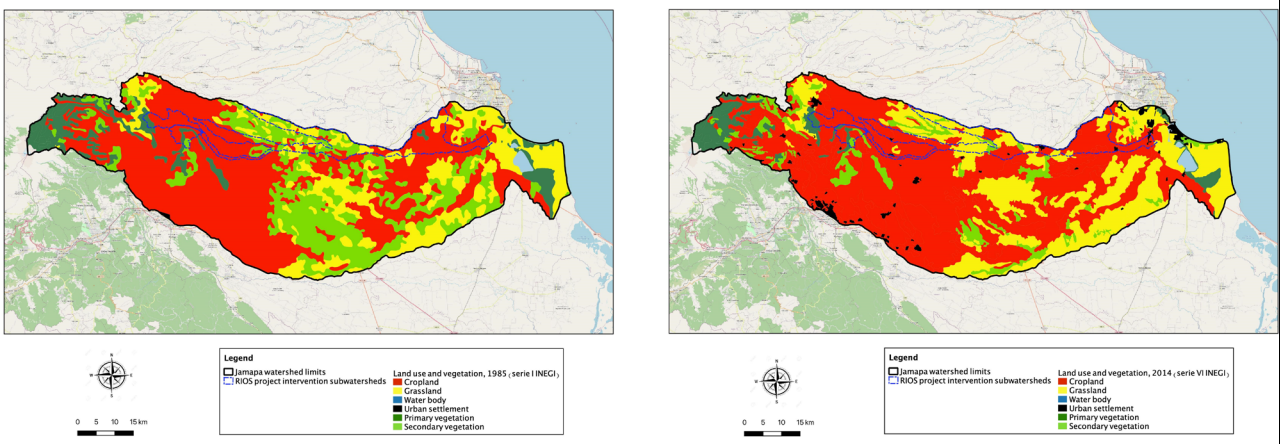
In the upper part of the Jamapa watershed is located the Santa Anita diversion dam, which supplies the El Potrero irrigation system. Currently, there is the Veracruz-El Tejar aqueduct, which carries water from the place called El Tejar, on the Jamapa River, to the city of Veracruz for domestic use (Pereyra and Pérez, 2006). There are also 30 storage dams in the municipalities of Paso del Macho, Camarón de Tejeda, Soledad de Doblado, and Comapa, and 507 wells and 188 norias in the rest of the basin (DOF, 2015). All these infrastructures were installed to store small volumes of water, especially for the dry season.

The total population in the watershed includes 821,949 inhabitants distributed in 2,848 km^2, around 289 inhabitants/km^2 (INECGI, 2010), 44.9% urban and 55.1% rural, which will be part of the indirect beneficiaries of the project. 38% of the population is considered economically active, mainly in the primary sector, mainly agriculture and livestock (INECC-FGM, 2018). In the target municipalities, there are 193 ejidos and agrarian communities, in which only 2.2% of the total watershed´s population has social property rights owning 111,846.4 hectares of land (INEGI, 2007). Thus, the atomization and small landholdings in the social ownership deepens the dangers of land overexploitation, soil erosion, and unsustainable use. Poverty remains a feature of the social landscape of these watersheds. Around 42% of the population lives in poverty, and 48% has an income below the well-being threshold (CONEVAL, 2010). There are eight municipalities in Veracruz with high and very high marginalization and social deprivation, representing the population's deficit and deprivation concerning the satisfaction of some basic needs and constitutional rights, such as access to decent housing (Constitutional Article 4), to elementary education (Constitutional Article 3) and to a wage sufficient to fulfill the average needs of a family (Constitutional Article 123). The Jamapa sub-basins comprise a total population of 52,522 inhabitants distributed in 129 rural towns and four urban localities, which will be the direct beneficiaries of the RIOS project. 38% are the economically active population occupied in agriculture and cattle ranching. Further information on the watershed´s population can be found in Chapter 1 of the Pre-feasibility study.

The Jamapa watershed loss of natural vegetation is due to land-use changes promoted by livestock and agriculture (Figure 13). In 1985, agriculture occupied 49.8% of the watershed, 30% was primary and secondary vegetation, and livestock held almost 20% of the surface. Thirty years later, in 2014, the agricultural land increased 36,207 hectares (9.4%), followed by grasslands with 26,431 hectares (6.9%). The highest transformation occurred between 1985-2002. Urban areas in 1985 covered 220 hectares, but 35 years later, they multiplied 30 times (6,727 ha). This growth affected the primary and secondary vegetation, which contracted by 69,557 hectares (18%). 90% of the loss occurred between 1985 and 2002. Since 2002, primary and secondary vegetation loss has continued at a slower rate. The annual rate of vegetation loss between 1993 and 2011 was 3.23%. In the three target sub-basins, the greatest change is observed in their middle part, where secondary vegetation has been converted to agricultural areas and pastures.



Jamapa watershed



Jamapa sub-basins

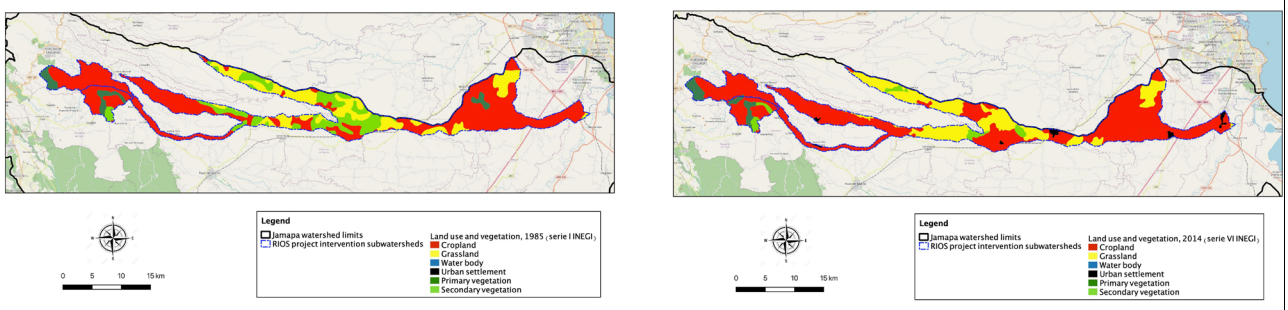


Figure 8. Land-use change in the Jamapa watershed. Source: own elaboration using data from INEGI´s Land-use and vegetation chart Series I (1985), II (1993), III (2002), IV (2004, V (2011) and VI (2014).

During the last century, public subsidies promoted the transformation of forests into pastures to release pressure from populated areas. Territories were turned into small units of extensive and inefficient cattle ranching. High use of agrochemicals resulted in land degradation and loss of ecosystem services. Ranching keeps further expanding into upper watersheds, exacerbating the environmental degradation. Climate change is contributing to

this upward migration since regions to grow high-quality pastures are now found at higher elevations where the cloud forest is found. River degradation processes associated with land-use change, loss of vegetation, erosive processes, and sediments are present throughout the entire Jamapa watershed, including the three sub-basins, being greater in the lower parts of the watersheds. Nevertheless, the potential for erosion occurs mostly in the middle and upper areas. Detailed information on the degradation conditions in the targeted watershed can be found in Chapter 1 of the Pre-feasibility study.

c) Climate context (historic and projected climate change)

The Jamapa watershed is considered highly vulnerable to climate change.We analyzed National Meteorological Service (SMN's) stations in the project area. The stations selected for detailed analysis for Jamapa watershed are:

Station	Location	Altitude (masl)
30047 Coyol	19.72° Lat. -96.69 Lon.	545
30342 Huatusco	19.14° Lat. -96.95 Lon.	1186
30163 Soledad	19.04° Lat. -96.42 Lon.	94

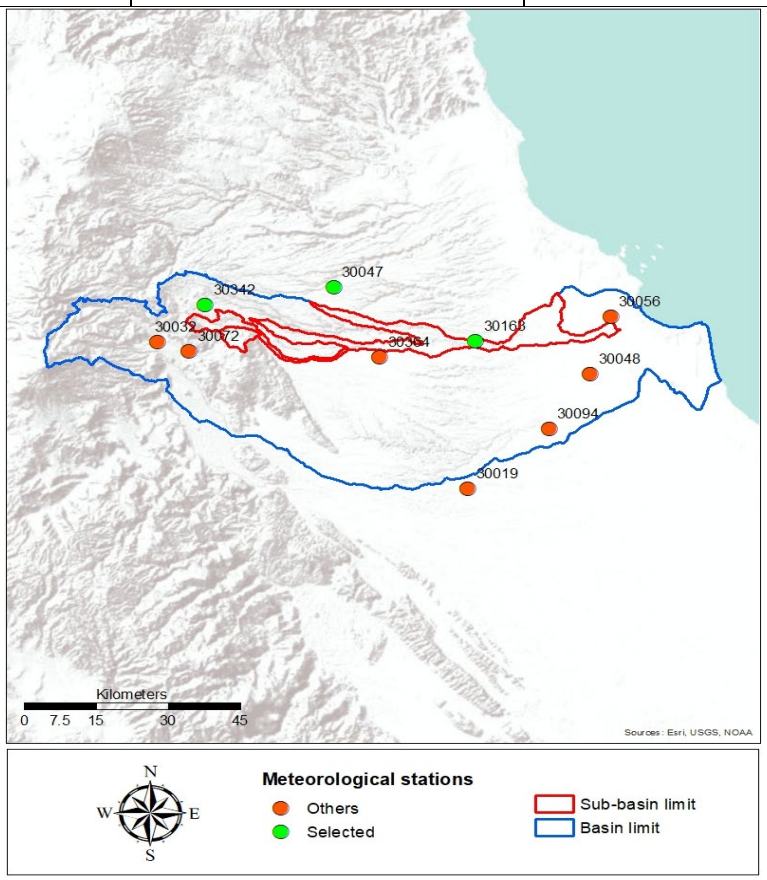


Figure 14. Distribution of meteorological stations in the municipalities with influence in the Jamapa watershed.

The observed data the three stations comprised around 30 years of data for each station. The main observed trends in Jamapa spring-summer (SS) and autumn-winter (AW) are (see Chapter 1 PFS for calculations):

Basin/part of the basin	**Mean temperature SS and AW**		**Max temperature (SS) Min temperature (AW)**		**Mean precipitation SS and AW**		**Extreme precipitation (days 95% higher precipitation)**	**Hurricanes**
Jamapa								
Higher – Huatusco	-	-	0 (+)	-	+	+	+	

Middle – Coyol	+	-	+	-	-	-		**Increase in magnitude**
Lower - Soledad	+	-	+	-	-	-		

According to the National Atlas of Vulnerability to Climate Change (ANVCC) (INECC, 2019), climate change scenarios in the near future project an increase between 1 and 2°C in temperature and precipitation up to +20mm change. Under this scenario, the Jamapa watershed presents vulnerability of human settlements to flooding (vhsf) and landslides (vhsl), and extensive livestock farming exposed to flooding (velff) and water stress (elfws) (INECC, 2018) (Figure 15). Climate change projections show that all these vulnerabilities will increase for 2030. Chapter 1 of the Pre-Feasibility study describes details of the climate change vulnerability assessment in the region.

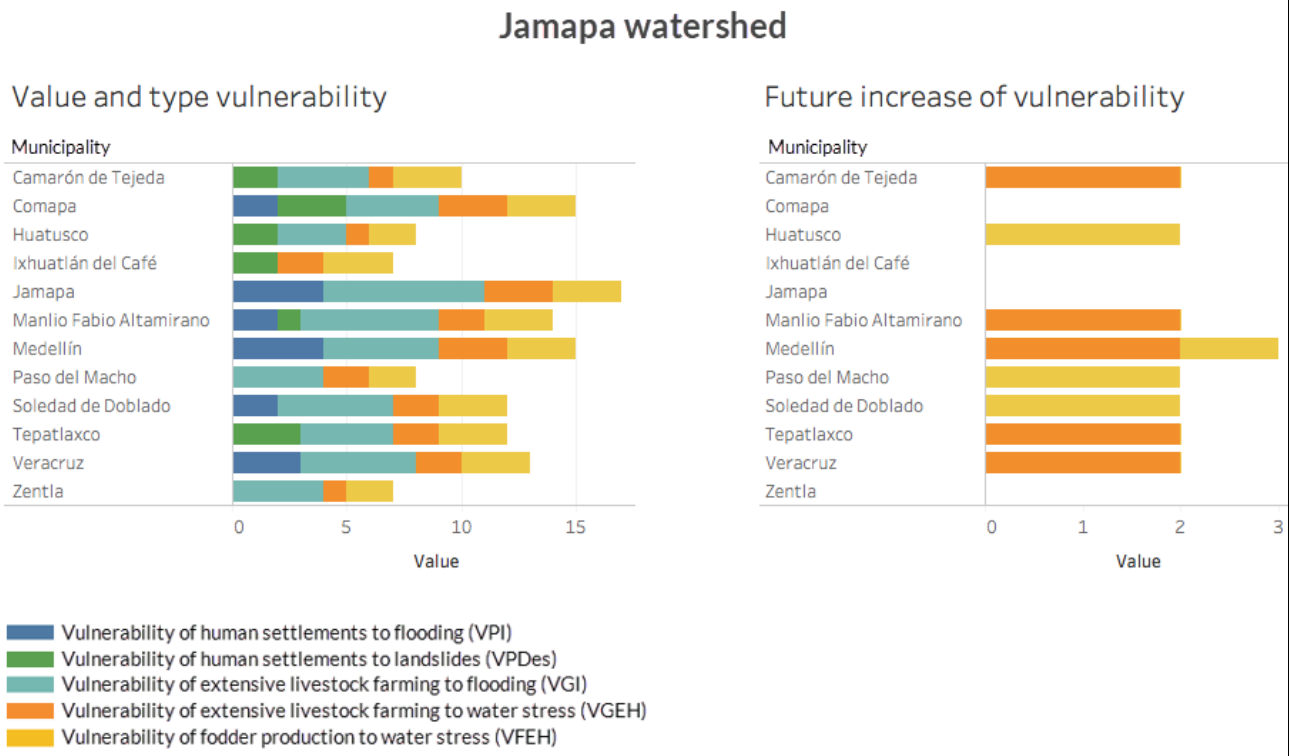


Figure 15. Number (value) and variety (type) of current vulnerabilities (left) identified in the Jamapa´s municipalities and their future projection (right) according to the four global circulation models (GCM: CNRMC-M5, GFDL-CM3, HADGEM2-ES, and MPI-ESM-LR, RCP 8.5) for the period 2015-2039, measured according to INECC´s vulnerability index. Source: INNEC, 2018.

Pereyra et al. (2011) found that in the Antigua watershed, adjacent to our target area, the increase in the average temperature under climate change scenarios will increase the real evapotranspiration (ETR), causing a deficit in soil humidity. The increase of ETR will have its maximum values in the lower parts of the watershed and the minimum values in the mountain area. So, together with the decrease in precipitation, will turn out the demand for water in agricultural and urban sectors more critical, especially during the dry season (March to May).

In the study "Impacts of climate change on Mexican soils" published by PNUD-INECC (2016), the Potential Evapotranspiration (PET) was estimated using the Penman's method modified by Monteith (Sys et al., 1991). Databases of average monthly temperature, cloudiness to estimate hours of sunshine, relative humidity, and wind speed, which define the PET, were generated in each Area of Climate Influence (AIC). To define the average annual isotherms, the method described by Gómez et al. (2008) was used, generating simple linear regression models for the different areas of thermal variation in the country, based on the analysis of temperature behavior related to the height of the terrain, as temperature variation and altitudinal range are influenced by the geographic position

and humidity conditions of the different regions of the country. The results of this evaluation showed that in the Jamapa watershed, an increase in potential evapotranspiration is expected in the future (Figure 16).

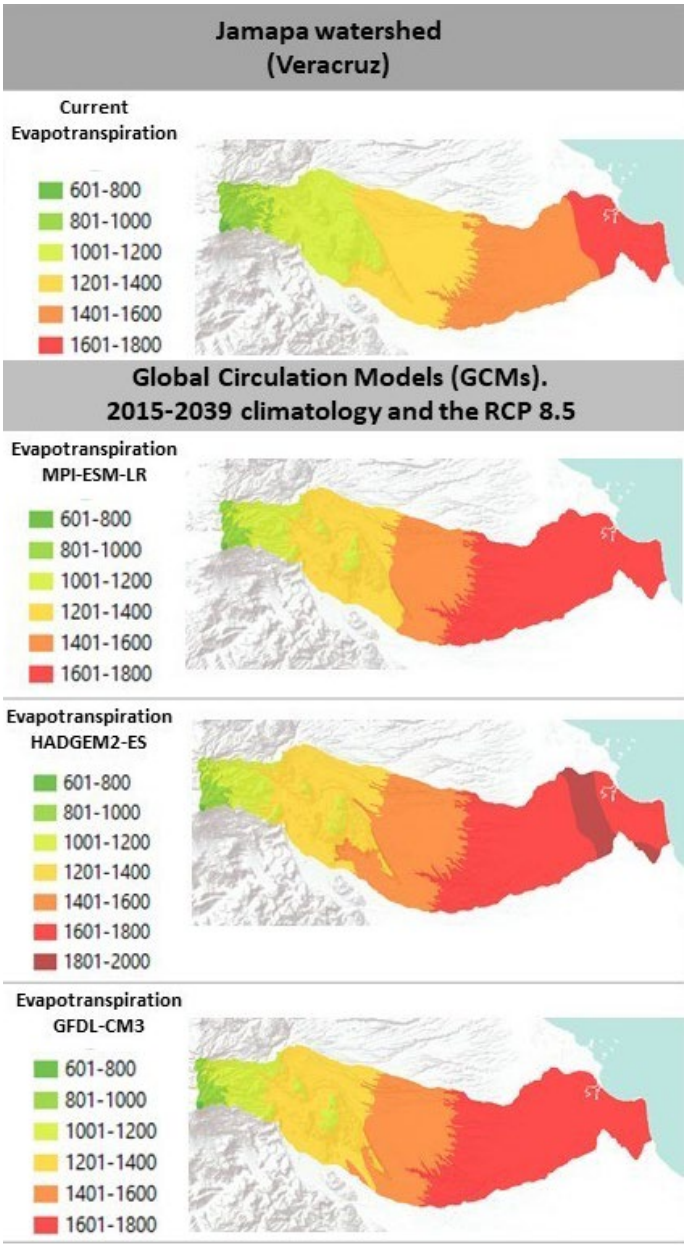


Figure 9. Behavior of potential soil evapotranspiration for the Jamapa basin under the global circulation models. Source: PNUD-INECC, 2016.

These changes will also affect vegetation distribution, such as cloud forests, which are relevant for moisture maintenance. Estrada-Contreras et al. (2015) found that the potential distribution of cloud forests in Veracruz will decrease by almost 60% by the year 2050, while the tropical evergreen area will diminish by 97%. However, the potential distribution area of the coniferous forest will increase by 21%. They found that 24 of the 51 modeled species could suffer losses larger than 50% of its potential distribution towards the 2050-time horizon. The substantial reduction suggests that changes in temperature and precipitation could be excessive for the physiological tolerance of thermophilic species. The loss or reduction of the current dominant species (or of those that characterize each vegetation type) might take place, but the vegetation phenology will largely remain. In this transformation, some species that might currently be non-dominant might find better conditions in the future and become dominant to characterize new vegetation types. The results of this study emphasize the critical importance of safeguarding connectivity by increasing the area and density of networks of protected ecosystems in regions

where sources of dispersion are small and widely distributed in addition to the needs of rehabilitation, reforestation, and restoration.

The potential change of natural vegetation in the Jamapa watershed, according to climate change projections in the bioclimatic zones of Mexico, is shown in Figure 17. For the upper part of the basin, the coniferous forests will decrease between 16 and 26% concerning the current surface. In the middle part, the humid forests will disappear, benefiting the development of dry forests. The lower area of the basin will present conditions for the development of halophilic vegetation, partially replacing hydrophilic vegetation. The greatest impacts for agricultural areas will occur in the middle and lower parts of the watershed, where they are concentrated.

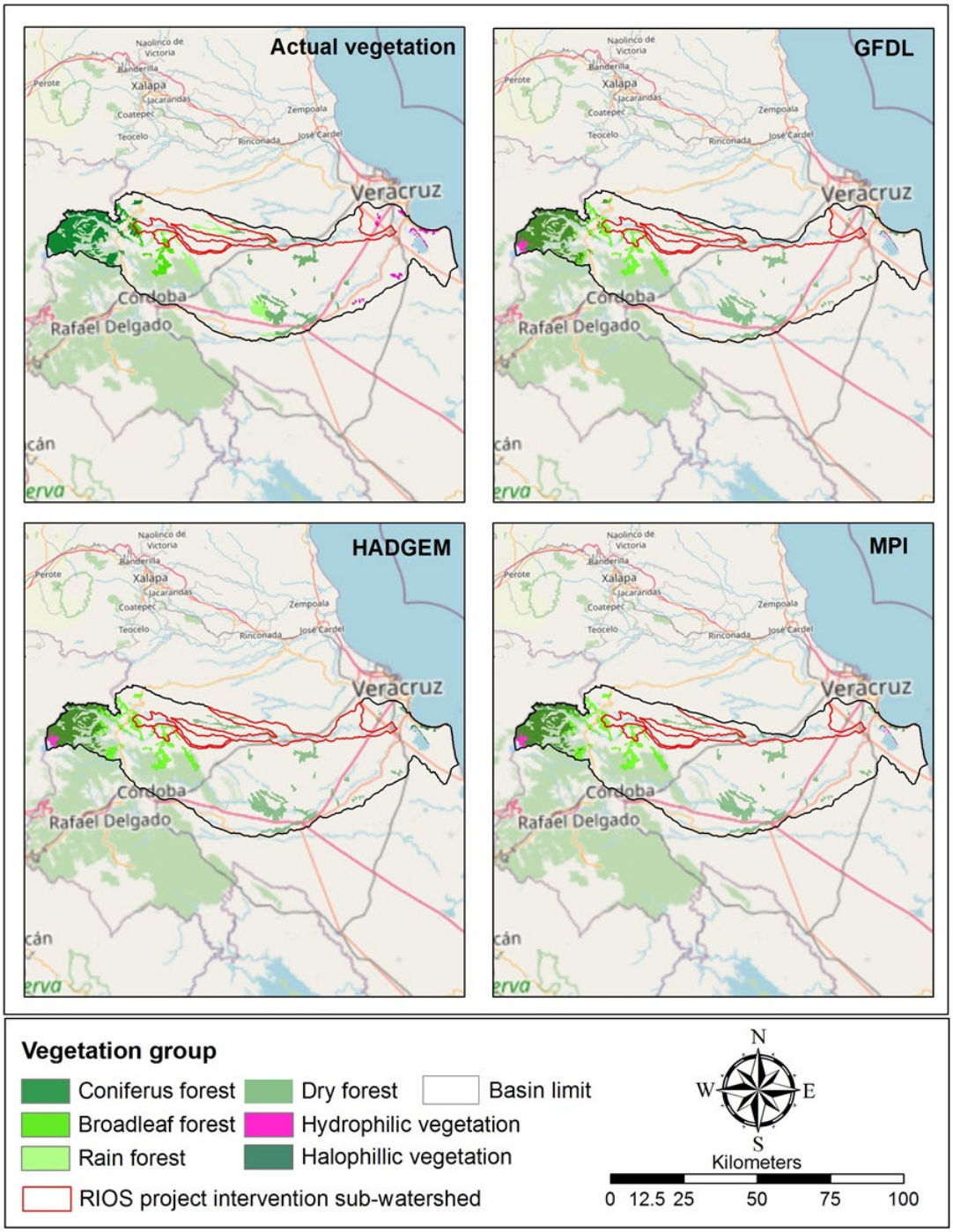


Figure 10. Changes in bioclimatic conditions and distribution of vegetation under climate change scenarios for the Jamapa watershed. Source: own elaboration.

INECC assessed the potential hazards in the Jamapa watershed related to climate change. Statistics on the danger of water erosion show the greatest danger (very high and high) in approximately 9% of the total basin area, representing 42% of the surface of the upper watershed. Concerning flooding, the coastal plain of the Jamapa watershed includes at least 62.1% of this area susceptible to flooding, covering 37.9% of the lower basin. For landslides, a real danger exists in the mountainous areas with steep slopes. The greatest hazards (very high and high) cover an area close to 12.6% of the basin, concentrated in the high-altitude areas, where more than 50% of the upper watershed has high susceptibility values. Data from the Communications Center of the Veracruz Civil Protection Secretariat (CECOM) and the Damage and Needs Assessment (EDAN) carried out from 2005 to 2013, there have been 2,013 landslides associated with heavy rains. When hurricanes Karl, Mathew, and tropical storm Barry occurred, 789 landslides associated with these phenomena were recorded in the basins located in the center of the state (De la Rosa and Ruelas, 2019). During Hurricane Ernesto in 2012, Morales-Martínez et al. (2016) identified that the heavy rains increased surface erosion and caused the removal of rocky and sandy material at altitudes above 4,200, producing water flows that drained into the basins of the Jamapa and Tiapa rivers on the lower slopes, mainly affecting cultivated areas with heavy economic losses. Moreover, from a total of 374 disasters that occurred in the Jamapa watershed, 99% are weather-related, mainly tropical cyclones and storms. The national disaster fund (FONDEN) has invested 3,981 million pesos (US$185 million) in these municipalities from 1999 to 2018. Therefore, 55.4% of the total inhabitants are exposed to at least one hazard related to climate change, so are the production systems, in which more than 17% of agriculture is exposed to at least one danger, as well as nearly 27% of shade coffee plantations, and 30% of forest plantations (INECC, 2019).

4. RIOS strategy to address climate change impacts in the Ameca-Mascota and Jamapa watersheds

In a context of climate change, where hydrological ecosystems services would be reduced, the IPCC Special Report (2018) recommends the implementation of watersheds, rivers, or water integrated management plans, including best practices and governance instruments. One of the most common practices to address the impacts of climate change is the reduction of deforestation and increased reforestation of river basins and coastal areas.

The proposed Project RIOS contributes to the IPCC recommendation and to Mexico's national green growth agenda, according to its General Law on Climate Change Law (2012), its Climate Change Adaptation Strategy (2016), and the Nationally Determined Contribution (NDC), by reducing vulnerability to both extreme hydro-meteorological phenomena and long-term environmental degradation processes. It includes measures in three main areas: adaptation of the social sector, ecosystem-based adaptation, and adaptation of strategic productive sectors.

RIOS will focus on the Ameca and Jamapa rivers that flow from the mountains and plateaus, intertwine valleys with coastlines, transport nutrients and organic compounds to feed plains and deltas and maintain diverse ecosystems and human activities along their way to the ocean. These rivers entangle a complex mosaic of physical, biotic, and socioeconomic relations that requires effective forms of management and protection. Thus, the shift towards sustainable river management can only be performed through a watershed approach, allowing to maintain ecosystem services, provide the rural population with sustainable grazing, forestry products, and agriculturally productive areas, and increase resilience to climate change.

The project will address the vulnerabilities identified for both watersheds, such as vulnerability of human settlements to flooding (vhsf) and landslides (vhsl), extensive livestock farming exposed to flooding (velff) and water stress (elfws), and forage production exposed to water stress (fpws).

RIOS will encourage a holistic view of river rehabilitation, based on the principles of Ecosystem-based Adaptation (EbA), to recover the riparian ecosystems, their ecological functions, and adaptive capacity to buffer climate-change impacts and provide hydrological environmental benefits, such as protecting and improving water quality by trapping sediment runoff from land, promoting bank stability and minimizing further loss of soil into the watercourse, maintaining the natural irrigation and drainage, by buffering the extremes in the discharge of rivers (causing floods) and regulating the channel flow, shading the watercourses and regulating the temperature of aquatic ecosystems, and functioning as wildlife corridors. In the face of climate change, riparian ecosystems will experience an increase in air and surface water temperatures, alterations in the magnitude and seasonality of precipitation and runoff, and shifts in reproductive phenology and distribution of plants and animals (Seavy et al., 2009; Palmer et al., 2009).

Unfortunately, riparian ecosystems have not received enough attention. Mexico possess limited regulatory frameworks and public policies to safeguard their protection and restoration, as well as no specific instruments to guide and operationalize restoration demands (Meli and Brancalion, 2017). Article #27 of the National Constitution of 1917 determines that watercourses are submitted to a regime of public ownership. The 1992 National Water Law established riparian buffers as federal zones of at least 5 m for streams with width <5 m, and of 10 m for larger watercourses. Two Mexican Official Norms (NOM-060-SEMARNAT-1994 and NOM-022-SEMARNAT-2003) define riparian vegetation as "the vegetation that grows on or near the banks of streams or water bodies in soils that have certain characteristics of humidity" and regulate the protection and restoration of their natural vegetation. The General Law of Climatic Change of 2012 advanced the official promotion of restoration in the country to mitigate and adapt to climate change, including the design of policies and mechanisms for the protection, conservation and restoration of riparian vegetation of the federal zones (art. 34). It is also the only one defining "biological corridors" to maintain the connectivity of biological processes and defining the National Forestry Commission as responsible for designing restoration strategies, included in the current National Forestry Program. Still, the General Law on Ecological Equilibrium and Environmental Protection does not mention riparian forests. Consequently, RIOS will provide a comprehensive support to riparian forest restoration through the National River Restoration Strategy for reconciling the regulatory instruments, policies and governance frameworks with the ecological processes, community-based ecosystem conservation, and climate change adaptation.

The specific climate change impacts per system and sector within RIOS target areas are summarized in Table 9 and Figure 18, while the local adaptation activities proposed to respond to the identified vulnerabilities can be found in Table 10. Detailed information on the project´s objective, components, activities, and outcomes are described in the next section of this proposal.

Table 9. Main impacts of climate change identified per system and sector within RIOS target areas.

RIOS Systems		**Impacts of climate change in RIOS regions**
Key ecosystems	Rivers	In upper watersheds, more rain will falls during the rainy season, producing soil erosion and landslides. Increase of suspended solids and their accumulation in rivers leads to lower water quality, siltation and increasing floods in the middle and lower parts of the basins.
	Forests	The increase in maximum and extreme temperatures and the decrease of precipitation in the dry season will intensify evapotranspiration, augmenting water stress, which in turn is predicted to produce changes in the floristic composition and affect ecosystem functions. Changes in temperature and precipitation are predicted to be excessive for the physiological tolerance of many species, causing them to change their distribution and diminish their area of occupancy, which will be especially evident in cloud forest and tropical evergreen forests in the project basins. The predicted result includes habitat fragmentation, loss of ecosystem services, and of biodiversity, particularly amphibians and reptiles.
Productive practices	Agroforestry	Rising temperatures, especially in the middle and lower parts of the watersheds, will increase evapotranspiration and diminish water availability, as well as infiltration, causing a deficit in soil humidity. Thus, irrigation may increase in response to rising temperature extremes and drought, further depleting water supplies. A reduction in agricultural productivity with increased risks of wildfires is predicted to occur. Reductions in agricultural productivity or sudden losses of crops will have ripple effects, including increased food prices and food insecurity. The increased frequency (in the Jamapa basin) and intensity (in the Mascota watershed) of extreme storms and

		tropical cyclones leads to siltation and floods that devastate crops, accelerate soil erosion, and decrease water quality.
	Sustainable livestock management	The increase in extreme temperatures and decrease of precipitation in the AW season in the middle and lower watersheds will impact cattle through heat stress, climate-related diseases, and shortages in drinking water, augmenting morbidity and mortality. Quality, availability, and even the composition of pasture and forage species will also be affected. Sudden losses of livestock will likely have ripple effects, including increased food prices and food insecurity. Increased frequency or intensity of extreme storms, tropical cyclones, and floods will harm livestock, accelerate soil erosion, and pollute water.
	Human settlements and infrastructure	Increased frequency of extreme storms, landslides and floods will affect populations, damaging people, homes, livelihoods, schools, hospitals, as well as tourism, energy, communication, and transport infrastructure. A decrease in water quality and availability will also occur.

Figure 18. Climate change and non-climate impact chain for RIOS.

