United Nations Development Programme

Country: Mexico

PROJECT DOCUMENT[1]

Project Title: Strengthening Management Effectiveness and Resilience of Protected Areas to Safeguard Biodiversity Threatened by Climate Change

UNDAF Outcome(s): Direct effect 6. Environmental sustainability and green economy. All three levels of government, the private sector, academia and civil society will have strengthened their capacities to reverse environmental deterioration, and to sustainably develop natural resources through mainstreaming environmental sustainability, low emissions development, and green economy in the legislative, programming and decision making processes.

UNDP Strategic Plan Environment and Sustainable Development Primary Outcome: Mainstreaming environment and energy

Expected CP Outcome(s): Strengthened national and local capacities for mitigation and adaptation to climate change[2]

Expected CPAP Output (s) Adaptation and mitigation climate change strategies

Executing Entity/Implementing Partner: Comisión Nacional de Áreas Naturales Protegidas (CONANP)

Implementing Entity/Responsible Partners: United Nations Development Programme (UNDP)

Brief Description: The proposed project aims to transform management and coverage of terrestrial and coastal protected areas in Mexico to alleviate the direct and indirect impacts of climate change on globally significant biodiversity. This will be achieved through a three-pronged approach: development of management systems (monitoring and early warning systems, management decision making tools and sustainable financing) in order to optimize readiness at the national level to address the anticipated implications of climate change for the PA system as a whole; expanding PAs in landscapes that are particularly sensitive to climate change, in order to protect refugia and corridors; and building readiness to address specific climate change impacts in vulnerable PAs through ecoregion-specific interventions in 17 priority PAs.

[1] For UNDP supported GEF funded projects as this includes GEF-specific requirements

2 This corresponds to CPD 2008-2013. However, due to the timeframe of the Project, the new CPD will apply: "Promoted risk disaster and low-emission, resilient and environmentally sustainable development strategies with a gender and multicultural approach for poverty reduction and equity".

Programme Period:	60 Months
Atlas Award ID:	00074960
Project ID:	00087099
PIMS #	4647
Start date:	01/09/2013
End date:	30/08/2018
Management Arrangements	NIM
PAC Meeting Date	*TBD*

Total resources required	**$87,144,687**
Total allocated resources:	
o GEF	$10,172,727
o Government	
• CONANP	$52,000,000
• CONAFOR	$9,000,000
• CONABIO	$500,000
o NGO (ENDESU)	$500,000
o FMCN	$2,171,960
o GIZ	$12,000,000
o UNDP	$800,000

Agreed by (Government):

Date/Month/Year

Agreed by (Executing Entity/Implementing Partner):

Date/Month/Year

Agreed by (UNDP):

Date/Month/Year

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List of abbreviations

CCIC Inter-ministerial Commission on Climate Change
CI Conservation International
CONABIO National Commission for Knowledge and Use of Biodiversity
CONAFOR National Forestry Commission
CONANP National Commission for Natural Protected Areas
COP Conference of the Parties
DGDIP General Department of Institutional Development and Promotion
DGOR General Department of Regional Operation
DGCD General Department of Conservation for Development
DES Department t of Evaluation and Monitoring
DECC Department in charge of Climate Change Strategies
CHyZMC Coordination for the attention of Wetlands and Marine-coastal Zones
DRyCNANP Department of Representation and creation of New Protected Areas
DPM Department in charge of Management Programs
DFOR Department of Regional operation Strengthening
DEP Department of Priority Species for Conservation
DAPA Department of Alternative Productive Activities
DCC Department of Agreement and Coordination
ENACC National Strategy on Climate Change 2007-2012
ENCC National Strategy on Climate Change 213-2018
ENDESU Natural Spaces and Sustainable Development
ECCAP Climate Change Strategy for Protected Areas in Mexico
FMCN Fondo Mexicano para la Conservacion de la Naturaleza
GEF Global Environment Facility
GHG Greenhouse gas
GII Gender Inequality Index
IPCC Intergovernmental Panel on Climate Change
IUCN International Union for Conservation of Nature
KP Kyoto Protocol
LGCC General Law on Climate Change

NDP National Development Plan
PROFEPA Federal Attorney of Environmental Protection
SEMARNAT Ministry of the Environment and Natural Resources
SAGARPA Ministry of Agriculture, Livestock, Rural development, Fishery and Food
SCT Ministry of Communications and Transport
SE Ministry of Economy
SEDESOL Ministry of Social Development
SENER Ministry of Energy
SEDUE Ministry of Urban Development and Ecology
SRE Ministry of Foreign Affairs
SHCP Ministry of the Treasury and Public Credit
UN United Nations
UNDP United Nations Development Programme
UNEP United Nations Environment Programme
UNFCCC United Nations Framework Convention on Climate Change
WB World Bank
WMO World Meteorological Organization

1. SITUATION ANALYSIS

1.1 Context and Global Significance

Geographical and climatic situation

1. Mexico is located in North America between 14°32'-32°43' north, and 118°22'-86°42' west. It limits north with the United States of America, south with Guatemala and Belize, east with the Pacific Ocean and west with the Caribbean Sea and the Gulf of Mexico. Mexican territory covers 11,964,375 km^2 and is divided by the Tropic of Cancer[3]. Mexico is very mountainous with more than 65% of its territory situated over a thousand meters above sea level (m.a.s.l.), and nearly half of it with slopes steeper than 27°. There are three mountains over 5,000 m, and important cities range from 10 to more than 2,000 m.a.s.l.

2. Mexico's position in the Neartic-Neotropical boundary and rough relief originates a wide variety of climates and microclimates. Rainfall is unequally distributed over space and time in most Mexican territory. Based on temperature and rainfall, Mexican territory can be divided in arid (56% of the territory), sub-humid (37%), and humid (7%). The pattern of mean annual temperature shows cyclic warming and cooling modulated by El Niño-Southern Oscillation (ENSO) and La Niña (the opposite effect of El Niño). Yet, these two phenomena do not explain all the variation. Since 1990, the country has surpassed historic temperature means (maximum of 28.4°C and minimum of 13.2°), while rainfall trends are dropping in most parts of the country, affecting the agricultural sector and water supply[4].

Biodiversity in Mexico

3. Mexico's geographical position, its topography, variety of climates and complex geological, biological and cultural history, have contributed to the formation of a mosaic of environmental conditions that have enabled the evolution of a large variety of habitats and life forms. Mexico ranks fifth overall among the world's megadiverse countries, harboring an estimated 12% of the world's species within its borders. Mexico ranks first worldwide in terms of reptile biodiversity, second in terms of mammals, fourth in terms of amphibians and tenth in terms of birds. Mexico is also of high global biodiversity importance as the center of origin of many species and varieties with great use potential in both agricultural and forestry sectors. Notable examples include agricultural crops like maize (*Zea mays*), squash (*Cucurbita* spp.) and cotton (*Gossypium hirsutum*).

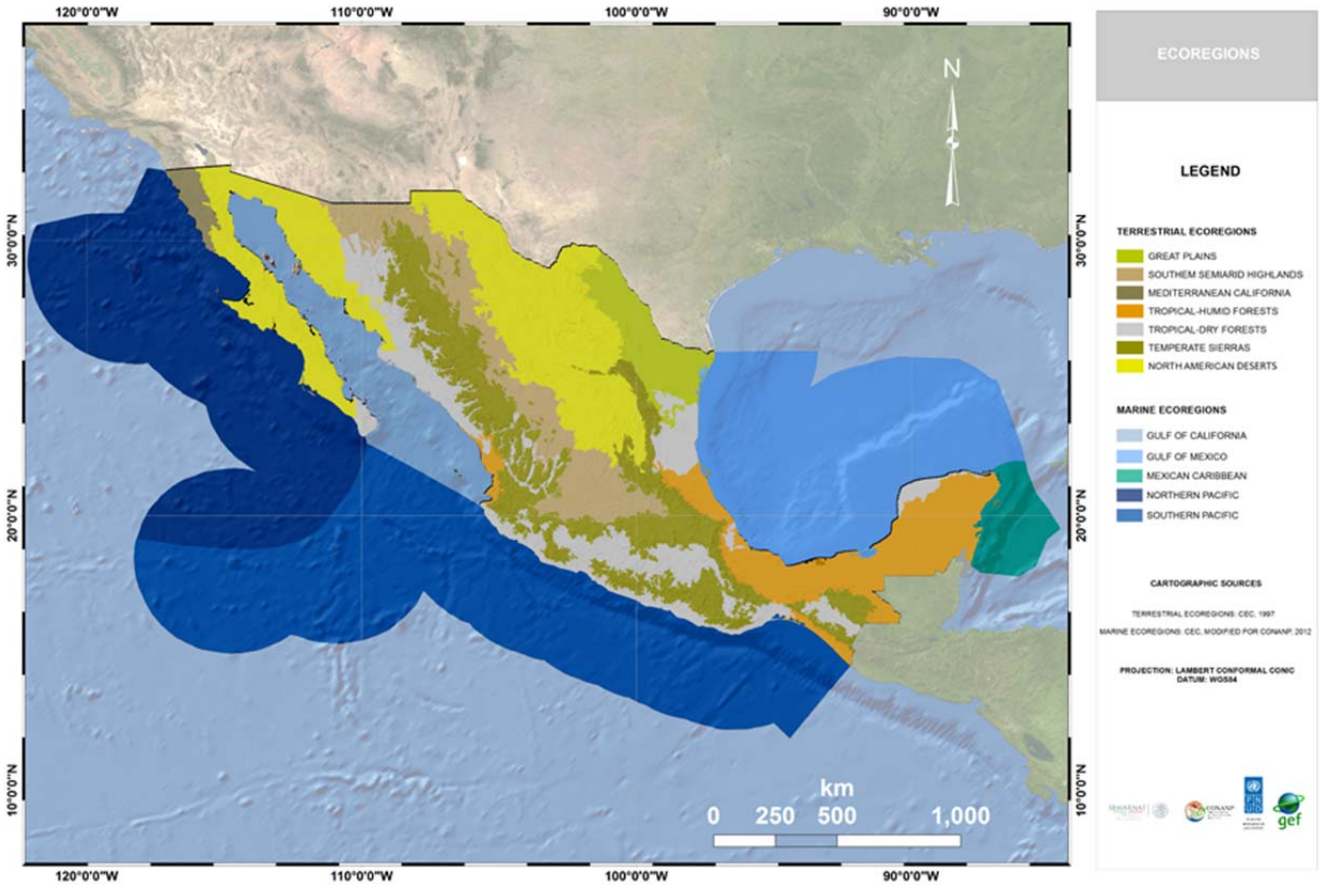
4. Between 50% and 60% of the known plants of Mexico are endemic, and the proportion is greater for some families like Cactaceae (83%)[5], and in some genera like *Pinus*[6]. Reptiles and amphibians also have notable levels of endemism, 45% and 48%, respectively. The highest concentration of endemic

[3] INEGI. 2012a. Anuario estadístico de los Estados Unidos mexicanos 2011. National Institute of Statistics, Geography and Informatics, Mexico.
[4] SEMARNAT-INE. 2007. Mexico's Third National Communication to the United Nations Framework Convention on Climate Change. Ministry of Environment and Natural Resources and National Institute of Ecology, Mexico; SEMARNAT-INE. 2009a. Contexto nacional. Pp. 33-60 in: México: Cuarta Comunicación Nacional ante la Convención Marco de las Naciones Unidas sobre el Cambio Climático. Ministry of Environment and Natural Resources and National Institute of Ecology, Mexico.
[5] CONABIO. 2006. Capital Natural y bienestar social. National Commission for the Knowledge and Use of Biodiversity, Mexico.
[6] Styles, B. T. 1993. El género *Pinus*: su panorama en México. Pp. 385-408 *in*: Diversidad biológica de México. Orígenes y distribución (T. P. Ramamoorthy, R. Bye, A. Lot and J. Fa, eds.). Biology Institute, National Autonomous University of Mexico, Mexico.

species is along the Eastern Sierra Madre Oriental, Western Sierra Madre and the Trans Mexican Volcanic Belt[7].

5. Mexico's ecosystem diversity is exemplified by the fact that the country straddles seven terrestrial and five marine ecoregions, as represented in the following map.

Map 1. Marine and Terrestrial Ecoregions in Mexico[8]



6. Mexican territory is mostly covered by vegetation (83.8%), with natural vegetation representing 67.5% and disturbed 32.5%[9]. The 7 terrestrial eco-regions are based on climatic conditions, geology and edaphology[10]:

[7] Koleff, P. *et al.* 2008. Patrones de diversidad espacial en grupos selectos de especies, Pp. 323-364 *in*: Capital Natural de México, vol. 1: Conocimiento actual de la biodiversidad (J. Sarukhán coord.). National Commission for the Knowledge and Use of Biodiversity, Mexico.

[8] From the PPG's GIS consultancy using information from: INEGI, CONABIO and INE. 2008. Ecorregiones terrestres de México. Scale 1:1,000,000. National Institute of Statistics, Geography and Informatics; National Commission for the Knowledge and Use of Biodiversity; and National Institute of Ecology, Mexico; and Wilkinson, T. A. C., et al. 2009. Marine ecoregions of North America. Commission for Environmental Cooperation. Canada.

[9] SEMARNAT 2011. El ambiente en números: selección de estadísticas ambientales para consulta rápida. Ministry of Environment and Natural Resources. Mexico.

[10] CEC. 1997. Ecological regions of North America, towards a common perspective. Commission for Environmental Cooperation. www.cec.org; CEC. 2009. Ecological regions of North America Level 1. Commission for Environmental Cooperation. www.cec.org; INEGI *et al.* 2008. *Op cit.*; Wiken, E., F. Jiménez Nava, and G. Griffith. 2011. North American Terrestrial Ecoregions—Level III. Commission for Environmental Cooperation, Canada.

- The *Mediterranean California* is the smallest eco-region and is found in northwestern Baja California Peninsula. It has mild Mediterranean climate with annual temperature ranging from 14°-18°C and annual precipitation from 200-1,400 mm, as well as chaparral vegetation associated with patches of oak forest, grassland and coniferous forest. It is home to several endangered arthropods, reptiles, birds, and mammals. Principle economic activities include irrigation agriculture and several industries (maquiladora manufacturing and assembly).