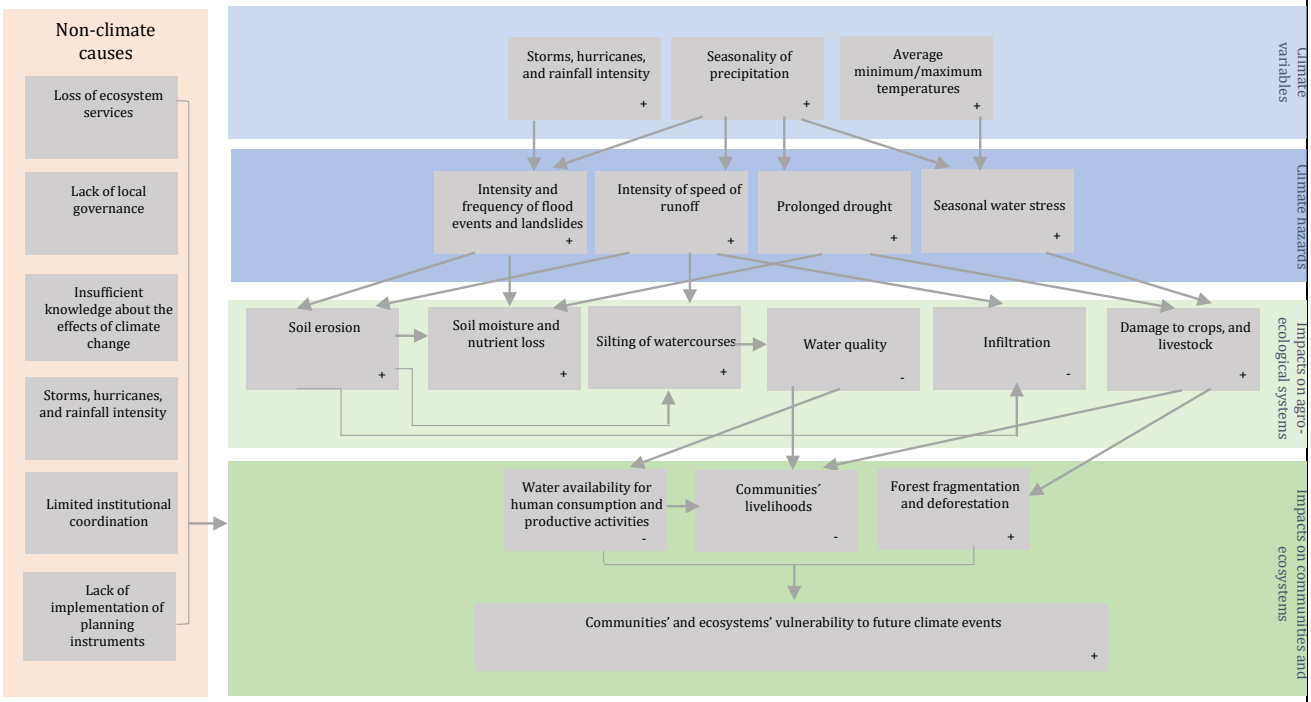


Table 10. Sample activities that will be supported by RIOS, including their expected impact in terms of increased adaptation capacity and for reducing vulnerabilities to climate change, in particular Vulnerability of human settlements to flooding (VPI), Vulnerability of human settlements to landslides (VPDes), Vulnerability of extensive livestock farming to flooding (VGI), Vulnerability of extensive livestock farming to water stress (VGEH), and Vulnerability of forage production to water stress (VFEH).

Systems	Examples of eligible	Main ecosystem	Expected climate change	Vulnerability	Sources

		activities	services provided/ improved by those practices	adaptation impact	addressed	
River restoration	**Riparian restoration**	Community work on reforestation/ restoration of riverbanks (for example, watershed committees)	•Reduce soil erosion to decrease sediments, improve water quality and diminish silting of watercourses •Increase the time that water remains within the basin, decreasing the force and speed of runoff, as well as increasing infiltration •Conserve soil for productive activities •Moderate extreme temperature thanks to vegetation coverage	Increased capacity building and re-appropriation of traditional knowledge in the communities where the project is implemented to promote riverbank reforestation/restoration for flood risk reduction.	VPI, VGI	Meli, 2011 Mushamuka, 2011 Chazdon, 2008 Riis et al., 2020
		Restoring riverbanks with native vegetation		Increased hillside stability and reduced sediment deposits that limit water flow and increase floods downstream. Improved capacity of riparian ecosystems to provide soil retention and water provision services.		Tillery and Renges, forthcoming Addy, 2016 Dixon et al., 2016
	Restoration	Restore forests with native species	•Reduce soil erosion to decrease sediments, improve water quality	Maintained biodiversity of ecosystems to improve the provision of ecosystem	VFEH, VGEH	Ministerio Medio Ambiente Chile, 2014 Chazdon, 2008

			and diminish silting of watercourses •Increase the time that water remains within the basin, decreasing the force and speed of runoff, as well as increasing infiltration • Moderate extreme temperature thanks to vegetation coverage	services and the capacity to respond to possible impacts of climate change.		
		Restore patches to increase connectivity		Increased connectivity and habitat corridors of species of ecological relevance and to improve the provision of ecosystem services and the capacity to respond to possible impacts of climate change.		Fundación Biodiversidad, 2016 Useche, 2006 Riis et al., 2020
		Recover and restore soils	•Reduce soil erosion to decrease sediments, improve water quality and diminish silting of watercourses •Conserve soil for productive activities	Promoted the recovery of soil ecosystems to contribute to the storage of carbon in the roots of plants and soil, in order to mitigate greenhouse gas emissions to the atmosphere. Improved soil retention to reduce flood risk and drought. Restoration not only gives quick results, but also is		UNFCCC, 2019 Ortiz, 2007 Riis et al., 2020

				economical, generates jobs and ensures food security.		
Forest protection and conservation	**Agroecological practices**	Conserve soils with agroecological practices (living fences, stubble, cover crops, organic fertilizing, productive diversification)	•Reduce soil erosion to decrease sediments, improve water quality and diminish silting of watercourses •Conserve soil for productive activities	Increased implementation of sustainable production practices to reduce potential sources of diffuse pollution to water bodies, improve diets, and adapt practices to climatic events.	VFEH, VGEH, VGI VPI, VPDes	Martínez-Rodríguez et al. 2017 Keenan, 2015 Garbach et al., 2014
		Train and acquire equipment for fire prevention, control and management	•Increase the time that water remains within the basin, decreasing the force and speed of runoff, as well as increasing infiltration •Moderate extreme temperature thanks to vegetation coverage	Decreased risk of fires and reduced impact from fires as a potential impact of climate change. Incorporate fire spread prevention measures that compromise the maintenance of biodiversity and environmental services.		UNDP, 2017 Giannakopoulos et al., 2012 Garbach et al., 2014
		Build capacities in communities for extracti	•Moderate extreme temperature thanks to vegetation coverage	Increased use of biodiversity in a sustainable manner in order to		Cach, 2016 Garbach et al., 2014

		on and sustainable use of plants of interest (seed banks, nurseries, cover crops, organic fertilizing, productive diversification)		minimize the potential effects of climate change on biodiversity.		
		Develop green business	• Reduce soil erosion to decrease sediments, improve water quality and diminish silting of watercourses • Increase the time that water remains within the basin, decreasing the force and speed of runoff, as well as increasing infiltration • Conserve soil for productive activities Moderate extreme temperature thanks to vegetation coverage	Improved systems that promote provision of ecosystem services and increase the commercial value of products.		Ochoa, 2018 Garbach et al., 2014

Productive practices	**Sustainable livestock management**	Improve livestock practices in transition to sustainable livestock management including silvopastoral systems.	•Reduce soil erosion to decrease sediments, improve water quality and diminish silting of watercourses •Increase the time that water remains within the basin, decreasing the force and speed of runoff, as well as increasing infiltration •Conserve soil for productive activities	Reduced sources of diffuse contamination to water bodies. Restored the water flow to contribute to the connectivity of the basin to reduce the risks of landslides un the upper basin and floods downstream.	VFEH, VGEH, VGI	FAO, 2011 Gaccio, 2011 SEMARNAT, 2011 FAO, 2000 Hoffmann et al., 2014 Riis et al., 2020
		Living fences (fruit and fodder trees)	• Moderate extreme temperature thanks to vegetation coverage			
		Improvement of pastures (grass enrichment, rotations, legumes, fodder)	• Moderate extreme temperature thanks to vegetation coverage			
		Reforest/restore riparian corridors along streams and rivers,	• Moderate extreme temperature thanks to vegetation coverage			

		excluding cattle or limiting access points	•Reduce soil erosion to decrease sediments, improve water quality and diminish silting of watercourses •Increase the time that water remains within the basin, decreasing the force and speed of runoff, as well as increasing infiltration •Conserve soil for productive activities			
	Agroforestry	Enrich fallow areas	• Moderate extreme temperature thanks to vegetation coverage •Reduce soil erosion to decrease sediments, improve water quality and diminish silting of watercourses •Increase the time that water remains within the	Increased productivity and reduced losses due to climate impacts by implementing practices resilient to climate change.	VFEH, VGEH, VGI, VPDes	Torres et al., 2008 Armelinda, 2013 Jose, 2009
		Develop sustainable management programs (diversified systems, shade coffee)		Improved systems that promote provision of ecosystem services and increase the commercial value of products.		Schaller et al., 2017 Jose, 2009

		Develop business plans for shade systems like coffee or diversified systems.	basin, decreasing the force and speed of runoff, as well as increasing infiltration •Conserve soil for productive activities	Improved systems that promote provision of ecosystem services and increase the commercial value of products.		Bunn et al., 2018 Baker and Haggar, 2007 Jose, 2009

Other barriers to be addressed. Although the origin of the potential impacts identified in the target watershed is in the physical-geographic and climatic domain, these impacts are exacerbated by inadequate land-use planning, resulting in drivers such as the expansion of human settlements, environmental degradation, and deforestation in the upper parts of the watersheds (INECC, 2019). Six main barriers have been identified in the two watersheds: (i) loss of ecosystem services, (ii) lack of local governance, (iii) insufficient information and knowledge about the effects of climate change, (iv) limited institutional coordination, (v) limited alignment of public and private investments, and (vi) lack of implementation of planning instruments. Among these, significant barriers to engaging, aligning, and mobilizing private and public capital for climate action remain, such as short-terminism, missing financial instruments, lack of information on the risk of climate change, missing data to rank sustainable investments, challenges sourcing a viable pipeline of bankable projects, among others. Therefore, new funding structures and innovative collaborative partnerships represent important shifts for developing solutions.

Complementarity with other projects. RIOS will be complemented and co-financed by the CONECTA Project, to be implemented during 2021-2026 and financed by the World Bank through a Global Environment Facility (GEF) USD$15 million grant. The objective of CONECTA is to improve integrated landscape management in selected watersheds in the states of Chihuahua, Chiapas, Jalisco, and Veracruz. The components are (i) Development and Promotion of Integrated Landscape Management, (ii) Strengthening Business Skills for Sustainable Rural Production, (iii) Conservation and Implementation of Sustainable Productive Practices in Cattle and Agroforestry Landscapes, and (iv) Monitoring and Project and Knowledge Management. The co-financing from CONECTA for the RIOS project will support livestock and agroforestry producers to access credits, the implementation of a learning community, and a community-based water monitoring system, all of which are activities under RIOS Component 1. Besides, RIOS contemplates the lessons learned from other projects, mainly from the Integrated Coastal Watershed Conservation in the Context of Climate Change Project (C6). The World Bank, through a GEF grant, provided the financing for US$ 39.52 million. The project was implemented in 2013-2019. C6 promoted integrated management of coastal watersheds to conserve biodiversity, contribute to climate change mitigation, and enhance sustainable land use in the Gulf of Mexico and Gulf of California. The National Commission for Protected Areas (CONANP), the National Forestry Commission (CONAFOR), the National Institute of Ecology and Climate Change (INECC), and FMCN were the implementing partners. The complete World Bank Implementation Completion and Results (ICR) Report rated all the outcomes as Satisfactory, furthermore the Monitoring and Evaluation Quality as Substantial. The project has been highlighted by the World Bank as one of the most successful projects in the 2020 Spring Meetings and by GEF as a Best Practice Project.

Further information on the project´s barriers and other initiatives implemented by FMCN for the scaling-up strategy of RIOS can be found in Chapter 1 of the Pre-feasibility study.

B.2. Project/Programme description (max. 1,000 words)

The RIOS Project builds on the experience and information generated in these basins over the past six years through the GEF-funded project, "Coastal Watershed Conservation in the Context of Climate Change" (C6), implemented by INECC, FMCN and other government institutions. This initiative generated local capacity with the creation of two regional funds and a collaborative network that included Civil Society Organizations (CSOs), government, and key local stakeholders. In the framework of this project, Integrated Watershed Action Plans (IWAPs) were designed for the Ameca-Mascota and Jamapa basins, based on geo-hydrological models and proposing activities, which were widely consulted with local stakeholders.

In line with the IWAPs, RIOS proposes to carry out activities that increase the vegetation cover in riparian systems and slopes, as well as in areas to protect springs, or important for infiltration and soil retention. The aim is to reduce the vulnerabilities observed in the climatic regions, mainly: vulnerability of human settlements to flooding, of human settlements to landslides, of extensive livestock farming to water stress and of fodder production to water stress. The proposed activities will: (i) reduce soil erosion to decrease sediments, improve water quality and diminish silting of watercourses; (ii) increase the time that water remains within the basin, decreasing the force and speed of runoff, as well as increasing infiltration; (iii) conserve soil for productive activities; (iv) moderate extreme temperature thanks to vegetation coverage. As a result of these activities, RIOS aims to reduce vulnerability to the impacts of climate change, mainly by decreasing exposure to landslides, floods, and drought. Likewise, the project seeks to augment the adaptive capacity of the population and ecosystem resilience as a key strategy in a country where two-thirds of the territory are mountains and therefore highly sensitive to climate change (World Bank, 2010). Alignment of investments in the basins will also contribute to the increase in people's adaptive capacity and ecosystem resilience. The lessons learned from these activities will feed into the development of a National Strategy for River Restoration, which will allow for scaling-up actions to reduce vulnerability to climate change throughout Mexico's watersheds. These will support to the livelihoods of watershed-dependent communities and will increase the provision of ecosystem services.

RIOS has three components: i) Component 1: Increase in forest and water connectivity with a vision of adaptation to climate change through restoration, conservation and best productive practices , ii) Component 2: Alignment of public and private investments through natural capital accounting for scaling-up activities for the restoration of rivers for adaptation to climate change , and iii) Component 3: Design of a National River Restoration Strategy for climate change adaptation .

Component 1: Increase in forest and water connectivity with a vision of adaptation to climate change through restoration, conservation and best productive practices . This Component will finance activities to strengthen capacities in producers and landholders along the Ameca-Mascota and Jamapa watersheds to conduct activities on their land that promote ecosystem-based adaptation through functional connectivity. Functional connectivity refers to biological corridors that improve ecosystem services, which are directly linked to increased resilience to the effects of climate change. INECC -the National government agency that coordinates climate change research and policy, and the technical leader of this project- has identified the required actions to reduce climate change vulnerability through Integrated Watershed Action Plans (IWAPs) built with key local stakeholders. The IWAPs were developed during the Global Environmental Facility GEF-Financed C6 Project coordinated by FMCN in 2013-2018 (FS Section 1.6).

This component will be implemented through subprojects financed with GCF resources and executed by selected community, civil and private organizations working with producers on the ground to increase capacities in: (i) **rehabilitation and restoration** of forests along rivers and springs (increase coverage with native species, soil restoration); (ii) **protection and conservation** of forests; and (iii) **productive activities** that promote connectivity for river restoration (agroforestry and sustainable livestock management). These subprojects comprise a portfolio of four type of schemes, depending on the nature and objective of the activity (see Table 11). Schemes are not mutually exclusive and not progressive.

- **Scheme 1:** Grants through request for proposals**.** FMCN will launch a demand-based request for proposals (RFP) through Regional Funds (RF) to Civil Society Organizations (CSO) that group landholders and producers, including communities, *ejidos*[3], small landowners, and community enterprises.

- **Scheme 2: Payment-for-Performance (PfP).** This scheme will serve to pilot a results-based mechanism to a subset of subprojects selected for the grant scheme (scheme 1). It will be a sub-group from the subprojects of Scheme 1. It will be implemented as a hybrid grant and pay-by-performance model that rewards the results that generate an increase in functional connectivity and climate adaptation. It will pay a final bonus of 10% to those sub-projects that exceed the expected and agreed outcomes, at the final project year. All disbursements will be attached to intermediate results through proxy indicators.

- **Scheme 3**: **Public-Private Payment for Ecosystem Services (PES)**. Regional Funds (RFs) will provide technical assistance to communities identified in the IWAPs as important suppliers of hydrological ecosystem services (HES). The RFs will support those communities to develop proposals to access to the

[3] Ejidos and Agrarian Communities: Social property of land that covers most of the surface in the Mexican rural areas.

Payment for Ecosystem Services (PES) matching fund scheme from the Mexican Forest Commission (CONAFOR). Under Component 2, the project will identify private sector institutions downstream that require and benefit from those HES, and will link them to these communities seeking their matching contribution to the PES concurrent scheme.

- **Scheme 4**: **Business development and access to credits**. FMCN will launch a demand-based RFP through the Regional Funds to Local Providers of Technical Assistance (PLATs, for its acronym in Spanish), which are consulting firms or CSOs focused on promoting organizational and business management skills of Producer Groups (PG) in an integral manner. This scheme will be co-financed by the CONECTA project, financed by a GEF grant (2021-2026, see FS Section 1.6). The PLATs will prepare producers implementing livestock, agroforestry and other EbA activities to apply to credits promoted under Component 2.

Table 11. Portfolio of schemes supported under Component 1.

Type of Scheme	Type of support	Target beneficiaries	Example of systems supported	Maximum amounts (per year)
Scheme 1: **Grants through Request for Proposals** **(Subactivity 1.1.1.5)**	Financial resources to implement EbA conservation, restoration and productive activities. Provide funding through grants to implement activities that promote functional connectivity and climate adaptation.	CSOs that group landholders and producers, including communities, *ejidos*, small landowners, and community enterprises, in the upper and middle basin.	Rehabilitation and restoration of forests along rivers and springs. Protection and conservation of forests. Productive activities (agroforestry and sustainable livestock systems) that require technical assistance and have a high starting cost.	USD$55K per subproject
Scheme 2: **Payment-for-Performance (PfP)** **(Subactivity 1.1.1.5)**	Financial resources to implement EbA conservation, restoration and productive activities. Grant plus pay-by-performance model that rewards the results that generate an increase in functional connectivity and climate adaptation. This scheme envisages payment to CSOs and local communities for performance. Under this Scheme, those Beneficiaries (i) whose Sub-Projects have received funding under Scheme 1, and (ii) who have exceeded performance results, as set out in the Operations Manual, will receive an additional sub-grant in the amount of ten per cent (10%) of the respective Sub-Project's budget. The rewarded amount will be proportional to the target, up to 10% of the total grant amount when the goal is achieved. This scheme will serve to pilot PfP to a subset of subprojects selected for the grant scheme.	CSOs that group landholders and producers, including communities, *ejidos*, small landowners, and community enterprises, in the upper and middle basin.	Activities with measurable impact within the project timeframe and learning potential. Productive activities (sustainable livestock and agroforestry) that require flexibility in management options and have adaptation learning potential. Rehabilitation and restoration of forests along rivers and springs. Protection and conservation of forests.	USD$5.5K Bonus to the grant awarded in Scheme 1 per subproject
Scheme 3: **Public-Private Payment for ecosystem services (PES)** **(Subactivity 1.1.1.8)**	Liaison between communities, private and public sectors, and capacity building. Support local communities to access and implement public-private schemes for PES.	Local communities identified in the IWAPs as important providers of HES in the upper and middle basin.	Protection and conservation of forest and riparian areas.	USD$550 per ha maximum 3,000 ha (leveraged funding)
Scheme 4: **Facilitate access to credits** **(Subactivity 1.1.1.9)**	Finance PLATs for capacity building. Build business and organizational capacity of livestock and/or agroforestry Producer Groups (PGs) for sustainable rural production	Producer Groups implementing income-generating sustainable livestock and agroforestry	Productive activities (sustainable livestock and agroforestry) carried-out by PGs that have the potential for private financing.	

	Trough Component 2, FMCN and the Regional Funds will create synergies with financial institutions and intermediaries to develop dedicated credit lines (with co-financing from CONECTA) and train them in the development of financial products that promote sustainable practices. Through Component 1 with the co-finance from GEF project CONECTA, the project will develop capacities in producers on financial literacy and business and will provide technical assistance on sustainable practices during credit implementation.	activities mainly in the middle basin.		US$ 25K per PLAT

Selected practices are proved to be effective to increase adaptation and will be appropriate for the regions. The RfPs will promote the inclusion of women, through dissemination in appropriate spaces, and gender-sensitive activities (see Gender Action Plan -GAP). Subprojects will be linked to private and public financial sources aligned under Component 2. The final selection criteria will be defined by the Technical Committee during the design of the RfP. Table 12 shows preliminary selection criteria

Table 12. Preliminary selection criteria for subprojects under Component 1.

Beneficiary category	Definitions	Activities supported	Selection criteria
Communities	They are the final beneficiaries of Schemes 1 and 2. Communities includes communities, ejidos, small landowners, and community enterprises.	Finance subprojects that implement: Rehabilitation and restoration of forests along rivers and springs. Protection and conservation of forests. Productive activities (agroforestry and sustainable livestock systems)	Under Scheme 1 and 2, CSOs will apply to the RFP by grouping communities. Selection criteria for this RFP includes: 1. Relevance: the sub-project is aligned with the objective and eligible activities of this call for proposals; 2. Strategic planning: the sub-project has a clear objective. The expected results and the activities are aligned with the objective; 3. Financial planning and viability: The budget is congruent with the proposed activities and the resources requested are sufficient to ensure the implementation of the project; 4. Impact: the proposal clearly defines the forest area it will conserve, will use sustainably or restore. The selected indicators are measurable and correspond to the results included in the planning; 5. Social participation: the local community, the owners of the resources and / or the users participated in the preparation of the proposal and show clear ownership of the project; 6. Organization and governance: the sub-project supports the community involved in its integration, strengthening and in transparent decision making around the management of natural resources; 7. Scientific / technical / social support: the proposed interventions have a clear scientific, technical, social, legal and / or economic basis; 8. Complementarity with additional initiatives: the project promotes or strengthens synergies and inter-institutional collaboration, for example, it is linked to other public or private investments and attracts them as counterpart funding; 9. Institutional capacity: the proposing organization has the experience and human, technical and administrative capabilities to successfully carry out the project. 10. Continuity: the strategy of the proposal contemplates actions that will allow the impact of the project to be long-term. For example, the proposals include productive activities based on business plans and
Civil Society Organizations (CSOs)	They apply to Schemes 1 and 2 by grouping landholders and producers, including communities, *ejidos*, small landowners, and community enterprises.		

			contemplate links with markets, or encourage the creation of revolving funds that ensure financing productive activities in the long term
Community enterprises and Producer Groups	Community enterprises, family businesses or producer groups implementing sustainable livestock and agroforestry activities.	Technical assistance on managerial aspects, governance, financial and accounting training, marketing, and market access. Specialized consultancies and technical inputs can be financed in parallel for the selected PGs, including but not limited to sustainable milk processing, cheese production, eco or agritourism services, commercialization of sustainably produced goods, and access to credit markets for sustainable production.	Under Scheme 4, PLATs will apply to the RFP by matching with one or more community enterprise or producer group. Selection criteria for this RFP includes: 1. Location and knowledge of the territories involved in the project, 2. Experience in working with PGs in the region, 3. Experience of technical assistance services to similar production groups with a climate change adaptation focus, 4. Knowledge of the technical activities of the project, organizational aspects of production and business management and 5. Knowledge of producer organizations and government actors in the region.
Local Providers of Technical Assistance (PLATs)	Consulting firms or CSOs focused on promoting organizational and business management skills of Producer Groups		

In equal circumstances, the additional selection criteria to be considered by the Project Technical Committee are the following:

1. Gender approach: the proposal has an approach that favors equality in the relationship between men and women;
2. Surface area: the proposal offers a greater surface of forest attended with relation to the alternative proposal;
3. Diversity of organizations: the set of proposals comes from the largest number of organizations, although those organizations that submit more than one proposal will be considered;
4. Linking between sub-projects: the proposal includes synergies with other proposals for sub-projects and are territorially related.

This Component will also support institutional strengthening of local actors to enhance coordination and connectivity in the basins. It will create a "learning community" that will meet annually to exchange experiences between beneficiaries, engage regional and national actors to coordinate activities and achieve connectivity in the watersheds. This learning will be scaled-up nationally under Component 3. Activities will include workshops, publications, and dissemination events. The learning community will be co-financed by the CONECTA project.

This Component will also adapt existing methodologies for communities of the project basin to continuously evaluate their vulnerability s and to monitor the provision of ecosystem services (biodiversity, soil and water quality). It will provide subprojects , particularly those under the PFP scheme, with technologies and assistance to learn about vulnerability and monitor project benefits and co-benefits. The results will serve to: i) determine the level of reward for the beneficiaries under the PFP scheme, ii) improve adaptive capacity in communities, iii) support the vulnerability assessment to be conducted by INECC at the onset and end of project, iv) provide inputs for impact evaluation. Additionally, the protocol developed will support the National River Restoration Strategy (NRRS), designed under Component 3.

Sample activities supported under Component 1, including their expected impact in terms of increased adaptation capacity and reduced vulnerabilities to climate change, follow:
Type of vulnerabilities to climate change:

1. Vulnerability of human settlements to flooding (VPI)
2. Vulnerability of human settlements to landslides (VPDes)
3. Vulnerability of extensive livestock farming to flooding (VGI)
4. Vulnerability of extensive livestock farming to water stress (VGEH)
5. Vulnerability of forage production to water stress (VFEH)

Table 13. Relationship between eligible activities eligible to be financed by subprojects, main ecosystem services provided by those activities, expected climate change adaptation impact and vulnerability to climate change addressed.

Systems	Eligible activities to be financed	Main ecosystem services	Expected climate change	Vulnerability	Sources

		by subprojects	provided/improved by those practices	adaptation impact	addressed	
River restoration	**Riparian restoration**	Community work on reforestation / restoration of riverbanks (for example, watershed committees)	• Reduce soil erosion to decrease sediments, improve water quality and diminish silting of watercourses • Increase the time that water remains within the basin, decreasing the force and speed of runoff, as well as increasing infiltration • Conserve soil for productive activities • Moderate extreme temperature thanks to vegetation coverage	Increased capacity building and re-appropriation of traditional knowledge in the communities where the project is implemented to promote riverbank reforestation/restoration for flood risk reduction.	VPI, VGI	Meli, 2011 Mushamuka, 2011 Chazdon, R., 2008 Riis et al., 2020
		Restoring riverbanks with native vegetation		Increased hillside stability and reduced sediment deposits that limit water flow Improved capacity of riparian ecosystems to provide soil retention and water provision services.		Tillery, and Renges., forthcoming Addy, 2016 Dixon, et al., 2016
	Restoration	Restore forests with native species	• Reduce soil erosion to decrease sediments, improve water quality and diminish silting of watercourses • Increase the time that water remains within the basin, decreasing the force and speed of runoff, as well as increasing infiltration • Moderate extreme temperature thanks to vegetation coverage	Maintained biodiversity of ecosystems to improve the provision of ecosystem services and the capacity to respond to possible impacts of climate change.	VFEH, VGEH	Ministerio Medio Ambiente Chile, 2014 Chazdon, R. L., 2008
		Restore patches to increase connectivity		Increased connectivity and habitat corridors of species of ecological relevance and to improve the provision of ecosystem services and the capacity to respond to possible impacts of climate change.		Fundación Biodiversidad, 2016 Useche, 2006 Riis et al., 2020
		Recover and restore soils	• Reduce soil erosion to decrease sediments, improve water quality and diminish silting of watercourses • Conserve soil for	Promoted the recovery of soil ecosystems to contribute to the storage of carbn in the roots of plants and soil, in order to mitigate greenhouse gas emissions to		UNFCCC, 2019 Ortiz H, 2007 Riis et al., 2020

			productive activities	the atmosphere. Improved soil retention to reduce flood risk and drought. The restoration of the land stores not only gives quick results, but also is economical, generates jobs and ensures food security.		
Forest protection and conservation	**Agroecological practices**	Conserve soils with agroecological practices (living fences, stubble, cover crops, organic fertilizing, productive diversification)	• Reduce soil erosion to decrease sediments, improve water quality and diminish silting of watercourses • Conserve soil for productive activities	Increased implementation of sustainable production practices to reduce potential sources of diffuse pollution to water bodies, improve diets, and adapt practices to climatic events.	VFEH, VGEH, VGI VPI, VPDes	Martínez-Rodríguez, M.R., et al. 2017 Keenan, R. J., 2015 Garbach et al., 2014
		Train and acquire equipment for fire prevention, control and management	• Increase the time that water remains within the basin, decreasing the force and speed of runoff, as well as increasing infiltration • Moderate extreme temperature thanks to vegetation coverage	Decreased risk of fires and reduced impact from fires that do occur b early warning and fire prevention mechanisms as a potential impact of climate change. Incorporate fire spread prevention measures that compromise the maintenance of biodiversity and environmental services.		UNDP, 2017 Giannakopoulos, C. et al., 2012 Garbach et al., 2014
		Build capacities in communities for extraction and sustainable use of plants of interest (seed banks, nurseries, cover crops, organic fertilizing, productive diversification)	• Moderate extreme temperature thanks to vegetation coverage	Increased use of biodiversity in a sustainable manner in order to minimize the potential effects of climate change on biodiversity.		Cach, J., 2016 Garbach et al., 2014
		Develop green business and sustainable certification plans	• Reduce soil erosion to decrease sediments, improve water quality and diminish silting of	Improved systems that promote provision of ecosystem services and increase the commercial value of products.		Ochoa, J., 2018 Garbach et al., 2014

			watercourses • Increase the time that water remains within the basin, decreasing the force and speed of runoff, as well as increasing infiltration • Conserve soil for productive activities Moderate extreme temperature thanks to vegetation coverage			
Productive practices	**Sustainable livestock management**	Improve livestock practices in transition to sustainable livestock management including silvopastoral systems.	• Reduce soil erosion to decrease sediments, improve water quality and diminish silting of watercourses • Increase the time that water remains within the basin, decreasing the force and speed of runoff, as well as increasing infiltration • Conserve soil for productive activities	Reduced sources of diffuse contamination to water bodies. Restored the water flow to contribute to the connectivity of the basin to reduce the risks of landslides un the upper basin and floods downstream.	VFEH, VGEH, VGI	FAO, 2011 Gaccio, 2011 SEMARNAT, 2011 FAO, 2000 Hoffmann et al., 2014 Riis et al., 2020
		Living fences (fruit and fodder trees)	• Moderate extreme temperature thanks to vegetation coverage			
		Improvement of pastures (grass enrichment, rotations,leguminous, fodder)	• Moderate extreme temperature thanks to vegetation coverage			
		Reforest/restore riparian corridors along streams and rivers, excluding cattle or limiting access points	• Moderate extreme temperature thanks to vegetation coverage • Reduce soil erosion to decrease sediments, improve water quality and diminish silting of			

			watercourses • Increase the time that water remains within the basin, decreasing the force and speed of runoff, as well as increasing infiltration • Conserve soil for productive activities			
	Agroforestry	Enrich fallow areas	• Moderate extreme temperature thanks to vegetation coverage • Reduce soil erosion to decrease sediments, improve water quality and diminish silting of watercourses • Increase the time that water remains within the basin, decreasing the force and speed of runoff, as well as increasing infiltration • Conserve soil for productive activities	Increased productivity and, reduced losses due to climate impacts by implementing practices resilient to climate change.	VFEH, VGEH, VGI, VPDes	Torres, Tenorio, & Gómez, 2008 Armelinda, 2013 Jose, 2009
		Develop sustainable management programs (diversified systems, shadow coffee)		Improved systems that promote provision of ecosystem services and increase the commercial value of products.		CIGAR, 2017 Jose, 2009
		Develop business plans for shade systems like coffee or diversified systems.		Improved systems that promote provision of ecosystem services and increase the commercial value of products.		Bunn C., et al, 2018 Baker P. and J. Haggar, 2007 Jose, 2009

Output 1.1. Increased area of land conserved, restored, or under best management practices that reduce climate vulnerability.

Activities:

1.1.1 Provide funding -through different schemes- to subprojects to conserve, restore and improve management practices to increase adaptive capacities trough river restoration.

- Define detailed selection criteria for each scheme under a participatory approach.
- Disseminate the RFP.
- Rate proposals by external evaluators.
- Select the proposals by the Technical Committee.
- Award contracts to organizations whose subprojects were selected.
- Support the implementation subprojects through the provision of funding.
- Monitoring and reporting of the implementation subprojects.
- Provide technical assistance on sustainable practices.
- Support the development of capacities in producers on financial literacy and business management.
- Evaluate and, where appropriate, extend annual contracts with the organizations in charge of the subprojects.

1.1.2 Support subprojects to implement procedures to maximize environmental and social benefits, with a gender approach.

- Supervise administrative management of subprojects.
- Supervise the implementation of the Environmental and Social Action Plan.
- Supervise the implementation of the gender action plan.

Output 1.2. Target communities have applied a participatory methodology for monitoring biodiversity and water quality to provide inputs for an evaluation of the ecosystem and social vulnerability of the basins.

Activities:

1.2.1 Monitor biodiversity and water quality impact of subprojects through community participation.

- Adjust existing community monitoring methodologies for assessing the ad hoc vulnerability of the project.
- Raise awareness of local actors on the issue of vulnerability through workshops and training related to the effects of climate change.
- Train local actors and communities to implement monitoring methodologies.

1.2.2 Evaluate vulnerability of the watershed-dependent communities with a participatory methodology.

- Evaluate vulnerability of baseline, medium term and final project.
- Communicate the results of vulnerability assessed to provide feedback on adaptation actions at the community level.

Output 1.3. A learning community fostering knowledge has exchanged and coordinated experiences between watersheds and with key actors to increase functional connectivity.

Activities:

1.3.1 Develop a multi-stakeholder knowledge exchange platform to mainstream river restoration.

- Incentivize the linkage of connectivity instruments (from federal, state and municipal actors).
- Conduct national and local experience exchange workshops.
- Design and publish communication materials to communicate to key stakeholders project´s lessons learned.
- Adjust existing communication platforms and adapt them to project needs.

1.3.2 Scale-up lessons learned from subprojects to inform local and national policies and programs.

- Scale-up lessons learned from subprojects to inform private and public programs under Component 2 and National strategies under Component 3.

Component 2: Alignment of public and private investments through natural capital accounting for scaling-up activities for the restoration of rivers for adaptation to climate change . This Component aims to implement coordination activities to align public and private investments, including credits, to scale-up the best practices supported under Component 1. It includes three strategies: (i) promote the alignment of local and national public programs related to connectivity (including CONAFOR Payment for Ecosystem Services, Silvopastoral Program in Jalisco, and others); (ii) mobilize investment of private funds in watershed connectivity in target and additional

Output 2.1. Investments of public programs in targeted watershed catalyzed towards climate resilience have increased.
Activities:
2.1.1 Assess the economic value of ecosystem services to catalyze public financing.
- Evaluate economic contribution of ecosystem services toward vulnerability reduction related to public programs.

2.1.2 Promote the alignment of regulatory instruments and programs at the federal/state level to promote river restoration through EbA.

- Identify public programs with investments in connectivity (existing and potential).
- Analyze and propose regulatory instruments and programs at the federal/state level.

Output 2.2. Investments of private programs in targeted watershed catalyzed towards climate resilience have increased.
Activities:
2.2.1 Conduct assessment of the economic value of ecosystem services to promote private incentives.
- Evaluate economic contribution of ecosystem services toward vulnerability reduction related to private incentives.

2.2.2 Facilitate the implementation of schemes that link the private sector to river restoration as an adaptation measure.
- Identify potential private contributors.
- Design linkage schemes with the private sector in connectivity investments as an adaptation measure.
- Conduct awareness workshops with private actors to promote connectivity investments.
- Supervise that private sector investments land correctly in the territories.

Output 2.3. Dedicated credit lines, and financial products and services developed towards climate resilience have increased.
Activities:
2.3.1 Develop/improve dedicated credit lines and financial products to catalyze financing for EbA activities related to river restoration.
- Promote the development of dedicated credit lines with Development Finance Institutions.
- Train financial intermediaries to develop financial products and services that promote sustainable and climate-resilient practices.

basins, for example, from the tourism industry and water service providers; (iii) promote an enabling environment and improve capacities of producers benefited by Component 1 to access dedicated credit lines for sustainable, climate-resilient productive practices in sustainable ranching and agroforestry. It is expected to have leveraged finance for PES from State Ministries of Rural Development, CONAFOR, CONAGUA, Tourism sector (hotels and restaurants) and water concessions; and for credits from the French Development Agency (AFD) , the Institutionalized Trusts for Agriculture (FIRA) , and Financial Institutions (see PF Section 5.1 for a list). It is expected to have a leveraged finance of at least 50% of the total amount of subprojects´ financing (USD$ 1,785,500).

Financial institutions will be selected to be trained based on (i) presence in the region; (ii) experience working with small rural producers; and (iii) expertise tailoring financial products to sustainable producers. Private sector will be selected based on: (i) their proven capacity to provide funding for more than 3 year, and (ii) direct linkage as receivers of ecosystem services provided by the communities in the watershed.

This Component will also implement a Natural Capital Accounting system, to serve as a basis to increase private and public investments focused on river restoration for climate vulnerability reduction that will be leveraged under this Component. This will be implemented through an economic valuation of selected ecosystem services to quantify, valuate, and attribute the contribution of river restoration to the reduction of climate vulnerability.

Component 3: Design of a National River Restoration Strategy for climate change adaptation. Under the leadership of INECC, this Component will support the design of the NRRS to strengthen the country's adaptation to climate change. It will identify relevant stakeholders for the design of the strategy; establish a Design Committee and its institutional arrangements; incorporate lessons learned from intermediate results from Components 1 and 2; and organize workshops to define objectives, scope, and guidelines of the NRRS. It will also support the work with public officials and legislators to define the legal framework of the strategy; identify relevant key decision-makers and legislators that require strengthening in their knowledge on climate change adaptation, and develop

and launch a communication strategy for the NRRS. Those relevant key decision-makers and legislators will be selected based on their ability to influence the development of the NRRS, their interest on climate change and sustainability and their interest to participate.

Once approved, the NRRS will expect to become: (i) a strategic plan for river restoration at the national level, as well as the inter institutional alignment of productive and conservation sectors, financing and actions in priority sites, with a basin approach in the context of climate change; (ii) an instrument at the national level that contributes to increasing the population's capacity to adapt to climate change, as well as actions for the restoration and connectivity of rivers that improve the quality of ecosystems and the population well-being; (iii) a tool for documenting, assessing, and scaling-up decision making at the national level, in the context of the NRRS; and (iv) a link to the NDCs 2020.

RIOS will engage and work closely with the federal government agencies to proactively prioritize efforts across their full range of operations to foster the alignment of investments, programs, subsidies, and activities for supporting and scaling-up long-term low-GHG and climate-resilient development. On this matter, the RIOS Coordinating Committee (CC) will be key to strengthen collaboration between federal-level environmental, agricultural, water, and rural finance entities participating as project partners. The CC will be composed of INECC, the FMCN that also serves as its Technical Secretariat, and the following key government agencies: Secretariat of Environment and Natural Resources (SEMARNAT), Secretariat of Agriculture and Rural Development (SADER), Secretariat of Welfare (BIENESTAR), National Commission for Protected Areas (CONANP), National Forestry Commission (CONAFOR), National Water Commission (CONAGUA), Mexican Institute of Water Technology (IMTA) and National Trust for Rural Development (FIRA).

Output 3.1. The design of the National River Restoration Strategy has been supported.

Activities:
3.1.1 Design and agree with key stakeholders on a National River Restoration Strategy.Identify and convene relevant actors for the design of the NRRS.

- Establish the inter-institutional arrangements of the Design Committee.
- Incorporate lessons learned from IWAPs, project and similar initiatives.
- Develop workshops to define objectives, scope and guidelines of the Strategy.
  Present and agree on a proposal of a NRRS with key stakeholders from the environmental sector.

Output 3.2: Legislators and officials have actively participated to operationalize the National River Restoration Strategy.
Activities:
3.2.1 Involve key stakeholders on EbA for river restoration, with a gender approach.

- Train legislators and officials on the importance of EbA for river restoration, with a gender approach.
  Definition of the legal framework in which the Strategy may be incorporated.

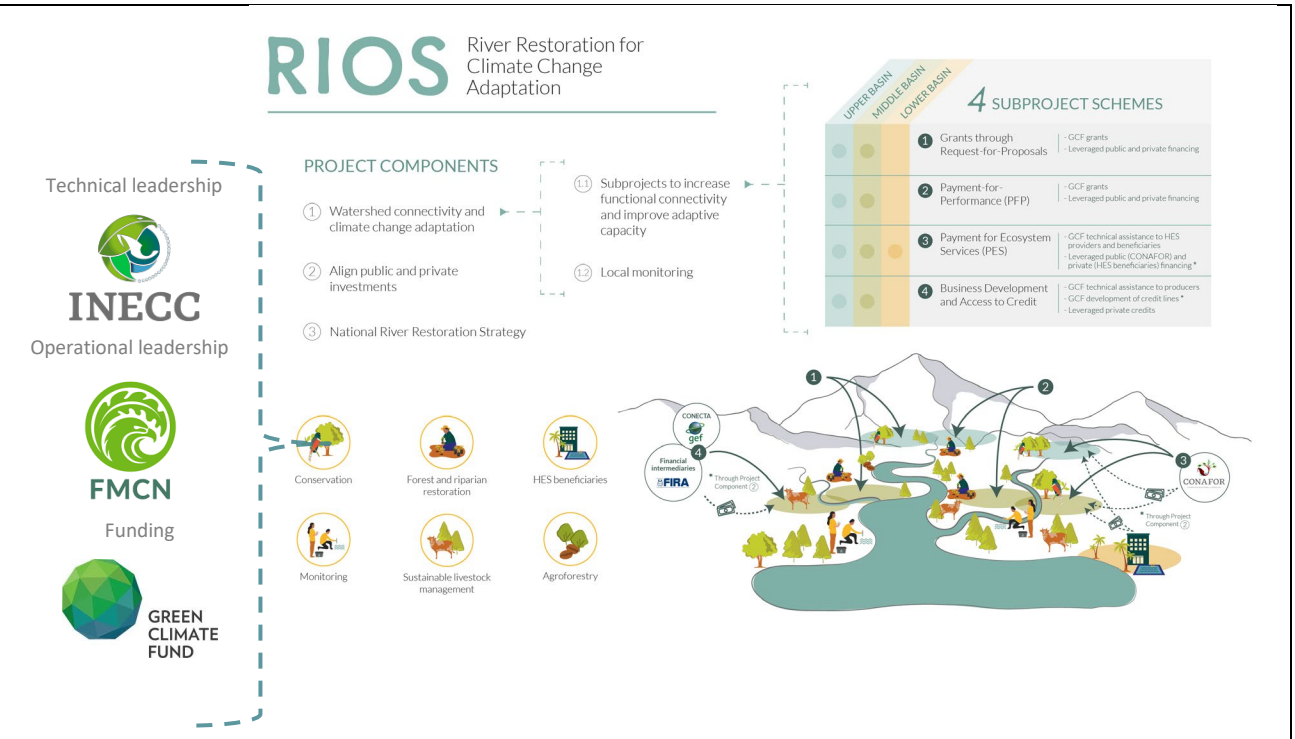


Figure 19. Summary of RIOS Project's Components.

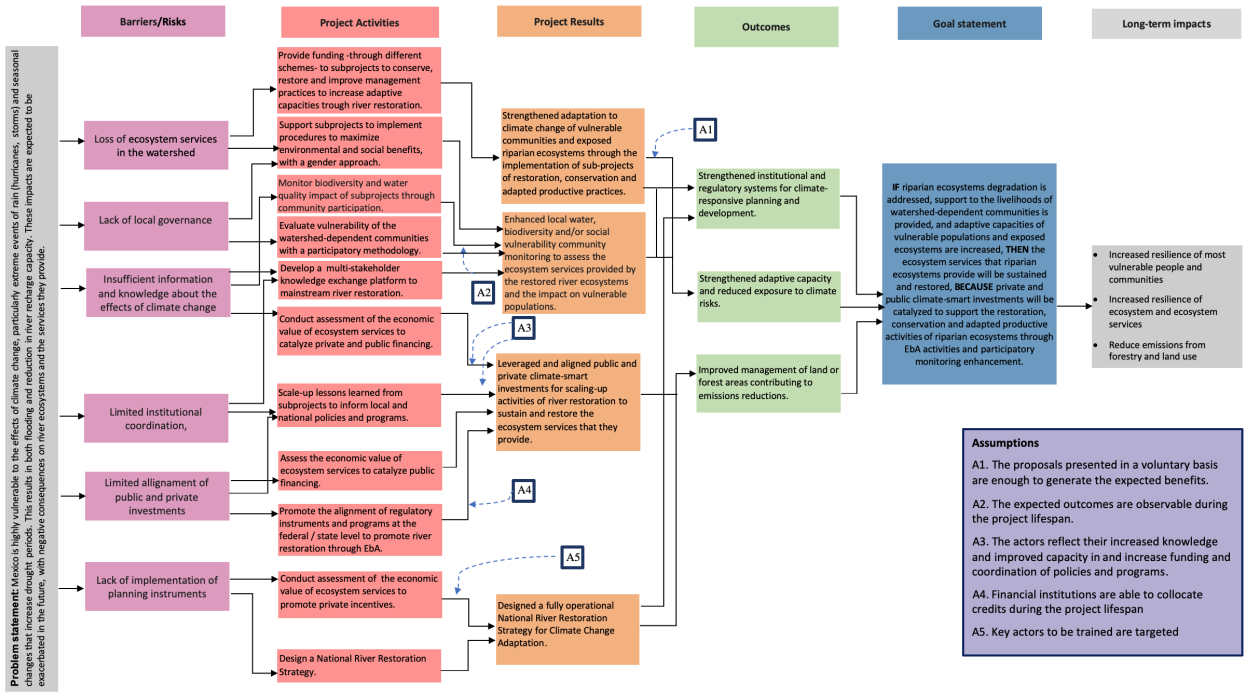


Figure 20. Theory of Change

If riparian ecosystems degradation is addressed, support to the livelihoods of watershed-dependent communities is provided, and adaptive capacities of vulnerable populations and exposed ecosystems are increased, then the ecosystem services that riparian ecosystems provide will be sustained and restored, because private and public climate-smart investments will be catalyzed to support the restoration, conservation and adapted productive activities of riparian ecosystems through EbA activities and participatory monitoring enhancement. In this way,

the objective of RIOS is to increase adaptive capacity in watersheds vulnerable to climate change through river restoration and connectivity by: (i) conducting restoration, conservation and improved productive activities, implemented by local organizations in the states of Jalisco and Veracruz, (ii) increasing local monitoring capacities to reduce climate vulnerability, (iii) catalyzing public and private climate-smart investments; and (iv) supporting the development of climate policy in a National River Restoration Strategy.

B.3. Implementation / institutional arrangements (max. 750 words)

FMCN will play the role of both Accredited Entity and Executing Entity. Two Regional Funds, Fondo Golfo de México (FGM) in Veracruz and Fondo Noroeste (FONNOR) in Jalisco will be co-Executing Entities along with FMCN. INECC will be the technical leader of the project and will ensure country ownership. . The governance structure of RIOS includes a Coordinating Committee (CC), a Technical Committee (TC), and two Regional Funds.

a) Instances of responsibility (Figure 23 and Table 14)

Table 14. Instances of responsibilities

Coordinating Committee (CC).	The CC will be composed by INECC, FMCN and the following participating government agencies: Ministry of Environment and Natural Resources (SEMARNAT), Ministry of Agriculture and Rural Development (SADER), Ministry of Welfare (BIENESTAR), National Commission for Protected Areas (CONANP), National Forestry Commission (CONAFOR), National Water Commission (CONAGUA), Mexican Institute of Water Technology (IMTA) and Institutionalized Trusts for Agriculture (FIRA). It will be responsible for providing policy guidance and will support coordination of project work among the participating agencies and promote their collaboration
Technical Committee (TC).	The TC will be composed of representatives from the National Institute of Ecology and Climate Change (INECC) and FMCN. The TC will meet at least three times a year and will monitor and supervise the operation of RIOS. The staff housed at INECC and FMCN will respond to the TC. The designated staff at INECC includes five specialists: River restoration Officer, Technical assistant adaptation to climate change, Policy Alignment Officer, Technical assistant analysis of environmental services, Technical assistant social safeguards and gender. They will oversee and generate the technical information for the project components and will be equipped by computers and specialized technology packages financed by the project. FMCN will house: a Project director, a safeguards specialist, an accounting assistant, a communication officer, and a technical assistant hired by the FMCN (the first three part-time). They will be responsible for administration, reports, audits, fiscal and legal aspects, compliance with fiduciary and procurement procedures, as well as guidance, supervision and reporting on the implementation of safeguards.
FMCN	FMCN will play the role of both Accredited Entity and Executing Entity. FMCN, as the Accredited Entity (AE), has the adequate capacity to carry out the administration and supervision of the Project, given its trajectory in implementing projects financed by international institutions such as the World Bank, the State Development Bank of the Federal Republic of Germany (KfW) and the Inter-American Development Bank (IDB), among others. FMCN's internal control is solid, since it has manuals, policies and operating procedures that will be applicable to the execution of the Project. FMCN will channel resources to two Regional Funds
INECC	INECC is the national government agency that coordinates research to feed policy on climate change in Mexico. INECC is the technical leader. INECC will adapt monitoring systems from C6 and will complement under Component 1 a social vulnerability community assessment that will be applied and monitored during project implementation. Under the leadership of INECC, Component 3 will support the design of the NRRS to strengthen the country's adaptation to climate change. INECC involvement will ensure country appropriation.
Regional Funds (RF)	The project will be co-executed by two Regional Funds previously created by FMCN. These RF have been proved to reduce operation costs by working closer to local organizations and communities. In Veracruz, the FMCN will transfer funds to Fondo Golfo de México (FGM), and in Jalisco to Fondo Noroeste (FONNOR). The World Bank has supervised both RF for six years and highlights them as key for local engagement, supervision, and capacity building. They have the governance mechanism of non-profits and follow the standards established by FMCN and derived from the Practice Standards for Conservation Trust Funds developed by the Conservation Finance Alliance. Management units in each RF will consist of a Project Coordinator, a Monitoring and Evaluation Analyst, and an Administrative Assistant. The RF will be in charge, among other activities, of the request for proposals process and the selection, training, support, and supervision of subprojects, as well as the disbursements that will finance civil, community or private organizations that work directly with local communities and producers in Component 1. They will also be responsible for the socialization of the grievance redress mechanism in the watersheds, receiving and processing complaints and consultations related to the project and sending them to the FMCN safeguards specialist, as well as identifying problems and finding their solutions together with stakeholders.
Beneficiaries	The direct beneficiaries are the 63,294 inhabitants of the targeted sub-basins that will have increased provision of ecosystem services and reduced vulnerability to climate change. The main beneficiaries of subprojects are 6,000 men and women from vulnerable communities and producer groups that will implement activities related to conservation, restoration and adaptation of practices in target basins. Also, financial institutions will be trained in a variety of topics, including gender mainstreaming in their operation, and the design of dedicated sustainable credit lines. Legislators and key institutional actors will also be trained in various topics including gender aspects in the design of a NRRS. The indirect beneficiaries are over 850,00 people that live in the Ameca-Mascota and Jamapa basins, and will have improved provision of ecosystem services. Additionally, over 6,000,000 tourists that visit the both regions per year, will have better water quality and landscape aesthetics derived from the project.

FMCN undertakes an AE role. FMCN as an Executing Entity (EE) will be responsible for carrying out activities 1.3.2, and most activities related to Component 2 and 3 (2.1.1, 2.1.2, 2.2.1, 2.3.1, 3.3.1, and 3.2.1). FONNOR and FGM as EEs will be responsible for carrying out activities 1.1.2 and 1.2.2. In relation to activities 1.1.1,1.2.1, 1.3.1 and 2.2.2, FONNOR and FGM will lead the sub-activities related to the local implementation in the field, and FMCN will be responsible of planning related sub-activities. Where a sub-activity is to be implemented by more than one EE, these EEs will be jointly and severally responsible for implementation of such sub-activity. INECC acts as technical leader of the activities, and is a key actor to upscale lessons learned from the subprojects into the National River Restoration Strategy under Component 3.

Table 15. Responsibility per EE for each activity.

Component	Output	Activities	Sub-activities	Executing Entities	
				Leads	Co-EE
Component 1: Increase in forest and water connectivity with a vision of adaptation to climate change through restoration, conservation and best productive practices	Output 1.1 Increased area of land conserved, restored, or under best management practices that reduce climate vulnerability.	1.1.1 Provide funding - through different schemes- to subprojects to conserve, restore and improve management practices to increase adaptive capacities through river restoration.	1.1.1.1 Define detailed selection criteria for each scheme under a participatory approach (all Schemes).	FMCN	
			1.1.1.2 Disseminate the RFP (Scheme 1,2, and 4).	FGM[1] FONNOR	
			1.1.1.3 Rate proposals by external evaluators (Scheme 1,2, and 4).	FGM FONNOR	
			1.1.1.4 Select the proposals by the Technical Committee (Scheme 1,2, and 4).	FMCN	
			1.1.1.5 Award contracts to organizations whose subprojects were selected (Scheme 1, and 2).	FGM FONNOR	
			1.1.1.6 Support the implementation subprojects through the provision of funding. (Scheme 1,2, and 4).	FGM FONNOR	
			1.1.1.7 Monitoring and reporting of the implementation subprojects (all Schemes).	FGM FONNOR	
			1.1.1.8 Provide technical assistance on sustainable practices (Scheme 3).	FGM FONNOR	
			1.1.1.9 Support the development of capacities in producers on financial literacy and business	FGM FONNOR	

			management (Scheme 4).		
			1.1.1.10 Evaluate and, where appropriate, extend annual contracts with the organizations in charge of the subprojects (Scheme 1,2, and 4).	FGM FONNOR	FMCN
		1.1.2 Support subprojects to implement procedures to maximize environmental and social benefits, with a gender approach.	1.1.2.1 Supervise administrative management of subprojects (Scheme 1,2, and 4).	FGM FONNOR	
			1.1.2.2 Supervise the implementation of the Environmental and Social Action Plan (all Schemes).	FGM FONNOR	FMCN
			1.1.2.3 Supervise the implementation of the gender action plan (all Schemes).	FGM FONNOR	
	Output 1.2 Target communities have applied a participatory methodology for monitoring biodiversity and water quality to provide inputs for an evaluation of the ecosystem and social vulnerability of the basins	1.2.1 Monitor biodiversity and water quality impact of subprojects through community participation.	1.2.1.1 Adjust existing community monitoring methodologies for assessing the ad hoc vulnerability of the project (all Schemes).	FMCN	
			1.2.1.2 Raise awareness of local actors on the issue of vulnerability through workshops and training related to the effects of climate change (all Schemes).	FGM FONNOR	
			1.2.1.3 Train local actors and communities to implement monitoring methodologies (all Schemes).	FGM FONNOR	FMCN
		1.2.2 Evaluate vulnerability of the watershed-dependent communities with a participatory methodology.	1.2.2.1 Evaluate vulnerability of baseline, medium term and final project (all Schemes).	FGM FONNOR	FMCN
			1.2.2.2 Communicate the results of vulnerability assessed to provide feedback on adaptation actions at the community level (all Schemes).	FGM FONNOR	
	Output 1.3	1.3.1 Develop a multi-stakeholder knowledge exchange platform to	1.3.1.1 Incentivize the linkage of connectivity instruments (from	FGM FONNOR	

	A learning community fostering knowledge has exchanged and coordinated experiences between watersheds and with key actors to increase functional connectivity.	mainstream river restoration.	federal, state and municipal actors) (all Schemes, mainly Scheme 3)		
			1.3.1.2 Conduct national and local experience exchange workshops (all Schemes).	FGM FONNOR	FMCN
			1.3.1.3 Design and publish communication materials to communicate to key stakeholders project´s lessons learned (all Schemes).	FMCN	
			1.3.1.4 Adjust existing communication platforms and adapt them to project needs.	FMCN	
		1.3.2 Scale-up lessons learned from subprojects to inform local and national policies and programs.	1.3.2.1 Scale-up lessons learned from subprojects to inform private and public programs under Component 2 and National strategies under Component 3 (all Schemes).	FMCN	
Component 2: Alignment of public and private investments through natural capital accounting for scaling-up activities for the restoration of rivers for adaptation to climate change	Output 2.1 Investments of public programs in targeted watershed catalyzed towards climate resilience have increased.	2.1.1 Assess the economic value of ecosystem services to catalyze public financing.	2.1.1.1 Evaluate economic contribution of ecosystem services toward vulnerability reduction related to public programs.	FMCN	
		2.1.2 Promote the alignment of regulatory instruments and programs at the federal / state level to promote river restoration through EbA.	2.1.2.1 Identify public programs with investments in connectivity (existing and potential).	FMCN	FGM FONNOR
			2.1.2.2 Analyze and propose regulatory instruments and programs at the federal / state level.	FMCN	FGM FONNOR
	Output 2.2 Investments of private programs in targeted watershed catalyzed towards climate resilience have increased.	2.2.1 Conduct assessment of the economic value of ecosystem services to promote private incentives.	2.2.1.1 Evaluate economic contribution of ecosystem services toward vulnerability reduction related to private incentives.	FMCN	
		2.2.2 Facilitate the implementation of schemes that link the private sector to river restoration as an adaptation measure.	2.2.2.1 Identify potential private contributors.	FMCN	FGM FONNOR
			2.2.2.2 Design linkage schemes with the private sector in connectivity	FMCN	

			investments as an adaptation measure.		
			2.2.2.3 Conduct awareness workshops with private actors to promote connectivity investments.	FMCN	
			2.2.2.4 Supervise that private sector investments land correctly in the territories.	FGM FONNOR	
	Output 2.3 Dedicated credit lines, and financial products and services developed towards climate resilience have increased.	2.3.1 Develop/improve dedicated credit lines and financial products to catalyze financing for EbA activities related to river restoration.	2.3.1.1 Promote the development of dedicated credit lines with Development Finance Institutions.	FMCN	
			2.3.1.2 Train financial intermediaries to develop financial products and services that promote sustainable and climate-resilient practices.	FMCN	
Component 3: Design of a National River Restoration Strategy for climate change adaptation	Output 3.1 The design of the National River Restoration Strategy has been supported.	3.1.1 Design and agree with key stakeholders on a National River Restoration Strategy.	3.1.1.1 Identify and convene relevant actors for the design of the NRRS.	FMCN	
			3.1.1.2 Establish the inter-institutional arrangements of the Design Committee.	FMCN	
			3.1.1.3 Incorporate lessons learned from IWAPs, project and similar initiatives.	FMCN	
			3.1.1.4 Develop workshops to define objectives, scope and guidelines of the Strategy.	FMCN	
			3.1.1.5 Present and agree on a proposal of a NRRS with key stakeholders from the environmental sector.	FMCN	
	Output 3.2 Legislators and officials have actively participated to operationalize the National River Restoration Strategy.	3.2.1 Involve key stakeholders on EbA for river restoration, with a gender approach.	3.2.1.1 Train legislators and officials on the importance of EbA for river restoration, with a gender approach.	FMCN	
			3.2.1.2 Definition of the legal framework in which the Strategy may be incorporated.	FMCN	

Based on the institutional arrangements that are in place, contractual arrangements will be made, which begin with the signing of a Specific Funded Activity Agreement (Grant Agreement) between GCF and FMCN. This contract will be the framework agreement for the project. Once this agreement is signed and operating, FMCN will sign regional grant agreements with the Regional Funds, who will have the responsibility to carry out the supervision of the direct operation in the field, as are the sub-projects with civil society organizations. To ensure the co-financing that the GEF provides to the RIOS project, FMCN will sign a Grant Agreement with the World Bank to carry out such resource collaboration. INECC is the technical leader of the project, and will ensure country appropriation and long-term sustainability. INECC role does not includes carrying out any funded activity directly, but advising on the technical design and implementation.

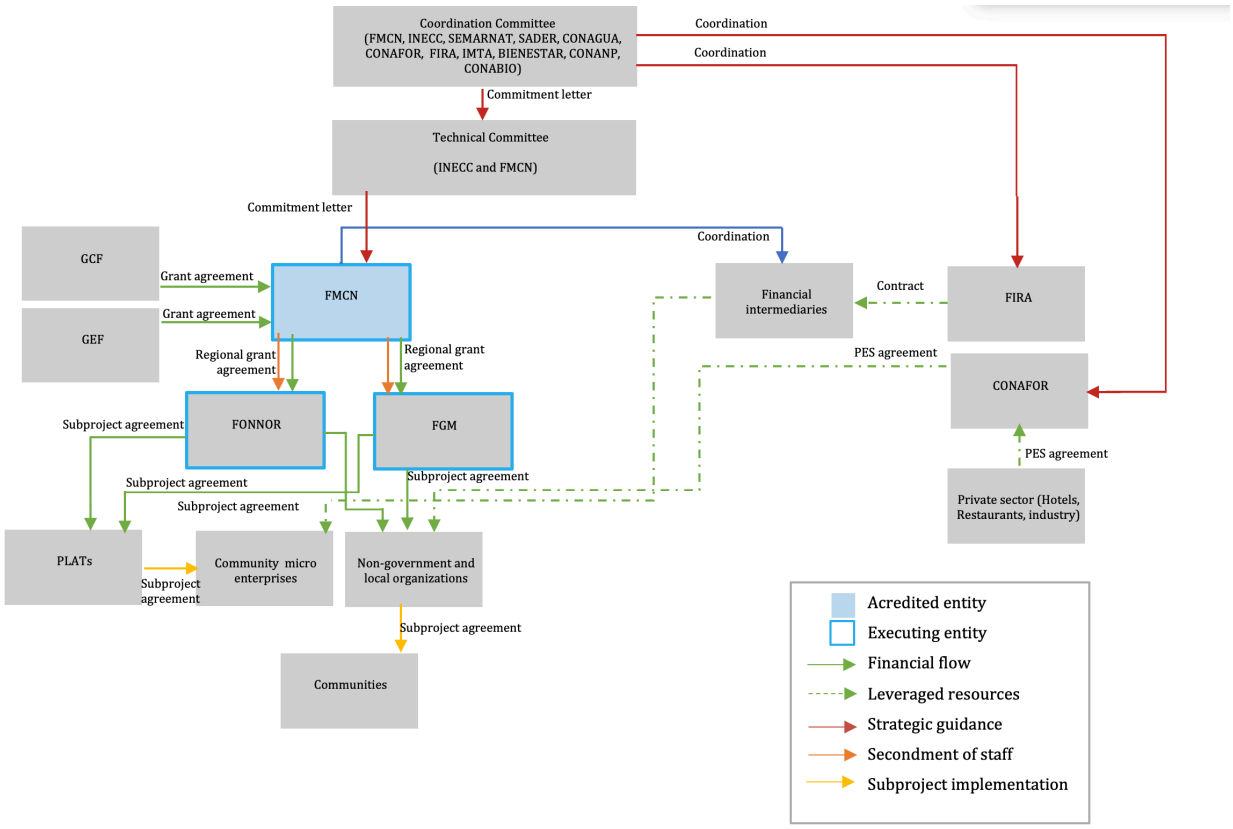


Figure 21. Implementation arrangements and flow of funds

C. FINANCING INFORMATION					
C.1. Total financing					
(a) Requested GCF funding (i + ii + iii + iv + v + vi)		9		million USD ($)	
GCF Financial Instrument		**Amount**	**Currency**	**Tenor**	**Pricing**
(i)	Senior loans	Enter amount	Options	Enter years	Enter %
(ii)	Subordinated loans	Enter amount	Options	Enter years	Enter %

(iii)	Equity	Enter amount	Options		Enter % equity return
(iv)	Guarantees	Enter amount	Options	Enter years	Enter %
(v)	Reimbursable grants	Enter amount	Options		
(vi)	Grants	9	million USD ($)		

(b) Co-financing information[4]	**Total amount**			**Currency**		
	1 million			million USD ($)		
Name of institution	**Financial instrument**	**Amount**	**Currency**	**Tenor**	**Pricing**	**Seniority**
FMCN- GEF	Grant	1	million USD ($)	Enter years	Enter%	Options
Click here to enter text.	Options	Enter amount	Options	Enter years	Enter%	Options
Click here to enter text.	Options	Enter amount	Options	Enter years	Enter%	Options
Click here to enter text.	Options	Enter amount	Options	Enter years	Enter%	Options

(c) Total investment (c) = (a)+(b)	**Amount**	**Currency**
	10	million USD ($)
(d) Co-financing ratio (d) = (b)/(a)	*0.11*	
(e) Other financing arrangements for the project/programme (max ½ page)	RIOS will be complemented and co-financed by the GEF- financed CONECTA Project. The project will align additional funding developed/improved credit lines, as well as national and regional public programs.	

C.2. Financing by component

Please provide an estimate of the cost per component (as outlined in Section B.2. above) and disaggregate by sources of financing. This table should match the one presented in the term sheet and the names (in the rows) should match those presented in the logic framework in section D below.

Component	Output	Indicative cost (USD)	GCF financing		Co-financing			
			Amount (USD)	Financial Instrument	Type	Amount (USD)	Financial Instrument	Name of Institutions
Component 1 Increase in forest and water connectivity with a vision of adaptation to climate change through restoration, conservation and best productive practices	1.1 Increased area of land conserved, restored, or under best management practices that reduce climate vulnerability.	5,010,600	4,555,444	Grants	Public Source	455,156	Grants	GEF

[4] If the co-financing is provided in different currency other than the GCF requested, please provide detailed financing information and a converted figure in the GCF requested currency in the comment box. Please refer to the date when the currency conversion was performed and the reference source.