- The *North American Deserts* comprise the largest eco-region in Mexico, found along the Baja California Peninsula, part of Sonora and north central Mexico. It is distinguished by flat relief, arid weather with high temperature and annual precipitation less than 400 mm, and an abundance of cactus, shrubs and succulents. Birds, small mammals and reptiles are common. Irrigated agriculture is found in the areas close to large rivers, and cattle grazing is prevalent. Mining is also an important activity in the area.

- The *Southern semi-arid highlands* have a semiarid weather, with 300-600 mm of annual rainfall and mean temperature of 12-20°C. This ecoregion is formed by hills, bottom valleys and plains, and their vegetation is composed of grasslands as well as some scrublands and forests in the transition zones. This eco-region is home to about 8% of Mexico's population, and main activities include livestock grazing, agro-industries, and irrigated agriculture.

- The *Great Plains* is distinguished by little topographic relief, sub-humid to semiarid climate with seasonal and daily temperature variations, abundance of grasslands and almost no forests. The vegetation dominated by prickly shrub, with salt-tolerant communities being common. It provides habitat for migrant waterfowl and several threatened species. It is highly used for agriculture and grazing.

- *Tropical-humid forests* consist mainly of rainforest with high mean temperatures (20°-26°C) and high annual precipitation evenly distributed around the year (1,600-1,800 mm) or seasonally distributed (2,000 mm). Tropical wet forest is the richest terrestrial ecosystem in terms of number of species, and has a high local (α) diversity, but there is a small variation in species composition among sites (low β diversity[11]). Tropical-humid forests are threatened mainly by deforestation, changes in land use and fires.

- The *Tropical-dry Forests* eco-region covers 13% of Mexican territory. It is characterized by steep relief, high average annual temperatures (20°-29°C), a highly seasonal rain period with up to 8 months of dry season, and annual precipitation from 600-1,600 mm. Dry forests mainly consist of deciduous vegetation dominated by trees and bushes, with high endemism for vascular plants. They are high in local (α) diversity and also show a high variability in species composition among sites (β diversity[12]). This eco-region is highly used for agriculture and grazing, producing one third of Mexico's total agricultural products.

- The *Temperate Sierras* eco-region comprises the majority of Mexico's mountains, and covers around 25% of the nation's territory Vegetation can be perennial or semi-deciduous, conformed mainly of conifers and oaks, and sometimes associated with shrubs and herbaceous plants. Mexico is known as the prime diversity center of pine trees, with up to 50% of known species[13]. Cloud forests are present

[11] Challenger, A. and J. Soberón. 2008. Los ecosistemas terrestres. Pp. 87-108 en: Capital Natural de México, vol. 1: Conocimiento actual de la biodiversidad (J. Sarukhán coord.). National Comission for the Knowledge and Use of Biodiversity, Mexico.

[12] Trejo, I. 2005. Análisis de la diversidad de la selva baja caducifolia en México. Pp. 111-122 *in*: Sobre diversidad biológica: El significado de las diversidad es alfa, beta y gamma (G. Halffter, J. Soberón, P. Koleff and A. Melic, eds.). Sociedad Entomológica Aragonesa, España.

[13] Challenger and Soberón. 2008. *Op cit.*

in this region, covering 1,844,354 ha, and are a very rich and diverse ecosystem with several endemic species[14]. . Most major cities are located within this region (approximately 40% of the nation's population), and it has been highly transformed for agriculture, forestry and industry.

7. Most freshwater ecosystems in Mexico are rivers (68.2%); the rest are distributed in aquifers (11.7%) lakes and lagoons (2.3%), and reservoirs (17.8%[15]). Freshwater ecosystems have the greatest number of species per unit of area, slightly more than their terrestrial counterparts and 15 times more than marine ecosystems[16]. Many of the aquatic vegetation forms in Mexico play significant roles in transition between terrestrial and aquatic ecosystems, and influence the ecological dynamics of both. They usually support specific fauna and give refuge to aquatic and terrestrial species for reproduction.

8. The combination of climate, rough topography and complex geological formations has also resulted in a broad diversity of wetlands in Mexico. Wetlands exceed all other land types in terms of wildlife productivity per area, and provide critical habitat for several hundred threatened and endangered species in Mexico[17]. Wetlands provide multiple ecosystem services including fish, wild foods, medicinal plants, water storage and recharge, water filtration, nutrient cycling and microclimate buffering[18]. Important among coastal or estuarine wetlands are tidal marshes, deltas, coastal lagoons, inlets, estuaries and bays, rocky zones, dunes, mangrove swamps, and beaches.

9. Mexico possesses some of the largest tracts of mangroves in the world. In 2002, SEMARNAT estimated that Mexico had 900,000 ha[19]. Mangroves are a particularly important ecosystem because many species, both terrestrial and aquatic, live or develop in them; they function as barriers against hurricanes, waves and floods; protect shoreline from erosion; maintain water quality; provide food and building materials; work as carbon sinks; and participate in nutrient cycling[20].

10. Mexico's littoral is approximately 11,122 km long, and includes nearly 130 lagoon systems. There are four regional seas: the Pacific, the Gulf of Mexico, the Caribbean Sea, and the world's only exclusive sea: the Gulf of California[21]. The marine wetlands include lagoons, rocky coasts and coral reefs. Coral reefs protect the coast from storm surges and waves; reduce erosion; help the formation of beaches and islands; serve as nursery for many species, including commercial ones; have recreational and touristic value; and participates in the nutrient cycle[22]. Approximately 39% of Mexican coral reefs are considered to be endangered to some degree[23].

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[14] SEMARNAT. 2011. *Op cit.*

[15] Arriaga, L., V. Aguilar and J. Alcocer (coord.). 2000. Aguas continentales y diversidad biológica de México. National Commission for the Knowledge and Use of Biodiversity, México.

[16] Carabias, J., and R. Landa. 2006. Agua, medio ambiente y sociedad: hacia la gestión integral de los recursos hídricos en México, National Autonomous University of Mexico, The College of Mexico, Gonzalo Río Arronte Fund, México.

[17] Payne, N. F. 1992. Techniques for wildlife habitat management of wetlands. IUCN 2008

[18] Groom, M., Meffe, G., and C. Carroll. 2006. Principles of Conservation Biology. Sinauer Associates, Inc. Third Edition.

[19] The estimation of mangrove area varies depending on methodology (cf. FAO, 2007; CONABIO, 2008). Mexican mangroves once covered nearly 1.5 million ha, but in 2002, SEMARNAT estimated that Mexico had 900,000 ha, and in 2005 they were estimated at just over 650,000 with an estimated rate of deforestation of 1.1% (INE, 2005. Evaluación preliminar de las tasas de pérdida de superficie de manglar en México, Mexico: INE, SEMARNAT. Available at: http://www.ine.gob.mx/dgioece/con_eco/descargas/informe_manglar.pdf).

[20] UNEP-WCMC/UNEP. 2006. In the front line: shoreline protection and other ecosystem services from mangroves and coral reefs. United Nations Environment Programme and World Conservation Monitoring Centre, Cambridge, UK.

[21] CONABIO. 2006. *Op cit.*

[22] UNEP-WCMC/UNEP 2006.In the front line: shoreline protection and other ecosystem services from mangroves and coral reefs.

[23] SEMARNAT. 2009. Arrecifes de coral. Ministry of Environment and Natural Resources. Available at: http://app1.semarnat.gob.mx/dgeia/informe_resumen/04_biodiversidad/cap4.html#6

11. Mexico's marine territory is divided in 5 coastal and marine eco-regions, based on the oceanic basins, marine temperature and currents[24]:

- The *Southern Pacific* is a year-round tropical sea that supports important fisheries. It experiences high seasonal variability due to upwelling, and is strongly influenced by freshwater discharge from coastal lagoons and river systems. It acts as a nutrient and phytoplankton carbon pump, enriching adjacent offshore waters. Mangrove communities and limited coral reef structures in relatively good condition are also found in the region. Fishing and coastal industrial development based on oil, sugar and transportation are placing pressures on the region.
- The *North Pacific* is a fairly complex region, with a narrow shelf that drops off steeply to great ocean depths close to the coast. It is incised by several canyons and the Mesoamerican Trench that plunges to depths between 4,000 and 5,000 m. In addition, the region is dotted by numerous submarine hills and mountains, and includes a rift system and volcanic cones that have emerged from the depths of the ocean. It also has a great diversity of coastal systems and subsequently high species diversity. Tourism has contributed to shaping many of the coastal communities in the region.
- The *Gulf of California* (also known as the Sea of Cortez or Mar de Cortés) is a semi-enclosed sea known for its exceptionally high levels of biodiversity and rates of primary productivity due to a combination of its topography, warm climate, and upwelling systems. It is also home to several endemic species, like the vaquita porpoise—the most endangered cetacean in the world—and the large, corvina-like totoaba. The Gulf of California contributes to approximately 50 percent of Mexico's national fisheries production by volume. However, decreases in abundance of several species of fish and changes in gear types have caused much concern. Moreover, mega-resort/tourism/vacation properties developments have commenced, including new marinas for increased recreational watercraft, and are rapidly proceeding with little ecological oversight.
- The *Gulf of Mexico* is a semi-enclosed sea basin with tropical currents that has a distinct sea surface temperature gradient from north to south (up to 7^{o} C) in winter. It is characterized as semi-tropical due to the seasonal pattern of its temperature regime, which is influenced mainly by tropical currents in the summer and temperature continental influences during the winter. Hurricanes greatly affect the physical, biological and human systems of the region. Coastal communities range from salt marshes to seagrasses, and mangrove systems to salt pans, with scarce and isolated coral reef formations, all of which help to support the more than 1,000 species of fish that occur in the Gulf of Mexico. The region also supports oil and gas production, fisheries, and tourism.
- The *Caribbean Sea* is a tropical, nutrient-poor sea that is characterized by strongly seasonal rainfall patterns and tropical storms and hurricanes. Coral reefs, mangrove forests and seagrass meadows form large coastal systems or complexes that can provide important habitat—such as feeding and breeding areas for the more than 1,300 fish species, numerous marine mammals and sea turtles found in the region. The Caribbean Sea is showing signs of stress, particularly in the shallow waters of coral reefs. Habitat and biodiversity loss results from intensive coastal tourism, urbanization, land-based sources of pollution, artisanal fisheries.

[24] Wilkinson *et al.* 2009. *Op cit.*; Most literature refers to eight coastal and marine ecoregions, but during the PPG phase it was decided to merge the three smallest ones into other similar marine ecoregions so as to ease management, and because the smaller ecoregions have very few PA. Northern Pacific includes Monterrey Pacific Transition and Southern Californian Pacific; Southern Pacific covers Mexican Pacific Transition and Middle American Pacific; and Gulf of Mexico combines Northern and Southern Gulf of Mexico.

1.2 Ecosystem goods and services

12. Preserved ecosystems provide a wide variety of ecosystem services to the human being. Ecosystem services can be divided in support services (e.g. nutrient recycling, oxygen production, soil formation), provision services (e.g. food, fibers, active substances for medications, water), regulation services (e.g. climate regulation, water purification, protection against hurricanes), and cultural services (e.g. education, recreation, esthetic value[25]). Some of the most representative services provided by Mexican ecosystems are:

Biodiversity

13. Mexico is a globally important center of origin of economically important plant species. At least 118 species (70 genera, 39 families) of plants with economic value have been domesticated in Mexico since pre-Hispanic times[26], to produce food, drinks, compost, condiments, stimulants, fiber, rubber, waxes and pigments. Some species have their origin in southern Mexico and part of Central America, such as maize, of which wild species still exist (*teosintle*). The substitution of creole variety crops for "improved" or genetically-modified ones poses a risk of losing the species' wealth of Mexican germplasm, i.e., the disappearance of the genetic diversity of one or many varieties which are no longer grown.

Fisheries

14. Mexico's coastal and marine wetlands such as coral reefs, mangroves and estuaries, support the country's fisheries industry, which is among the 20 largest in the world. Annual production oscillates between 1.35-1.57 million tons, mostly from minor pelagic fish, such as sardine and anchovies (34% of total production), tuna (9%) and shrimp (7%).

Environmental mitigation

15. Several ecosystems such as mangroves, coral reefs, forests, etc. provide protection against hurricanes, floods, landslides and other events, but ecosystem transformation and degradation have reduced this capacity. Between 1980 and 1999, cyclones and storms were associated with high economic costs, as well as with significant loss of lives. Climate change models predict that extreme weather events will intensify in the future. In this context, the loss of ecosystem integrity would likely result in reduced resilience to climate change.

Carbon storage

16. According to a study done in 2005, Mexico's potential for carbon uptake is estimated at 24.513 million tons per year. Around 54% of this amount corresponds to temperate forests and 45% to tropical forests (the contribution of commercial plantations is marginal and the role of soils is not considered). Coastal wetlands have large carbon stocks that need to be quantified. Moreover, oceans have the highest capacity to capture and store carbon; oceans absorb around 30% of atmospheric carbon every year.

Water supply

17. Water capture in forested areas is estimated to represent 48.028 million m^3/year. Roughly 75% of this amount is captured by tropical forests and the remaining 25% by temperate forests. The states with

[25] MEA. 2005. Ecosystems and Human Well-being: Synthesis. Millennium Ecosystem Assessment, Island Press, Washington, DC.

[26] Hernández X., E. 1993. Aspectos de la domesticación de plantas en México: una apreciación personal. Pp. 733-753 in: in: Diversidad biológica de México. Orígenes y distribución (T. P. Ramamoorthy, R. Bye, A. Lot and J. Fa, eds.). Biology Institute, National Autonomous University of Mexico, Mexico.

the largest water capture potential are Chiapas, Oaxaca, and Quintana Roo, which together capture around 42% of the estimated total amount.