Component 1: Increase in forest and water connectivity with a vision of adaptation to climate change through restoration, conservation and best productive practices	1.2: Target communities have applied a participatory methodology for monitoring biodiversity and water quality to provide inputs for an evaluation of the ecosystem and social vulnerability of the basins.	1,666,883	1,320,788	Grants	Public Source	346,095	Grants	GEF
Component 1: Increase in forest and water connectivity with a vision of adaptation to climate change through restoration, conservation and best productive practices	1.3: A learning community fostering knowledge has exchanged and coordinated experiences between watersheds and with key actors to increase functional connectivity.	605,065	453,935	Grants	Public Source	151,130	Grants	GEF
Component 2: Alignment of public and private investments through natural capital accounting for scaling-up activities for the restoration of rivers for adaptation to climate change	2.1: Investments of public programs in targeted watershed catalyzed towards climate resilience have increased.	647,795	647,795	Grants	Choose an item.	Enter amount	Choose an item.	Click here to enter text.
Component 2: Alignment of public and private investments through natural capital accounting for scaling-up activities for	2.2 Investments of private programs in targeted watershed catalyzed towards climate resilience have increased.	302,027	302,027	Grants	Choose an item.	Enter amount	Choose an item.	Click here to enter text.

the restoration of rivers for adaptation to climate change.								
Component 2: Alignment of public and private investments through natural capital accounting for scaling-up activities for the restoration of rivers for adaptation to climate change.	2.3: Dedicated credit lines, and financial products and services developed towards climate resilience have increased.	385,276	385,276	Grants	Choose an item.	Enter amount	Choose an item.	Click here to enter text.
Component 3: Design of a National River Restoration Strategy for climate change adaptation	3.1: The design of the National River Restoration Strategy has been supported.	500,926	500,926	Grants	Choose an item.	Enter amount	Choose an item.	Click here to enter text.
Component 3: Design of a National River Restoration Strategy for climate change adaptation	3.2: Legislators and officials have actively participated to operationalize the National River Restoration Strategy.	204,093	204,093	Grants	Choose an item.	Enter amount	Choose an item.	Click here to enter text.
Mid-term and Final Reviews		201,144	201,144	Grants				
PMC		476,190	428,571	Grants		47,619		GEF
Indicative total cost (USD)		10,000,000	9,000,000		1,000,000			

C.2.1 Financing structure (if applicable, mandatory for private sector proposal (max.300 words)

The Project has a total financing of US $ 10 million, of which US $9 million are financed by the GCF and US $ 1 million by a co-finance by FMCN from the GEF- financed project CONECTA. The cost and financing of the Project will be executed according to the components established for the Project, which are summarized in Figure 24 and detailed in Annex 1.

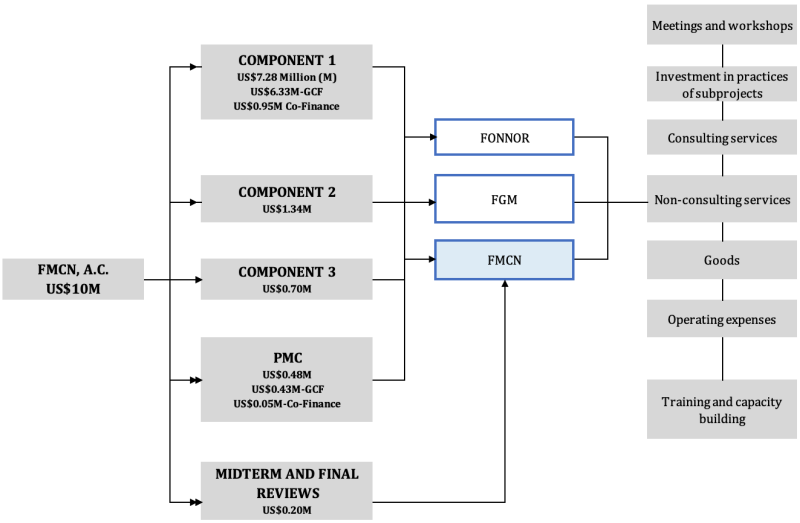


Figure 24. Financing structure of RIOS

C.3 Capacity Building and Technology development/transfer

Capacity building includes the development and enhancement of endogenous capacities of INECC, other public officials, legislators, private sector and communities (workshops and training under all Components, and 80% of subproject cost under Component 1).
Technology development includes the promotion, facilitation and financing to transfer , access and deploy climate-friendly technologies in subproject implementation (20% of subproject cost under Component 1).

C.3.1 Capacity building	Amount:_ 2,997,067___ USD
C.3.2. Technology development	Amount:_ 668,626___ USD

C.4. Justification for GCF funding request (max. 500 words)

GCF funding is crucial due to the limited national budget channeled to increase adaptive capacity in basins vulnerable to climate change. The project objectives are directly linked to Mexico´s NDCs and National Development Plan (see section E.5), in specific related to (i)reforestation in watersheds, with particular focus on riparian ecosystems; (ii)conservation and restoration of ecosystems; (iii)integral watershed management, and (iv)integration of climate change criteria into agricultural and livestock programs. However, the required investment for climate adaptation needs cannot be met with the national budget alone. The national Budget reductions in 2019 included reductions in the environmental sector, were 32% compared to the allocation of 2018. According to the Think Tank FUNDAR this budget reduction "risks the capacity to meet Mexico´s goals of the Paris Agreement on Climate Change" (FUNDAR, 2019). The low costs compared to the expected benefits of the RIOS project will be an essential element to incentivize public investment in the future. GCF funding will allow showcasing efficient local and sustainable examples, that can be linked to the regional alignment of private and public funding, as well as national strategies.

RIOS will provide the incremental cost for a new output that will result in an important adaptation impact in Mexico, which is ecosystem based adaptation (EbA) through river restoration. At this point, riparian restoration through natural processes does not have public investments or policies, so the baseline scenario is zero. Present public investments to address landslides and floods, which are the main effects of climate change in rivers, are costly infrastructure projects.

The project mobilizes public and private investments to reduce risks and align the limited investments in the basins to respond to climate adaptation needs. The GCF investment will allow for coordination of multiple agents in the watersheds to increase climate adaptation through river restoration. RIOS leverages and catalyzes finance in a tailored way, depending on the type of activity. For those with positive private returns, such as sustainable livestock, it will be complemented with credits. For activities with a positive impact on ecosystem services such as upstream conservation, a Payment for Environmental Services program will be incorporated, catalyzing public-private investments. This coordination of funding sources from RIOS is required to improve forests and river connectivity to increase the adaptive capacity in basins vulnerable to climate change. Moreover, the demonstration of costs and results of ecosystem based adaptation in rivers through the constant monitoring included in RIOS will aim at the paradigm shift required to mobilize

both public and private finance by the end of the project. It is expected to have a leveraged finance from private and public resources of at least 50% of the total amount of subprojects´ financing (USD$ 1,785,500).

The concessionally of this project is only for the activities that wouldn't occur by private pf public investors in the absence of this grants, and have high environmental and social co-benefits. The economic analysis (see FS Section 4.3) includes all the activities supported by the project, including conservation, restoration, and improved productive practices. The analysis shows that the net present value (NPV) is projected to reach US$ 30.6 million (lower bound), and US$ 68 million (upper bound) in the baseline scenario (20 years, carbon social price of US$ 60, and 6 percent discount rate). The investments evaluated for the economic analysis have a Benefit-Cost ratio between 1.58 and 2.30 and an internal rate of return (IRR) between 54.89 and 95.08 percent. The results of the quantitative simulations are robust in terms of sensitivity analyses by increasing the discount rate from six to nine percent, reducing the carbon social price (from US$ 60 to US$ 40), as well as adopting the value of voluntary carbon market (US$ 3.01), and using more conservative estimates regarding the value of ecosystem services provided.

RIOS will be complemented and co-financed by the GEF- financed CONECTA Project. CONECTA will provide the co-financing for RIOS, which will be financed by the World Bank, through a GEF USD$15 million grant, to be implemented during 2021-2026. The objective of CONECTA is to improve integrated landscape management in selected watersheds in the states of Chihuahua, Chiapas, Jalisco and Veracruz. (see FS Section 1.6). RIOS complements the integrated landscape approach of CONECTA, with a climate mitigation and adaptation impacts.

C.5. Exit strategy and sustainability (max. 300 words)

The long-term sustainability strategy gathers experiences from FMCN and the RFs to ensure that the project activities continue once the project is completed. RIOS will replicate and improve the sustainability strategy implemented in C6. For example, an evaluation 16 months after C6 ended showed that 90% of the subprojects continued their operation and obtained additional financing from other sources, including public (Sembrando Vida, Jóvenes Construyendo el Futuro) as well as private investments. The project will take into account lessons learned of similar GCF projects, including FP131 (Improving Climate Resilience of Vulnerable Communities and Ecosystems in the Gandaki River Basin, Nepal), FP107 (Supporting Climate Resilience and Transformational Change in the Agriculture Sector in Bhutan) and FP124 (Strengthening Climate Resilience of Subsistence Farmers and Agricultural Plantation Communities residing in the vulnerable river basins, watershed areas and downstream of the Knuckles Mountain Range Catchment of Sri Lanka).The main aspects of the exit strategy for long-term sustainability are:

i. **Include activities with positive economic returns to ensure long-term sustainability** Pre-Feasibility Study Section 4.3 shows that activities have a positive return of investment. A detailed financial analysis was carried out on sustainable livestock activities and showed that they are profitable. The activities have a high probability of continuing once the project ends.
ii. **Mobilize public and private investments to ensure long-term sustainability**. For those activities with positive private returns, such as sustainable livestock, RIOS' capacity building on best practices will be complemented with credits. For activities with a positive impact on ecosystem services such as upstream conservation, a Payment for Environmental Services program will be incorporated, catalyzing public-private investments. This variety of financing sources reduces risks and increases long-term sustainability.
iii. **Demonstrate the positive impact of the activities through robust monitoring.** Through intensive monitoring, the economic valuation of ecosystems, and the implementation of a PfP scheme, the initiatives' positive impact will be apparent to both landowners and the public and private sectors. This will allow the creation of long-term sustainable financing mechanisms based on the activities' real and monitored impact.
iv. **Allows replication and systemic change through a National Strategy**. Rather than implementing stand-alone subprojects, RIOS is designed to expand the lessons learned from Component 1 to support a National River Restoration Strategy for greater nationwide impact through the Government's own resources or additional multilateral financing.

C.6. Financial management/procurement (max. 300 words)

Financial management. FMCN, as the Accredited Entity (AE), has the adequate capacity to carry out the administration and supervision of the Project, given its trajectory in implementing projects financed by international institutions such as the World Bank, the State Development Bank of the Federal Republic of Germany (KfW) and the Inter-American Development Bank (IDB), among others. FMCN's internal control is solid, since it has manuals, policies and operating procedures that will be applicable to the execution of the Project. FMCN will channel resources to two Regional Funds (RF) Fondo Golfo de México, A.C. (FGM) and Fondo Noroeste, A.C. (FONNOR) as Executing Entities (EE). These RFs have

undergone a due diligence evaluation by FMCN that shows they have the installed capacity to execute the Project (see FS Section 5.3). EEs have a proven experience implementing other projects (for example, GEF funded C6), and recently (May 2020) were positively evaluated under a due-diligence process by the World Bank, to carry-out expenditure categories supervised by the World Bank , which are the same categories as those of the GCF . FMCN is also an EE. As EE, it has a qualified team that will provide follow-up, advice and direct support to the project activities.

During execution, the three components of the project will finance operating expenses, consulting services, non-consulting services, goods, education and training, meetings and workshops, and sub-projects. Operating expenses include travel expenses, salaries and benefits, office supplies, rent and maintenance.

Procurement. Procurement will be performed in accordance with FMCN Operations Manual used for GCF accreditation . FMCN will be in charge of the supervision, and approval of procurement procedures. The RFs will supervise the acquisitions made by Civil Society Organizations (CSOs) during the execution of the subprojects.

External audits. FMCN has a general external auditor that reviews the administration of all projects. The auditors are selected in accordance with the FMCN Operating Standards and Administrative Procedures. When the project finances subprojects within its activities (like RIOS), the external auditors are asked to make a random selection of 20% of total subprojects to carry out annual audits of all the executors in the field. The general audit and special audits are annual. The general audit is delivered no later than April 30 of each year. Special project audits are delivered to the donor no later than June 30 of each year.

Detailed information on financial management and procurement are in Annex 8.

D. LOGIC FRAMEWORK AND MONITORING, REPORTING AND EVALUATION

This section refers to the project/programme's logic framework in accordance with the GCF's Performance Measurement Framework under the Results Management Framework to which the project/programme contributes as a whole, including in respect of any co-financing. This is different from the project/programme-level log frame(as there may be other impact measures for example that go beyond those defined by the GCF).

A project-level logical framework, with specific indicators, baselines and targets, means of verification and assumptions should be provided as part of Annex 2.

D.1. Paradigm shift objectives (max.200 words)

Increased climate-resilient sustainable development	The project directly contributes to resilient development by addressing the pressures of land use change generated by the deterioration in territorial suitability for agricultural and livestock activities, caused by climate change; this leads to a decrease in the provision of ecosystem services. Other barriers that the project will address and that will contribute to climate-resilient development are limited institutional coordination, and deficient alignment of public and private investments.
Shift to low-emission sustainable development pathways	The project contributes to low-emission development by mitigating emissions and enhancing carbon stocks by: reducing the pressure on forest degradation and deforestation, restoring key vegetation and improving productive practices.

D.2. Impacts measured by GCF indicators

Select the appropriate impact for the project/programme. Note that more than one indicator may be selected per expected impact result. Add results as appropriate.

Expected Result	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
A1.0 Increased resilience and enhanced livelihoods of the most vulnerable people,	A1.2 Number of males and females benefiting from the adoption of diversified, climate resilient livelihood options (including	Official data from national population surveys (census, and inter census	0 people	Male = 12,250 Female = 12,750	Male = 31,016	The adoption of diversified, climate-resilient livelihood practices will directly benefit

communities and regions	fisheries, agriculture, tourism, etc.)	data) triangulated to project data where the activities are being financed		Total= 25,000	Female = 32,278 Total= 63,294	the inhabitants from the localities of all the basin by increasing the provision of ecosystem services. This will increase their resilience to climate change effect.
A4.0 Improved resilience of ecosystems and ecosystem services	A4.1 Coverage/scale of ecosystems protected and strengthened in response to climate variability and change	Publications endorsed by the government (IWAPs), independent water community monitoring evaluation and field visits	64,348 ha	100,000 ha	260,000 ha	Areas with improved ecosystems endorse the Integrated Watershed Action Plans IWAP (co-financed by GEF CONECTA project) and are strengthened via a reduction in the risk of deforestation and improved management. Baseline includes those areas that currently have a formal protection/conservation strategy (i.e. Pico de Orizaba and Sierra Vallejo Natural Protected Areas).
M4.0 Reduced emissions from land use, reforestation, reduced deforestation, and through sustainable forest management and conservation and enhancement of forest carbon stocks	M4.1 Tonnes of carbon dioxide equivalent (t CO2eq) reduced or avoided (including increased removals) as a result of Fund-funded projects/programmes	Ex-Act, and BUR and triangulated with geospatial data (for ex-post)	Without project 335,733 tCO_2e	120,000 tCO_2e net carbon sink	2.391 M t CO_2 eq net carbon sink	GHG estimates are based on the twenty-year project asset lifespan, estimated with the EX-ACT tool complemented with national official data (BUR, NIR). Reduced or avoided means the area for which new and/or improved sustainable landscape

						management has been promoted through IWAPs and by practices introduced through the project.

D.3. Outcomes measured by GCF indicators

Expected Outcomes	Indicator	Means of Verification (MoV)	Baseline	Target		Assumptions
				Mid-term (if applicable)	Final	
A5.0 Strengthened institutional and regulatory systems for climate-responsive planning and development	A5.2 Number and level of effective coordination mechanisms[5]	Publication of rules of operation in the official National Gazette, Memorandums of understanding and other formal agreements. Relevant minutes.	1 Mechanism= Level 3	1 Mechanism = Level 3 1 Mechanism = Level 4	2 Mechanism= Level 3 2 Mechanism= Level 4	Baseline agreement is the mechanism agreed by INECC-CONAFOR for the selection criteria of the PES project under IWAPs priority areas.
A7.0 Strengthened adaptive capacity and reduced exposure to climate risks	A7.1: Use[6] by vulnerable households, communities, businesses and public-sector services of Fund supported tools, instruments, strategies and activities to respond to climate change and variability	Pre-post project survey, and field data	Level= 2 0% of subprojects have been trained	Level =3 50% of subprojects have been trained	Level =4 80% of subprojects have been trained	Fund-supported tools, instruments, strategies, and activities mean the social vulnerability assessment tool developed under Component 1. The baseline tool is the National Atlas for Vulnerability, developed by INECC.
M9.0 Improved management of land or forest areas contributing to emissions reductions	M9.1 Hectares of land or forests under improved and effective management that contributes to CO2 emission reductions.	Georeferenced databases, drone photos, and databases verified by a third party in the mid-term and independent evaluations	0 ha	4,000 ha	7,725 ha	Land or forest areas are the number of hectares under rehabilitation, restoration, and improved management practices under Component 1. Based on CIF Forest Investment

[5] Level 1 = no social vulnerability assessment tool exists at national level; Level 2 = the social vulnerability assessment tool has been adapted at local level with a participatory inclusive approach (including gender aspects); Level 3 = at least 50% of subprojects have been trained on how to implement the the social vulnerability assessment tool; Level 4 = at least 80% of subprojects have been trained on how to implement the the social vulnerability assessment tool and are implementing it.

[6] Use Level 1 = no coordination mechanism; Level 2 = coordination mechanism in place; Level 3 = coordination mechanism in place, meeting regularly with appropriate representation (gender and decision-making authorities); Level 4 = coordination mechanism in place, meeting regularly, with appropriate representation, with appropriate information flows and monitoring of action items/issues raised.

						Program (FIP) indicator guidance: reduction/avoidance/removals refer to greenhouse gas emissions, mainly CO2, and enhancement of carbon stocks.

D.4. Arrangements for Monitoring, Reporting and Evaluation (max. 300 words)

Monitoring and evaluation. FMCN as AE will be responsible for project monitoring and will provide oversight of regional funds involved in developing capacities in local organizations for Components 1 and 2 and will coordinate with INECC for technical supervision. Progress will be measured against the GCF Results Framework. The FMCN has developed strong monitoring and evaluation systems and capacity; the results information on Component 1 will rely on the FMCN Information System for Project Follow-up (Sistema de Información y Seguimiento de Proyectos, SISEP) improved under the GEF-funded C6 project, both implemented by the FMCN through the World Bank. The Monitoring and Evaluation (M&E) plan will include midterm and final independent evaluations. The final review will assess the achievement of indicators, sustainability of results, and identify lessons learned. Moreover, the PfP component of RIOS will be designed with an experimental approach, to be able to attribute environmental impact to the activities implemented by the subprojects. The team is currently collaborating with J-Pal affiliated researcher in a National University to incorporate an experimental design.

INECC will adapt monitoring systems from C6 and will complement under Component 1 a social vulnerability community assessment that will be applied and monitored during project implementation. This will empower local communities to monitor and adapt after project ends. The community monitoring of water quality and biodiversity supported under Component 3 will be designed by INECC and FMCN, selecting the monitoring points based on scientific models and cost-effectiveness. This local monitoring is based on citizen science, promoting public participation in climate adaptation and management of local habitats, landscapes, and ecosystems to prioritize areas, adaptation options and species' management. Its results aim at improving the information base on which decisions are made and filling many data gaps with regards to biodiversity information, such as taxonomic, spatial, and temporal gaps, which may contribute to state and national large-scale policy objectives for wildlife conservation.

E. EXPECTED PERFORMANCE AGAINST INVESTMENT CRITERIA

E.1. Impact potential (max. 300 words)

Impact potential. The Project has an integrated vision to promote connectivity between sub-basins and the people who live in them. Connection is geographically determined by the limits of the sub-watersheds where the project interventions will take place -where the direct beneficiaries are found- and the whole watershed, considering the population downstream as the indirect beneficiaries of increased resilience and reduced vulnerability (e.g. floods and landslides). The project will benefit 63,294 people directly (51% women) and 865,634 indirectly (52% women) (see FS Section 4.1) by increasing their climate adaptation capacity and by maintaining the benefits that they receive from riparian ecosystems. The indirect beneficiaries are 5.42% of the total population in the states of Jalisco and Veracruz. Although this is an adaptation project, it also has a significant mitigation potential of 2.39 Mton CO2eq (see Annex 13). Interventions and data generated at the sub-basin level will feed regional initiatives to align investments and the development of a NRRS, potentially scaling up country-wide the examples supported at the local level.

E.1.1. Expected tons of carbon dioxide equivalent (t CO_2 eq) to be reduced or avoided (Mitigation and cross-cutting)	Annual	119,504.35 tCO_2 eq
	Lifetime	2,390,087 tCO_2 eq
E.1.2. Expected total number of direct and indirect beneficiaries, disaggregated by gender (Adaptation and Cross-cutting)	Direct	63,294 51% of female
	Indirect	865,634 52% of female
	**For both, Specify the % of female against the total number.*	
	Direct	0.05 (Expressed as %) of the country

E.1.3. Percentage of beneficiaries relative to total population	Indirect	0.0067 % (Expressed as %) of the country

Impact potential. The Project has an integrated vision to promote connectivity between sub-basins and the people who live in them. Connection is geographically determined by the limits of the sub-watersheds where the project interventions will take place -where the direct beneficiaries are found- and the whole watershed, considering the population downstream as the indirect beneficiaries of increased resilience and reduced vulnerability (e.g. floods and landslides). The project will benefit 63,294 people directly (51% women) and 865,634 indirectly (52% women) (see FS Section 4.1) by increasing their climate adaptation capacity and by maintaining the benefits that they receive from riparian ecosystems. The indirect beneficiaries are 5.42% of the total population in the states of Jalisco and Veracruz. Although this is an adaptation project, it also has a significant mitigation potential of 2.39 Mton CO2eq (see Annex 13). Interventions and data generated at the sub-basin level will feed regional initiatives to align investments and the development of a NRRS, potentially scaling up country-wide the examples supported at the local level.

RIOS is a crosscutting project that focuses on GCF results areas Ecosystems and ecosystem services (70%), most vulnerable people, communities, and regions (20%) and Forestry and land use (10%). The interventions proposed are part of the main priorities of GCF strategic plan 2020-2023 under the three results areas that RIOS contributes. For example, according to the Strategic Plan, some of GCF-1 key interventions are:

- **Forestry and land use**: By providing a variety of financial structures to leverage private involvement, from de-risking long-term investments, and generating dedicated credit lines.
- **Ecosystems and ecosystem services:** By offering ecosystem-based climate adaptation and mitigation solutions which are flexible and cost-effective options to address climate risks and can also deliver substantial co-benefits in terms of livelihood protection and poverty alleviation.
- **The most vulnerable people, communities, and regions .** By focusing on areas where communities are highly vulnerable to the effects of climate change and by preventing erosion and landslides under the ecosystems result area. Only 41% of the people in the municipalities in the basins are economically active, and over 42% are considered below the poverty line. The project will provide important socio-economic benefits to this communities, including productive activities that will generate jobs and improve local livelihoods. Women are particularly vulnerable, and will be particularly benefited through dissemination in appropriate spaces, and gender-sensitive activities.

E.2. Paradigm shift potential (max. 300 words)

The current paradigm based on loss of ecosystem services in watersheds due to limited capacity for adaptation will shift to connected watersheds with communities with capacities in adaptation, aligned investments in the territory and a national strategy to scale this adaptive capacity. In the absence of the RIOS project, beneficiaries would likely remain without access to financing and other support to transition to practices that promote river restoration and connectivity in the targeted watersheds. The basins in Jamapa and Ameca-Mascota would continue the trend of deforestation and vegetation degradation. Conventional extensive ranching and agriculture activities will continue to expand unsustainably; those productive activities will increase further pressure on the agricultural frontier, having intensive water use and polluting rivers. All this will generate a reduction on climatic adaptation capacity, a reduction of carbon stocks and an increase in climate-change related emissions. This will also generate a loss of other Ecosystem Services. Without the project, the budget forecast to be allocated for river restoration and sustainable watershed management would be limited.

With RIOS, the GCF incremental support will strengthen the watersheds' health with river restoration and improvement of sustainable productive practices, and it is long-term economic and financial sustainability. The project will develop instruments to overcome national budget limitations for activities that are priorities in the NDCs and national policies, involving leveraging new public and private actors to address policies related to river connectivity. The beneficiaries will reduce their climate vulnerabilities of human settlements to flooding and to landslides, of extensive livestock farming and of fodder production to water stress. The beneficiaries will also have socio-economic co-benefits, especially women, who will improve their livelihoods. The results of the field activities will be monitored, and the learning will be scaled-up through the design of a National Strategy, with a close involvement of key government institutions. This will allow a long-term impact at national level.

The approach proposed in RIOS has proven to be effective in the C6 project and other initiatives previously implemented by the FMCN, which accomplished significant results and revealed substantial experiences and lessons learned that are

incorporated into RIOS design to increase the impact, as to benefit more people and foster policy and program development on a lasting basis.For example:

- The recently closed project "Support for Micro, Small and Medium Enterprises that Operate in Forest Environments in Ejidos " (EmFoCo), financed by the Climate Investment Funds (CIF) through the Innovation Laboratory of the Inter-American Development Bank (IDBLab) during 2013-2019 and implemented by FMCN supported over 80 community forest enterprises. The project proved the financial capacity of community organizations implementing climate-smart practices in forest landscapes; in six years of operation, the average repayment was close to 100%. Only in one semester there was delay of 3% of the total amount (one loan), while the goal authorized by the IDB was 5%. The success was linked to the advisory services that supported the credit. This experience is the base for the PLAT scheme supported under Component 1.
- The IWAPs created during C6 will better target the eligible areas for funding under the sub-projects of Component 1, and will also strengthen the national capacities and policies driven by conservation and production objectives, through improving the existing methodologies to evaluate the vulnerability of the project basins (Output 1.2) and support the development of the National River Restoration Strategy with a climate focus (Outputs 3.1 and 3.2) to ensure their long-term sustainability and impact.
- The proven C6 and EmFoCo´s financial mechanisms and strategies to leverage private and public financing will contribute to RIOS´ Component 2, making innovative mechanisms (e.g., credits and PES or pay-for-performance schemes in Outputs 2.1 and 2.2) attractive for investments as funding bankable project pipelines to ensure its long-term sustainability and achieving a maximum impact. Both experiences also proved that producers successfully make foundational improvements on their sustainable businesses, as long as they are given technical support and their capacities are strengthened accordingly to specific needs.
- Previous experiences showed that working closely with CSO and regional networks facilitate the flow of knowledge, strengthen the bonds of communities across regions, and bolster community enterprises to support economies of scale, collective marketing, and integration into the local economy. These bonds often turned into networks or coalitions to continue the work after the project closed. Through the learning community platform (Output 1.3), RIOS will strengthen civil society organizations and community networks, some of which were formed during the implementation of the C6 project, as they will be key to increasing forest and water connectivity through conservation, restoration, and best management practices sub-projects, as well as monitoring vulnerability, enforcing continued action, supporting local capacity building, raising awareness, and promoting outreach. These same local networks will constitute an important partnership to provide successful factual examples and proposals for the design of the National River Restoration Strategy for climate change adaptation under Component 3.

Moreover, RIOS will shift governance processes by increasing local capacities to address climate change and adaptive management through taking territorial approach based on systems of rivers and a watershed approach. The project will upscale the EbA approach implemented by subprojects into the NRRS, promoting EbA as a cost-efficient climate change and adaptation strategy.

E.3. Sustainable development (max. 300 words)

Rivers provide a range of services that benefit local and downstream communities. Parker & Oates (2016) developed a conceptual framework to visualize the complex interactions between the river and society, this framework illustrates the relationship between the river health, ecosystem services, and different societal benefits. These relationships are depicted in relatively simple terms while acknowledging that the links between river health and societal benefits are complex. We use this conceptual framework to illustrate the expected benefits and co-benefits from RIOS. Improved river ecosystem connectivity and functionality under RIOS will have implications for the portfolio of services a river can provide, and therefore the benefits society can receive. These ecosystems have the potential to sustain livelihoods and commercial production (agriculture, livestock, and fisheries), provide water for domestic consumption and industries, and are used for tourism. These all contribute to local and national economic growth and poverty reduction (Emerton and Bos, 2004; TEEB, 2013).

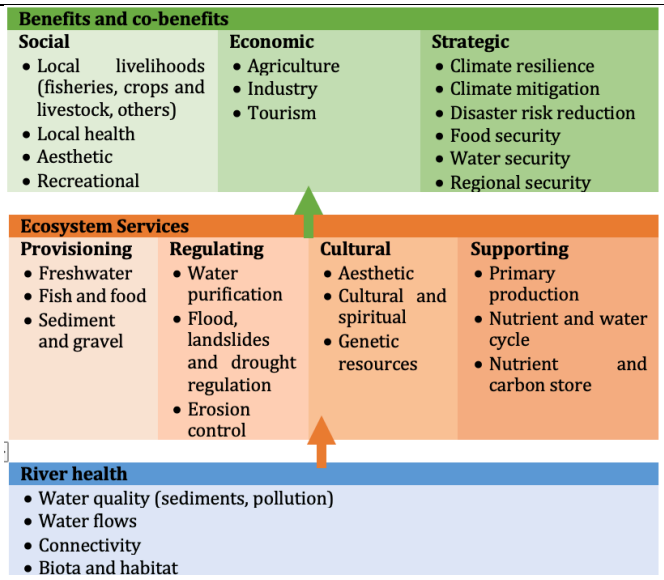


Figure 22. Relationship between river health, ecosystem services, benefits and co-benefits in the context of RIOS

Source: Own elaboration, based on typology proposed by Parker, H., & Oates, N. (2016)

Some ecosystem services provided by riparian ecosystems that will be impacted are: (i) reduced soil erosion to decrease sediments, resulting in improved water quality and diminished silting of watercourses; (ii) increased water retention time in the basin, decreasing the force and speed of runoff, as well as increasing infiltration; (iii) conserved soil for productive activities; (iv) micro-climates established that moderate extreme temperature thanks to vegetation coverage. As a result of these activities, RIOS aims to reduce vulnerability to the impacts of climate change, mainly by decreasing exposure to landslides, floods. The socio-economic co-benefits include the improvement of local livelihoods of landholders participating in sub-projects, such as an increase in productivity and improved jobs. For example, a realistic scenario detailed in FS section 1.5 shows a reduction of 549,716 tons of soil loss into the rivers. This reduction also increases the water quality and reduces the risks of landslides and floods. Additionally to the expected reductions in soil loss, the project will improve water quality. The experience in C6 when monitoring suspended solids in a body of water showed that with the presence of a forest the solids present in the water is 19.4 mg / L, a level that is in normal values, however when this forest disappears (in this case due to forest use) the levels of solids rise to 27.1 mg / L, a value above normal levels, the loss of the forest causes sediment levels to increase by erosion, putting at risk the infrastructure for water collection and storage that provide the population of small towns and medium and large cities. Moreover, according to the participatory water system implemented in C6, after 4 years of project implementation, the fecal coliforms decreased 49% after 2km of the area where riparian restoration was implemented and suspended solids were reduced 25-65%.

The RIOS project will optimize riparian restoration strategies to maximize summer stream temperature reductions, decrease surface runoff volume and rates, modify sediment erosion/deposition regimes, and influence stream water quality.

Water quality monitoring, including air and water temperature, total suspended solids, hardness, alkalinity, dissolved oxygen, and turbidity will be fundamental to screen changes and document the benefits of riparian vegetation throughout the project.

Women will be particularly benefited with activities and criteria that encourage their participation according to a Gender Action Plan. The gender perspective will be applied in this project not only to improve its results, but also to provide a platform for recognizing the problems faced by women who participate in the rural sector. The gender action plan will eliminate the possible negative effects of proposed interventions on the living conditions of women who are directly or indirectly involved in planned activities and to incorporate solutions that, together, promote progress for rural women, following the national and international agenda to strengthen gender equality, non-discrimination, the empowerment of women and to prevent and mitigate gender based violence (GBV).

RIOS contributes to the Sustainable Development goals directly and indirectly. Directly, it contributes to Goal 13, Take urgent action to combat climate change and its impacts, Goal 15, Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt

biodiversity loss, and Goal 5, Achieve gender equality and empower all women and girls. As a co-benefit, it also contributes to Goal 1, to end poverty in all its forms, everywhere; Goal 2, End hunger, achieve food security and improved nutrition and promote sustainable agriculture; and Goal 17 Strengthen the means of implementation and revitalize the global partnership for sustainable development.

RIOS will also grow particular benefits to covid-19 pandemic not only contributing to get local economies and livelihoods back on their feet, but also safeguarding social and environmental prosperity for the longer term. By aligning public and private investments to finance nature-based solutions, augmenting communities´ resilience to climate impacts under a well-being and inclusiveness approach, promoting the transition to long-term low-carbon initiatives, and increasing circularity of supply chains, the project will be protecting livelihoods in the face of abrupt losses of income and supporting its resilience for future similar scenarios.

E.4. Needs of recipient (max. 300 words)

Although the NDC highlights the LULUCF sector as the most ambitious with a potential reduction of GHG of -144%, the total climate budget for ecosystem management and conservation is only 17% of the total climate budget. During the 2014-2018 period, Mexico received $28,003 million dollars (mdd) from National, International, Private sector and Green Bonds for climate financing. $3,232 mdd were from public multilateral and bilateral sources, to finance 75 projects. The distribution of resources by climate change thematic area corresponds to 47% for cross-cutting projects (adaptation and mitigation), 46% for mitigation projects and 7% for adaptation projects. The main financial instruments were loans (86%), followed by grants (9%) and technical assistance (3%). The most financed sectors were energy (45%), and housing (23%). Environment and natural resources, and agriculture received less than 10% of the total financing . In the same period, the sectors of environment and natural resources and agriculture received less than 1% of the private financing.