1.3 Current status of biodiversity

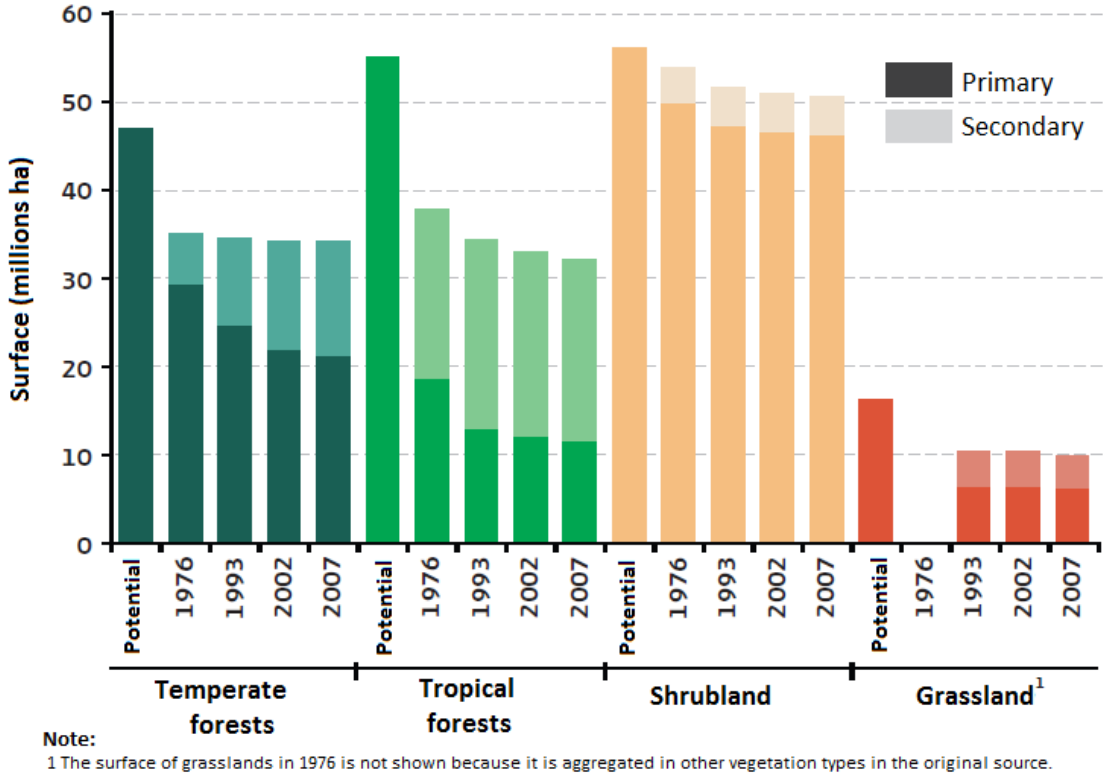
18. The Mexican Official Standard 059 lists 2,583 species at some level of threat or risk, with 58% of reptiles at risk, 54% of amphibians and 55% of mammals. Ecosystem transformation and degradation have affected most of Mexico's ecosystems. However, these phenomena have been more significant in tropical forests. For most ecosystems with these vegetation types, primary vegetation currently constitutes only a minor fraction of the original area, as shown in Figure 1, below.

19. Around 67% of Mexico's forests are fragmented, which results in reduced quality and quantity of wildlife habitats. Available information, which is outdated or inferred from global assessments, indicates that fragmentation is more severe in Mexico's southern states, including Veracruz, Tabasco, Yucatan, Quintana Roo, Michoacan and Chiapas.

20. Mexican mangroves once covered nearly 1.5 million ha and in 2005 they were estimated at just over 650,000. In 2005, the estimated rate of deforestation was 1.1% (varying between 1% and 2.5% depending on methodology), and SEMARNAT estimated that only 40-50% of the present area would be left by 2025 if current conditions persist[27].

[27] INE. 2005. Evaluación preliminar de las tasas de pérdida de superficie de manglar en México. National Institute of Ecology, Ministry of Environment and Natural Resources, Mexico

Figure 1. Transformation of the main vegetation formations in Mexico[28]



Note:
1 The surface of grasslands in 1976 is not shown because it is aggregated in other vegetation types in the original source.

1.4 Protected Areas in Mexico

21. Protected areas constitute a cornerstone of Mexico's efforts to conserve its globally-important biodiversity endowment. The country's national protected area estate consists of 176 Natural Protected Areas, representing 12.92% of the nation's surface area, which are protected and administrated by the federal National Commission of Natural Protected Areas (CONANP), a federal agency (see Table 1).

[28] *Ibid.*; SEMARNAT. 2012. Informe de la situación del medio ambiente en México: compendio de estadísticas ambientales, indicadores clave y de desempeño ambiental. Ministry of Environment and Natural Resources, México.

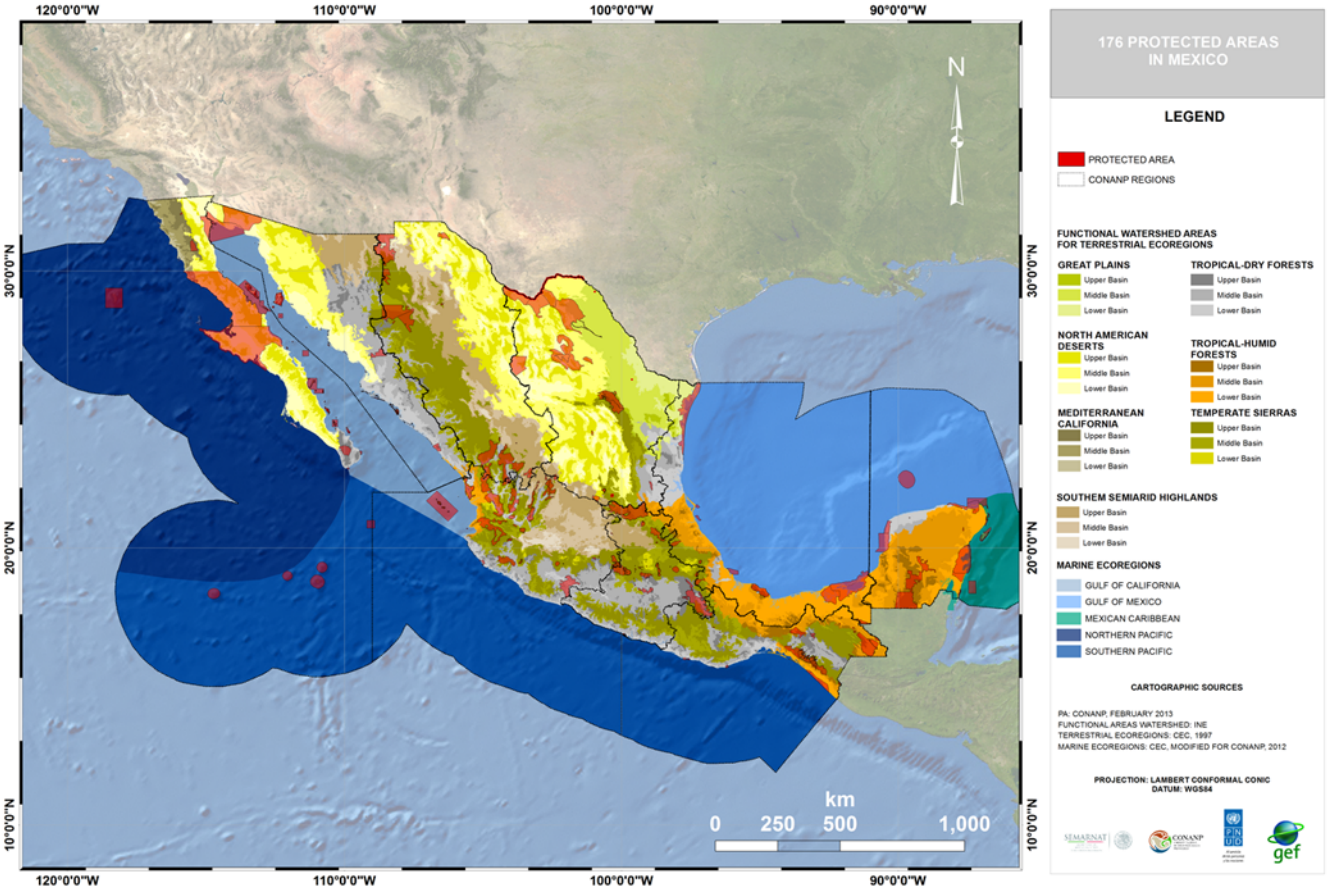
Table 1: Categories of Federal PA in Mexico[29]

Categories	Objectives	Number	Area (km^2)
Biosphere Reserves	Conservation of intact ecosystems or those requiring preservation or restoration, containing nationally representative, endemic or threatened species. Core zones are limited to preservation, research and education; buffer zones can be used by existing local communities in ways compatible with conservation.	41	126,527.87
National Parks	Conservation of ecosystems of national importance due to scenic beauty, scientific, educational, recreational or historical value, the presence of flora and fauna, or tourism potential. Only activities related to natural resource protection, research, tourism and education are allowed.	67	14,824.89
Natural Monuments	Contain natural elements that are unique or exceptional, have aesthetic interest, historical or scientific value. Only activities related to preservation, scientific research, recreation and education are allowed.	5	162.68
Natural Resource Protection Areas	Areas intended for preservation and protection of soil, watersheds, waters and other natural resources located in land suited for forests, including forestry reserves and zones, protection zones for water bodies and water sources. Only activities related to the preservation, protection and sustainable use of natural resources are allowed.	8	44,440.78
Fauna and Flora Protection Areas	Established in areas that contain habitats on the equilibrium and preservation of which depend the existence, transformation and development of wild flora and fauna. Activities related to preservation, repopulation, propagation, acclimatization, refuge, research and sustainable use of these species are allowed, as well as related education and awareness raising. They can also be subject to sustainable use by existing local communities.	37	66,872.84
Sanctuaries	Established in areas with considerable wealth of flora and fauna, or by the presence of species, subspecies or habitat with restricted distributions. Only research, recreation and environmental education are allowed.	18	1,462.58
Total		**176**	**254,291.64**

22. In addition to these federal PA, there are five other broad categories of PA in Mexico: state, municipal, community, *ejidal* and private. At least 22 states have declared state-level PA; Jalisco and Oaxaca have gone further to establish integrated State-level Protected Areas Systems. Over the last 10 years, many indigenous and ejidal communities have formalized PA at the community level; there are currently more than 150 such PA, typically with sizes in the range of 3,000 to 5,000ha.

[29] CONANP, 2013 (http://www.conanp.gob.mx/que_hacemos/); SEDUE. 1988. Ley General de Equilibrio Ecológico y la Protección al Ambiente. Ministry of Urban Development and Ecology. Diario Oficial de la Federación (DOF). Last reform published in May 24th, 2013.

Map 2. Protected Areas in Mexico



23. With regards to marine areas, CONABIO has classified coasts based on their physical, biological and climatic similarity, and domestic oceans according to their currents and water masses. Based on this effort, CONABIO has identified 70 priority marine conservation areas, including 23 littoral regions, 33 neritic-littoral regions, nine oceanic regions and five neritic-oceanic regions.[30]

1.5 Socioeconomic conditions

24. Mexico's population is still growing and in 2009 reached 112 million people[31]. Despite its relatively high total and per capita GDP and Human Development Index (HDI)[32], the country's high Gini coefficient (Table 2) is a measure of the large gap that exists between rich and poor. According to INEGI's figures in 2008, 47.7% of the country's population (or 48.9 million people) lived in poverty and most of them (60.8%) lived in rural areas[33]. Although a large number of poor people live in urban areas, those in rural areas face extreme poverty, meaning they lack the means to satisfy basic nutrition needs.

[30] CONABIO's GeoInformation Portal: http://CONABIOweb.CONABIO.gob.mx/metacarto/imagen.pl?img=100
[31] INEGI. 2012b. México en cifras. National Institute of Statistics and Geography, Mexico. www.inegi.org.mx
[32] The Human Development Index (HDI, based on life expectancy, schooling, and national income per capita) for 2013 placed Mexico in the group of High Development, ranking 61st out of 186 countries. PNUD. 2013. Informe sobre Desarrollo Humano 2013, "El ascenso del Sur: Progreso humano en un mundo diverso". Available at: http://hdr.undp.org/es/estadisticas.
[33] SEMARNAT-INE. 2009a. *Op cit.*

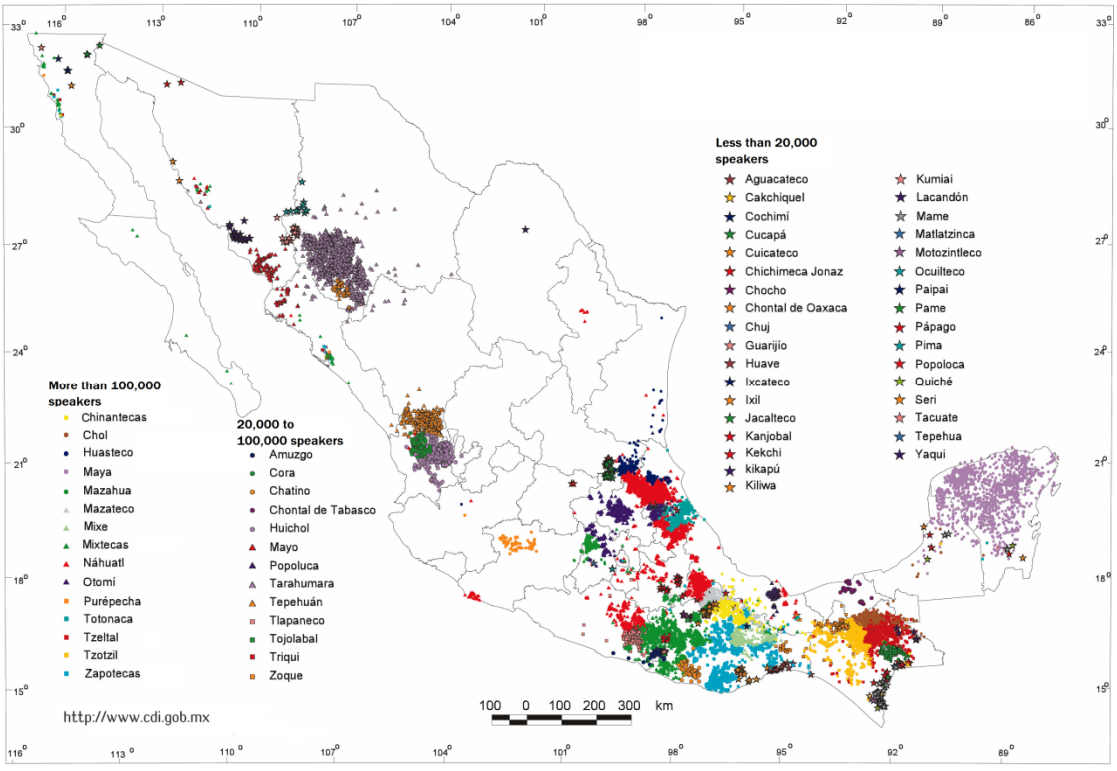
Table 2. Key socioeconomic data

Category	Result
Total population (2010)	112,322,757
Population density	57/km^2
Total GDP (PPP—2011 estimate)	$1.629 trillion (11th worldwide)
Per capita GDP (2011 estimate)	$14,856 (58th worldwide)
Total GDP (nominal—2011 estimate)	$1.041 trillion (13th worldwide)
Per capita GDP (nominal—2011 estimate)	$9,489 (58th worldwide)
Gini coefficient (2008)	51.6 (high)
Human Development Index (2013)	0.775 (Rank 61)
Gender Inequality Index (2013)	0.382 (Rank 72)

Indigenous groups

25. In Mexico, the total population of Indigenous Peoples is 12.7 million, distributed among 62 diverse ethnic groups with their corresponding languages and customs (see Map 3, below). Municipalities with a high proportion of indigenous population are also those that rank lowest in the HDI and have the highest poverty levels.

Map 3. Distribution of languages and indigenous groups in Mexico[34].

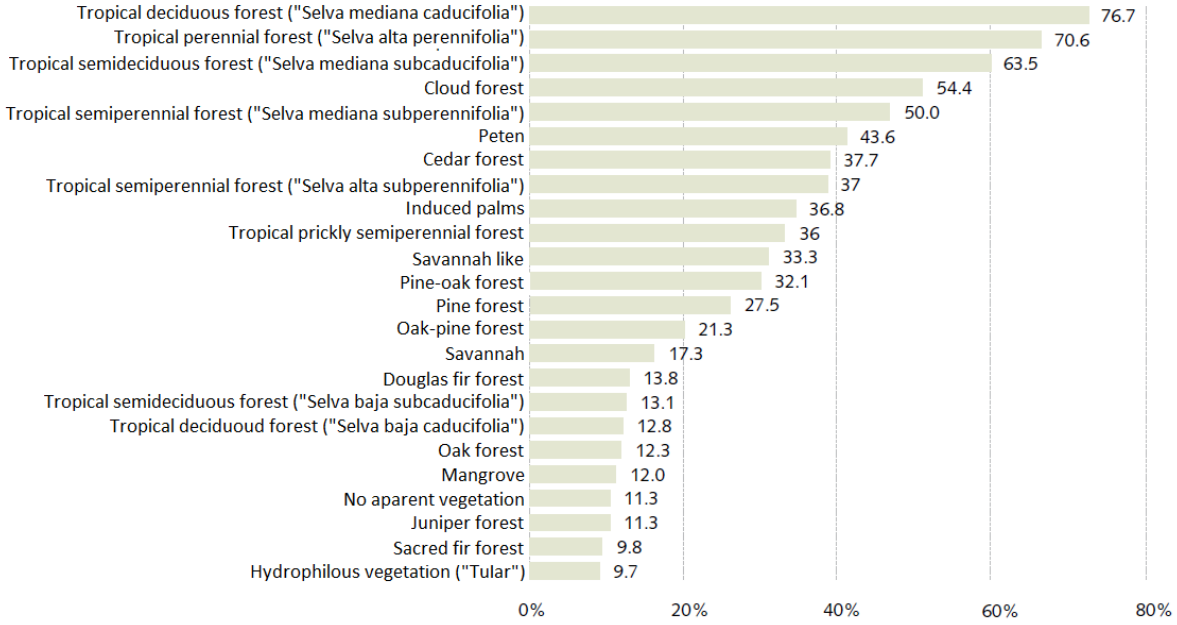


26. A considerable portion of the best preserved forests and tropical forests and the high part of the water catchment basins of the country's main rivers are located in those same areas with high indigenous

[34]CDI. 2000. National map of indigenous languages. National Commission for the Development of Indigenous People. México. http://www.cdi.gob.mx/identifica/mapa_nacional_lenguas_indigenas_cdi.jpg

concentration. An estimated 19 million hectares of natural vegetation are located in areas with important populations of indigenous groups. These areas include significant portions of ecosystems that support Mexico's unique biodiversity and provide crucial environmental services, including mesophile forests and humid rainforests, as depicted in Figure 2.

Figure 2. Percent of each vegetation type located in indigenous territories[35]



Migration

27. Migration from rural areas to urban and to the United States is a phenomenon that has been on the rise in the past 40 years due to the lack of opportunities of employment and development in the country and the economic, social, legal or other barriers to develop a profitable management of natural resources. Migration has resulted in the abandonment of forests, leaving them unprotected, thereby increasing their vulnerability to plagues, fires, clandestine logging and illegal extraction of species. The presence of an organized population around the management and preservation of ecosystems is fundamental to avoid their loss.

28. Despite high levels of migration, Mexico's population growth is still higher than the replacement rate. It should be noted that Mexico's rate of population growth has declined markedly over the past several decades (registering a rate of 3.3 per cent in 1970, of 2.6 per cent in 1985 and of 1.7 per cent in 2000). Furthermore, the recent global economic crisis (in 2008 and 2009) has resulted in a slight dip in the migration rate with a large number of people returning to Mexico due to lack of employment opportunities abroad. While it is still uncertain whether this downward trend will continue or if it is a temporary event, the current decrease in migration, coupled with population growth above replacement rate lead to greater demands for natural resources, and may result in over-harvesting, increased land conversion and pollution.

[35] Boege Schmidt E. 2008. La cobertura vegetal y el uso de suelo en los territorios de los pueblos indígenas. Pp. 99-135 *in*: El patrimonio biocultural de los pueblos indígenas de México. Hacia la conservación in situ de la biodiversidad y agrodiversidad en los territorios indígenas (E. Boege Schmidt, ed.). National Institute of Anthropology and History, and National Commission for the Development of Indigenous People. Mexico.

Gender

29. Despite its relatively high HDI, when measured with regards to gender, Mexico drops 11 positions because of high gender inequality (Table 2). In recent years, women have gained greater access to higher education: for 2010, 40% of women from 15 to 29 years old have acquired mid-level education, while 5.6% have incomplete basic education or no formal education at all. Education is still less accessible for women than for men, with fewer women studying high school and university levels. Moreover, 7.1% of women in Mexico are illiterate, while only 4.9% of men are unable to read or write.

30. The National Survey on Occupation and Employment[36] indicates that in 2010, women were the head of 25.5% of all Mexican homes and 11% of rural homes. These women have lower degrees of literacy and lower salaries than men. Also, women perform on average 32.2 hours/week of unpaid work, while men perform 19.8 hours/week. The difference is bigger in rural areas. Furthermore, territorial management is also unequal, with only 23% of women involved in land-tenure, and women's terrains averaging 2.8 has, while men's lands are 5-10 has[37].

Land Tenure

31. Land tenure rights are relatively secure in Mexico. Around 53% of national territory, corresponding to 70% of forests is officially assigned to *ejidos*[38] and communities, but about 2 million ha are disputed among communities or indigenous groups[39]. Mexican Law indicates that the communities and *ejidos* have complete control over their lands, and can manage them freely, use the natural resources produced in them and decide the land use according to their traditions[40].

Fossil Fuels

32. Mexico is still highly dependent on fossil fuels. For 2008, energy production came primarily from hydrocarbons (89.1%), and in a minor way from other sources such as hydropower plants (3.7%), wood (2.3%), carbon (2.2%), nuclear energy (1.0%), sugarcane bagasse (0.9%), geothermic energy (0.7%), and wind turbines (<0.2%). The sector that consumed most energy was transport (47.6%), followed by industry (26.3%), and street, commerce and residential lighting (17.7%[41]).

1.6 Baseline causes of biodiversity loss

33. Current threats and causes of biodiversity loss are not directly dependent on climate change, but they both exacerbate and are exacerbated by the impacts of it. Moreover, with climate change a new set of threats will arise that will affect ecosystems in an uncertain way.

Land Conversion

34. Land conversion completely eliminates habitats and its speed, severity, and (frequent) irreversibility make it a direct major threat to Mexico's fauna and flora. Habitat fragmentation, a direct result of land conversion, reduces species and ecosystems' possibilities of migrating and adapting to new

[36] INEGI. 2011. Encuesta Nacional de Ocupación y Empleo 2010. National Institute of Statistics and Geography. Mexico.
[37] SEMARNAT. 2007. Programa Hacia la Igualdad de Género y la Sustentabilidad Ambiental 2007-2012. Ministry of Environment and Natural Resources. Mexico.
[38] *Ejidos* are a communal form of land tenure established in the revolution of the 1920s to secure rural population access to agricultural lands. *Ejidos* are composed of two different kinds of property rights over land: private parcels and commons. Private land is mostly dedicated to agricultural activities. The commons are mainly dedicated to pasture and forest.
[39] SEMARNAT. 2010. Propuesta de preparación (R-PP) para el Fondo Cooperativo par el Carbono de los Bosques. Ministry of Environment and Natural Resources. Mexico
[40] Mexico Constitution of 1917, Article 27 was amended in 1992, ending land redistribution, permitting peasants to rent or sell ejido or communal land, and permitting both foreigners and corporations to buy land in Mexico.
[41] SEMARNAT-INE 2009a. *Op cit.*

conditions. Highly fragmented landscapes have greater "edges", and suffer from greater "edge effects". There is lower humidity, higher temperatures, and greater wind impacts on edges. Species composition along edges is often significantly different from the interior. Also, GHG emissions from deforestation are estimated to account for 30% of total GHGs in Mexico. Natural ecosystems are typically converted for additional pasture for cattle, agricultural expansion, creation of timber plantations, or urban expansion/infrastructure building. In coastal areas, the conversion for tourism and infrastructure development is responsible for conversion of mangrove areas as well as increased sedimentation in aquatic habitats, which causes a reduction in the productivity of coral reefs and seagrass beds.

Illegal Logging

35. Illegal logging has negative consequences both for ecosystems and society, since it is carried out without a defined plan or techniques that would minimize its impacts on the environment and protect sites, species and ecosystems. Moreover, competition from illegal timber, which is cheaper than legal timber, removes legal wood from the market and reduces prices for legitimate businesses. In 2006, the cost of illegal logging on formal producers was estimated at $3.6 billion pesos. Estimates of the volumes of timber extracted illegally each year range from 3-13 million m^3 per year[42].

Wild Fires

36. Wild fires are a major cause of deterioration and degradation of the country's forest territory. The main causes include uncontrolled slash and burn agricultural practices, as well as abandoned or unattended bonfires. Additionally, droughts and excessive combustible material not removed from forests help fires spread. According to data from yearly reports by CONAFOR, in the last 10 years fires have affected an average 224,000 ha per year, including forested areas, shrubs, bushes and pastureland. Of this total figure, only 17% refers to fires in areas with forest. Some of Mexico's forests are fire-adapted, such as pine. In contrast, tropical forests are not fire-adapted and may be permanently altered by fires. With climate change it is expected to have an increased number of wildfires in most vulnerable areas, such as tropical-dry forests.

Invasive Species and Diseases

37. Invasive and introduced species present a threat as they may outcompete native species. This can result in local incidents of extinction and altered ecosystem processes, thus reducing biodiversity. Although Mexico recognizes the threats from invasive species, there are no specific laws in place to respond directly to this risk[43].

38. According to CONAFOR it is estimated that 2 million hectares are at risk of attack by 16 different species of insects or native diseases, resulting in significant economic, ecological and social repercussions[44]. The causes of pests and diseases in forests include: introduction of foreign species; increased area and monoculture of forest plantation; and weakening of forests through poor management and natural causes[45]. With climate change, native species will be affected, modifying ecosystem functionality and opening opportunities for the arrival and establishment of invasive and disease-causing species.

[42] CONAFOR, 2008
[43] Koleff, P., J. Soberón, et al. 2008. Patrones de diversidad espacial en grupos selectos de especies, Pp. 323-364 en: Capital Natural de México, vol. 1: Conocimiento actual de la biodiversidad (J. Sarukhán coord.). National Commission for Knowledge and Use of Biodiversity. Mexico.
[44] Zenteno, 2007
[45] Billings *et al.*, 1996

Over-harvesting

39. Over-harvesting of plants and animals puts populations at risk of extinction if the rate of extraction exceeds natural reproduction rates. In marine areas, over-exploitation of fish from a poorly controlled fishing industry is a particularly important challenge in Mexico. In terrestrial areas, the collection of wood as a source of fuel, illegal capture of wildlife, and overgrazing is affecting ecosystems, degrading soil and water retention capacity, and altered plant diversity and regeneration.

Freshwater and Aquifer Depletion / Contamination

40. Freshwater habitats, such as rivers, streams, and desert pools are being degraded or drying up, leading to a reduction in biodiversity. Climate change, deforestation, dams and the diversion of water flow for use in agriculture, industry, and households, are all contributing to the loss of water bodies. Extraction rates from aquifers are exceeding the rate of replenishment through rainfall. This can lead to desertification, ground subsidence, and saltwater intrusion. Also, pollution is contaminating water bodies and wetlands. Waste water management is variable across Mexico; not all waste is disposed of properly, thereby leading to further contamination of already-stressed water sources.

1.7 Threats and root causes

41. Despite the efforts made by Mexican institutions to mitigate and adapt to climate change, some impacts are already present and are projected to affect biodiversity and ecosystem services in several ways. There is scientific consensus "that climate is changing and that these changes are in large part caused by human activities."[46] As mentioned earlier, Mexico's economy is highly dependent on fossil fuels, particularly in energy and transport sectors. This is further accompanied by land-use change, degradation and deforestation, all of which are important causes of GHG emissions.

42. As a result of these GHG sources, and the climate change scenarios already in play, it is projected that by the mid-twenty-first century, the average annual mean temperature of Mexico may increase by 1.6–2.58^{o}C[47], and mean annual precipitation may decrease by 70–130 mm. Temperature increases are expected over most of the country, but particularly in the north-west where reductions in rainfall levels are also likely to be most pronounced[48]. In addition, rainfall is expected to be compressed into fewer rain days, with more frequent and intense storms and increases in the average severity of hurricanes; sea levels are also expected to rise[49]. These trends are likely to vary greatly across the country, with for example increases in the maximum number of dry days per year in some parts of central and southern Mexico and decreases in parts of the northwest.