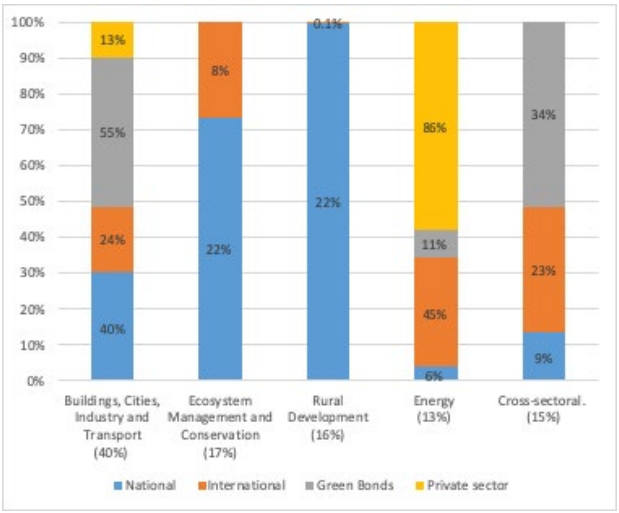


Figure 23. Climate finance in Mexico 2014-2018
Source: GGGI from GFLAC, 2018

The project focuses on capacity building of key national actors. This project aims to increase the capacity of national institutions, mainly INECC. INECC is the national government agency that coordinates research to feed policy on climate change in Mexico. Capacity building includes the development and enhancement of endogenous capacities of INECC, other public officials, legislators, private sector and communities.

Activities that will be supported have been identified as the most strategic for the most vulnerable populations. Only 41% of the people in the municipalities in the basins are economically active, and over 42% are considered below the poverty line. The project will provide important socio-economic benefits to this communities, including productive activities that will generate jobs and improve local livelihoods. Experience shows that technical assistance is a key initial investment that is required for productive activities, especially for those with little access to capacity building. The experience of FMCN in linking a variety of actors, the technical expertise of INECC, and the economic resources of this project are essential to increase the adaptive capacity of watersheds. Moreover, the beneficiaries of sub-projects require the grants, credits and technical assistance to ensure a transition and continuation of sustainable practices that improve

climate adaptation in basins. The sub-project activities have been tested and accepted by local populations. Women are particularly vulnerable, and will be particularly benefited through dissemination in appropriate spaces, and gender-sensitive activities.

The current COVID-19 crisis poses additional challenges but it is also an opportunity to build more sustainable, creative, inclusive and resilient systems. The project will support the national post-COVID 19 recovery, by supporting improve the livelihoods, mainly of the most vulnerable ones, and maintaining/generating jobs.

E.5. Country ownership (max. 500 words)

This project directly responds to a request by INECC to scale up the lessons learned from C6. FMCN and the RFs have a unique capacity to ensure that a variety of local and national actors, from private, public, and social sectors, coordinate their actions to align field investments. This coordination is required to improve forests and river connectivity in basins vulnerable to climate change. This has been demonstrated by FMCN in implementing other projects from bilateral and multilateral organizations.

This project is fully aligned with Mexico´s priorities. The project will support the financing of additional costs of implementing adaptation activities prioritized by the government´s climate commitments. The adaptation National Determined Contributions (NDCs) includes three pillars: (i)Social Adaptation, (ii)Ecosystem-Based Adaptation, and (iii)Infrastructure and Productive Systems. The NDC includes in its goals: (i)reforestation in watersheds, with particular focus on riparian ecosystems; (ii)conservation and restoration of ecosystems; (iii)integral watershed management, and (iv)integration of climate change criteria into agricultural and livestock programs.

To date, FMCN and INECC have already coordinated a series of meetings with the institutions that will be part of the Technical Committee. This Committee was created to ensure complete ownership of the project. The TC includes representatives from INECC, FMCN, National Forestry Commission, National Commission for Protected Areas, while the Commission adds representatives from National Water Commission and National Institute of Water Technology. INECC will lead the design of NRRS to ensure country appropriation. This project will continue to apply the lessons learned on how to coordinate local actors such as communities, local organizations and governments, private sector and academia. The latter two institutions are already participating in the project design. There has been further engagement with local stakeholders during project design in regional multistakeholder platforms created under C6 and other local participation spaces.

RIOS stakeholder engagement plan has been successfully carried out during project design and will continue during implementation. The central purpose of this plan (see FS Section 5.1) is to allow for systematic stakeholder engagement to let the various groups express their distinct views and opinions, and for the project to appropriately respond to them. The plan is aimed at enabling dynamic meaningful engagement with stakeholder groups by identifying different participation mechanisms and specifically targeting vulnerable groups. Three consultation workshops have so far been undertaken as part of the process. The purpose of these consultations was to develop an understanding of the local stakeholder's perception of the project and its proposed activities, impacts on the community, and possible restoration activities that could be introduced. Based on these consultations, local stakeholders confirmed that the overall perception of the project is positive and well received.

To catalyze investments, involvement with stakeholders from the private sector during project design has been a priority. Private sector engagement will be key in RIOS implementation. For this reason, private sector actors have been informed regarding the project, including its scope, location, activities, and potential benefits. Some examples of meetings where this information has been disclosed are ADAPTUR First Regional Encounter in Puerto Vallarta, Jalisco; working Meetings among the Association of Entrepreneurs of Puerto Vallarta and Banderas Bay, meetings with the Water Operating Agencies from the municipalities of Veracruz and Medellín (MAS Group), which included the participation of the Metropolitan Water Institute. Financial sector institutions including FIRA and microfinance institutions such as FINDECA and other key institutions such as the French Development Agency have been informed of the project and provided feedback to FMCN and INECC about project design. Additionally, as part of CONECTA, FMCN and INECC have started a collaboration with private sector institutions related to sustainable livestock and agroforestry.

E.6. Efficiency and effectiveness

E.6.1. Estimated cost per t CO_2 eq, defined as total investment cost / expected lifetime	(a) Total project financing	US$__10,000,000____
	(b) Requested GCF amount	US$__9,000,000____

emission reductions (Mitigation and Cross-cutting)	(c) Expected lifetime emission reductions	_ 2,390,087 __ tCO_2eq
	(d) Estimated cost per tCO_2eq (d = a / c)	US$_ .395 ___ / **$tCO_2eq$**
	(e) Estimated GCF cost per tCO_2eq removed (e = b / c)	US$__ __ **/ tCO_2eq**
E.6.2. Expected volume of finance to be leveraged by the proposed project/programme and as a result of the Fund's financing, disaggregated by public and private sources (Mitigation and Cross-cutting)	(f) Total finance leveraged	US$_ 3,000,000
	(g) Public source finance leveraged	US$1,500,000 _____
	(h) Private source finance leveraged	US$1,500,000 _____
	(i) Total Leverage ratio (i = f / b)	**__30%_____**
	(j) Public source leverage ratio (j = g / b)	**__15%_____**
	(k) Private source leverage ratio (k = h / b)	**15%**
	This does not include credits, that have a potential of USD$10 million in the selected states and sectors	

E.6.3. *(max. 500 words)*

The financial structure of the project allows a tailored financing based on four different schemes, namely:

- **Blended private finance.** For those activities that have a positive rate of return and are already being implemented; the project helps to mobilize additional funds to link producers with dedicated credit lines. The project will address barriers from both the demand and the supply side of sustainable credit lines.
- **Grants for selected activities with proven positive impact.** For those activities that require technology transfer, and have high starting costs, a grant will be given, but most subprojects will require observed impact to disburse.
- **Leveraged public and private financing.** Private and public finance will be catalyzed trough the development of dedicated credit lines and public-private partnerships for Payment for Ecosystem services.

In relation to the need of credit lines, the FIP-IDB Program "Financing low carbon strategies in forest landscapes in Mexico" observed that the lack of finance was one of the main ejidos and communities' challenges, yet they were willing to adopt financial schemes for sustainable practices but identify missing capacities to do so. In general, only 1% of rural productive units have access to medium to long-term finance required for productive investments (INEGI, 2017). The main factors limiting financing are: (i) lack of dedicated credit lines adapted to sectorial demands and local needs (in terms of interest rates, grace periods, and maturity) due to limited knowledge and experience from the financial sector, (ii) extended maturity periods of projects due to the natural biological cycle of products, which increase the risk exposure of investors, and (iii) lack of institutional capacity of the borrowers to manage loans and long term investments.

Efficiency and effectiveness. The costs and benefits of the proposed activities have been widely analyzed in similar projects. For RIOS, the economic and financial analysis a "business-as-usual" baseline case is used that assumes that future development trends follow those of the past and no changes in policies and practices will take place. A 20-year period is assumed to assess the economic feasibility of the project and no further changes of project-generated benefits beyond the 20-year project evaluation period. Project costs are only assumed for the five years of project implementation, but benefits and opportunity costs are assumed to be generated beyond the 5-year implementation period during the 20-year period.

Economic analysis of all the activities. The economic analysis (see FS Section 4.3) includes all the activities supported by the project, including conservation, restoration, and improved productive practices. The analysis shows that the net present value (NPV) is projected to reach US$ 30.6 million (lower bound), and US$ 68 million (upper bound) in the baseline scenario (20 years, carbon social price of US$ 60, and 6 percent discount rate). The investments evaluated for the economic analysis have a Benefit-Cost ratio between 1.58 and 2.30 and an internal rate of return (IRR) between 54.89 and 95.08 percent. The results of the quantitative simulations are robust in terms of sensitivity analyses by increasing the discount rate from six to

nine percent, reducing the carbon social price (from US$ 60 to US$ 40), as well as adopting the value of voluntary carbon market (US$ 3.01), and using more conservative estimates regarding the value of ecosystem services provided.

Economic and financial analysis of sustainable livestock. One of the main strengths of RIOS is the capacity to leverage private funding, and ensuring long-term sustainability by promoting profitable sustainable practices. A specific analysis for transitioning from traditional livestock practices to sustainable proves that, from a private perspective, RIOS will bring socio-economic co-benefits to the farmers transitioning to sustainable livestock practices. The analysis differentiates small, medium and large producers, and shows the difference between both target watersheds. The Benefit-Cost ratio for sustainable livestock is positive in both Jalisco and Veracruz, form 0.76 - 1.86 depending on the producer size and region. The private IRR is from 36.6 to 45.5 and the chance of success is over 80 percent in all cases. The breakeven point is only 2 years. The results observed in this analysis support the promotion of livestock transformation to a more sustainable pathway not only as an option for green investment but also as an opportunity to improve the livelihoods of the people dedicated to this activity.

F. ANNEXES

F.1. Mandatory annexes

☒	Annex 1	NDA No-objection Letter(s) (Template)
☒	Annex 2a	Example project level logframe (Example) Chapter 3.5 Pre-feasibility study
☒	Annex 2b	Example timetable (Example)
☒	Annex 3	Budget plan that provides breakdown by type of expense (Template in excel sheet)
☒	Annex 4	Gender assessment and action plan (Template)
☒	Annex 5	Co-financing commitment letter (no need at this stage, provided by FMCN)
☒	Annex 6	Term sheet and evidence of internal approval
☒	Annex 7	Risk assessment and management (Template)
☒	Annex 8	Procurement plan model (Template)
☒	Annex 9a	Legal Due Diligence (regulation, taxation and insurance) (Template) (no need)
☒	Annex 9b	Legal Opinion/Certificate of Internal Approvals (Template) (

F.2. Other annexes to be submitted when applicable/requested

☒	Annex 10	Economic and/or financial analysis (mandatory for private-sector proposals)
☒	Annex 11	Appraisal, due diligence or evaluation report for proposals based on up-scaling or replicating a pilot project
☒	Annex 12	Environmental and Social Action Plan (ESAP)
☒	Annex 13	GHG analysis
		Due-diligence to EE

** Please note that a funding proposal will be considered complete only upon receipt of all the applicable supporting documents.*

No-objection letter issued by the national designated authority(ies) or focal point(s)

Subsecretaría de Hacienda
y Crédito Público
Asuntos Internacionales
Dirección General de Organismos
Financieros Internacionales

347.B.-183

Mexico City, October 26th 2020

Mr. Javier Manzanares,
Deputy Executive Director
Green Climate Fund

Funding proposal for the GCF by Fondo Mexicano para la Conservación de la Naturaleza (FMCN) regarding River Restoration For Climate Change Adaptation (RIOS)

We refer to the project **"River Restoration for Climate Change Adaptation (RIOS)"** in Mexico as included in the funding proposal submitted by Fondo Mexicano para la Conservación de la Naturaleza to us on August 8th, 2020.

The undersigned is the duly authorized representative of the National Designated Authority of the United Mexican States.

Pursuant to GCF decision B.08/10, the content of which we acknowledge to have reviewed, we hereby communicate our no objection, it is implied that:

a. The government of the United Mexican States has no-objection to the project as included in the funding proposal.

b. The activities as included in the funding proposal are in conformity with the United Mexican States' national priorities, strategies and plans;

c. In accordance with the GCF's environmental and social safeguards, the project as included in the funding proposal is in conformity with relevant national laws and regulations.

We also confirm that our national process ascertaining no objection to the project as included in the proposal has been duly followed.

We acknowledge that this letter will be made publicly available on the GCF website.

Sincerely,

Maria Fernanda Montero Lara
Director for Sustainable Finance

Secretariat's assessment of SAP023

Proposal name:	River Restoration for Climate Change Adaptation (RIOS)
Accredited entity:	Fondo Mexicano para la Conservación de la Naturaleza A.C. (FMCN)
Country/(ies):	Mexico
Project/programme size:	Micro

I. Summary of the Secretariat's assessment

1. The funding proposal is presented to the Board for consideration with the following remarks:

Strengths	Points of caution
This SAP is the first single country project in Mexico, and it is being submitted by a Mexican direct access entity (DAE). Two regional (sub-national) funds will act as executing entities (EEs) for the project implementation. The geographical proximity of the regional funds to the final beneficiaries is expected to foster coordination and mediation among stakeholders, but also greater legitimacy and sustained interest based on an adequate understanding of the local context, needs and priorities.	Although no co-financing is expected from the recipient country, leverage is expected from different private and public sources and through varied mechanisms. Leverage funding from public and private sources is expected to be reported during project implementation and through annual performance reports.
The project builds on the experience of a Global Environment Facility (GEF)-funded project (C6 project) implemented by FMCN in the same geographies, allowing for the upscaling of successful initiatives and for the capitalization of lessons learned for watershed-level connectivity and riparian restoration.	
The project strategy and interventions are built on a robust baseline and climate rationale, which in turn relates to the strong technical leadership of the National Institute of Ecology and Climate Change (INECC) (governmental entity) during project formulation.	

2. The project aims to increase climate resilience in two highly vulnerable regions in Mexico, the Ameca-Mascota watershed in the states of Jalisco and Nayarit and the Jamapa watershed in the state of Veracruz, through the restoration and connectivity of riparian ecosystems. In these two watersheds that connect mountains to the ocean, river restoration has

the potential to support ecosystems and communities to adapt to climate change impacts. The climate change impacts that have been thoroughly characterized and quantified in the funding proposal and pre-feasibility study (PFS) mainly relate to an increase in precipitation variability and extreme weather events such as floods, landslides, and drought. The project adopts a robust geo-hydrological perspective that allows the proposed ecosystem-based adaptation (EbA) practices to focus on restoring soils, forests and vegetation along rivers and in areas of hydrological importance. The EbA interventions will focus on: (i) reducing soil erosion to decrease sediments, improve water quality and reduce silting of watercourses, (ii) increasing the time that water remains within the basin, which would decrease the strength and speed of run-off and increase infiltration; (iii) conserving soils for productive activities of the local economy; and (iv) moderating extreme temperature from increase in vegetation coverage.

3. The project is structured into three components:

(a) Increase functional connectivity and improve adaptive capacity in two prioritized watersheds (*total cost: USD 7.3 million; GCF cost: USD 6.3 million*): This component is expected to be implemented through subprojects and under four different implementation schemes;

(b) Align and catalyse public and private climate-smart investments to upscale river restoration for climate change adaptation (*total cost: USD 1.3 million; GCF cost: USD 1.3 million*); and

(c) Support the development and operationalization of the national river restoration strategy (NRRS) as a policy to mainstream climate change in river restoration and to lay the foundations for climate-resilient river restoration in Mexico *(total cost: USD 0.7 million; GCF cost: USD 0.7 million)*.

4. The accredited entity (AE) for the project is FMCN. FMCN will undertake the role of EE together with Fondo Golfo de Mexico (FGM) in Veracruz and Fondo Noroeste (FONNOR) in Jalisco, which are two regional (sub-national) funds that were established with the support of the AE to dynamize sustainable finance and landscapes in these territories. As the project has a cross-cutting nature, the impact potential includes an estimated 2.39 million tCO_2eq in emission reductions (ERs) throughout the project lifetime of 20 years attributed to forestry and land use related interventions, including restoration and agroforestry. In terms of adaptation potential, the project expects to increase the climate resilience of 928,928 direct and indirect beneficiaries located in highly vulnerable territories against the effects of climate change.

5. The total budget of RIOS is USD 10 million, of which USD 9 million are requested from GCF in the form of grants, and USD 1 million are financed in the form of grants through the GEF CONECTA project (from USD 15 million grant) to be implemented in 2021–2026.

6. The Board may wish to consider approving this funding proposal with the terms and conditions listed in the respective term sheet and addendum XVII, titled “List of proposed conditions and recommendations”, respectively.

II. Assessment of performance against investment criteria

2.1 Impact potential *Scale: N/A*

7. Mexico, with a population of over 120 million people and an extension of around 1.9 million km^2, holds particular geographic characteristics that make it a highly vulnerable country to the adverse impacts of climate change. As explained in Mexico’s 2015 nationally determined contribution (NDC), its location between two oceans, as well as its latitude and topography, significantly increases its exposure to extreme hydro-meteorological events. While coastal communities are expected to be more vulnerable to flooding, communities and ecosystems in

the mountains are expected to be increasingly impacted by landslides, drought, and wildfires. Mexico's mountain systems, valleys, and coastal plains form a set of 757 watersheds (National Water Commission (CONAGUA), 2017) with characteristics depending on their geographical location. Among these watersheds, the RIOS project has prioritized two: (i) the Ameca-Mascota basin in the state of Jalisco that drains towards the Pacific; and (ii) the Jamapa basin in the state of Veracruz that drains into the Gulf of Mexico. According to INECC (2019), these watersheds are particularly vulnerable to climate change and are highly vulnerable to landslides, floods, and droughts. The funding proposal and PFS include the eligibility criteria used in selecting these two watersheds for project implementation. Of relevance to site selection is the fact that in the lower part of these basins, there are important human settlements, seaports, and high productivity of the agricultural, industrial, tourism, and commercial sectors, which are all vulnerable to climate change.

8. The project will contribute towards a reduction in communities´ vulnerability to the impacts of climate change, mainly by decreasing exposure to landslides, floods, and drought. Likewise, the project seeks to augment the adaptive capacity of a total of 928,928 beneficiaries (63,294 direct beneficiaries and 865,634 indirect beneficiaries), and 260,000 hectares of ecosystems as a key strategy in a country where two-thirds of the territory are mountains and therefore highly sensitive to climate change.

9. In relation to the climate context, the funding proposal and PFS indicate that precipitation in Mexico in the period 1960–2010 decreased in most of the territory. Based on the results of the regionalized climate change scenarios for Mexico (INECC), a reduction in the average natural availability of water would be expected, which would be affected by greater evapotranspiration as well as by the decrease of its quality. Climate change is also expected to increase the variation in the frequency and intensity of extreme hydrometeorological phenomena. As a reference, between 2000 and 2018, climate-related disasters caused 86.8 per cent of the total damage recorded in the country, resulting in an average annual cost of USD 2.1 billion (Mexico's National Center for Prevention of Disasters (CENAPRED), 2018).

10. In particular, the Ameca-Mascota and Jamapa basins, being coastal basins, are exposed to the impact of tropical storms and hurricanes, which can cause floods and landslides. In addition, the variations in temperature and precipitation project a greater seasonality of rainfall, concentrating more rain in less time and prolonging the periods of low water availability, causing drought problems. For each of the two targeted watersheds, the funding proposal and PFS adequately link the climate context (historic and projected climate change) to a robust baseline climate description (precipitation, temperature, evapotranspiration) and in terms ecosystems and ecosystem services status, and land use and land use change dynamics.

11. The RIOS project considers the representative concentration pathways (RCP) 8.5 since it shows the greatest change against the historical climate. This allows identifying the areas where the greatest potential changes would occur according to climate change projections. It also considers a time horizon (2050) relevant for policy assessment, while following the precautionary principle on the most intense concentration route in the near temporal horizon. One of the main effects of climate change in Mexico is expected to be the alteration of the regional thermo-hydrological cycle, which is linked to changes in run-off as well as in water availability, storage and, ultimately, quality.

12. The funding proposal and PFS explain the vulnerability conditions of the population, ecosystems, physical infrastructure and productive activities to different climate change threats. They also explain and adequately justify why river restoration has the potential to support ecosystems and communities to increase their resilience against climate change impacts. RIOS will focus on increasing watershed connectivity through river restoration, which includes restoring soils and forests along rivers and in areas of hydrological importance.

13. The climate change vulnerability analysis is supported by a recent study conducted by INECC (2019) to produce the National Atlas of Vulnerability of Climate Change in Mexico. The Atlas shows the current and future vulnerability of Mexico at municipal level to landslides, floods, and water stress, as well as the underlying causes that make the population and economic activities of the municipalities vulnerable, including detailed descriptions of the sensitivity, exposure and adaptive capacity of the systems under analysis. In particular, the RIOS project aims to reduce the climate change vulnerability in the two selected watersheds by decreasing exposure to landslides, floods and drought. The project aims to reduce the vulnerabilities of human settlements to flooding and landslides, and the vulnerabilities of extensive livestock farming and fodder production to water stress.

14. The project will also contribute to the reduction of greenhouse gas (GHG) emissions through the implementation of forestry and land use-based interventions such as restoration, afforestation, agroforestry and activities leading to a reduction in deforestation and ecosystems degradation. Land use, land-use change and forestry (LULUCF) is a priority for climate strategies and actions in Mexico. Halting land-use change and promoting reforestation and restoration have both mitigation and adaptation impacts.

15. The cross-cutting nature of the project is supported by the fact that deforestation and forest degradation are some of the drivers of habitat fragmentation, and loss of ecosystem services and forest livelihoods. The major driver of forest loss and ecosystem degradation is land-use change for agriculture and livestock raising. The project presents a mitigation impact of 2.39 million tCO_2eq over the project lifetime (0.591 $MtCO_2eq$ for the Ameca-Mascota basin and 1.798 $MtCO_2eq$ for the Jamapa basin).

16. The mitigation potential is expected to respond to the changes in the current land use models towards low carbon emission agroforestry and afforestation models as well as silvopastoral systems. To estimate the mitigation potential of the project, the AE applies the Ex-Ante Carbon Balance Tool (EX-ACT) methodology. The default values used in the EX-ACT tool are consistent with tier 1 factors from the 2016 report of the Intergovernmental Panel on Climate Change (IPCC). Through a review of the documentation of Mexico's greenhouse gas inventory for 2018 (National Inventory Report) and the Second Biennial Update Report (BUR II) to the United Nations Framework Convention on Climate Change (UNFCCC), some available national emission factors were identified to improve the tier 2 analysis. The EX-ACT estimates were carefully revised, referencing the available literature. The EX-ACT tool calculation is well justified and adequate. The methodology is based on similar assumptions used by the co-financed GEF project CONECTA, allowing for complementarity and comparability.

17. The proposed interventions have the potential to create a model that could be scaled to support other watersheds and territories in the country at large and, eventually, to achieve greater climate resilience impact and higher CO_2 emission reductions.

2.2 Paradigm shift potential *Scale: N/A*

18. Under component 1, RIOS will increase functional connectivity in two watersheds through the implementation of subprojects to increase capacities in (i) rehabilitation and restoration of forests along rivers and springs (increase coverage with native species, soil restoration); (ii) protection and conservation of forests; and (iii) productive activities that promote connectivity for river restoration (agroforestry and sustainable livestock management). These subprojects will be funded through four types of schemes, depending on the nature and objective of the activity: scheme 1: grants through a request for proposals (RFPs); scheme 2: pay-for-performance (PFP); scheme 3: public-private payment for ecosystem services (PES); and scheme 4: business development and access to credits. One of the innovative aspects of the RIOS project is its implementation modalities, which aim at upscaling, replicating and validating different strategies for implementation, targeting different beneficiaries and

stakeholders. This diversified manner of implementing the project aims at strengthening appropriation by the key territorial stakeholders and beneficiaries.

19. Scheme 1 (competitive RFP) has proven to be a very effective method to identify the best organizations working in the field with good track records both in terms of technical aspects and participatory processes with communities, as well as in transparency and efficient use of resources. FMCN's extensive networks could allow for the use of a systematic outreach process to call for all possible interested and capable organizations. The RFP process relies on independent evaluators that score the proposals, while a committee selects the best proposals based on the scoring.

20. Scheme 2 will serve to pilot a results-based mechanism to a subset of subprojects selected for the RFP scheme (scheme 1). The consideration of this scheme as part of the implementation modalities resulted from early discussions between the AE and the GCF Secretariat based on lessons learned from past projects in the target areas. This scheme would allow for an additional ex ante incentive based on performance for organizations and communities that surpass the goals of the indicators initially proposed.

21. Under scheme 3, regional funds (RFs) will provide technical assistance to communities and beneficiaries identified in the Integrated Watershed Action Plans (IWAPs) as important suppliers of hydrological ecosystem services. The RF will support those communities in developing proposals to access the PES matching fund scheme from the National Forestry Commission of Mexico (CONAFOR). This PES programme allows for private entities that are users of ecosystem services to take co-responsibility in the maintenance of watersheds and biological corridors.

22. Under scheme 4, FMCN will launch a demand-based RFP through the regional funds to local providers of technical assistance, which are consulting firms or civil society organizations (CSOs) focused on promoting the organizational and business management skills of producer groups in an integral manner. This scheme will be co-financed by the CONECTA (GEF) project. The local providers of technical assistance will prepare producers implementing livestock, agroforestry and other EbA activities to apply for credits promoted under RIOS component 2. In this sense, the RIOS project will support micro, small and medium-sized enterprises in the development of bankable projects to be financed locally.

23. Under output 1.2, RIOS will support target communities in applying a participatory methodology for monitoring biodiversity and/or water quality and in providing inputs for an evaluation of the ecosystem and social vulnerability of the basins.

24. Output 1.3 of RIOS will establish and foster a learning community to exchange and coordinate experiences between watersheds and with key actors to increase functional connectivity. The implementation of a learning community will ensure long-term sustainability and impacts by strengthening CSOs and community networks, who will also play a key role in providing best practices and examples for the design of the NRRS for climate change adaptation under component 3.

25. Component 2, with its aim to "align and catalyse public and private climate-smart investments to upscale river restoration for climate change adaptation", will establish dedicated credit lines and financial products and services developed towards reducing climate vulnerability in the two watersheds. RIOS will depart from the experience supported by the French Development Agency and will partner with the Institutionalized Trusts for Agriculture (FIRA), which is the main development bank in Mexico for agricultural support. In 2019, FIRA opened a credit line to support sustainable agricultural businesses through microfinance institutions in the territories. RIOS could expect to support micro, small and medium-sized enterprises that exhibit good performance, including climate-related performance indicators.

26. Component 3 aims to support the design and operationalization of the National River Restoration Strategy (NRRS). The NRRS aims to be conceived as a policy to mainstream climate change in river restoration and to lay the foundations for climate-resilient river restoration in Mexico. A participatory design process for the NRRS should be adequately commensurate to the advocacy efforts required for a successful national policy formulation process. This is seen as the project's main contribution to the national regulatory framework.

27. The upscaling potential is partially explained through the RFs acting as EEs for this project. RFs play an important role as the investment and maintenance costs of conservation and restoration can be greatly reduced by organizations with permanent presence in the territories and by building on existing projects and intrinsic value. The geographical proximity of the RFs to the final beneficiaries—as well as the greater legitimacy, sustained interest, coordination and mediation competencies—and their ability to establish effective engagement, training, and technical assistance mechanisms become more relevant to the local contexts, thus providing tangible opportunities for upscaling and replication.

28. The project will scale up the World Bank (WB) and GEF-financed project Coastal Watershed Conservation in the Context of Climate Change (C6) of USD 39.52 million and implemented between 2014–2019, which successfully promoted a landscape approach for watershed ecosystem management to help build resilience against climate change and curb ecosystem degradation through increased local capacity and stakeholder network. The project helped establish IWAPs with innovative mechanisms for inter-institutional collaboration and social participation at different levels. Two mutually supporting endowment funds were established to ensure sustainable and long-term financing.

29. In terms of geographical location, the Mascota-Ameca watershed feeds the city of Puerto Vallarta, the second most important tourism destination in the country, while the Jamapa watershed provides water to Veracruz, the largest port in the country. The scalability and replicability will largely depend on the ability of the AE, EEs and project partners to ensure the participation of tourism sector entities (e.g. hotels and restaurants) and water concessions.

30. INECC, as project technical advisor, has already ensured the participation of nine public agencies through a Coordination Committee, that will serve both CONECTA (GEF) and RIOS. Alignment of programmes and investments in productive aspects in four public agencies was successfully accomplished by INECC and FMCN in the C6 project funded by GEF. The Coordination Committee is now building on this first experience beyond environmental agencies by including the agriculture and welfare ministries focusing on sustainable landscapes. RIOS will build on this arrangement and put climate change in the centre through adaptation practices achieved through river restoration. The innovation provided by RIOS will be continuously shared with members of the Coordination Committee. The demonstration of costs and results of EbA in rivers through the constant monitoring included in RIOS will aim at the paradigm shift required to mobilize both public and private finance by the end of the project.

31. In terms of ensuring markets in each of the two watersheds, the AE and EEs will need to complement the baseline description with an assessment of the type of market and financial agreements that could be achieved by the project, in order to better understand the commercial appetite to scale the model through the different schemes.

32. The theory of change is well presented to align with Mexico's NDC goals. The project's goal statement is as follows: "If riparian ecosystems degradation is addressed, support to the livelihoods of watershed-dependent communities is provided, and adaptive capacities of vulnerable populations and exposed ecosystems are increased, then the ecosystem services that riparian ecosystems provide will be sustained and restored, because private and public climate-smart investments will be catalyzed to support the restoration, conservation and adapted productive activities of riparian ecosystems through EbA activities and participatory monitoring enhancement".

2.3 Sustainable development potential *Scale: N/A*

33. The interventions that the project will support are all based on local environmental conditions and the priorities and needs identified by local communities and stakeholders. The RIOS project, under a realistic scenario, expects to reduce 549,716 tons of soil loss into the river, increasing water quality and decreasing risks of landslides and floods. Increase in vegetation cover is expected to reduce the run-off volume and increase groundwater recharge rate, and furthermore, enhance ecosystem productivity in livelihoods options in the local communities, including agriculture, fishery and livestock, with higher economic returns.

34. The project introduces long-term financing options that make a sustainable flow of financial resources available to the project beneficiaries in the project area.

35. Particular focus is on mainstreaming gender perspectives through the project by contributing positively to gender equality in the rural sector by enhancing women's engagement through increased access to finance and training opportunities.

2.4 Needs of the recipient *Scale: N/A*

36. Despite Mexico being considered a middle-income economy, half of the population is living below the monetary poverty line. Mexico continues to implement several measures towards poverty reduction and social inclusion. In 2020, the COVID-19 pandemic affected the main pillars of the Mexican economy: trade, oil, remittances and tourism. Several social programmes targeting the rural agriculture and forestry sectors are expected to be supported with an increased budget from the central government during the pandemic and recovery efforts, including cash flows and the deployment of credit lines. FMCN has already introduced measures to address immediate COVID-19 challenges, while formulating the project in compliance with national requirements as well as international recommendations in line with the objectives of the relevant environmental and social safeguards. Basically, the project will grow benefits after the COVID-19 pandemic by contributing to get local economies and livelihoods back on their feet. Communities receiving subsidies require technical support to manage their land in a way that contributes to reducing vulnerability to climate change threats while ensuring long-term benefit for both ecosystems and livelihoods. The activities to be supported through the GCF proceeds under these circumstances could provide lessons that can scale and redirect public funding and emergency public expenditure in the future.

37. Selected watersheds identified are high priority areas for climate change adaptation and practices, mainly due to hydrological functionality and conservation potential. The watershed approach allows for work within natural systems and beyond political-administrative units, enabling linkages among river dynamics, the local environment and the socio-economic context. Moreover, Jalisco and Veracruz show high levels of climate change vulnerability (water stress and high economic loss in abrupt climate events). A comprehensive vulnerability analysis presented in the funding proposal and PFS for both watersheds supports the need for investment in climate-resilient interventions. In summary, the rationale for the selection of these watersheds responds to the following: (i) these two watersheds connect mountains to the ocean, and provide key ecosystem services along the gradient; (ii) the watersheds are key to addressing the impacts of climate change, mainly the increase in precipitation variability, which cause floods and landslides as well as drought; (iii) these watersheds were also part of the completed GEF project (C6), allowing for upscaling and strengthening of the climate rationale of RIOS; and (iv) the two watersheds have developed IWAPs, which were widely consulted with key stakeholders and had identified areas and activities required to conserve and restore ecosystem services (e.g. soil retention and water yield).

38. The direct beneficiaries are the Ejidos[1] and small farmers, and producers within the selected river basins who are mainly settled upstream. Indirect beneficiaries include other human settlements along the watershed that are most climate impacted. These beneficiaries are of different socio-economic conditions: from rural farmers living in poverty to those able to access credit lines as they participate in income generating activities related to agriculture and forestry, thus able to generate some fund reflow. According to the AE, most of the final beneficiaries, especially those living upstream, are not in the condition to access credit lines. Based on a recent characterization performed by the DAE on the microfinance institutions, there is evidence that only some of the available microcredits are awarded for sustainable ranching and shade coffee under agroforestry systems. However, no credit lines are currently available for restoration and riparian vegetation rehabilitation activities.

2.5 Country ownership *Scale: N/A*

39. In line with Mexico's NDC, RIOS identifies the need to provide a landscape integral perspective to investments in the prioritized sectors. The NDCs set the focus on watershed sustainable management as a priority and identified the restoration of riparian corridors as a critical practice to reduce vulnerability to climate change. The focus of RIOS is expected to respond to the climate adaptation needs and priorities identified in Mexico's NDCs.

40. A capacity assessment of the two EEs (FONNOR and FMG) was conducted by FMCN as part of first level due diligence, which included technical and fiduciary capacity assessments of both EEs. As a result of the assessment, it was determined that both entities have the proven experience and capacity to execute the project and that the organizational mandate of both EEs is aligned with the project. The AE has shared, in a transparent manner, the complete reports produced from the due diligence process conducted to assess the capacities of the EEs. In May 2020, WB conducted a due diligence process to evaluate the capacities of the EEs to carry out expenditure categories supervised by the WB. The result was satisfactory.

41. In terms of project governance, the Coordinating Committee will be responsible for providing policy guidance and will support coordination of project work among the participating agencies as well as promote their collaboration. A technical committee will monitor and supervise the operation of RIOS. The CC will be composed of INECC, FMCN and the following participating government agencies: Ministry of Environment and Natural Resources (SEMARNAT), Ministry of Agriculture and Rural Development (SADER), Ministry of Welfare (BIENESTAR), National Commission for Protected Areas (CONANP), CONAFOR, CONAGUA, Mexican Institute of Water Technology (IMTA) and FIRA. The technical committee will be composed of representatives from INECC and FMCN.

42. INECC has a key role as the technical leader of the project. INECC is the national government agency that coordinates research to feed policy on climate change in Mexico. For the RIOS project, INECC will adapt monitoring systems from C6 and will conduct, under component 1, a social vulnerability community assessment that will be applied and monitored during project implementation. Under the leadership of INECC, component 3 will support the design of the NRRS as a policy to mainstream climate change in river restoration and to lay the foundations for climate-resilient river restoration in Mexico. INECC's involvement during project formulation and for project implementation contributes to demonstrate country appropriation.

43. CONAFOR is a governmental entity that has been leading the implementation of a national PES mechanism using substantial fiscal investment (funds from collected water fees in response to the Federal Rights Act provided by CONAGUA). This PES programme allows private entities who are users of ecosystem services to take co-responsibility in the maintenance of

[1] Ejidos and Agrarian Communities: Social property of land that covers most of the surface in the Mexican rural areas.

watersheds and biological corridors. In this effort, the user of the service pays at least 50 per cent of the required amount and CONAFOR the remaining amount. The PES scheme has three programmes: (i) the national PES programme, where CONAFOR provides funding to owners that have at least 50 hectares of forest and selected after an annual call for proposals; (ii) concurrent funds, where private or public parties provide a 1:1 match to the funds that CONAFOR gives forest owners and that can be multi-annual; and (iii) the Biodiversity Endowment Fund, where annual interests from an endowment are provided to selected owners of forests with high biodiversity and can be long-term support. RIOS is expected to support the alignment of the concurrent PES mechanism with additional funding from private sector companies including tourism and water companies. It is worth mentioning that payments under the PES scheme are ex post and based on performance; therefore, the landscape monitoring efforts expected to be in place with the support of the RIOS project are of great importance for generating the required performance evidence.

44. Project formulation involved a series of stakeholder consultation workshops that aimed to capture the local stakeholders' perception of the project and its activities as well as to inform them about the impacts of the project on the territories and the practices that could be promoted with project implementation. A stakeholder engagement plan identifying key partners has been delineated. The AE has indicated that both the local governments of the states of Jalisco and Veracruz have been involved in the development of the project. In the case of Jalisco, the AE indicated that the Secretary of the Ministry of the Environment and Territorial Development (responsible for rural development and the environment) has actively participated in formulation fora.

45. The RIOS project puts heavy focus on inclusive engagement, particularly women, youth, elderly people, people with disabilities and indigenous stakeholders. There are no indigenous communities in the project target areas; however, RIOS accounts for the possibility of indigenous peoples being detected during the project cycle in their stakeholder engagement plan and will also develop an indigenous peoples plan.

2.6 Efficiency and effectiveness *Scale: N/A*

46. This proposal is a public sector SAP proposal; however, the AE still developed an economic and financial model indicating that the productive activities in the landscape will have a positive rate of return, and stating that small-scale producers will be linked to business development and have access to credits (scheme 4 under component 1).

47. The RIOS project has a budget of USD 10 million of grants, of which USD 9 million is from GCF. The GEF CONECTA project will co-finance USD 1 million. No co-financing is expected from the Mexican government or any other actor within the country.

48. This project is expected to have a catalytic effect through the anticipated leverage from public and private funding sources. In relation to public fund mobilization, the AE has indicated that the federal investment depends on the subsidies resulting from applications by interested landowners. Since these subsidies are assigned in response to applications, the RIOS project would be in the capacity to track the approval of subsidies in the two selected watersheds, fostering finance alignment. Moreover, RIOS is expected to work with federal agencies to ensure direct synergies with the supported beneficiaries.

49. Prior to the current COVID-19 context, the Government of Mexico increased the budget allocation for direct subsidies to people in need. The RIOS project can take advantage of the subsidies alignment to promote sustainable practices being conducted to increase climate resilience. As municipal governments are expected to be engaged in the RIOS project, the involvement of the Municipal Boards (*Juntas Intermunicipales*) could be of particular interest and favourable for project implementation. These are joint efforts by neighbouring

municipalities that enable the alignment funds to address shared development and territorial challenges. This is of particular relevance for the state of Veracruz since the project could expect to leverage funds from the city of Veracruz through the water fees collection in order to support the integrated management of the watershed that feeds this city. This type of arrangement could maximize public leverage potential.

50. The USD 39.5 million investment by GEF through the C6 project consisted of USD 28.6 million in endowment funds. During implementation and according to the AE, FMCN managed to leverage significant contributions to the endowment funds from foundations, companies, the federal government and international cooperation agencies. The annual interest of the funds sustains the project activities in the long term. The social and institutional basis that has been created would allow for new initiatives of greater scale, such as the ones being presented under RIOS.

51. RIOS is expected to leverage an additional 50 per cent at the minimum for subprojects' finance from public and private sectors. Additionally, it is expected to catalyse credits, which may be over USD 10 million, from financial intermediaries in the states of Jalisco and Veracruz.

52. In terms of mitigation impact, the estimate of expected tonnes of carbon dioxide equivalent (tCO_2eq) to be reduced is 2,534,015 tCO_2eq, which gives a cost per tCO_2eq removed for GCF at USD 3.55/tCO_2eq. This seems appropriate when comparing with the WB GEF C6 project where estimates were 16.406 $MtCO_2eq$ avoided in 20 years at USD 2.40/tCO_2eq.

53. The economic analysis of all activities shows a benefit-cost ratio between 1.58 and 2.30 and an internal rate of return (IRR) between 54.89 and 95.08 per cent. A specific analysis of introducing sustainable livestock practices shows a benefit-cost ratio between 0.76 and 1.86 depending on producer sizes, both positive in the two target watersheds. The private IRR is from 36.6 to 45.5 per cent.

III. Assessment of consistency with GCF safeguards and policies

3.1 Environmental and social safeguards

Does the project comply with the GCF Environmental and Social Policy?	Yes ☒ No ☐
Does the project have minimal to no environmental and social safeguards (ESS) risks compatible with SAP?	Yes ☒ No ☐

54. The project is designed to improve the integrated management of the landscape in two selected livestock and agroforestry basins (the Ameca-Mascota and Jamapa basins), and to accelerate climate financing embedded in the country's river restoration strategy. The beneficiaries of the project in the basins targeted will have increased access to the ecosystem services that the forest and riverine ecosystems provide, thus reducing their vulnerability to climate change. Moreover, the ecotourism potential of the area is also expected to be enhanced due to improved water quality and landscape aesthetics as a result of the project. The accredited entity (AE) has classified the proposal as having minimal to no environmental and social risks and impacts, which the Secretariat confirms as being equivalent to a GCF category C classification and within the accreditation level of the AE.

55. Among the activities that the project intends to implement are forest and riparian restoration, and implementation of productive practices, such as through agroforestry and sustainable livestock management, that enhance adaptive capacity and reduce the vulnerability of the communities affected. The project aims to support activities that restore patches of forests and riverbank vegetation with native species to increase connectivity, and to recover,

restore and conserve soil to increase productivity. The project also intends to support improved livestock practices, including the adoption of sustainable silvopastoral systems such as the use of living fences for fruit and fodder. The project will implement these activities through community-based works, including provision of capacity-building to the communities affected, and purchase of appropriate equipment for its fire prevention, control and management implementation.

56. The project will generally have positive impacts on the biodiversity of the ecosystems and on the livelihoods of the beneficiaries. Potential minimal environmental and social impacts will be small-scale, reversible, and readily addressed through the proposed mitigation measures. The project will exclude activities related to infrastructure, resettlement, use of agrochemicals, or invasive species, and will not produce any adverse impact on indigenous peoples. The project will also have an exclusion list in its call for proposals, such as on activities that could involve conversion or degradation of critical habitats.

57. Within the governance structure of the project, the technical project committee will have specialized staff to support implementation of environmental and social safeguards, including gender. The AE will also engage a safeguards specialist to provide guidance, supervision and reporting as regards implementation on safeguards. Stakeholder engagement through consultations have been conducted, and a stakeholder engagement plan will be made operational during the lifetime of the project. This plan provides for the earliest opportunity of engagement with communities and various stakeholders during project implementation. While the AE states that there are no indigenous communities in the project´s target areas, if indigenous peoples are detected before or during the project´s implementation, an appropriate strategy to ensure their participation (such as an indigenous peoples plan) will be developed. The project also includes a grievance redress mechanism (GRM), which will be communicated to the communities as regards the GRM contact details, its modes for lodging concerns, and the channels by which the mechanism can be accessed through the Independent Redress Mechanism, the institutional GRM of the AE, as well as the project-level GRM. In addition, in line with the GCF Indigenous Peoples Policy, the Independent Redress Mechanism and the Secretariat's focal point for indigenous peoples will be available for assistance at any stage, including before a claim has been made.

3.2 Gender policy

Does the project comply with the GCF Gender Policy?	Yes ☒ No ☐

58. The AE provided a gender assessment and gender action plan (GAP); therefore, it complies with the requirements of the GCF Gender Policy.

59. The AE, in its assessment, highlights the existence of an enabling environment to promote gender equality and women's empowerment under the project and, more widely, Mexico. Some national-level legal instruments highlighted in context of an enabling environment are the: (i) Political Constitution of the United Mexican States; (ii) General Law for Equality between Men and Women; (iii) Law of the National Institute of Women; (iv) Law of the National Commission of Human Rights; (v) Law of the National Institute of Indigenous Peoples; (vi) Federal Law to Prevent and Eliminate Discrimination; and (vii) General Law of Access of Women to a Life Free of Violence. Further, the Constitutional Reform of Gender Parity was approved by the Government of Mexico, which legally proposes parity at three levels of governance and in autonomous bodies and indigenous communities. Mexico is a signatory to major international declarations and instruments such as the Convention on the Elimination of All Forms of Discrimination against Women; Optional Protocol to the Convention on the Elimination of All Forms of Discrimination Against Women; Universal Declaration of Human

Rights; and Inter-American Convention to Prevent, Punish, and Eradicate Violence against Women.

60. The AE provided an assessment that illustrates barriers and opportunities, particularly in the context of women participating and benefiting from project-level developmental outcomes. There is evidence of sex-disaggregated data across a number of indicators, thus allowing for an in-depth understanding of the situation faced by vulnerable women, girls, men and boys in the targeted areas. Sex-disaggregated information was collected through secondary research and stakeholder consultations including women. Crucially, gender inequalities are more than apparent in labour markets; educational levels; unpaid work; access to land tenures; and women's lower level of engagement in leadership roles and decision-making processes. The gender assessment deepens this understanding by capturing granularities in 14 municipalities across Veracruz and Jalisco through gender-related development indices that examine inequalities in health, education and income.

61. The gender assessment provided by the AE illustrates equal participation of women in water and natural resources management as well as their contribution in livestock production and in fulfilling household needs through engagement in productive backyard activities. On the other hand, it highlights existing inequalities in access to land tenure systems that render women economically dependent. Where women do own land, it seems to be of poor quality with little scope for sustainable management practices. Moreover, women seem to be left out of any measures or decision-making processes to contain or curb the degradation of vegetation and/or bio-corridors. This greatly amplifies the challenges faced by women, particularly in relation to their capacities to effectively manage land resources. Additional challenges faced are from increased workloads, exposure to hazards, and loss of local knowledge of traditional medicinal herbs/plants and food species. The assessment indicates there are many female-headed households; usually these female-headed households are perceived to be more vulnerable. The assessment also points out that care work falls disproportionally on women in addition to it not being remunerated and recognized.

62. In fulfilling the requirements of the GCF Gender Policy, the AE provided a GAP that includes activities to address challenges identified in the gender assessment. The GAP highlights relevant impacts, outcomes, activities, indicators and targets, responsibility units (including the placement of a gender specialist as AE staff), timelines, and budgets. The project will aim to achieve anticipated impacts by increasing adaptive capacity in watersheds vulnerable to climate change through river restoration and connectivity by: (i) conducting restoration, conservation and improvements on productive activities implemented by local organizations in the states of Jalisco and Veracruz; (ii) increasing local monitoring capacities to reduce climate vulnerability; (iii) catalysing public and private climate-smart investments; and (iv) supporting the development of climate policies in Mexico's NRRS. Anticipated impacts are:

(a) increased resilience of the most vulnerable women;

(b) increased knowledge of women of their vulnerability to climate change;

(c) increased abilities of women through their participation in restoration, water quality and conservation monitoring activities; and

(d) reduced scarcity scenarios experienced by women through their meaningful participation in relevant subprojects.

63. The above impacts will be achieved by providing vulnerable women, girls, men and boys increased access to resources, technologies, training, and information for project-relevant work compatible with their productive, non-productive and domestic responsibilities.

64. The AE will, keeping in mind gender-based violence (GBV) is a major issue in Mexico, train staff and partners to develop knowledge and skills on GBV core concepts and ensure staff, partners engage in preventive action and throughout the project life-cycle. The AE also commits

to developing partnerships with women's community groups and ensure community-based protection systems or a grievance redress mechanism (GRM) is institutionalized to receive complaints, grievances and address these through culturally-appropriate and gender-sensitive channels. The AE will adopt GBV guiding principles to ensure care, safety, confidentiality, respect for GBV survivors and practice non-discrimination. More specifically, the AE will: i) ensure the GRM considers obstacles which may prevent women from accessing such a mechanism (e.g. illiteracy, technology, visibility); ii) build capacities of staff/last-mile partners on how to address issues which prevent women from participating in complaint processes; iii) facilitate consultations with women through separate (and safe) spaces so that women can express their opinions freely and without coercion; iv) build awareness among relevant stakeholders and communities on linkages between climate change and GBV; v) and examine sex-disaggregated data which helps to inform accelerated actions on GBV prevention.

3.3 Risks

3.3.1. Overall programme assessment (medium risk):

65. GCF is requested to provide a grant of USD 9 million to improve adaptive capacity in two watersheds that are highly affected by climate change. The GEF financed CONECTA project will be providing co-financing of USD 1 million in the form of a grant through the AE.

66. Mexico has been given an investment grade credit rating. The fiscal situation of the country may support availing partial reimbursable financing from GCF or providing more co-financing. The AE has supported 100 per cent of grant financing as the project will cover the incremental cost for adaptation impact. In addition, the government is committed to providing USD 8 million parallel financing to the GEF CONECTA project, which is consistent with the RIOS adaptation measures.

3.3.2. Accredited entity/executing entity capability to execute the current programme (medium risk):

67. FMCN is the AE and a co-EE for this project. As a DAE, the AE has been carrying out the administration and supervision of projects financed by international development partners such as WB, the Kreditanstalt für Wiederaufbau (KfW), and Inter-American Development Bank (IDB).

68. There are three EEs: FMCN and two non-profit RFs, namely Gulf of Mexico Fund A.C (FGM) and Fondo Noroeste A.C. (CONNOR). The two RFs have experience in implementing GEF and WB projects over five years, playing key roles in local engagement and capacity-building. The AE has provided the due diligence evaluation reports, which show that the two funds have the capacity to execute the project.

3.3.3. Programme-specific execution risks (medium risk):

69. The governance of the watersheds: The project takes a territorial approach based on the location of the watersheds. As the watersheds are across different administration units, it may lead to the fragmentation of stakeholder interests and dilute the responsibilities of management. However, the AE considers this risk low as relevant stakeholders, including CSOs, will have the advantage of working and coordinating beyond political-administrative boundaries.

70. Continued support from the government: The funding proposal indicated that there was a national budget reduction in the environmental sector in 2018–2019. Also, the country is expected to have legislative elections in 2021 and the presidential referendum in 2022. The

willingness of the government to put climate actions as a priority will be critical for the sustainability of the project.

71. Economic and financial analysis: An economic analysis has been carried out based on five studies that valuate the benefits of river restoration. The benefits are estimated based on the economic values of ecosystem services and carbon prices at voluntary market with different scenarios. All cases result in positive Net present value (NPV). A financial analysis has been conducted and it resulted in IRRs ranging between 36.6–45.5 per cent for alternative livestock activities. The AE stated that the project will provide tailored support for the different beneficiaries by providing different schemes and the grant needed for initial transition costs and technical assistance for new production techniques.

72. Concessionality of GCF financing: The AE has requested 100 per cent grant financing, asking for maximum concessionality. The AE expects that the project will leverage and catalyse additional financing through credit lines and a PES mechanism. Specifically, scheme 4 under component 1 involving credits to private agriculture producers has revenue generation potential. Therefore, the Government of Mexico and the AE may consider partial reimbursable grants. Moody's has rated the country as Baa1 and stated that the country has low budget deficits and relatively moderate government debt ratios.

3.3.4. Compliance risk (medium risk):

73. The recipient country, Mexico, is not subject to United Nations Security Council resolutions.

74. The AE will be implementing the proposed project with two RFs, FGM and FONNOR, acting as EEs.

75. The AE determines that both the probability and the impact for money laundering (ML), terrorist financing (TF) and prohibited practices (PPs) risks are low, as the EEs have adequate controls to mitigate the abovementioned risks.

76. Nevertheless, the Office of Risk Management and Compliance (ORMC)/Compliance has some reservations about the ability of FGM and FONNOR to effectively deliver on their obligations to manage ML, TF and PPs risks, as they have a relatively limited number of staff members. In light of this, ORMC/Compliance would like to remind the AE of their crucial role in ensuring that ML, TF and PPs risks are adequately managed throughout the project life cycle.

77. The ORMC/Compliance team has conducted a review of the project in accordance with relevant GCF Board approved policies and does not find any material issue or deviation with respect to compliance issues. Based on available information for this funding proposal, the ORMC/Compliance team has determined a risk rating of "medium" and has no objection to this request proceeding to the next steps for processing.

3.3.5. GCF portfolio concentration risk (low risk):

78. In case of approval, the impact of this proposal on the GCF portfolio risk remains non-material and within the risk appetite in terms of concentration level, results area or single proposal.

3.3.6. Recommendation

79. It is recommended that the Board consider the above factors in its decision.

Summary Risk Assessment		Rationale
Overall project/programme	Medium	

AE/EE capability to implement the project/programme	Medium	The project plans to provide grant support in the form of different schemes for different groups of beneficiaries. Given the maximum concessionality provided by the project, the AE's capacity to select the beneficiaries and provide tailored support will be important for the efficient use of GCF financing.
Project specific execution	Medium	
GCF portfolio concentration	Low	
Compliance	Medium	

3.4 Fiduciary

Does the project comply with the GCF AE fee policy?	Yes ☒ No ☐
In case the EE (ies) is different to the AE, has the financial management capacity assessment of the EE (ies) been undertaken?	Yes ☒ No ☐

80. FMCN will play the role of both AE and EE. As an AE, FMCN will carry out the administration and supervision of the project. As an EE, FMCN will provide follow-up, advice and direct support to the project activities.

81. In addition to FMCN, two non-profit RFs will be EEs for the project: FGM and FONNOR. The RFs will be in charge of the RFP process and selection, training, support and project supervision. The RFs have gone through the due diligence evaluation that shows they have the capacity to execute the project.

82. Financial management and procurement will be performed in accordance with the FMCN Operations Manual used for GCF accreditation. FMCN will be in charge of the supervision and approval of procurement procedures. The RFs will supervise the acquisitions made by CSOs during the execution of the subprojects.

83. FMCN has a general external auditor that reviews the administration of all projects. The auditors are selected in accordance with the FMCN Operating Standards and Administrative Procedures. The general and special audits are conducted on an annual basis. The general audit will be delivered no later than 30 April of each year. Special project audits are delivered to the donor no later than 30 June of each year.

3.5 Results monitoring and reporting

Is the project in line with the GCF Monitoring and Accountability Framework?	Yes ☒ No ☐

84. The funding proposal is an SAP with a cross-cutting theme and aims to increase adaptive capacity in watersheds vulnerable to climate change in select states of Mexico.

85. Overall, the funding proposal and log frame are assessed to have adequately applied the results management framework and performance measurement framework elements. The revised log frame meets the requirements of GCF on monitoring and reporting the anticipated results of the intervention. The project level results are sufficiently aligned with the fund level impact and outcomes both on mitigation and adaptation. The tools and methods presented are appropriate. The monitoring arrangements have been aligned with the project objectives and that will provide sufficient basis for measuring the expected results.

86. Implementation timetable: The implementation timetable has been provided in a format that would enable progress assessment during the implementation period. All the essential elements such as milestones and deliverables have been provided to facilitate progress monitoring on implementation performance in concrete terms.

3.6 Legal assessment

Has the AE signed the Accreditation Master Agreement?	Yes ☒ No ☐ Date of AMA execution: 7/7/2019
Has a bilateral agreement on privileges and immunities been signed with the country where the proposed project/programme will be implemented?	Yes ☐ No ☒
Has a certificate of internal approval been submitted?	Yes ☒ No ☐

87. The Accreditation Master Agreement (the "**AMA**") was signed with the AE on 7 July 2019, and it became effective on 3 September 2019.

88. The AE has provided a legal opinion/certificate confirming that it has obtained all internal approvals and it has the capacity and authority to implement the project.

89. The proposed project will be implemented in Mexico, a country in which GCF is not provided with privileges and immunities. This means that, among other things, GCF is not protected against litigation or expropriation in this/these country(ies), which are risks that need to be further assessed. The GCF Secretariat sent a draft agreement, together with a background note on privileges and immunities, to the national designated authority of Mexico in November 2015. Discussions are still in progress, with the last communication from the national designated authority received in November 2017 and follow-up emails sent by the GCF Secretariat in December 2017 and October 2018.

90. The Heads of the Independent Redress Mechanism and the Independent Integrity Unit have both expressed that it would not be legally feasible to undertake their redress activities and/or investigations, as appropriate, in countries where GCF is not provided with relevant privileges and immunities. Therefore, it is recommended that disbursements by GCF be made only after GCF has obtained satisfactory protection against litigation and expropriation in the country(ies) or has been provided with appropriate privileges and immunities.

91. In order to mitigate risk, it is recommended that any approval by the Board is made subject to the following conditions:

(a) Signature of the funded activity agreement in a form and substance satisfactory to the GCF Secretariat within 180 days from the date of Board approval; and

(b) Completion of the legal due diligence to the satisfaction of the GCF Secretariat.

Independent Technical Advisory Panel's assessment of SAP023

Proposal name:	River Restoration for Climate Change Adaptation (RIOS)
Accredited entity:	Fondo Mexicano para la Conservación de la Naturaleza A.C. (FMCN)
Country/(ies):	Mexico
Project/programme size:	Micro

I. Assessment of the independent Technical Advisory Panel

1.1 Impact potential *Scale: N/A*

1.1.1. Adaptation impact

1. The RIOS project targets four subbasins in the states of Veracruz and Jalisco in Mexico, seeking to enhance climate change resiliency through the implementation of ecosystem-based adaptation (EbA). The funding proposal identifies the main climate change impacts as variations in rainfall patterns, surface temperature rise and increase in the intensity and frequency of extreme hydro-meteorological events such as tropical storms. The funding proposal indicates that the combination of these impacts could influence the occurrence of droughts and floods.

2. The project would be implemented in the following subbasins: The Talpa-Mascota subbasin, which is part of the Ameca-Mascota basin, and the Jam28-Ixcatla, Jam31-Tlamatoca, and Jam33-Matlaluca-Medellín subbasins, which are part of the Jamapa basin. Considered as indirect beneficiaries are the total population of the Ameca-Mascota and Jamapa basins, approximately 29,000 and 822,000 inhabitants, respectively. Direct beneficiaries are the total population of the targeted subbasins, approximately 11,000 inhabitants for the Talpa-Mascota subbasin and 52,500 for the three Jamapa subbasins.

3. Component 1 involves financing EbA activities aimed at creating or enhancing biological corridors, and include the rehabilitation and restoration of forests along rivers and springs, protection and conservation of forests, and implementation of productive activities such as agroforestry and sustainable livestock management.

4. Table 1 shows the expected reach of project activities at the end of the project:

Table 1. Expected reach of project activities at the end of the project

Producer level activities	**Expected number of hectares**
1. Area of landscapes under agroforestry system (cumulative)	732
2. Area of landscapes under sustainable livestock system (cumulative)	6,592
3. Area of landscapes under river restoration (cumulative)	402
4. Area of landscapes under conservation and reduced pressure of deforestation (cumulative)	260,333
Total area	268,059

5. Component 1 includes the use of existing methodologies to monitor biodiversity, soil and water quality. The independent Technical Advisory Panel (TAP) questioned the lack of description of the methodologies that would be used by communities in the targeted subbasins to evaluate their vulnerability and to monitor the provision of ecosystem services. To this the accredited entity (AE) responded with an adequate description of the methodologies to be used to monitor biodiversity (BIOCOMUNI), water (Global Water Watch protocols) and vulnerability (National Atlas for Vulnerability to Climate Change, developed by the National Institute of Ecology and Climate Change (INECC)).

6. Component 2 aims at scaling up component 1 through promoting: (i) the alignment of local and national public programmes related to connectivity; (ii) private investments in targeted and other basins, for example, from the tourism industry and water service providers; and (iii) an enabling environment and improved capacities of producers benefited by component 1 to access credit for sustainable, climate-resilient productive practices. The project expects to leverage finance from the Ministry of Agriculture and Rural Development (SADER), National Forestry Commission (CONAFOR), National Water Commission (CONAGUA), tourism and water sectors, French Development Agency (AFD), Institutionalized Trusts for Agriculture (FIRA), and financial institutions.

7. The proposal lacks a detailed description of the concrete incentives that stakeholders would receive to invest in activities that do not involve direct revenues, such as restoration and conservation of riparian vegetation and forests in general. Questioned by the independent TAP on this matter, the AE responded with an adequate description of the threefold incentives, including multiple examples of private investments in reforestation and ecosystem conservation for the benefit of enhancing ecosystem services; the Payment for Environmental Services Program, through which the government matches 1:1 the contributions of the private sector; and environmental responsibility, which is promoted by consumer pressure, accessibility to the international market, and requirements from banks for credit provision.

8. Component 3 involves the design of a National River Restoration Strategy (NRRS) for climate change adaptation, which would serve as an inter-institutional and intersectoral coordination instrument, and would facilitate upscaling of local actions at a national level. It would help strengthen the institutional and regulatory systems through supporting the definition of the legal framework of the strategy, and the identification of relevant key decision makers and legislators that may require capacity-building on climate change adaptation.

1.1.2. Mitigation impact

9. The project expects to reduce greenhouse gas emissions by a total of almost 2.4 million tCO_2eq during the 20-year project lifespan. The independent TAP evaluated the emission reductions estimated using the Ex-Ante Carbon Balance Tool (EX-ACT) and found them to be adequately calculated.

1.2 Paradigm shift potential *Scale: N/A*

1.2.1. Innovation

10. Sustainable livestock management, agroforestry and ecosystem restoration and conservation activities are not new in Mexico. As described in the proposal, several projects have already implemented these activities (such as the C6 project).[1] However, these EbA activities can still be considered as an innovative approach for enhancing climate resiliency.

[1] The Coastal Watersheds Conservation in the Context of Climate Change project (C6) promotes integrated management of coastal watersheds to conserve biodiversity, contributes to climate change mitigation, and enhances

11. Another innovative aspect of the project is the implementation of a Natural Capital Accounting System, which is a tool to measure the changes in the stock of natural capital and to integrate the value of ecosystem services into accounting and reporting systems. Selected ecosystem services would be economically valuated to quantify their contribution to climate resiliency.

1.2.2. Potential for knowledge and learning

12. Knowledge and learning activities are cross-cutting to the three project components.

13. Component 1 would support the strengthening of local institutions to enhance coordination through the creation of a "learning community" that would meet annually to exchange experiences between beneficiaries, and the engagement of regional and national actors to coordinate activities. Learning activities would include workshops, publications and dissemination events. These learning activities would be co-financed by the CONECTA project of the Global Environment Facility.

14. Component 2 includes capacity-building for financial institutions on the development of dedicated credit lines and financial products to promote financing for EbA activities.

15. The RIOS Project Coordinating Committee would also help strengthen collaboration and coordination among project partners, such as federal-level environmental, agricultural, water, and rural finance entities.

16. Component 3 has good potential for knowledge and learning. The design of the NRRS would incorporate lessons learned from intermediate results from components 1 and 2; include workshops to define objectives, scope, and guidelines; and develop and launch a communication strategy.

1.2.3. Contribution to the creation of an enabling environment

17. Agroforestry and sustainable livestock subprojects are expected to continue operation after the project lifespan through their own revenues. These subprojects would also have the potential to mobilize private investments.

18. The proponent explained the incentives that private companies may have for investing in ecosystem restoration and conservation activities.[2] Using the same logic, these private investors would also take care of post-project operation and maintenance costs. In cases where this kind of activity is implemented by civil society organizations without adequate financial capacity, these subprojects would ultimately depend on their capacity for securing long-term public and/or private funding. Public funding could be secured through the existing Payment for Environmental Services Program developed by CONAFOR.

19. Monitoring activities included under component 1 would help increase the awareness of the positive impacts of project activities which would, in turn, promote the development of long-term sustainable financing mechanisms.

1.2.4. Contribution to the regulatory framework and policies

20. The project would support public officials and legislators in defining the legal framework of the NRRS, identifying relevant key decision makers and legislators that may

sustainable land use in the Gulf of Mexico and Gulf of California. It was implemented by the National Commission for Protected Areas (CONANP), CONAFOR, INECC, and FMCN. Financing was provided by the World Bank, through a Global Environment Facility grant.

[2] 20210106 RIOS- FMCN Mexico_Responses ITAP.docx

require capacity-building on climate change adaptation, and developing and launching a communication strategy for the NRRS.

1.2.5. Scalability and replicability

21. One of the main objectives of the NRRS would be to serve as a tool for documenting, assessing, and scaling up decision-making at the national level.

22. Component 2 is fully focused on improving scalability potential through the promotion of private investments, and the support for the development of dedicated credit lines for sustainable, climate-resilient productive practices (sustainable ranching and agroforestry).

1.3 Sustainable development potential *Scale: N/A*

1.3.1. Environmental co-benefits

23. Environmental benefits are central to the proposal. Agroforestry, sustainable livestock management, and ecosystem restoration and conservation activities are all EbA activities that seek to enhance ecosystem services as a means to improve climate change adaptation. Environmental benefits would include decreased run-off and increased infiltration, reduced soil erosion and, consequently, reduced siltation, improved water quality, improved soil quality and increased biodiversity.

1.3.2. Social co-benefits

24. The environmental benefits would result in multiple social co-benefits, including reduced risk of landslides and floods and improved water quality for consumption and agriculture. More resilient and sustainable agricultural practices would reduce the exposure to climate risks.