43. The IPCC defines vulnerability as "the degree in which a system is susceptible to, and unable to cope with, adverse effects of climate change"[50]. Conditions in Mexico are, in theory, particularly favorable for the adaptation of biota to the effects of climate change, due to the fact that the country lies at the intersection of nearctic and neotropical bioregions, which results in high levels of genetic diversity

[46] America's Climate Choices: Panel on Advancing the Science of Climate Change and National Research Council. 2010. Advancing the Science of Climate Change. Washington, D.C.: The National Academies Press. ISBN 0-309-14588-0.
[47] Peterson A. T., M. A. Ortega-Huerta, J. Bartley, V. Sánchez-Cordero, J. Soberón, R. H. Buddemeier and D. R. B. Stockwell. 2002. Future projections for Mexican faunas under global climate change scenarios. Nature Vol 416, 627-7.
[48] The World Bank. 2007. Visualizing future climate in Latin America: Results from the application of the Earth Simulator. Latin America and Caribbean Region. Sustainable Development Working Paper 30.
[49] Aguilar, E. et al. 2005. Changes in precipitation and temperature extremes in Central America and Northern South America, 1961-2003. Journal of Geophysic and Research in Atmosphere 110:1-15.
[50] Parry M. *et al.* 2008, Technical summary. p. 23-78 *in*: Climate Change 2007: Impacts, adaptation and vulnerability (M. Parry, O. Canziani, J. Palutikof, P. Van der Linden, and C. Hanson, eds.). Intergovernmental Panel on Climate Change. Cambridge University Press. New York, U.S.A.

and adaptability, and the presence of extensive corridors linking different altitudinal and latitudinal zones, along which biota can migrate in the event of changes in climatic conditions. Despite this, climate change is expected to have a number of significant implications for biodiversity and for ecosystem goods and services, mainly due to the exacerbation of already existing threats described in Section 1.6.

Regression, fragmentation and degradation of ecosystems

44. A number of ecosystems are expected to be affected by shifts in the locations of the limits of the environmental conditions which they are able to tolerate, such as the rising sea level, the increasingly frequent and intensity of storms and hurricanes, changes in the humidity and temperature thresholds, among others. As a result, species will shift their distribution and abundance[51].

45. Increases in sea level are expected to cause mortality of coral reefs due to reduced photosynthesis, as sea levels rise above the coral faster than the coral is able to grow and light penetration is reduced due to increased phytoplankton production. Corals are also likely to suffer from increased levels of bleaching, as rising sea temperatures force corals to expel their symbiotic algae that provide much of their food. Corals in the Mesoamerican reef on the eastern side of the Yucatan Peninsula have experienced bleaching events in at least 1995, 1998, 2003, 2005, 2008, 2009 and 2010, as represented in Figures 3a and b, below. Corals that are already stressed by pollution and overfishing are less likely to recover from coral bleaching events[52].

Figure 3. Sea surface temperature and coral belaching in the Caribbean.

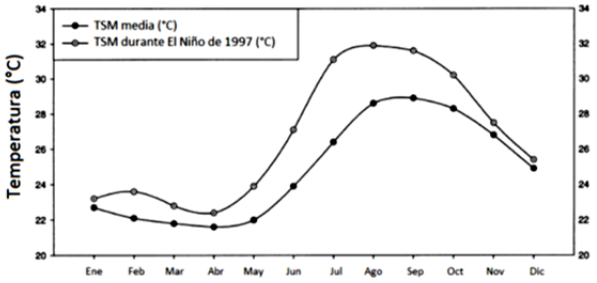


Figure 3a—Increase in sea surface water temperature (TSM) in Baja California Sur during the El Niño event of 1997, compared to historical means[53].

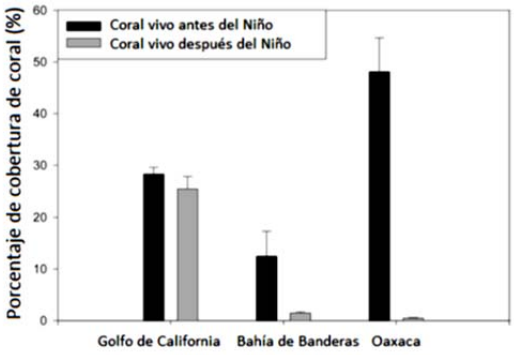


Figure 3b— The black columns represent the percentage of coral present before the El Niño event in 1997 while the grey columns represent the percentage of coral that survived that event[54].

46. Furthermore, reduction in pH levels in sea water is expected to lead to reduced calcification rates in reef-building corals and algae. This in turn directly impacts the abundance and diversity of fish, including economically-important species[55]. In the Gulf of California, for example, models indicate that

[51] Peterson A. T. *et al.* 2002. *Op cit.*
[52] Healthy Reefs for Healthy People. 2010. Report Card for the Mesoamerican Reef. An evaluation of ecosystem health 2010. Healthy Reefs for Healthy People Initiative.
[53] Reyes Bonilla, H., J. D: Carriquiry, G. E. Leyte-Morales, and A. L. Capul-Magaña. 2002. Effects of the El Niño Southern Osscilation and the anti-El Niño event (1997-1999) on coral reefs of the western coast of México. Coral Reefs 21:368-371.
[54] Ibid.
[55] Graham, N. A. J., S. K. Wilson, S. Jennings, N. V. C. Polunin, J. Robinson, J. P. Bijoux, and T. M. Daw. 2007. Lag effects in the impacts of mass coral bleaching on coral reef fish, fisheries and ecosystems.

reef fish will react in different ways to increased water temperatures with some species increasing their extension while others will decrease, thereby changing the overall composition of the reef populations[56].

47. Sea level rise will also affect mangroves: in the Gulf of Mexico, current relative rates of sea-level rise (since 1930) are higher than those during the 5500-3200 years BP period, and are about 10 times the rate during the past 3200 years. Mangroves may retreat at the shoreline or expand towards the seaward margin or on the landward side, but migration might be prevented, however, by steep slopes, or human barriers such as embankments or sea walls. This might have severe consequences on the ecosystem services provided by mangroves, causing a reduction in economic important species and increased vulnerability of shoreline to hurricanes.

48. Cloud forests are expected to be severely impacted by climate change, because of their delicate dependency on local climate. A number of climate models suggest that the low-altitude cloudiness will be reduced, which means that the optimum climate for many cloud forest habitats will shift to higher altitudes[57]. The complete loss of some sites and increased fragmentation of others could result in possible extinction of mountain-top endemics such as *Fagus grandifolia* var. *mexicana*, while reductions in the areas of cloud forest in other sites will lead to negative impacts on gene flow and population viability. Ultimately, the results of the climate change will be a loss in biodiversity, altitude shifts in species ranges and community reshuffling and, in some areas, complete loss of cloud forests[58].

49. Intertwined with this is the issue of increased vulnerability to wildfires, because of the changes in weather leading to a hotter and dryer environment. Forest ecosystems weakened by harmful human practices will be more vulnerable to this kind of disaster and its capacity for subsequent recovery (or to benefit from the positive effects) will be diminished[59]. Also, increased stresses imposed by climate change and severe weather events lead to increased susceptibility of ecosystems to pests and diseases, which in turn is a source of loss of biodiversity.

Extinction, range changes and population decline of species

50. Models to date under two climate scenarios[60], using data managed by CONABIO, predict that although extinctions and drastic range reductions of fauna species are likely to be relatively few, species turnover in some local communities may be high (>40% of species), suggesting that severe ecological perturbations may result. 0–2.4% of species are predicted to lose at least 90% of their present distributional area, and 5.1–19.5% are predicted to lose at least 50% of the present distributional area by 2055, under three different assumptions of dispersal capacity.

51. Changes in forest-species distribution have been predicted in different climate scenarios. Most models agree that temperate vegetation, such as temperate forest and cloud forest, will be reduced significantly, and that warm and arid vegetation, such as tropical deciduous forest and xerophilous

[56] Ayala-Bocos, A. and H. Reyes-Bonilla. 2008. Analysis of reef fish abundance in the Gulf of California, and projection of changes by global warming. Proceedings of the 11th International Coral Reef Symposium. pp. 1276-1280.
[57] Téllez-Valdés, O., P. Dávila-Aranda, and R. Lira-Saade. 2006. The effects of climate change on the long-term conservation of *Fagus grandifolia* var. *mexicana*, an important species of the cloud forest in Eastern Mexico. Biodiversity and Conservation, 15:1095–1107.
[58] Foster, P.. 2001, The potential negative impacts of global climate change on tropical montane cloud forests. Earth-Science Review 55:73-106; Bubb, P., I. May, L. Miles, and J. Sayer. 2004. Cloud Forest Agenda. United Nations Environmental Program – World Conservation Monitoring Centre. UK.
[59] USAID - Mexico. 2009. Assessment of Tropical Forest and Biodiversity Conservation in Mexico. FAA sections 118-119 report. United States Agency for International Development Mexico.
[60] Peterson A. T. et al. 2002. *Op cit.*

scrubland will increase its distribution[61]. However, it is important to consider that while tropical forests are likely to expand, they are the ecosystem with the highest rate of deforestation.

52. The increase in temperature will affect mainly plant species with distribution restricted by temperature and precipitation parameters, such as *Pinus*, *Quercus* and *Abies* in temperate forests, and *Euphorbia*, *Mimosa* and *Acacia* in deciduous forests and scrubland[62]. Two very vulnerable genus, *Pinus* and *Quercus*, will reduce their geographic range by 0.2-64% and 7-48% respectively, which is of particular importance given that Mexico is a diversity center for pine trees, as shown in Figure 4[63]:

Figure 4. Changes in distribution of pine species.

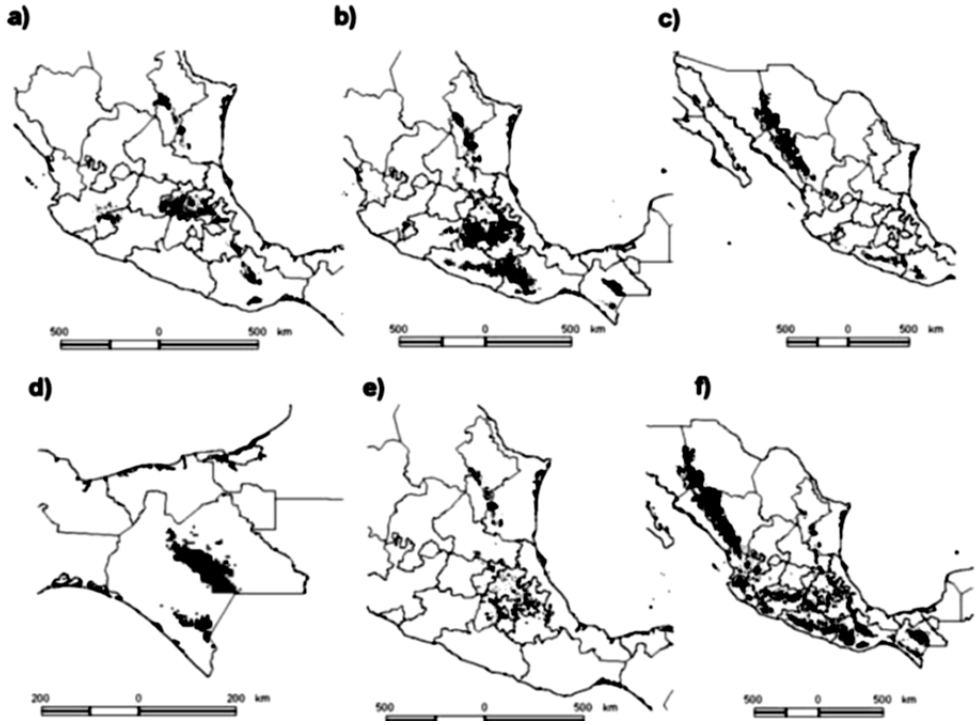


Figure 4.—Changes in distribution of pine species in Mexico under the severe climate change scenario HHGGAX50Mex; a) *Pinus rudis*, b) *P. montezumae*, c) *P. herrerae*, d) *Quercus crispipilis*, e) *Q. mexicana*, and f) *Q. obtusata*. The grey areas indicate the current potential distribution while the black areas indicate the predicted distribution[64].

[61] Arriaga, L. and L. Gómez. 2005. Posibles efectos del cambio climático en algunos componentes de la biodiversidad de México. On line: www.ine.gob.mx/ueajei/publicaciones/libros/437/arriaga.html; Gómez-Díaz et al. 2007. Comportamiento de la vegetación bajo escenarios de cambio climático en la reserva de la Biósfera Barranca de Meztitlán, Hidalgo, México. Zonas áridas 11:61-69; Villers-Ruíz, L. and I. Trejo-Vázquez. 1997. Assessment of the vulnerability of forest ecosystems to climate change in Mexico. Climate Research 9:87-93; Villers-Ruíz, L. and I. Trejo-Vázquez. 1998. Climate change on Mexican forests and natural protected areas. Global environmental change 8:141-157.

[62] Gómez-Mendoza, L., L. Galicia, and R. Aguilar-Santelises. 2008. Sensibilidad de grupos funcionales al cambio climático en la Sierra Norte de Oaxaca, México. Investigaciones Geográficas 67:76-100.

[63] Gómez-Mendoza L. and L. Arriaga. 2007. Modeling the effect of climate change on the distribution of oak and pine species of Mexico. Conservation biology 21:1545-1555.

[64] Ibid.

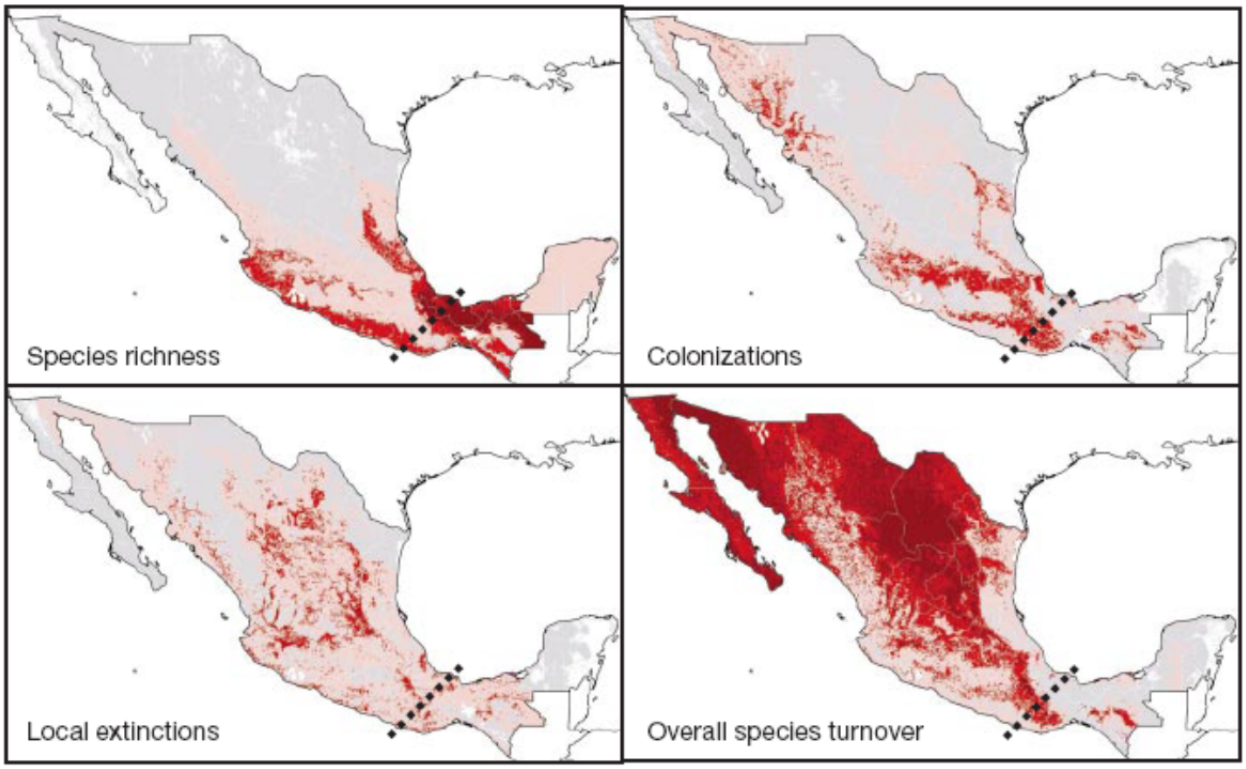
53. Although only limited numbers of fauna species will face entirely unsuitable conditions for persistence, others will experience drastic reductions and fragmentation of distributional areas, or extend their distributions, creating new natural communities with unknown properties. Endemic species are likely to be at highest risk given their limited range.

54. Some species' ranges (e.g. birds) are already changing, but their success is only possible if there is habitat available. The west Mexican chachalaca (*Ortalis poliocephala*), for example, is likely to encounter between 29.7% and 33.7% less habitable area by 2055 as a result of climate change, depending on the climate change scenario used. The main foci of species turnover are expected to be the Chihuahuan desert of northern Mexico, interior valleys extending south to Oaxaca, and the Baja California peninsula (with predicted species turnover rates as high as 45%). Upward regression of mountain ecosystems, such as cloud forest, due to the upward movement of the isotherms that define their limits, will result in reductions in their areas and increased fragmentation, to the detriment of the viability of the populations of their biota.

55. For example, frogs and lizards are expected to suffer from increased drought in cloud forests. An analysis of the impact of climate change on the distribution of amphibians in the American continent showed that, even under the mildest scenario, when the limited dispersion capacity of this taxa is considered, distribution of 95% of the species will be reduced. In Mexico, the projections show a shift of <60% of species[65].

[65] Lawler, J. J., S. L. Shafer, B. A. Bancroft, and A. R. Blaustein. 2009. Projected Climate Impacts for the Amphibians of the Western Hemisphere. Conservation Biology 24:38–50.

Figure 5. Modeled species turnover in biological communities (1,870 species) across Mexico[66]



Note: Modeled current species richness: white, <155 species; grey, 155–306 species; pink, 307–458 species; red, 459–610 species; dark red, 611–763 species. Local extirpations: white, <29 species; grey, 29–56 species; pink, 57–84 species; red, 85–112 species; dark red, 113–140 species. Colonizations: white, <25 species; grey, 25–48 species; pink, 49–71 species; red, 72–95 species; dark red, 96–119 species. Species turnover: white, <10%; grey, 10–20%; pink, 20–30%; red, 30–40%; dark red, >40%. The southern quarter of these maps (indicated by dashed line), however, may be subject to some bias, and thus should be interpreted with caution.

56. Some marine species are likely to be affected by changes in water temperature. For example, the marine turtles that nest on Mexican beaches have temperature-dependent sex determination, meaning that an increase in global temperatures could change the proportion of female and male turtle hatchlings and could result in marine turtle populations becoming unstable.

Social vulnerability

57. In addition to ecological consequences, climate change is expected to affect the economy and quality of life of Mexican people. Social vulnerability is caused by several factors, including the existence of *caciques* (individuals with strong local power), land concentration, land degradation, poverty, unequal distribution of resources, and poor availability of services, the agriculture system based on large single-crop fields, the lack of income diversity, and the lack of access to financial and material

[66] Peterson A. T. et al. 2002. *Op cit.*

resources[67]. This is exacerbated by Mexico's history of poverty, exclusion, lack of urban planning, weak policy, and corruption, all of which increase social vulnerability[68].

58. According to the Vulnerability-Resilience Indicator Model (VRIM), which measures vulnerability in ecological and social terms, the states with highest resilience are Jalisco, Sinaloa, Tamaulipas, Nuevo León, the State of Mexico, Quintana Roo, and Sonora. The states with the lowest resilience are Guerrero, Oaxaca and Chiapas. VRIM calculates sensitivity (of settlement, food security, ecosystems, human health, and water resource), exposure, and adaptation capacity (of economy, human resources, and environment). According to this analysis, the biggest concerns are economic development, water availability and food security[69].

59. When facing climate change, this social and economic vulnerability translates into increased ecological vulnerability across the nation, especially given current agricultural, forestry and land-titling policies that encourage "development" of forested areas. Many areas will experience localized increases in demographic pressures due to immigration from areas where livelihood sustainability has been undermined by climate change-induced livelihood collapse. For example, the impact of climate change on vegetation distribution will reduce crop production, as well as fodder for livestock. Pollinizers, such as birds and butterflies, will also see shifts in their distribution which will further impact vegetation. Shorter rain cycles and shifts in moisture-capturing vegetation will in turn increase drought conditions that impact on human populations. In 2011, it was estimated that the economic cost of environmental degradation represented 6.9% of Mexico's GDP, accounting for a tremendous drain on national resources[70] and ultimately increasing social vulnerability to further degradation induced by CC.

1.8 Legal, institutional and policy framework

60. Mexico has made significant efforts in national legislation and the international context, regarding biodiversity conservation and climate change. In 1992, Mexico joined the United Nations Framework Conference on Climate Change (UNFCCC) and ratified it in 1993. It also signed (1997) and ratified (2000) the Kyoto Protocol (KP). Mexico claims the distinction of being the only non-Annex 1 country that has submitted five National Communications on the implementation of the UNFCCC.[71]

61. In 1994, the Ministry of Environment and Natural Resources (SEMARNAT, originally named Ministry of Environment, Natural Resources and Fisheries, SEMARNAP) was established with the aim of promoting environmental protection and sustainable management of natural resources in an integrated manner. The Ministry is a purely normative entity, as it focuses mostly on regulating access to, and use of, renewable natural resources. Other sectorial entities, such as the National Commission of Natural Protected Areas (CONANP), carry out conservation activities. CONANP was created in 2000, as part of

[67] Eakin, H., M. Webhe, C. Avila, G. Sanchez Torres, L. A. Bojorquez-Tapia. 2006. A comparison of the social vulnerability of grain farmers in Mexico and Argentina. AIACC Working Paper No. 29. Assessments of Impacts and Adaptations to Climate Change. www.aiaccproject.org.; Vera Cortés, G. 2005. Vulnerabilidad social y expresiones del desastre en el distrito de Pochutla, Oaxaca. Pp. 35-150 *in*: La construcción social de riesgos y el huracán Paulina (V. García Acosta, ed.). Center of Research and Superior Studies on Social Anthropology. Mexico.

[68] García Acosta, V. ed. 2005 Construcción social de riesgos y el huracán Paulina. Center of Research and Superior Studies on Social Anthropology. Mexico.

[69] Ibarrarán, M. E., E. L. Malone and A. L. Brenkert. 2008. Climate change vulnerability and resilience: current status and trends for Mexico. U. S. Department of Energy. U.S.A..

[70] INEGI. 2013. Cuentas económicas y ecológicas de México, 2007-2011. National Institute of Statistics and Geography. Press bulletin 045/13. Mexico

[71] The First National Communication from Mexico to the UNFCCC included the first National Greenhouse Gases Emission Inventory (NGHGEI—SEMARNAP 1997) and the results of the first vulnerability studies of the country facing climate change. The Second National Communication included the NGHGEI update for 1994-1998 and the future emissions scenarios (SEMARNAT-INE 2001). The Third National Communication presented the updated NGHGEI for 1998-2002 and the Fourth National Communication through 2006. The Fifth National Communication was elaborated and presented in 2012.

SEMARNAT. Its mission is to preserve Mexico's natural capital through protected areas and other conservation instruments and to promote sustainable development in order to reduce poverty, especially in rural areas[72]. Table 3 describes the main functions carried out by different units and entities of the Federal Government's environmental sector.

Table 3: Mandates of Federal Government Environmental Entities[73]

Area	Mandate
Ministry of Environment and Natural Resources (SEMARNAT)	Protection, restoration, and conservation of eco-systems, natural resources, and environmental goods and services.
Undersecretary of Planning and Environmental Policy of SEMARNAT	Environmental planning, definition of environmental policies, mainstreaming in other sectors of the federal government, compilation and analysis of environmental data.
Undersecretary of Environmental Regulations of SEMARNAT	Elaboration of technical norms (NOMs), bills and regulations.
Undersecretary of Environmental Management of SEMARNAT	Issuance of permits and licenses, including those related to wildlife, forests, EIA, wastes and air emissions.
National Commission of Natural Protected Areas (CONANP)	Manage natural protected areas and implement sustainable regional development programs in areas of high biodiversity.
National Institute of Ecology and Climate Change (INECC, previously INE)	Conduct scientific and technical research to guide the design, implementation, and evaluation of environmental and climate change policies and programs.
National Water Commission (CONAGUA)	Manage and preserve national waters to achieve their sustainable use.
Federal Attorney General for Environmental Protection (PROFEPA)	Enforce legal dispositions governing environmental pollution, restoration of natural resources, preservation and protection of forest resources, wildlife, endangered species, coastal zones, natural protected areas, EIA, and regional development plans.
National Forestry Commission (CONAFOR)	Support productive, conservation, and restoration activities in the forestry sector; participate in the development and implementation of policies and plans for sustainable forestry development.
Mexican Institute for Water Technology (IMTA)	Conduct research to improve water management and develop technologies to improve water allocation and enhance water use efficiency.
National Commission for the Knowledge and Use of Biodiversity (CONABIO).	Carry out research on knowledge and use of biodiversity; advise governmental agencies and other sector; help comply with international conventions (particularly CBD), and disseminate knowledge on biological wealth.

62. The Inter-ministerial Commission on Climate Change (CICC[74]) was created in 2005 and ratified in 2013 under the newly issued General Law of Climate Change to coordinate the actions of government

[72] CONANP. 2011. National Commission for Natural Protected Areas. http://www.conanp.gob.mx/quienes_somos/mision_vision.php
[73] USAID - Mexico. 2009. *Op cit.*

entities relative to Mexican policy, to prevent and mitigate the emission of GHG, adapt to climate change, and promote the development of programs and strategies to attach to the commitments subscribed by Mexico at the UNFCCC and the KP[75]. The CICC works on five Work Groups on Mitigation, Adaptation, International Negotiation, REDD, PECC; and the Mexican Committee for Project on Reducing Emissions and GHG Capture (COMEGEI).

63. Mexico has developed a comprehensive legal framework for environmental and natural resource management. The General Law of Environmental Equilibrium and Protection (LGEEPA) is the cornerstone of Mexico's environmental laws. Until 2000, few environmental laws existed and regulations complemented LGEEPA's general provisions. Since then, however, the number of environmental and other related legislation has increased notably. The proliferation of laws, regulations and official Mexican norms (currently numbering more than 100) partly reflects a growing sophistication in environmental management, but also represents challenges for environmental enforcement agencies to oversee their compliance. Table 4 summarizes Mexico's main environmental laws with their corresponding regulations.

Table 4: Main environmental laws in Mexico

Instrument/ Legal Hierarchy	Scope
Mexican Constitution (First tier law, 1917)	Defines environmental rights and ownership of renewable and non-renewable natural resources.
General Law of Climate Change (Second tier law, 2012)	Framework law to regulate public policy regarding adaptation and mitigation of climate change, as well as promote the transition toward a competitive economy based on low carbon emissions.
General Law of Environmental Equilibrium and Protection (Second tier law, 1988)	Framework law for environmental and natural resource management; defines the attributions of each level of government; defines environmental policy's principles and the instruments for environmental management.
• Regulations of the General Law of Environmental Equilibrium and Protection in the Area of Natural Protected Areas (Third tier law, 2000, reformed in 2004)	Regulates the establishment, administration and management of federal natural protected areas.
• Regulations of the General Law of Environmental Equilibrium and Protection in the Area of Environmental Audits (Third tier law, 2010)	Regulates environmental audits, which include a firm's equipment and processes, as well as the associated pollution and risks.
• Regulations of the General Law of Environmental Equilibrium and Protection in the Area of Environmental Impact Assessment (Third tier law, 2000)	Regulates the Federal Government's use of Environmental Impact Assessment.
• Regulations of the General Law of	Regulates environmental zoning plans at the Federal

[74] The CICC is currently formed by the head of the Ministry of Environment and Natural Resources (SEMARNAT), Ministry of Agriculture, Livestock, Rural development, Fishery and Food (SAGARPA), Ministry of Communications and Transport (SCT), Ministry of Economy (SE), Ministry of Social Development (SEDESOL), Ministry of Energy (SENER), Ministry of Health (SA), Ministry of Tourism (ST), Ministry of Public Education (SEP), Ministry of Marine, Ministry of Finance (SHCP), Ministry of the Interior (SEGOB) and the Ministry of Foreign Affairs (SRE).

[75] SEGOB. 2005. Acuerdo por el que se crea con carácter permanente la Comisión Intersecretarial de Cambio Climático. Ministry of Government. Diario Oficial de la Federación, 25 de abril de 2005. Mexico.