1.3.3. Economic co-benefits

25. Economic benefits would be generated indirectly through the enhancement of ecosystem services and directly through the implementation of more resilient livelihoods, which in the context of climate change would be more productive.

1.3.4. Gender-sensitive development impact

26. The Gender Action Plan identifies activities that are mostly carried out by women, and describes gender related outputs, indicators and targets. The selection criteria of subprojects in component 1 includes the way in which the proposal favours equality in the relationship between men and women.

1.4 Needs of the recipient *Scale: N/A*

1.4.1. Climate rationale

27. Climate change projections are based on the RCP 8.5, which is the worst-case emission scenario.[3] Figures 1.9.2, 1.9.3 and 1.9.4 and 1.10.2, 1.10.3 and 1.10.4 in the pre-feasibility study compare the monthly average precipitation of the period 1980–2010 with the precipitation projected for 2015–2039, respectively, in four General Circulation Models. These graphs show,

[3] Pre-feasibility study, page 30.

for Ameca-Mascota, a decrease in precipitation in January and February and an increase in November:

Figure 1.9.2.

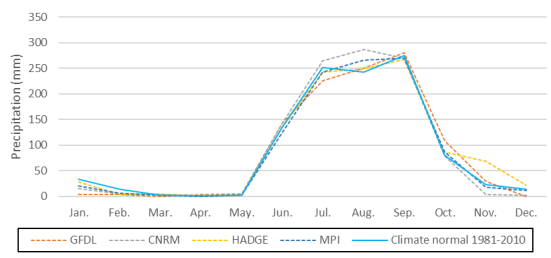


Figure 1.9.3.

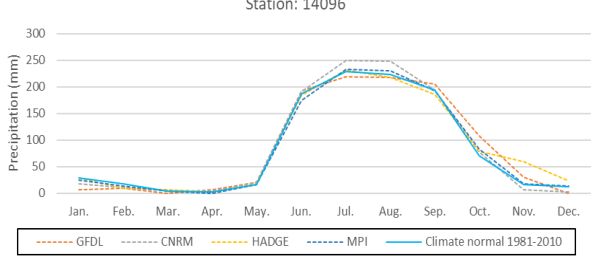
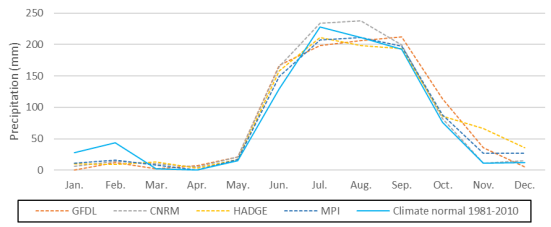


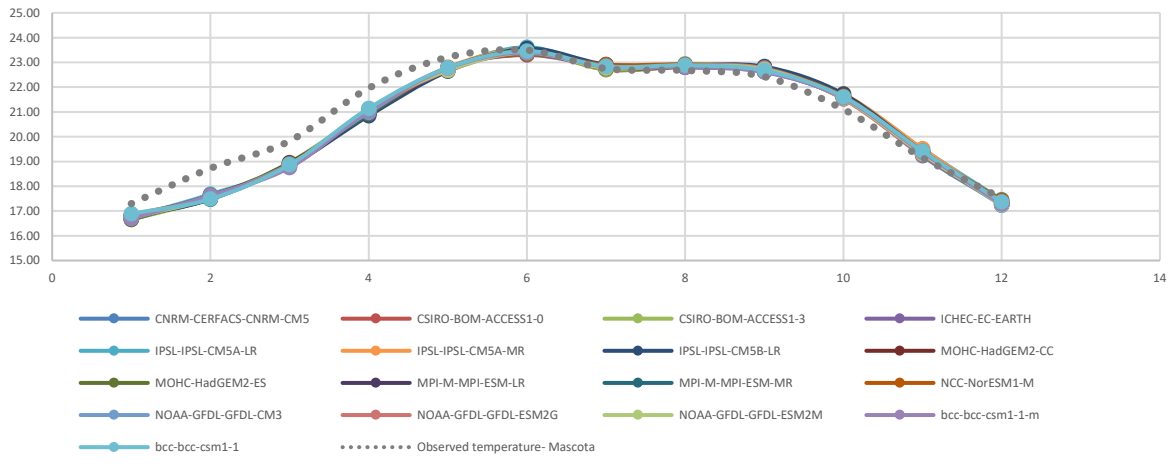
Figure 1.9.4.



Source: Original Pre-FS

28. However, the variations presented in the first version of the funding proposal were not very significant and the error range of these models was not defined. Questioned by the independent TAP on the error of these models and the lack of validation against observed data, the AE responded with a comparison of the proposed models and observed data, together with an analysis of errors and differences. For example, for Mascota, the comparison between models and observed data yielded the following results:

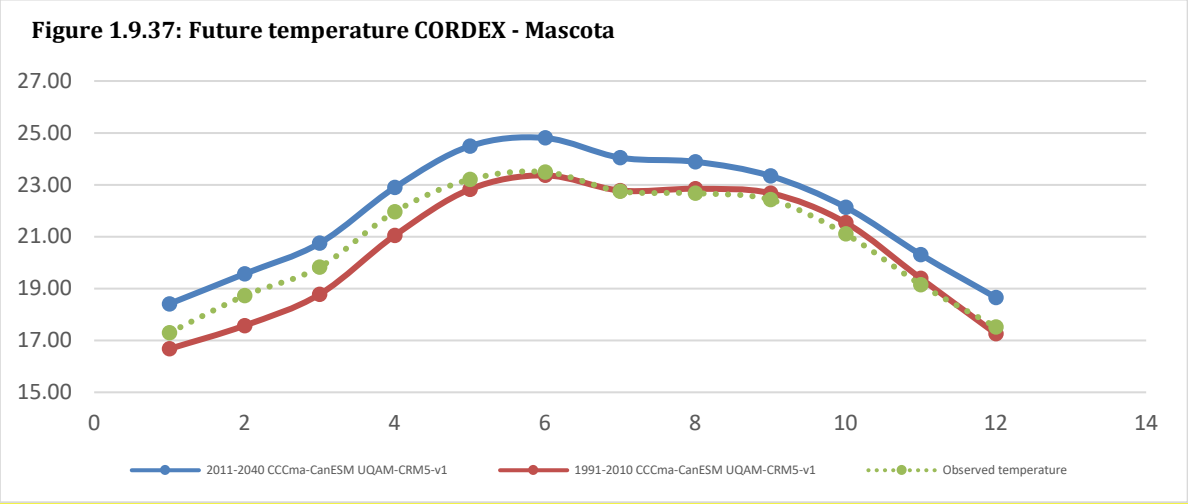
Figure 1.9.29: Comparison between observations and models temperature - Mascota



Source: Updated Pre-FS

29. Following the example of Mascota, future temperature predictions were projected, as shown in the following figure:

Figure 1.9.37: Future temperature CORDEX - Mascota



Source: Updated Pre-FS

30. Regarding drought, the study shows that some relatively significant changes in rain patterns have already occurred during the last decade. Comparing the period of 2003–2011 with the period of 2012–2020, the Jamapa basin shows an increase of abnormally dry days (ADD) in most months of the year, reaching 55 per cent in February. Although in the Ameca-Mascota basin the per cent changes are higher, the absolute numbers show that the variations are not too significant. For example, the period 2003–2011 had 2 ADD in March, while the period 2012–2020 had 23 ADD in March. This is an increase of more than 1000 per cent. However, in absolute numbers this represents a change of 0.25 ADD in March of any year in the 2003–2011 period, compared to 2.9 ADD in March of any year in the 2012–2020 period.

Figure 1.9.5.

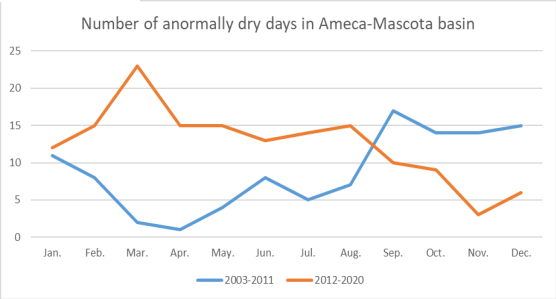
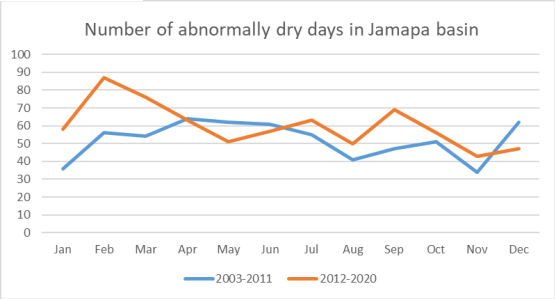


Figure 1.10.5.



Source: Original Pre-FS

31. The proposal also argues that the intensity of storms and hurricanes is increasing. Questioned by the independent TAP about the variation of precipitation patterns, the AE responded that "…in the Jamapa watershed the highest impact from climate change is due to punctual extreme hydrological events. Tropical storms and hurricanes have increased in frequency. According to a study conducted in 2017 (Ochoa Martínez) financed by the C6 project, from the total stations analyzed for the Jamapa basin, the main changes occur from the 90´s on, which correspond to years when extreme hydrometeorological phenomena (tropical storms or hurricanes) were present, such as El Niño associated events in 1997-1998, 1999 with tropical depression number 11, hurricane Stan in 2005, and hurricane Karl in 2010." Questioned by the independent TAP on the statistical analysis to demonstrate an increase in frequency or intensity of extreme weather events, the AE presented an analysis of the historical occurrence of tropical storms, tropical depressions and hurricanes. For the Ameca-Mascota basin the analysis concluded that "…In the period 1950-1979, 18 events occurred, over 70 percent of them classified as Tropical Depression or Tropical Storms, and only 5.5% were category 3 or above.

However, during 1990-2019, 20 events occurred and more than 30% were category 3 or above." For the Jamapa basin the analysis concluded that "…the number of events in the last decade (2010-2019) is 3.5 higher than the previous decade with more events (1930-1939). In the first 50 years with data (1920-1969) there were 15 events compared to 25 the last 50 years (1970-2019), 13 of them in the last decade."

32. Overall, the independent TAP finds that the climate rationale presented by the AE in the last version of the pre-feasibility study is acceptable and demonstrates the need for the proposed interventions.

1.4.2. Vulnerability of the country and vulnerable groups

33. As adequately described in the pre-feasibility study, Mexico is highly vulnerable to extreme weather events such as tropical cyclones and hurricanes, and to the variation in rainfall patterns that could affect the occurrence of floods and droughts.

34. The proposal identifies vulnerable groups as people without land, people without any potential source of income, single-women-headed households, young and elderly family members, physically or mentally disabled people, and indigenous people. The selection of proposals for subprojects in component 1 would give preferential treatment to proposals that integrate vulnerable groups.[4] The project target area does not contain indigenous territories.

1.4.3. Economic and social development

35. The poverty rates of the targeted basins are 51 per cent and 42 per cent for the Ameca-Mascota and Jamapa basins, respectively. Marginality, social deprivation and migratory indexes are presented for all municipalities in the targeted subbasins.

36. The total number of collective, informal and legal tenures is approximately six times greater in the Jamapa watershed than in the Talpa-Mascota subbasin (33 ejidos/agrarian communities and 3,097 holders). Thus, the atomization and small landholdings in the social ownership deepens the dangers of land overexploitation, soil erosion, and unsustainable use.

37. In the Ameca-Mascota basin, the main economic activities are agricultural activities, located in the valleys and consisting mainly in grains. In the mountains, the most common activities are in livestock and forestry. Another significant business activity in the municipality of Talpa is religious tourism, receiving approximately 3 million visitors per year. In the Jamapa basin, the main economic activities in the upper areas include the cultivation of coffee and maize and small-scale livestock management. In the middle and lower areas, there is extensive livestock ranching and farming of sugarcane and tropical fruit trees.

1.4.4. Absence of alternative sources of financing

38. The proposal does not demonstrate the lack of alternative sources of financing. However, the poverty rates of the targeted areas indicate that the type of work proposed needs a GCF grant to get started.

1.4.5. Need for strengthening institutions and implementation capacity

39. The proposal identifies several barriers related to institutional capacity, including lack of local governance, limited institutional coordination, limited alignment of public and private investments, and lack of implementation of planning instruments. These barriers would be tackled through the alignment of regulatory instruments and programmes at the federal/state

[4] Pre-feasibility study, page 264.

level and through the provision of capacity-building to INECC staff, other public officials and legislators.

1.5 Country ownership *Scale: N/A*

1.5.1. Alignment with national climate strategy and policies

40. The proposed project is aligned with Mexico's climate change agenda, particularly with its General Law on Climate Change (2012), Climate Change Adaptation Strategy (2016) and nationally determined contribution. Project activities also included in the nationally determined contribution are reforestation in watersheds, especially on riparian ecosystems, conservation and restoration of ecosystems, integral watershed management, and integration of climate change criteria into agricultural and livestock programmes.

1.5.2. Capacity of accredited entities or executing entities to deliver

41. The AE would be FMCN, which has adequate capacity to carry out the administration and supervision of the project. FMCN has already implemented projects financed by international institutions such as the World Bank, the State Development Bank of the Federal Republic of Germany (KfW) and the Inter-American Development Bank (IDB), among others. FMCN's manuals, policies and operating procedures would be applied to the execution of the project.

42. The FMCN would also act as executing entity, together with the Gulf of Mexico Fund (FGM) and Fondo Noroeste (FONNOR).

1.5.3. Engagement with civil society organizations and other relevant stakeholders

43. The stakeholder engagement plan was implemented since the project design phase, which included three consultation workshops. During these consultations, local stakeholders confirmed that the overall perception of the project is positive and well-received.

44. The stakeholder engagement plan is adequately described in the pre-feasibility study, including the three consultations undertaken in the design phase.

1.6 Efficiency and effectiveness *Scale: N/A*

1.6.1. Cost-effectiveness and efficiency

45. The costs for the implementation and management of subprojects under component 1 are estimated based on the per-hectare costs of the C6 project. These costs include the payment of salaries for technical support, labor and inputs, equipment (e.g. specialized equipment such as scales and dryers for coffee or electric fences and solar cells for the silvopastoral systems) and training. The C6 costs are relatively efficient compared to other similar projects.

46. The economic benefits considered in the analysis include improved provision of ecosystem services, reduced CO_2 emissions and enhanced carbon sequestration, and revenues associated with sustainable livestock and agroforestry.

47. It is not clear why the cost-benefit analysis considers the operation and maintenance costs as 2 per cent of total project cost even after project lifespan. The management costs of restoration and conservation activities may not be the same as the operation costs for livestock or agroforestry activities. These costs should be estimated separately, using data from previously implemented projects.

48. Expected cash flow from agroforestry is considered as USD 7 per hectare per year, which seems to be an underestimation of the potential economic benefits of these activities, especially when compared with the USD 55 assumed for conventional agriculture or USD 230 for silvopastoral activities.

49. The economic analysis shows that results are extremely sensitive to the assumed value of CO_2 emission reductions. In the lower bound of project benefits (conservative approach), the NPV ranges from USD 30 million when assuming a carbon price of 60 USD/tCO_2eq to USD -15 million when assuming a carbon price of 3 USD/tCO_2eq. The document describing the economic analysis defines a value of USD 5/tCO_2eq, explaining that "it is close to the carbon exchange prices that currently exist in Mexico". The calculations performed use a value of 60 USD/tCO_2eq and, in this scenario, between 50 and 65 per cent of total project benefits are estimated as coming from emission reductions. Nevertheless, if all GCF funds (USD 9 million) are divided by the predicted emission reductions throughout the life of the project (2,390,087 tCO_2eq), the result is a 3.77 USD/tCO_2eq ratio, which is very efficient. If the benefits of the adaptation measures were included, the efficiency would increase even more.

1.6.2. Amount of co-financing

50. Component 1 of RIOS would be co-financed with USD 1 million from the CONECTA project to support livestock and agroforestry producers to access credits, the implementation of a learning community, and a community-based water monitoring system.

1.6.3. Financial viability

51. The following table presents the results from the economic analysis presented in the funding proposal considering a 20-year project lifetime:

		Upper bound (higher benefits)		Lower bound (lower benefits)	
		NPV in USD	BC-ratio	NPV in USD	BC-ratio
Carbon price (USD 60)	Discount rate 6%	68,071,208	2.30	30,602,165	1.58
	Discount rate 9%	52,419,496	2.29	28,075,381	1.59
Carbon price (USD 40)	Discount rate 6%	51,776,946	1.99	14,307,903	1.27
	Discount rate 9%	39,451,411	1.97	13,126,516	1.27
Carbon price (USD 3.01)	Discount rate 6%	21,640,709	1.41	(15,828,334)	0.70
	Discount rate 9%	15,466,938	1.38	(14,521,408)	0.68

1.6.4. Best practices

52. The project would replicate best practices from the C6 project. There is no concrete description of best practices in the proposal.

53. The activities in the present proposal would be based on the Integrated Watershed Action Plans designed by the C6 project for the Ameca-Mascota and Jamapa basins, which are based on geo-hydrological models and consultations with local stakeholders.[5]

II. Overall remarks from the independent Technical Advisory Panel

54. The independent TAP recommends this project for approval.

[5] Pre-feasibility study, page 7.

Response from the accredited entity to the independent Technical Advisory Panel's assessment (SAP023)

Proposal name:	River Restoration for Climate Change Adaptation (RIOS)
Accredited entity:	Fondo Mexicano para la Conservación de la Naturaleza A.C.
Country/(ies):	Mexico
Project/programme size:	Micro

Impact potential
No comments.
Paradigm shift potential
No comments.
Sustainable development potential
No comments.
Needs of the recipient
No comments.
Country ownership
No comments.
Efficiency and effectiveness
No comments.
Overall remarks from the independent Technical Advisory Panel:
Thanks for your feedback and useful exchange with iTAP. We would want to thank the iTAP for the opportunity to strengthen the project design, in specific the climate rationale.

INECC
INSTITUTO NACIONAL DE ECOLOGÍA Y CAMBIO CLIMÁTICO

FONDO MEXICANO PARA LA CONSERVACIÓN DE LA NATURALEZA, A.C.
FMCN INSTITUCIÓN PRIVADA

ANNEX 4

GENDER ASSESSMENT AND ACTION PLAN

Restoration for adaptation to Climate Change (RIOS)

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ABBREVIATIONS

ANVCC	National Atlas of Vulnerability to Climate Change
WB	World Bank
CONAPO	National Population
CONEVAL	National Council for Evaluation of Social Development Policy
ENA	National Survey of
River	Restoration
ENDIREH	National Survey on the Dynamics of Household relationships
FMCN	Mexican Fund for Nature Conservation AC
FR	Regional Funds
IDG	Gender Inequality Index
HDI	Ta ice Human Development
IDRG	Index Development on Gender
INECC	Institute National Ecology and Climate Change
INEGI	National Institute of Statistics and Geography
INMUJERES	National Women Institute
UN	Organization of the United Nations
PAG	Action Plan Gender
GDP	Gross Domestic Product
UNDP	Program the United Nations for Development
SEDATU	Secretariat of Agrarian, Territorial and Urban Development
UP	Production Unit

1. Introduction

The RIOS project implements a set of actions in two basins in Mexico with high vulnerability to climate change that together cover an area of 59,011 ha directly benefiting 63,294 people (49.2% are women) and indirectly 865,634 people (52% are women). It will have the financial support of the GCF and it will be articulated with complementary and parallel investments, and it will have the participation of two Regional Funds (FR) [1] during its implementation.

The gender perspective is applied in this project not only to improve its results, but also to provide a platform for recognizing the problems of women who participate in the rural sector, to allow eliminating possible negative effects of the intervention on the living conditions of women that are directly or indirectly related to the activities that are planned to be carried out (some projects reinforce the gender roles that are seen as traditional), and to incorporate solutions that, together, promote progress for rural women, following the national and international agenda to strengthen gender equality, non-discrimination and the empowerment of women. This document in particular, and the entire RIOS project, adopt the following definitions:

Gender perspective: According to the General Law for Equality between Women and Men, it refers to: "The methodology and mechanisms that allow identifying, questioning and valuing discrimination, inequality and exclusion of women [to understand, design and implement] the actions that must be taken to act on gender factors and create the conditions for change that allow progress in the construction of equality between women and men "(Article 5, section VI).

Mainstreaming the gender perspective: According to the General Law for Equality between Women and Men, it is: "The process that guarantees the incorporation of the gender perspective to assess the implications that it has for women and for men in any action that is scheduled, in the case of legislation, public policies, administrative, economic and cultural activities in public and private institutions "(Article 5, section VII).

Equality between women and men: Defined by the same Law as: "The elimination of all forms of discrimination in any of the areas of life, which is generated by belonging to any sex" (Article 6).

Gender gap: refers to any disparity and inequality between the status of men and women because of their position or function in society. These are inequalities in terms of their participation, their access to opportunities, their rights, their ability to influence and make decisions, their income and benefits, and their control and use of resources.

Gender roles: they are stereotyped behaviors by each culture, which amount to socially accepted norms, about what a person is expected to do because of the sex to which they belong. Insofar as they are socio-historical constructs specific to each culture, they are susceptible to modification.

2. Legal status of women

Mexico has promoted important advances in the laws that protect the right, and position women in the public sphere, seeking to align its regulatory instruments with those of international nature to which it has subscribed. Among the variables that make up the Gender

[1] Fondo Golfo de México at Veracruz and Fondo Noroeste at Jalisco.

Inequality Index, the position of women in the political sphere is the one that has registered the most recent advances (UNDP, 2018).

International legal framework on the human rights of women signed by Mexico:

- Universal Declaration of Human Rights.
- American Convention on Human Rights.
- Convention on the Elimination of all Forms of Discrimination against Women.
- Convention on the Political Rights of Women.
- Inter-American Convention to Prevent, Punish, and Eradicate Violence against Women.
- Optional Protocol to the Convention on the Elimination of all Forms of Discrimination against Women.

National legal framework on women's rights applicable to the project

- Political Constitution of the United Mexican States
- General Law for Equality between Men and Women
- Law of the National Institute of Women
- Law of the National Commission of Human Rights
- Law of the National Institute of Indigenous Peoples
- General Law of Electoral Institutions and Procedures
- Federal Law to Prevent and Eliminate Discrimination
- General Law of Access of Women to a Life Free of Violence
- General Law to Prevent, Punish and Eradicate crimes in the Matter of Human Trafficking and for the Protection and Assistance to the Victims of these Crimes
- Agrarian Law
- Law on Agricultural Chambers that hereinafter will be called Agricultural Associations
- General Law of Cooperative Societies
- General Law of Ecological Balance and Protection of the Environment
- General Law of Climate Change
- General Law of Sustainable Forest Development
- Law of Rural Sustainable Development
- Federal Labor Law
- General Law of Education
- Health Law
- General Law of Human Settlements, Territorial Planning and Urban Development
- General Law for the Inclusion of People with Disabilities
- NOM-035-STPS-2018 Psychosocial risk factors at work, identification, analysis and prevention

- NOM-046-SSA2-2005 Family and sexual violence against women
- NOM-007-SSA2-2016 For the care of women during pregnancy, childbirth and puerperium, and of the newborn
- NMX-R-025-SCFI-2005 Labor equality and non-discrimination

Legal status of women in the basins of incidence. The platform of the National Institute for Women (INMUJERES) "México Rumbo a la Igualdad" evaluates mainstreaming of the gender perspective in the states of Jalisco and Veracruz, which has registered progress and identified pending issues[2]. Likewise, INMUJERES supports entities of the Federal, State and Municipal Public Administration through the Program for Strengthening Mainstreaming of the Gender Perspective and, PROEQUIDAD aimed at actions for the benefit of women in the territories. Both programs are part of the National Program for the Equality of Men and Women (PROIGUALDAD) that establishes the federal guidelines on the matter.

Political parity. In 2019 the Constitutional Reform of Gender Parity was approved, which legally proposes parity [3] the three powers and in the three levels of government, as well as in the autonomous bodies and indigenous communities. This reform is still in the process of being implemented, but by 2018, 48.4% of the public administration positions occupied by women were already registered (UNDP, 2019).

3. Demographic and economic characteristics of the population

3.1 National Gender Inequality

The Human Development Index (HDI) 2010 introduced the Gender Inequality Index (GDI), which reflects gender-based inequalities in three dimensions: reproductive health, empowerment and economic activity (UNDP, 2011).[4] Mexico obtained in 2018 a value of 0.334 in the Gender Inequality Index, for which it ranked 74 out of 162 countries.

Table 1: Breakdown of the variables for the Gender Inequality Index of Mexico in 2018 compared to the region.

	IDG	Classification according to IDG	Maternal mortality rate	Adolescent fertility rate	Parliamentary seats occupied by women (%)	Population with at least one year of secondary education		Participation rate of the labor force	
						Women	Men	Women	Men
Mexico	0.334	74	38	60.4	48.4	58.4	61.1	43.8	78.9

[2] Available at: http://rumboalaigualdad.inmujeres.gob.mx/temas

[3] Parity is the principle used to guarantee equality between men and women in access to positions of political representation. It is a criterion stipulated in the Law to ensure equal participation in the definition of candidacies for positions of popular election.

[4] Reproductive health is measured by maternal mortality and fertility rates among adolescent girls; empowerment is measured through the percentage of parliamentary seats held by women and the achievements of each gender in secondary and higher education; and economic activity, based on the participation rate in the labor market corresponding to women and men.

Latin America and the Caribbean	0.383	-	68	63.2	31.0	59.7	59.3	51.8	77.2

The maternal mortality rate is expressed as the number of deaths per 100,000 live births; adolescent fertility rate is expressed as the number of births per 1,000 women ages 15-19. Source: UNDP, 2019

However, the country's territorial extension, the distribution of its population and the concentration of infrastructure make it necessary to delve into internal differences in order to know the needs of specific sectors of the population.

Differentiated economic participation. Both men and women are mainly concentrated in populations with more than 2,500 inhabitants[5]. The average income increases as the size of the locality increases. In 2016, in towns with 100,000 and more inhabitants, the median income was $ 6,268 and $ 9,116 for women and men, respectively. On the contrary, in towns with less than 2,500 inhabitants, the average income was $ 2,403 and $ 3,728 for women and men, respectively, observing the highest gap (-35.6%) compared to the largest towns (INMUJERES, 2016).

The educational level is a determining factor, among others, to be inserted in the productive dynamics and obtain access to better working conditions. The average educational disadvantage of women amounts to 21.8%, while that of men is 19.4% (World Bank, 2018). Insufficient educational and health infrastructure is common in rural settings, so access to both services is subject to the ability to travel to nearby towns, support from government programs and subsidies, and in the case of women, to domestic agreements that facilitate or do not prevent it.

3.1.1 Situation of women in the country

Participation of men and women in the economy. Gender roles, whether adopted or imposed, show significant areas of opportunity at the national level. Unpaid work in women represents 25%, while male unpaid work barely exceeds 5% (INMUJERES with data from INEGI, 2018). This indicator reveals that unpaid work carried out in households has an important contribution to the national economy, providing fundamental support for the continuity of productive and social dynamics. These support activities are carried out by women in an approximate ratio of 4 to 1 without receiving direct remuneration for their contribution, delegating the mechanisms of remuneration to family agreements. Productive backyard activities are usually considered part of domestic work, so it is usually invisible for formal economic accounting purposes, and the importance of this activity for the family economy is not recognized either.

3.1.2 Women in the rural context

Land tenure distribution. 53% of the total land in Mexico is communal property, made up of 31,514 of a type of community property called *ejidos* and approximately 2,344 communities (World Bank, 2018). 62% of Mexico's forests are under a collective ownership structure (of the rest, 32% belong to small private owners and 6% are public property in the form of forest

[5] INEGI distinguish urban from rural using 2,500 inhabitants as a parameter, that is, it uses a parameter that internationally facilitates comparability between countries. (SEDATU, 2018).

reserves) (World Bank, 2018). Land tenure confers the legal right to vote in community assemblies and other decision-making powers.

Governance in the communities or *ejidos*. Of the 4.2 million Mexican members of communities in 2013 with land titles, only 18% were women. Furthermore, in 2013 women held only 12.5% of the 350,000 administrative positions in local assemblies and governing structures (World Bank, 2019).

Land tenure and decision-making. The highest proportion of women is resident (*avecindados*) of the *ejidos* (41.8% without private property rights, no voice, or vote), or have full rights as owners of the land (22.98% owners of private property, but without decision on the common land, neither voice nor vote), compared to a lower percentage of women who are owners as part of the community or *ejidatarios* (19.80%) and therefore participate in the decisions of the *ejido* (Table 2). The largest proportion of women living in these communities does not have a representation in community decision-making.

Table 2: Population by sex in the "ejidos" according to type of tenure, administrative positions and participation in non-agricultural activities.

	Total	**Men**	**Women**
"*Ejidatarios*" and other type of community owners	**4´210,830**	3´377,035	833,795
"*Ejidatarios*" with individual parcels	3´392,126	2´780,931	611,195
Land owners in the *ejidos*	1´442,807	1´111, 237	331,570
Residents in the *ejidos*	2´447,226	1´423,298	1 ´023,928
Presidents of the *ejido*	31,514	30,716	798
President of the *ejido* who speaks an indigenous language	Na	16.5%	0.2%

Source: Own elaboration with data from the *Ejido* Census, INEGI, 2007

Situation of women and men in agricultural production. According to the 2017 National Agricultural Survey, 14 out of 100 agricultural producers responsible for the management and decision-making of the Production Units (UP) are women (INEGI, 2017). The labor force employed in these UPs was 83.0% men and 16.7% women. The largest proportion of this labor participation is classified as unpaid labor (30.8%) and not economically dependent on the Production Unit (25.7%).

Table 3: Participation by sex in Agricultural Production Units.

	Men	**Women**
Total	83.0%	16.7%
Unpaid labor	69.2%	30.8%
Not dependent on company name	74.3%	25.7%
Producers *	85.1%	12.9%
Paid labor	87.5%	12.5 %

* 2% of respondents did not specify their gender during the survey.

Source: ENA, 2017

The set of existing gender gaps (land tenure, participation in governance bodies, unequal payments, unpaid employment and domestic care activities) keep women in culturally reinforced cycles of poverty that discourage the self-organization and individual efforts to overcome them.

3.1.3. Women and socio-environmental problems

Table 4 shows differentiated impacts between men and women of some of the main problems faced by the rural sector and agricultural production, which in many cases refers to environmental problems and vulnerability to climate change from a socio-environmental perspective. Women and men access natural resources differently and therefore the effects are also different when these resources undergo changes. This information is derived from assessments in the states where the watersheds were selected for the project as part of the design of the CONECTA project, which will co-finance RIOS. It is further enriched by the experience of the gender aspects of the "Conservation of Coastal Watersheds in the Context of Climate Change" that took place in regions that included the RIOS basins from 2014 to 2019 and was financed by the Global Environment Facility.

Table 4. Main socio-environmental problems related to conventional agricultural and their differentiated impact on men and women.

Problems	Triggers	Impacts on men and women	Differentiated impacts on women
Degradation of soils	Bare soil, crops without soil conservation practices, overgrazing, compaction and wind and water erosion.	Loss of land value, high production costs to supply environmental services. Loss of income and livelihoods stimulates temporary or permanent migration.	No participation in decision making on productive resources. Greater losses since the lands managed by women generally have smaller surfaces and lower quality of soils for production than those managed by men. Increased tension, domestic violence and abandoned homes.
Loss of fertility in soils	Overexposure of soils to insolation (due to breakage), high use of pesticides and synthetic fertilizers.	High production cost due to having to use agrochemicals. Health risks from being in contact with pesticides, if they are not well managed.	Work overload to manage production for self-consumption, which requires work in the domestic transformation to sustain food.
Degradation of vegetation cover quality	Grazing/browsing of cattle in forests. Production oriented to monoculture, removal of tree cover and, in general, of natural vegetation as a condition for cultivation and grazing.	Dependence on productive packages and loss of rural knowledge. High temperature exposure during working with livestock and agriculture due to lack of shade. Increased exposure to pests and vectors.	Must enrich the family diet with production from backyard, without other options provided naturally by the ecosystem. Unpaid work overload.