Instrument/ Legal Hierarchy	Scope
Environmental Equilibrium and Protection in the Area of Environmental Regional Planning (Third tier law, 2003)	Level, including marine zones, plans covering areas of two or more states, and the definition of criteria to guide the development of plans by states and municipalities.
• Regulations of the General Law of Environmental Equilibrium and Protection in the Area of Prevention and Control of Air Pollution (Third tier law, 1988, reformed in 2004)	Defines general environmental criteria for air quality management; defines Federal Government's responsibilities for air quality management, including control of pollution from federal sources, transboundary pollution, and management of air basins covering parts of two or more states.
• Regulations of the General Law of Environmental Equilibrium and Protection in the Area of Emissions Registry and Pollutant Transfers (Third tier law, 1988)	Regulates the registry of emissions and discharges from selected sources to air, water, soil, subsoil, and through wastes.
General Law of Sustainable Fisheries and Aquaculture (Second tier law)	Regulates the promotion and management of fisheries and aquaculture resources.
General Law of Wildlife (Second tier law) • Regulations of the General Law of Wildlife (Third tier law)	Regulate the conservation and sustainable use of wildlife and its habitat (excluding the use of timber and non-timber goods, marine species, and endangered or at risk species).
General Law for the Prevention and Integrated Management of Wastes (Second tier law) • Regulations of the General Law for the Prevention and Integrated Management of Wastes (Third tier law)	Determines the responsibilities for hazardous, special, and solid waste management for the Federal, State, and Municipal Governments, respectively.
General Law of Sustainable Forest Development (Second tier law) • Regulations of the General Law of Sustainable Forest Development (Third tier law)	Regulates the use and administration of forest resources; recognizes the environmental services provided by forests; aims to reduce poverty rates among forest dwellers'.
Law of National Waters (Second tier law) • Regulations of the Law of National Waters (Third tier law)	Regulates use and management of water; defines responsibilities of CNA and watershed organizations; mainstreams environment into water management.
Law of Biosafety of Genetically Modified Organisms (Second tier law) • Regulations of the Law of Biosafety of Genetically Modified Organisms (Third tier law)	Regulates use, trade, and experimentation with these organisms.
Law of Organic Products (Second tier law)	Regulates the criteria and requirements for the elaboration, use, verification and certification of organic products.
Law of Promotion and Development of Biofuels (Second tier law)	Establishes the requirements to produce biofuels; defines the responsibilities of Federal Government agencies in issuing permits and regulating biofuels; creates the inter-agency commission for biofuels.
Law for the Use of Renewable Energies and Financing for the Power Transition (Second tier law)	Regulates the use of renewable sources and cleaner technologies for electricity generation (excludes electricity for public use and from nuclear sources, large

Instrument/ Legal Hierarchy	Scope
	hydro projects, and incineration of industrial wastes).
Law for the Sustainable Use of Energy (Second tier law)	Aims to improve energy efficiency.
Law of Sustainable Rural Development (Second tier law)	Aims to improve welfare of rural communities; creates a program that provides resources to protect rural environment, enhance sustainability of rural development, and valuation of environmental services.
General Law of Public Property (Second tier law)	Regulates the concessions of the Federal Maritime and Terrestrial Zone and Lands Reclaimed to the Sea.
Law of Planning (Second tier law)	Mandates the incorporation of environmental criteria in the programs and actions of the Federal Government's administrative sectors.

64. In 2006, the document Towards a National Strategy on Climatic Action (HENAC) was released. It was the first effort made by the CICC to form a national strategy to combat climate change, and it presented the mitigation opportunities and identified the vulnerability of different sectors of the country.[76]

65. In 2007, Mexico presented the National Development Plan 2007-2012 (NDP, presented every six years with changing governments) that considered for the first time, actions regarding mitigation and adaptation to climate change[77]. In line with the NDP Environmental Sustainability concept, SEMARNAT has aimed to coordinate its efforts with those of other sectorial agencies, particularly to address cross-sectorial challenges (including climate change), as well as to protect priority areas. The Cross-sectorial agendas (*Agendas de Transversalidad*) have helped to mainstream environmental criteria in the activities of an important segment of the Federal Public Administration. Still, a number of public programs continue to foster unsustainable use of natural resources.

66. Also in 2007, the National Strategy on Climate Change (ENACC 2007-2012) was released, which identified measures and outlined the needs of the country in terms of climate change. In its Mitigation component, it recognized opportunities and made proposals for emissions reduction and carbon capture regarding the generation and use of energy, vegetation and land use, and carbon measurements. In its Vulnerability and Adaptation component, the impacts of climate change are exposed and the urgency of adaptation measures is stated, but in this instance there are no explicit goals, only calls for action[78].

67. The National Program for Protected Areas 2007-2012 (PNANP) was published by CONANP, in agreement with the Environmental Sustainability section of the NDP. It has six strategic objectives to preserve and restore ecosystems and boost sustainable development in local communities, but it does not include a climate change adaptation/mitigation component[79].

68. In 2009, the Special Program on Climate Change 2009-2012 (PECC) was released. It is an ambitious and specific approach to climate change actions based on four components: Long-term Vision, Mitigation, Adaptation, and Cross-cutting Policy. The PECC specified and developed precise objectives to be accomplished during the period 2009-2012, involving all of the agencies that integrate the CICC. It

[76] CICC. 2006. Hacia una Estrategia Nacional de Acción Climática: Respuesta de México ante el cambio climático global. Inter-ministerial Commission for Climate Change. Mexico.
[77] SHCP. 2007. Plan Nacional de Desarrollo 2007-2012. Ministry of the Treasury and Public Credit. Diario Oficial de la Federación, 31 de Mayo de 2007. Mexico.
[78] CICC. 2007. Estrategia Nacional de Cambio Climático. Inter-ministerial Commission for Climate Change. Mexico.
[79] CONANP. 2007. Programa Nacional de Áreas Naturales Protegidas 2007-2012. National Commission for Natural Protected Areas.

includes 86 explicit mitigation actions, involving the use and generation of energy; agriculture, forestry and other land use; waste treatment and disposal; and industrial processes. Also, the PECC includes 142 adaptation goals directed towards risk management; water resources; agriculture, livestock, fishery, and forestry; ecosystems; energy, industry, and services; transport and communications; land use and urban development; and public health. Some of the PECC objectives establish actions related to protected areas, like increasing vegetation under protection, preserving and restoring PA's biodiversity, instating fire Management Programs for PA, connecting high priority ecosystems, and include climate change activities into PA's Management Programs[80].

69. The most recent effort is the Climate Change Strategy for Protected Areas (ECCAP), published in 2011, in order to accomplish PECC's objectives concerning protected areas. The main goal of ECCAP is to orient actions and decisions of the CONANP in order to convert protected areas into an effective instrument for adaptation and mitigation to climate change, enabling the concurrence of economic, technical and human resources. The ECCAP is formed by two main components, Adaptation and Mitigation, which guide the operational processes. Three other components give support to the strategy: Knowledge, Communication and culture, and Capacity development. Finally, one last component helps with the assembly of public policy on climate change and PA. It is also closely related to the protection, management and restoration sections of the PNANP.

70. In 2011, in recognition of the importance of driving cooperation and coordination among different sectors in order to concert efforts toward the conservation of PA and confront the challenges expected from climate change, CONANP created the Resilient Mexico Alliance. This entity unites 23 partners, including government entities, non-governmental organizations, international societies, academic institutions, and other communities and local groups.

71. In 2012, the General Climate Change Law (LGCC) was published. It is the document that guides every action and program related to climate change in Mexico and recognizes the value of ecosystems and protected areas as adaptation strategies. Also in 2012, the CICC, with the support of UNDP, published the document "Climate Change Adaptation in Mexico: Vision, Elements and Criteria for decision-Making". This document aims to establish the necessary elements to identify, articulate and orient public policy instruments, actions and measures to strengthen the adaptation capacity of society, ecosystems and productive systems.

72. In 2013, Mexico presented its new National Development Plan (2013-2018) which incorporates climate change in three areas: civil protection and disaster prevention (*I. México en Paz*), sustainable development (*IV. México próspero*), and international negotiations (*V. México con responsabilidad global*), as well as Strategies 4.4.1., 4.4.3., 5.1.4., 5.1.6. and their respective lines of action. Of particular importance to this project are the general considerations the NPD makes for development of the Special Programme for Climate Change, including actions for strengthening national policy on climate change and environmental protection so as to pave the way toward an economy that is competitive, sustainable, resilient, and with low carbon emissions. Strategies 2.2.3., 4.4.3 and 4.4.4. address biodiversity conservation emphasizing the importance of sustainable use of natural resources that allows economic growth while maintaining ecosystem services, particularly through economic incentives such as PES (Payment for Ecosystem Services), and strengthening social capital and management capacities for ejidos and communities in forested areas as well as those of high value for biodiversity conservation.

73. With regards to gender equality, the NPD also states that all sectorial programs described above must be reformulated to take into account gender equality as a transversal criteria[81].The NPD 2013-2018

[80] CICC. 2009. Programa Especial de Cambio Climático 2009-2012. Inter-ministerial Commission for Climate Change. Mexico.
[81] SHCP. 2013. Plan Nacional de Desarrollo 2013-2018. Ministry of the Treasury and Public Credit. Diario Oficial de la Federación, 20 de Mayo de 2013. Mexico.

addresses indigenous peoples with regards to the need for a policy that is adequate for indigenous action to be conceived in an intercultural manner through dialogue between aboriginal populations, where diversity is the motive for harmony, respect, equality and justice, and in which the needs of that sector of the population are heard. Without this, there is a risk of implementing policies that fail to help the integral development of indigenous communities. Finally, Strategy 4.4.4 emphasizes the need to focus biodiversity conservation and sustainable use programs on generating befits to communities of high social and environmental vulnerability.

1.9 Long-term solution

74. The normative solution to these threats is to design and manage PAs in Mexico in such a way as to increase the resilience of their constituent biodiversity to the effects of climate change; to establish new protected areas or expand existing ones in order to compensate for the expected loss and degradation of existing areas as a result of climate change; and to manage the landscapes surrounding and connecting PA in such a way as to maintain their value in providing biological connectivity, and to contribute to the stability of the production processes carried out there under conditions of future climate change.

1.10 Barriers to achieving the solution

75. The barriers to the achievement of the normative solution are as follows:

Barrier 1. Lack of a concerted and coherent national planning and financial framework for responding to implications of climate change for PA and for the goods and services that they provide

76. The Climate Change Strategy for Protected Areas in Mexico (ECCAP) establishes general guidelines, strategic directions and priorities. However, there are as yet no clear national strategies for how to address specific ecosystems and threats in an effective and coherent manner, based on objective analyses of the relations between the location and nature of priority sites for BD conservation and the magnitudes and implications of climate change processes, or of spatial options for adaptation such as the establishment or expansion of protected areas or the definition of regional corridors.

77. The key institutions with responsibilities related to the management of protected areas and the surrounding landscapes (CONANP, CONABIO, CONAFOR, INECC, SAGARPA) have each individually recognized climate change as an issue that requires action. In addition, instruments such as ECCAP, the Special Program on Climate Change of the Federal Government, and the Policy Framework for Adaptation to Climate Change are evidence of higher-level policy commitment. Despite this, the full nature and magnitude of the potential implications of climate change for the biodiversity conserved by PAs are not yet adequately recognized by actors in individual institutions, or reflected in concrete terms in the actions of the institutions and corresponding policies and strategies. Of particular significance in this regard are spatial planning and economic development policies. Furthermore, as yet the levels of cooperation and coordination between these institutions are insufficiently developed to permit the implementation of effective multi-sector and landscape-wide approaches for supporting resilience and adaptation of PAs to impacts of climate change.

78. With respect to PA management tools, individual PAs rely on a Management Programme (MP) and Annual Work Plan to guide their activities regarding conservation, monitoring, etc. The MP is elaborated every 5 years and is only open to revision in the case of an extreme event, such as a forest fire or flood. This implies that the MP is not open for revision to take into consideration more subtle climatic events, nor more current scientific data regarding climate change that could influence management activities and processes within PAs. Consequently, while the MP provides an important management tool for status-quo practices, it is not sufficiently flexible for phenomena like climate change.

79. Current systems for monitoring and analysis of biodiversity are limited to individual sectorial tools that address specific components but do not consider them in a systemic manner to consider and respond to climate change implications. Furthermore, while these tools generate data, they do not interpret and disseminate the data in a readily usable manner, thus impeding quick responses to urgent events.

80. CONANP has undergone a financial gap analysis concerning the PA system's general operations. This gap has already been defined and addressed by other projects[82] [and] [83] and major progress has been made in consolidating the financial sustainability of the PA estate. However, CC resilience is a new issue and its implications on CONANP's budget have never been assessed. Analyses of financial needs and corresponding strategies do not as yet take into account the additional funds that will be required to build resilience to climate change, for example through the expansion of PA to compensate for ecosystem migration and fragmentation. Neither are there as yet adequate systems in place for monitoring the impacts of the resilience development strategies on the conservation status of key species and ecosystems. There are no pre-existing tools to determine what the implications of resilience could be on the institution's financial resources and management, nor any analysis on how to coordinate existing resources from other sectors and/or institutions to address CC resilience.

Barrier 2. Sector- and site-specific threats related to location and limited connectivity of PAs exacerbate vulnerability to climate change

81. The definition of the location of protected areas in Mexico is guided by an ecosystem gap analysis initiated in 2004 by CONANP, INECC, INEGI and NGOs including the Nature Conservancy. Missing from this analysis, however, was a consideration of how protected areas should be inserted into the broader landscape in such a way as to take into account the fragmentation and ecosystem migration that are likely to result from climate change. Also missing are concrete strategies, applicable at landscape level, for taking into account the additional costs of applying this landscape-wide approach to expanding the PA estate, for example by internalizing the value of the environmental services and other economic benefits provided by the PAs.

82. Furthermore, institutional actors (e.g. SAGARPA, CONAFOR and CONABIO) and land managers have limited technical knowledge and experience of how to work in a collaborative manner to adapt the management of the landscapes surrounding and/or connecting PA to the new and unfamiliar challenges posed by climate change. For example, they do not have the capacity to promote and develop appropriately located agroforestry and agro-silvo-pastoral systems that are resilient to climatic fluctuations and provide habitat and connectivity for the fauna species that would otherwise be affected by ecosystem regression and fragmentation. Additionally, planning and zoning decisions outside PA boundaries are developed independent of what has been planned for within PA. Oftentimes, land-use practices in the buffer zones are incompatible or even detrimental to the PA, particularly in the cases of agriculture and mining.