Contamination of water sources	Contamination by feces and incorporation of suspended solids due to the entrance of cattle to rivers and springs for watering. Contamination of bodies of water by the use of pesticides.	Health risks and shortages.	Longer trips to obtain better quality of water or investment in rudimentary processes to make it drinkable. Their needs are excluded from decision-making processes in water management systems for productive purposes.
Fires in forests and natural grasslands	Poor management of fire in agricultural burns, for renewal of grasslands and as a final destination of waste (burning of garbage).	Risks of poisoning, injury and death in firefighting, which increases if communities are not trained. Economic losses.	Exposure to hazards and increased fatigue when searching for food or supplies that they used to take from nearby forests.
Increased vulnerability to hurricanes and extreme rains	Soil compaction, erosion and loss of pasture cover due to overgrazing, weakening of the slope in riparian areas due to livestock entry. Rivers get obstructed due to soil erosion of river banks and floods downstream become more frequent.	Risks of injury and death due to flooding from river overflows. Risk of diseases due to unsanitary conditions after the flood. Economic losses and increase in expenses Loss of patrimony.	Wide vulnerability of domestic chores that provide life support to the family unit (food and hygiene). Higher risks of injury or death since women generally cannot swim. No access to safe resources for eventualities. Women and girls face increased health and safety risks.
Increased vulnerability to drought	Loss of infiltration capacity due to overgrazing.	Water shortage. Increase need of resources in case of eventualities. Increase in expenses (for example, in bottled water). Forest fire risk.	Increased distance to obtain water, exposure to extreme fatigue and greater dependence on providers of drinking water. Low women participation in water councils and committees.
Loss of biodiversity.	Misuse of pesticides that generically affect beneficial herbs and weeds, insects and pollinators, and biota in general. Agricultural monocultures, introduction of exotic grasses.	Productive dependency on agrochemicals. Reduction of the diversity of productive and self-consumption options.	The wealth of the family diet depends on the productivity of the backyard, demanding additional work from women. Loss of local knowledge about the species and their traditional uses (ex. medicinal, religious, food, etc.).
Land-use change	Expansion of grasslands and crops at the expense of natural vegetation.	Appearance of exotic or invasive species, as well as exposure to pests and rupture of food chains. Soil depletion.	Limited decision-making in the land where they live. The productive practices adopted in the territories do not include female participation, which reduces their influence on the plot or backyard.

Exclusion of women and vulnerable groups	Land tenure concentrated on men. Patriarchal social structures and cultural practices that make women invisible. Discrimination against indigenous groups.	Resistance to change makes it difficult to adapt or adopt innovations. Power grabbing leads to chiefdoms. Decisions are made without considering the impacts on the diversity of the group.	Invisibility of the contributions of women and vulnerable groups to the productivity and sustainability of the family-productive nucleus. Lack of property rights hinders access to opportunities for economic independence. Associations, cooperatives and support networks in these sectors do not receive public recognition, are considered informal or playful and do not participate in community decision-making.
Low human development	Poor health conditions, low formal educational level.	Difficulties to overcome the cycles of poverty by their own means.	Most affected by less access to opportunities in cycles of poverty and scarcity scenarios.
Migration	Poverty, low indices of human development, lack of opportunities for improvement. Impoverishment of the ecosystems that sustain the strategies of rural life.	Exposure to risks during transfers or adverse conditions during migration. Loss of positioning in the community of origin during the absence of men.	Women do not inherit rights or powers during the absence of migrant men, limiting their capacities to manage the Production Unit during their absence.
Aging of the productive sector	Migration due to lack of employment opportunities, lack of prospects for human and economic development for young people. Void social security schemes and retirement provisions.	The family unit does not have the labor force or sufficient capacities to make better use of the territory. Land use is changed to manageable, though less profitable, options. Territories are rented and in extreme cases, properties are sold.	Women have less family and community support to migrate, and if they migrate, they are more exposed to various types of violence. They are culturally responsible for the care of the sick and the elderly, increasing their workload when migration occurs. Remittances do not alleviate women´s poverty; they are invested in patriarchal productive activities. Women are driven to start a family as the only option to have some type of heritage.

Source: Own elaboration from Environmental and Socioeconomic Assessments for the Implementation of Regenerative Livestock Processes 2019, and project reports, FMCN, 2020

Field interventions indicate that men and women assume these risks and disadvantages unconsciously, assimilated into the roles that men and women play.

4. Women in the RIOS incidence basins

The two regions in which RIOS will be developed are located within 14 municipalities, of which 12 are located in Veracruz and two in Jalisco.

INMUJERES, through the Gender Indicator System, provides some of the data at the municipal level that are projected below. It should be noted that this platform reflects for municipalities the Gender-Related Development Index (IDRG), which is an indicator prior to the Gender Inequality Index[6]. The IDRG examines gender inequalities in the HDI dimensions (health, education and income), it is an indicator that goes from 0 to 1, in which the unit represents the enjoyment of development for women and 0 represents a low developmental level. For 2010, the national IDRG was 0.7840.

The difference between the number of *ejidatarios* and the number of residents (inhabitants of the *ejido*s without full land rights, and without voice or vote in the assemblies) is exposed, since it allows contrasting the percentage of women who take part in the decisions in the rural territories of the municipalities, and the percentage of women in the presidency of the *ejido* gives us an idea of their participation in community decision-making.

4.1 Jalisco

In 2010, the state of Jalisco reflected a Gender-Related Development Index of 0.8257, ranking 13th among the 32 states of Mexico (PNUD, 2010). The state-level recorded in the household survey 25.4% of households with female heads, and it was detected that 83% of the single-parent households are supported by a woman (ENDH, 2018).

Table 5. Demographic characterization of women in the municipalities of the RIOS basins in Jalisco.

Municipality	Total population	Women %	Female economic participation rate (2015) *	Family households headed by women% (2015)	Gender-related Development Index (2010)
Mascota	14 245	50.79	32.1	22.8	0.8464
Talpa de Allende	14 410	49.93	31.3	25.6	0.8233

* Rate for every 100 women aged 15 and over.

Source: CONAPO (2010), CONEVAL (2010). INMUJERES (2010).

Regarding the gender gap, the National Atlas of Vulnerability to Climate Change (ANVCC) of INECC (2019) shows data for the four indicators that make up the index (Table 6). This confirms that the gender gap in the incidence municipalities is rated as relatively low. Women register access to health and education services relatively similar to that of men, while the greatest disparity is found in the low income received and the greater performance of unpaid work.

Table 6: Indicators of the gender gap for the municipalities of Mascota and Talpa de Allende, 2015.

	Without access to health services		Without schooling		With low income		Who performs unpaid work	
	Men%	Women %	Men%	Women %	Men%	Women %	Men%	Women %
Mascota	13.1	8.9	4.7	4.3	13.4	33.5	57.3	89

[6] The IDG replaces the Gender-Related Development Index (IDRG) and the Gender Empowerment Index (IPG), encompassing some of the aspects reflected in both, in a single index. The variation of the new Gender Inequality Index is inverse to the variation of the gender indicators used in the traditional methodology, whose value is closer to 1 when it reflects greater equality between women and men.

Talpa de Allende	11	8.2	6.4	5.7	17.8	37.3	47.6	87.1

Source: AVCC, 2019

The state diagnosis for Jalisco, through the consultation process, captured the interest of including the elaboration of handicrafts, gastronomic products, forest and livestock sub-products, and tourist services as an opportunity to insert the participation of women in the microregions of the basins. Although there is not enough information to determine the labor insertion of women in rural Productive Units, it can be inferred that they participate to some degree in these productive activities.

Table 7: Units of production and participation in the *ejidos* in the Jalisco Basins.

Municipality	***Ejidatarios* and** other type of community owners		**Residents (with no property rights)**		**President of the *ejido***	
	Total	**Women%**	**Total**	**Women%**	**Total**	**Women%**
Mascota	894	16. 55	96	12.5	16	6. 25
Talpa de Allende	1,745	21. 03	1,239	51.98	17	0

Source: *Ejido* Census, INEGI, 2007.

The intervention sub-basin of the Ameca-Mascota river is 43% in *ejido* property, distributed in ten *ejidos*. We can see that in the *ejidos* of the Municipality of Tlalpa there is a significant number of residents, of which 51.9% are women. There is no land tenure in these territories under the other community schemes.

The coastal region is an area of livestock importance for the production of meat and cattle for dual purposes, it is worth mentioning that dual-purpose production is for meat and milk, however, milk is used mainly in the production of cheeses and it is in the production of dairy products where the participation of women is important, since they are the ones in charge of supervising workshops (production) and marketing.

In the mountain region, there are also small producers of milk in smaller quantities, especially from family companies that sell cheeses and panela (for example, in the municipality of Mascota).

4.2 Veracruz

In 2010, the state of Veracruz registered a Gender-Related Development Index of 0.7819, ranking 28th among the 32 states (PNUD, 2010). According to the 2018 National Household Dynamics Survey, 30.1% of households with female heads were registered, the same sample indicates that 83.9% of single-parent households are headed by a woman (ENDH, 2018).

Table 9. Demographic characterization of women in the municipalities of the RIOS basins in Veracruz.

Municipality	**Total population**	**Women%**	**Female economic participation rate (2015) ***	**Family households headed by women% (2015)**	**Gender-related Development Index (2010)**
Camarón de Tejeda	6 224	50.14	11.9	18.9	0.7438

Comapa	18 713	49.09	11.6	14.9	0.6802
Huatusco	54 561	51.95	34.4	26.1	0.7828
Ixhuatlán del Café	21 407	50.76	23.7	19.4	0.7514
Jamapa	10 376	50.99	26.1	34.9	0.752
Manlio Fabio Altamirano	22 585	50.54	22.7	29.4	0.7931
Medellín	59 126	51.91	40.9	31.2	0.8111
Paso del Macho	29 165	50.66	19.3	21.5	0.7827
Soledad de Doblado	27 008	50.61	24.3	27.3	0.7781
Tepatlaxco	8 249	49.00	16.5	13.7	0.7330
Veracruz	552 156	52.63	40.9	36.9	0.8636
Zentla	12 379	49.87	15.6	17.1	0.7691

* Rate per 100 women aged 15 and over.

Source: CONAPO (2010), CONEVAL (2010). INMUJERES (2010).

Regarding the gender gap, the INECC's National Atlas of Vulnerability to Climate Change (2019) builds a gender gap index based on four indicators (Table 10). In the case of the Jamapa river sub-basins, we found a municipality with a high index of gender gap (Zentla) and 4 municipalities with medium gaps (Tepatlaxco, Camarón de Tejada, Manlio Fabio, Comapa, and Jamapa).

Table 10: Indicators of the gender gap for the municipalities of the Jamapa sub-basin, 2015.

	Without access to health services		Without schooling		With low income		Who performs unpaid work	
	Men%	Women %	Men%	Women %	Men%	Women %	Men%	Women %
Camarón de Tejeda	15.4	12.4	7.3	9.6	43.6	29.6	31.8	86.7
Comapa	21.6	16.2	13.4	14.7	41.1	26.9	32.1	87.2
Huatusco	25.1	22.1	8.4	10.4	39.5	34.5	53.8	88.6
Ixhuatlán del Café	27.4	24.5	10.6	12.9	42.8	27.9	46.8	90.5
Jamapa	28.2	21.9	8.1	8.7	28.4	33.8	36	87
Manlio Fabio Altamirano	30.9	24.9	7.9	8.7	29.9	39.5	46.3	89.7
Medellín	25.6	22.2	4.1	5.3	22	34.8	59.7	88.7
Paso del Macho	18.6	17.8	9.9	11	49.4	41.1	42.8	88.5
Soledad de Doblado	26.7	21.7	6.7	8.3	34.7	42.2	49.2	91.3
Tepatlaxco	15.1	9.8	11.5	13.4	35.6	23.2	46.6	90.2

Veracruz	26.8	23.6	2.9	4.2	19.4	29.9	53.9	87.4
Zentla	21.6	15.2	6.8	8.2	55.3	29.5	42.2	89.7

Source: AVCC, 2019

Like the IDRG, the AVCC exhibits wide variability between the municipalities of the sub-basins in areas such as access to health and education services. However, a general trend is that women's participation in unpaid activities is always higher than men's participation in them.

The regional influence of urban poles generates important contrasts between municipalities, which reflects in differentiated access to health services, education and paid employment.

Table 11. Units of production and participation in the ejidos in the Veracruz basins.

Municipality	*Ejidatarios* and owner of other types of communities		Residents (without property rights)		President of the *ejido*	
	Total	Women%	Total	Women%	Total	Women%
Camarón de Tejeda	401	10. 22	469	27. 29	5	0
Comapa	1,196	10. 03	471	11. 68	15	0
Huatusco	623	18. 14	5	0	10	0
Ixhuatlán del Café	1,311	18. 61	4	0	13	0
Jamapa	753	21. 12	1 677	79. 79	12	0
Manlio Fabio Altamirano	1,981	17. 87	3 808	48. 11	28	0
Medellín	2,150	30. 47	31 718	59. 91	33	6. 06
Male Pass	1,372	13. 99	2 104	27. 04	27	3. 7
Sheep Pass	1,720	16. 57	3 290	38. 21	26	0
Soledad de Doblado	1,464	13. 59	2,921	48. 82	26	0
Tepatlaxco	249	16.87	397	37. 28	5	0
Veracruz	825	22. 18	844	35. 78	16	6. 25
Zentla	567	14. 64	171	22. 81	3	0

Source: Ejido Census, INEGI, 2007

In the selected sub-basins of the Jamapa River in Veracruz, we find the presence of 59 ejidos (total and partial). 43% of the surface of the sub-basins belongs to one of these *ejidos*[7]. Likewise, there are no other type of communal lands in the sub-basins.

The beneficiaries of the upper part of the sub-basins are linked to productive activities such as the cultivation of coffee and corn, as well as backyard livestock. For the middle and lower part

[7] RAN (2019) Perimeter agricultural nuclei SHAPE Federal Entity Veracruz. Downloaded on April 23, 2020 from: https://datos.gob.mx/busca/dataset/datos-geograficos-perimetrales-de-los-nucleos-agrarios-certificados-por-estado--formato-shape

of the sub-basins there is the cultivation of sugarcane and tropical fruits such as mango, banana and citrus, in addition to extensive livestock.

4.3 Women perspectives as part of project consultation

The RIOS project went through a consultation process in March of 2020, which included workshops in the basins. The workshops were attended by women that have participated in previous projects with FMCN such as "Conservation of Coastal Watersheds in the Context of Climate Change" (C6) and that have received capacitation in gender perspective as part of the gender strategy of C6 project. Women from new organizations also attended the consultation workshop. In the Jamapa basin 42% of the participants were women, while 22.5% of the people that attended the workshop in Mascota were women. Both men and women welcomed the RIOS project. Women suggested to include family businesses, as well as establishing backyard production as some of the activities to be developed through subprojects.

5. Conclusions

Overall, the analysis so far highlights various limitations and opportunities, depending on each context, in which strategic interventions can leverage the participation of women in activities, particularly economic ones.

The activities that women currently carry out are recognized in this analysis:

- Manufacture and marketing of dairy products.
- Elaboration and commercialization of artisan products.
- Administration in civil, community and productive organizations.
- Participation in rural tourist services.
- Solar management and backyard production.
- Domestic, upbringing and care tasks combined with productive activities.

Female leadership in productive enterprises (such as cheese factories, administrative functions in various types of productive organizations, the elaboration of handicrafts and retail trade) are usually considered successful achievements during interventions in rural areas. However, this success not only supposes a certain degree of economic independence and empowerment of the participants, but also supposes the displacement of domestic activities to other members of the family or community, the increase in unpaid working hours, and in some extreme cases, coercive or violent relationships can be detonated in the family unit or the community environment in which they are inserted. This reflects the need to increase the capacities of institutions and organizations in the territory to incorporate actions that are sensitive to existing gaps.

With these circumstances in mind, the RIOS project incorporates, through the Gender Action Plan, parameters that distinguish proposals that incorporate measures, crosscutting or specific, sensitive to the gender gap or aimed at increasing equal opportunities between men and women.

The implementation of the RIOS project results in a potential opportunity to induce changes in the productive activities and uses of the territories with favorable balances for the conservation

of ecosystem services, increase adaptation to climate change and strengthen the most vulnerable sectors, including the women.

Based on the information presented, as well as what was detected in the State Socioeconomic Diagnostics and in the consultation processes developed, the Gender Action Plan starts from the need to recognize and strengthen the role of women in the productive processes and use of the territories. This Work Plan will lead to activities aimed at:

- **Encourage access to participate in subprojects and Production Groups (PG)** that favor sustainable productive systems that generate income for women, such as, helping women to organize themselves in productive groups, empower them and provide technical assistance to stablish cheese and dairy fabrics or establishing supply chains for selling agro-ecological products grown as backyard production;
- Generate opportunities for men and women to **access to financial resources, technologies, training, information, and support for productive work compatible with domestic responsibilities that avoid work overloads and double work load** (as household and other activities);
- **Reduce the cognitive load that access to new activities implies for women, as they are saturated with obligations assumed in their double or triple shift**. Executing agencies in charge of training activities, technical assistance and workshops in all components will provide materials such as tutorials (short videos and infographics) that women can consult at their own convenience using technology accessible for women like smartphones (when possible) or printed materials. Technical staff will provide accompaniment to ensure women can access the materials;
- **Reduce scarcity scenarios for project beneficiaries by developing capacities in monitoring activities that will be financed,** capacities in developing familiar or community business, technical assistance to access or use technology that makes easier their daily activities, such as wood-saving stoves, hire women to develop monitoring activities related to water quality, also hire women to develop administrative activities, all these are new forms of participation and distribution of benefits under equal conditions.
- **Share successful experiences carried out with a gender perspective** among the participants of the different components of the project, as well as between both regions included. Learning community events, with specific time to exchange experiences among women to develop their capacities for effective participation to demonstrate the potential of women leaders to inspire and increase women participation..

6. Gender and Social Inclusion Action Plan

A Gender specialist will be hired as AE staff, to develop monitoring and reporting activities across the project lifecycle. Using co-financing from GEF, a Gender specialist consultant will be hired to conduct an initial assessment to identify perceptions, family structures, rights, local needs and investigate specific problems to accessing markets. Additionally, GCF resources will be allocated to train selected CSOs on how to apply the gender approach in subprojects according to the initial diagnosis. Moreover, each subproject will have gender-specific indicators to measure their progress during the subproject lifecycle.

Summary of the project:
Mexico is highly vulnerable to the effects of climate change, such as the increase in extreme events, which are affecting watersheds (floods, landslides, droughts), and the negative ecological, economic, and social impacts are expected to be exacerbated. The objective of RIOS is to increase adaptive capacity in watersheds vulnerable to climate change through river restoration and connectivity by: (i)conducting restoration, conservation and improved productive activities, implemented by local organizations in the states of Jalisco and Veracruz, (ii)increasing local monitoring capacities to reduce climate vulnerability, (iii)catalyzing public and private climate-smart investments; and (iv)supporting the development of climate policy in a National River Restoration Strategy.

Impact statement:
At the end of the project, the expected impacts on women are:

1. Increase resilience of women living in the most vulnerable communities in the intervention area.
2. Increase women's knowledge about their vulnerability to climate change.
3. Increase women´s abilities through their participation in restoration and water monitoring activities.
4. Women's scarcity scenarios (time, financial, and aspiration scarcities) will be reduced through their participation in subprojects.

Outcome 1: Increase in forest and water connectivity with a vision of adaptation to climate change through restoration, conservation and best productive practices.

Gender-related output 1.1. Increased women access for participation in financed subprojects and Production Groups (PG).

Activities	Indicator	Target	Timeline for activities´ implementation	Responsibilities	Cost per output
1.1.1 Make the request for proposals (RFP) process to finance subprojects and Production Groups (PG) gender-sensitive (proposal	Number of subprojects that were selected under gender criteria.	14 subprojects	Year 1	FMCN	$10,322 GCF $9,179

design including gender related criteria, adequate dissemination and training on structuring proposals).				FGM, FONNOR (EE for each region) Gender specialist (staff)	GEF (co-finance) $1,143
	Number of Production Groups selected using gender- sensitive criteria.	To be determined once the subprojects are selected.	Year 1	FMCN FGM, FONNOR Gender specialist	
1.1.2 Train potential and selected proponents of support for subprojects and PG in gender-sensitive perspectives (including gender based violence (GBV) core concepts) through workshops	Number of gender-sensitive workshops to support subproject preparation and inception.	2 workshops to present and support the development of the RFP (1 Ameca-Mascota, 1 Jamapa) 2 inception workshops (1 Ameca-Mascota, 1 Jamapa)	Year 1	FGM, FONNOR Gender specialist	
	Number of PGs that participates in gender inception workshops.	To be determined once subprojects have been selected	Year 1	FGM, FONNOR Gender specialist	
	Percentage of women and men participating in workshops	To be determined once the subprojects have been selected	Year 1	FGM, FONNOR Gender specialist	
Gender-related output 1.2. Enhanced gender perspective incorporated in sustainable rural production.					
1.2.1 Assess gender aspects in selected subprojects and PG on topics such as:	Percentage of subprojects and PG with	100% subprojects and PG	Year 1 and 2	FMCN FGM, FONNOR	$22,701

• Perceptions, experiences, risks and opportunities differentiated between men and women related to the project. • Specific problems women have in accessing markets for their products. • Family structures and how they affect women's ability to act and interact. • Rights, needs, roles and responsibilities of women in the localities.	an initial gender diagnosis.			Gender specialist	GEF (co-finance) $22,701
1.2.2 Develop capacities in selected CSOs, and PLATs on how to incorporate a gender approach according to initial assessment	Number of workshops to build capacities in CSOs to apply gender approach.	2 workshops (1 Ameca-Mascota, 1 Jamapa)	Year 1	FGM, FONNOR Gender specialist	
	Number of women and men participating in workshops	To be determined once the subprojects have been selected	Year 1	FGM, FONNOR Gender specialist	
	Percentage of business plans developed by PLAT´s that have at least one gender indicator.	90% business plans	Year 2	FGM, FONNOR Gender specialist	
1.2.3 Provide assistance to selected subprojects for complementary alternative technologies that make women daily activities easier and	Number of subprojects that provides access to technology that	4 subprojects (30% subprojects)	Year 2	FMCN FGM, FONNOR	

improve their resilience to climate change (such as wood-saving stoves or rainwater harvesting systems).	improves women activities.			Gender specialist	
Gender-related output 1.3. Increased capacities and knowledge of women related to climate change vulnerability and quality water monitoring.					
1.3.1 Select and train monitoring leaders with a gender scope including GBV (selection of leaders, induction workshops, etc.)	Percentage of monitoring leaders, disaggregated by sex, that are trained to incorporate practices with a gender perspective.	100% trained leaders	Year 2 and 4	FGM, FONNOR Gender specialist	$2,919 GCF $1,776 GEF (co-finance) $1,143
1.3.2 Organize workshops to train local actors on vulnerability to climate change and differentiated effect on women and men.	Number of gender-sensitive workshops on vulnerability to climate change.	2 workshops (1 Ameca-Mascota, 1 Jamapa)	Year 4	FGM, FONNOR Gender specialist	
	Number of women and man participating in workshops	To be determined once the subprojects have been selected	Year 1	FGM, FONNOR Gender specialist	
Gender-related output 1.4. Increased participation of women in the Learning Community.					
1.4.1 Finance the participation of women in meetings of the Learning Community to promote the exchange of experiences.	Number of women participating in the national Learning Community event, sponsored by RIOS project.	To be determined once sub-projects, PG, and public and private stakeholders have been identified.	Year 2 and 4	FMCN FGMM, FONNOR Gender specialist	$63,194 GEF (co-finance) $63,194
1.4.2 Provide training for women to effectively exchange experiences in the Learning Community events.	Percentage of women participating in the Learning Community events that receive	100%	Year 2 and 4	FGM, FONNOR Gender specialist	

	training for effective exchange of experiences.				
Outcome 2: Alignment of public and private investments through natural capital accounting for scaling-up activities for the restoration of rivers for adaptation to climate change.					
Gender-related output 2.1: Increased knowledge of public and private stakeholders for mainstreaming gender issues.					
2.1.1. Train private and public stakeholders to induce them on how to integrate gender approach in their sector.	Number of inductive workshops for stakeholders on how to integrate gender approach.	3 workshops	Year 2-5	FMCN FGM, FONNOR Gender specialist	$6,290 GCF $6,290
	Percentage of women and men participating in workshops	To be determined once private and public stakeholders to be trained are identified	Year 2-5	FGM, FONNOR Gender specialist	
Outcome 3: Design of a National River Restoration Strategy for Climate Change Adaptation.					
Gender- related output 3.1 Increased women participation in the Design Committee.					
3.1.1. Make aware legislators and decision makers on vulnerability to climate change and its effects on men and women.	Number of workshops for legislators to build capacities in gender-sensitive vulnerability to climate change.	3 federal workshops	Year 2-5	FMCN FGM, FONNOR	$15,096 GCF $15,096
	Percentage of women and men participating in workshops	To be determined once eligible legislator are selected	Year 2-5	FGM, FONNOR Gender specialist	

Gender-related activities for the RIOS project in general					
Activities	**Indicator**	**Target**	**Timeline**	**Responsibilities**	**Cost**

4.1 Hire a Gender specialist to manage and oversee the implementation of the GAP.	Gender specialist hired.	One Gender specialist hired.	Year 1-5	FMCN	GCF $155,346
4.2 Ensure equal pay for men and women performing same activities in all project components.	Percentage of women and men hired for same responsibilities with equal pay.	100% of women hired are equally payed than men for doing the same work.	Year 1-5	FMCN FGM, FONNOR	No cost
4.3 Incorporate gender specific indicators to monitor how the subprojects contribute to addressing gender inequalities [8].	Percentage of subprojects that track at least one of the following gender indicators (additional indicators could be incorporated during inception): Number of women-headed/ men-headed families. Number of affirmative actions with women participation per community. Percentage of men and women participating in knowledge generation and technological innovation.	90% subprojects	Year 1-5	FMCN FGM, FONNOR	

[8] These indicators were developed during the last year of the project: "Coastal Watershed Conservation in the Context of Climate Change, C6" by a Gender specialist consultant, based on the experiences of C6 subprojects and lessons learned through the beneficiaries of C6 project.

	Percentage of women leading groups. Number of credits, payments, economic incentives that women/men obtain from sources different to RIOS, but as a result of the activities implemented during the project.				

Cost: Since RIOS will be implemented closely with the CONECTA project, financed by GEF, gender strategy for each project has been designed to complement each other in activities and costs and avoiding duplicity. The investment in the respective GAP are:

Subtotal GCF	USD $ 187,686
Subtotal GEF	USD $88,181
TOTAL Gender	**USD $275,867**

Annual Operational Plan at project level.
Each year in November, during the life of RIOS project, AE will plan the activities to be developed in the next calendar year using the Annual Operational Plan template (AOP). Activities and its corresponding budget are planned on quarterly basis and captured in the Project Monitoring System (Sisep), which is the AE's electronic platform, in which all projects and subprojects are uploaded for tracking proposes (Technical and administrative). The activities proposed in the Gender Action Plan will be included in the AOP each year and will be supervised by the PCU and the Gender specialist staff. Executing agencies are also required to develop and AOP each year to program the activities of the gender action plan that they are responsible for.

Monitoring and evaluation
The operational PCU, through the environmental and social standards specialist, will be responsible for monitoring and reporting on the project's performance and impacts on gender issues. For this, the PCU will use the monitoring and supervision procedures established in the Operational Manual of FMCN (MOAC), following the Environmental, Social and Gender Safeguards Standards

(NSASG) contained in said manual and within the framework of institutional policies such as the Gender Policy and the Policy against sexual exploitation, abuse and harassment.

Electronic monitoring through the Project Tracking System (Sisep):
All projects implemented by AE and the subprojects financed by FMCN report their technical and administrative progress though Sisep. This Platform currently provides executing agencies with a catalog of 15 indicators, plus they can create their own. Executing agencies choose indicators according to the type of subproject, those indicators that involve people show data disaggregated by sex. Likewise, the narrative technical report through Sisep requests to describe the affirmative actions that the subproject or the consultancy has carried out in favor of women and indigenous peoples. As far as possible, the indicators that could be fed by the subprojects will be included in the platform to systematize their application and monitoring.

Monitoring through supervision field visits:
The operational PCU and/or the regional funds (FR) (under the supervision of the PCU) will carry out supervision visits in the field according to the procedures established in FMCN Operational Manual. The visits may be carried out at any stage of execution, to ensure compliance with the planned activities, as well as the proper application of the NSASG and the Gender Plan. A supervision report is prepared by EA, and shared with AE and CSOs. Remediation actions are taken in case the subproject of PG is not achieving the planned goals.

Systematization of monitoring:
The PCU and the FR will monitor compliance with the GAP, implementing the activities and feeding the indicators included in said instrument. The operational PCU will be in charge of systematizing the information and will report it to the CTP.

Human Capital to implement the Gender Action Plan
The human capital available to the CONECTA project to apply the Gender Action Plan will consist of:

• INECC: Has extensive experience in the design and implementation of projects financed by the GEF, and has the capacities to implement the GAP during the life of the project. With RIOS leveraged resources, FMCN will hire a gender and social expert for INECC.

• FMCN: Has proven experience in monitoring safeguards through the implementation of the SINAP I, SINAP II and C6 projects financed by the GEF through the World Bank. For the RIOS project, FMCN will supervise the implementation of GAP, from the General Directorate, through the Social Standards Officer who is responsible for ensuring the implementation of the FMCN social standards in the design and operation of the projects and the PCU, who will be trained in gender issues based on the experience of Project C6, the FMCN accreditation process with the Green Climate Fund and the gender cross-cutting issues of the organization as establishes in its 2018-2023 Strategic Plan.

• The EA (Regional Funds) have experience in the application of environmental and social standards derived from the implementation of projects financed by the World Bank, such as the C6 project. FMCN will guide and accompany the RF in the implementation of the Gender Action Plan.

Grievance Redress Mechanism

The project-level grievance redress mechanism (GRM) will apply multiple communication channels to disseminate information on how to initiate a complaint related to the implementation of the RIOS project among all affected and interested parties, including women and other vulnerable groups, such as:

- Capacity building workshops and learning exchange events will make information on the GRM available and easy to people, and support particular meetings to increase the user´s ability to access the GRM.
- Culturally and linguistically appropriate materials will be developed and placed in visible strategic locations used most by the target audience (e.g., ejidal house, schools, local market, others) to increase users' awareness to access the GRM.
- Social media (e.g., Facebook and WhatsApp) will publish messages with a clear call to action to use the GRM, providing relevant information, continuous guidance, and advice, especially in remote areas.
- Community radios will provide effective opportunities to broadcast simple, easy to recall, repeated, and attention-getting messages about the GRM in rural populations with high illiteracy rates as 98% of Mexican households own radios.

We will ensure that the RIOS grievance mechanism is gender-sensitive by taking into consideration the obstacles that may prevent women from accessing the GRM (e.g., illiteracy, technology, visibility), training staff to learn to identify and address issues that may affect women participating in the complaint process, consulting women outside the presence of men and facilitating separate spaces for women to express opinions and provide input without fear or retribution, awareness-raising and capacity-building workshops to assist in mainstreaming a gender perspective, and collecting and assessing sex-disaggregated data. The project will also partner with women's community groups and ensure that community-based protection systems (e.g., GRM) are effective to protect women from GBV.

Concerns, complaints, and grievances from affected stakeholders, including women and other vulnerable groups, may be raised by:

- Website
  - FMCN: www.fmcn.org
  - FONNOR: https://FONNOR.org
  - FGM: http://fgm.org.mx
- E-mail
  - FMCN: denuncia@fmcn.org
  - FONNOR: info@FONNOR.org

- FGM: info@fogomex.org
- Postal mail
  - FMCN: Damas 49, San Jose Insurgentes, Benito Juárez, CDMX, 03900.
  - FONNOR: Loreto 215, Col. Bellavista, La Paz, BCS, 23050
  - FGM: Camino a Rancho Viejo 8, Col. Briones. Coatepec, Veracruz, 91500
- Phone number
  - FMCN: 55 5611 9779 ext. 220
  - FONNOR: 612 1295 190
  - FGM: 228 203 1327
- During the project´s monitoring and follow-up visits, capacity building workshops, and learning exchange events. The project-contracted personnel will be trained on the GRM and include women to allow female stakeholders to feel more comfortable to raise complaints or lodge grievances.

Grievances should include at least the following information:

- Full name
- E-mail
- Description of the grievance in detail
- If any, evidence to support the grievance

Contact details are required to seek further clarification on the grievance, yet the party reporting the grievance may request that their identity remain confidential.

Gender Violence:

The institutions involved in the project have the capacities to timely identify situations that could represent a risk for women during the execution of the project. In which case, it will provide the affected party with a proposal from relevant institutions and authorities on the subject making use of the complaint lines published by the National Institute of Women (INMUJERES) for cases of gender violence in each state:

State	**Institution in charge of the line**	**Address**	**Phone Number**	**Services**	**Attention days and times**
Jalisco	Instituto Jaliciense de las Mujeres	Miguel Blanco No. 883, cruza con Colón y 16 de	Línea mujer 01800 087 66 66	Psychological guidance, legal advice and	Monday to Friday 9:00 a 17:00 h.

		Septiembre, Col. Centro, C.P. 44100, Guadalajara, Jalisco.	Instituto (333) 658 3170 Ext. 50616 (333) 586 6150	information in general on events of the Jalisco Institute of Women.	
Veracruz	Instituto Veracruzano de las Mujeres	Av. Adolfo Ruíz Cortines No. 1618, Col. Francisco Ferrer Guardia, C. P. 91020 Xalapa, Veracruz.	(228) 8170789 (228) 8171009 Ext.1211	Legal, psychological and shelter orientation.	Monday to Friday 8:00 a 16:00 h 13:00 a 20:00 h sábados,domingos

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