Barrier 3. Limited capacities for socially responsible application of climate change resilience/adaptation strategies in individual PAs

83. Recognition of the importance of resilience to climate change is incipient in Mexico's political and legal environment. Neither the main environmental law, General Law of Ecologic Equilibrium and Environmental Protection (LGEEPA), nor its regulations (not even the Regulation on Protected Areas)

[82] Bezaury-Creel J. E., S. Rojas-González de Castilla and J.M. Makepeace. 2011. Brecha en el Financiamiento de las Áreas Naturales Protegidas Federales de México. Fases I y II. National Commission for Natural Protected Areas, The Nature Conservancy and Mexican Fund for Nature Conservation. México. 48 pp.

[83] CONANP, Vo.Bo. Asesores Integrales and The Nature Conservancy. 2013. Estrategia para el abatimiento de la brecha financiera de las áreas naturales protegidas federales de México: fases III y IV. First edition. National Commission for Natural Protected Areas and Ministry of Environmnent and Natural Resources. México.

include climate change or resilience information. Rather, the regulation on Environmental Planning is the only one to consider the vulnerability to the possible effects of climate change as one of the aspects to consider when creating environmental planning. The National Strategy on Climate Change (ENACC 2007-2012) published in 2007, also does not recognize the importance of PA as tools for resilience. Meanwhile, the regulation on Protected Areas includes neither climate change nor resilience. The recently published General Climate Change Law (LGCC) includes the importance of Protected Areas as instruments to promote resilience; however, there is no Regulation that explicitly expresses the role of PA as resilience tools.

84. Despite the initiatives undertaken by the Government of Mexico to date (such as the LGCC, ECCAP, the Special Program on Climate Change of the Federal Government, and the Policy Framework for Adaptation to Climate Change), the full nature and magnitude of the potential implications of climate change for the environmental goods and services provided by PA remain to be widely recognized or taken into account in relevant policies and strategies. Of particular significance in this regard are spatial planning and economic development policies.

85. At present, Management Programs for most PAs do not take into account the potential implications of climate change, such as the risk of increased incidence of fires and pests, or make provisions for adapting their management accordingly. PA staff lack know-how to detect warning signs of the effects of climate change, to monitor processes and to develop and apply appropriate management responses. Their ability to combat threats is likely to be further weakened in the future as opportunities for effective co-management become scarcer, as a function of processes of demographic change that weaken social capital in rural areas. Effective management of PA will also be dependent upon conservation objectives being harmonized as much as possible with local development strategies: at present, relations between PA managers and local authorities are insufficiently developed to allow this.

86. Current levels vary among PAs regarding awareness, knowledge and capacity of PA personnel to recognize and address climate change impacts and implications. This is reflected in the Management Programs (MP) that guide the activities and interventions of each individual PA. To date, only 2 of the 17 priority PAs to be covered in this project have a MP with CC considerations built-in.

87. Furthermore, few PAs have active Community Advisory Councils involved in co-management schemes. Opportunities for stakeholder participation exist in activities like community brigades but are not consistently engaged across the PA estate. Community participation is vital to ensuring the project is appropriated by key stakeholders.

88. Finally, despite important legal and institutional advances with respect to the transversal nature of gender, PAs still require strengthening of capacities regarding programmes and personnel in order to have an impact on reducing social vulnerability and promote greater gender equality. On the other hand, within and around the PAs live indigenous men and women whose communities have common cultural traits such as the use of native languages and forms of organization and use of natural resources. Efforts that focus on addressing the needs of these populations have, on occasion, had little impact due to cultural and linguistic barriers, as well as failing to take into account cultural values. Without proper engagement of local populations through culturally and gender sensitive considerations, groups in vulnerable situations are not aware of the risks they face, nor are their needs accounted for in decision-making processes regarding PA management, thereby increasing their vulnerability.

1.11 Stakeholder analysis

89. The project is expected to engage a diverse set of PA stakeholders; primarily those who will be involved in planning and managing the resilience activities in the PA (see Section 5, Table 12). The project's success is dependent upon their active participation in project development and the implementation of project activities.

90. With regards to institutions of the federal government, key to the project are those related to environmental policy and compliance with government programs, especially those with actions associated with issues of conservation and sustainable use of natural resources.

91. The federal government institutions to be involved with the project's implementation are those related to environmental policies led by SEMARNAT, Mexico's federal government institution whose primary purpose is "to promote protection, restoration and conservation of ecosystems and natural resources and environmental goods and services, in order to facilitate their use and sustainable development "(Organic Law of Public Administration, Article 32a, amended on February 25, 2003). As such, key national-level stakeholders are CONANP, CONABIO, CONAFOR and CONAGUA, which are responsible for the definition of policy and regulations that translate into management tools for the PA.

92. CONANP is responsible for the management of Protected Areas, including their conservation and sustainable development. At the regional level, CONANP Regional Directors are responsible for oversight of PA management, interventions and interactions. At the local level, community organizations and community members are active participants in the management of the PA, particularly in areas where social property rights exist (communities and *ejidos*); therefore, the project will make every effort to include and coordinate actions with them.

93. CONABIO is responsible for the promotion, coordination, support and realization of activities aimed at increasing knowledge of biological diversity and its conservation and sustainable use: the national institution with greatest capacities for the generation, management, analysis and communication of information on the magnitude, nature and implications of climate change for PA management. CONABIO is also responsible for promoting the implementation of biological corridors in six southern states of Mexico: Campeche, Chiapas. Oaxaca, Quintana Roo, Tabasco and Yucatan.

94. CONAFOR is the federal government institution responsible for the promotion of forest management, forest conservation and restoration, and the formulation of plans and programs for sustainable forest management. In the context of the project, responsible for developing strategies for the adjustment of forest management in conservation areas to climate change.

95. National NGOs also make an important contribution to the management of protected areas by obtaining resources and providing technical assistance. Key NGOs for the project's interventions include Espacios Naturales y Desarrollo Sustentable (ENDESU), The Nature Conservancy (TNC), the Mexican Fund for Nature Conservation (FMCN), the World Wildlife Fund (WWF), and the AMBIO Cooperative.

1.12 Baseline analysis

96. The baseline on which this initiative will build is the establishment and management, by the Government of Mexico and its institutional and local partners, of protected areas, within the framework of the Mexican Protected Areas System.

Financial framework for PA management

97. Currently the Government of Mexico invests around US$96.4 million per year in the establishment and management of protected areas, which is complemented by around US$36.37 million of external cooperation funds. In recognition of the strategic role PA play in conservation efforts, the fiscal budget destined to PA management has substantially increased over the past decade in Mexico. In 2000, Mexico's federal protected area budget received its first substantial increase, from US$ 1.7 million in 1995 to US$15 million. This increase was consolidated with support from Congress, the Finance Ministry and the Ministry of the Environment (SEMARNAT), reaching US$96.4 million in 2008 and allowing for increased management effectiveness. In 2011, CONANP's budget was increased to US$ 98.6 million. Between 1996 and 2009, external funding for Mexican PA averaged US$ 8.2 million annually. Sustained yearly funding from invested capital provided by the Protected Area Fund and the Monarch Butterfly Fund managed by the Mexican Fund for the Conservation of Nature (FMCN), accounted for an

additional US$ 2 million in 2009. An incomplete list of historical funding commitments obtained by CONANP or partner NGOs from bilateral and multilateral agencies or capital funds, each covering a period of at least 5 years, indicates an average annual investment in Mexican protected areas of US$ 4 million. New international cooperation projects will allow for the maintenance of external funding as older commitments phase out. An especially important external fiscal funding component for PA is currently derived from CONAFOR's Environmental Services Payment Program, representing an average of US$ 5.8 million[84]. For 2013, the Mexican Government will invest US$253.18 million in consolidating the Protected Area System[85].

Investment and protection instruments

98. To date these investments have focused on i) expanding and consolidating the PA estate and other conservation modalities; ii) formulating and developing a programme for the conservation of high risk species; iii) consolidating tourism in protected areas, generating benefits for local populations; iv) increasing the coverage and effectiveness of the strategy of conservation for development, which guarantees that local and indigenous communities and landowners receive incentives and benefits from their participation in conservation; and v) maintaining the participation of members of society in the conservation of protected areas.

99. The achievements to date as a result of these investments, in terms of the coverage of Natural Protected Areas, are summarized in Table 1 (above). In addition to PAs, Mexico also has a series of other biodiversity protection instruments, including Management Units for Sustainable Use of Wildlife (UMAs); PA voluntarily dedicated to conservation; private and communal PA; Ramsar sites; refugia for protecting aquatic species; restoration zones; municipal and state PA; and sites dedicated to research.

Institutional framework

100. It was not until the ECCAP was formulated in 2011 that specific proposals were developed for taking into account the implications of climate change for protected areas, the biodiversity that they contain, and the ecosystem goods and services that they provide. The ECCAP aims to orient CONANP's actions and decisions to convert protected areas into an effective instrument for adaptation and mitigation to climate change, enabling the concurrence of economic, technical and human resources. However, is not adequate on its own to ensure that effective measures are taken to reduce the vulnerability of PAs to climate change:

101. Despite the baseline investments, there are still deficiencies in information availability, planning capacities, inter-institutional coordination and collaboration, technical capacities in PA institutions and land managers, and local governance and planning mechanisms, which have impeded implementation.

102. In order to strengthen management effectiveness and resilience of protected areas to protect biodiversity under conditions of climate change, the project will prepare a framework which effectively safeguards BD from predicted CC impacts and addresses climate risks through institutional capacity building; will promote the expansion of PA system to protect important refugia through connectivity and increased resiliency; and will manage sites effectively for reducing climate-related threats to BD. Activities implemented during the project execution, will be directed to improve the baseline indicators established at the beginning of the project, as detailed in the Project Results Framework.

[84] Bezaury-Creel, J. E. *et al*. 2011 *Op cit.*
[85] DOF, 2013

2. STRATEGY

2.1 Project rationale and policy conformity

103. The project will contribute directly to the GEF Biodiversity Focal Area of conserving biodiversity and helping to safeguard the flow of goods and services from ecosystems, by helping to address the impacts of climate change on biodiversity. Climate change is one of the principal drivers of biodiversity loss and degradation of ecosystem goods and services highlighted in the Millennium Ecosystem Assessment. The focus of the project on strengthening the national protected area system, as a strategy for improving the resilience and adaptation capacity of biodiversity and ecosystem services, is in line with Objective 1 of the Biodiversity Focal Area, improved sustainability of PA systems.

104. Furthermore, the Project directly contributes to achievement of the Aichi Targets, in particular under the Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity. It also contributes to Target 11 through increasing significantly the coverage and connectivity of the PA system in important regions with high biodiversity importance and significant ecosystem services, and by increasing management effectiveness of the PA system in a way that is integrated into the wider landscape/seascape.

2.2 Country ownership: country eligibility and country drivenness

105. Mexico ratified the Convention on Biological Diversity on 3rd November 1993.

106. The present project responds directly to the provisions of the Climate Change Strategy for Protected Areas in Mexico (ECCAP[86]), prepared by the National Commission for Natural Protected Areas (CONANP) in accordance with the National Program for Natural Protected Areas 2007-2012 and as a response by CONANP to the Special Program on Climate Change of the Federal Government, and the Policy Framework for Adaptation to Climate Change that was presented at COP16. The general objectives of the ECCAP are to increase the adaptive capacity of ecosystems and of the communities that live within them in the face of climate change, and to contribute to the mitigation of greenhouse gases and enhancement of carbon stocks. The vision of the ECCAP is to conserve the natural heritage of Mexico in order to address the effects of climate change, by converting protected areas (PA) into an effective instrument for adaptation and mitigation, with the participation of diverse members of society.

2.3 Programmatic Framework of UNDP

Millennium Development Goals

107. This project directly supports the progress of the 7th Millennium Development Goal: Ensure environmental sustainability.

108. Mexico has made progress in meeting environmental goals in the past few years and has created innovative policies and programs to address climate change.

109. In relation to Target 9: "Integrate the principles of sustainable development into country policies and programs and reverse loss of environmental resources", during 2007-2009 México developed and executed studies on impacts, vulnerability and adaptation to climate change. Special attention was given

[86] CONANP. 2010. Estrategia de Cambio Climático para Áreas Naturales Protegidas. Second edition. National Commission for Natural Protected Areas and Ministry of Environment and Natural Resources. Mexico.

to the downscaling of climate change scenarios that incorporate expected changes in temperature and precipitation and their impacts due to a decrease in water availability, agricultural productivity, as well as their effects on human health, biodiversity and forest ecosystems.

2008-2012 United Nations Development Assistance Framework

110. Through the 2008-2012 United Nations Development Assistance Framework (UNDAF), the United Nations System in Mexico completed the process of programmatic harmonization, in accordance to the United Nations reform agreement and presented the government a joint proposal for the years 2008-2012.

111. The Project is linked to Outcome 3.3 of the UNDAF, "Environmental governance based on principles of mainstreaming, transparency, access to information, communication and participation of society, in order to ensure a healthy and productive environment for all people, respecting collective rights within the framework of international agreements, particularly those of regional scope."

112. In addition, it has a direct effect on the following priority of "Institutional and individual capacities strengthened to stop and /or reverse environmental degradation, support natural resources conservation, encourage participatory management, natural resources governance and promote human development through policies and programmes for sustainable development."

UNDP's 2008-2012 Country Programme Document

113. The 2008-2012 Country Programme Document (CPD) of UNDP Mexico recognizes that climate change mitigation and adaptation is an urgent matter of economic survival and social development.

114. This project is related with the CPD expected Outcome "Strengthened national and local capacities for mitigation and adaptation to climate change."

115. For this reason UNDP offers technical assistance in the compliance of the international commitments of Mexico and to strengthen national and local capacities to improve its strategies of mitigation and adaptation to climate change.

2.3 Design principles and strategic considerations

116. During 2013, the Mexican Government will spend US$253.18 million in consolidating the Protected Area System[87]. However, the gap analysis for Mexican PA shows that effective management requires a budgetary increase of 287% over the next eight years, representing an investment of US$ 2 billion over this timeframe[88], an amount that is far from being reached.

117. Sustainable financing for protected areas should consist of a combination of national and international resources and include the whole spectrum of possible funding instruments such as: public, private, national and international funding, remuneration of services provided by PA, at the national and international levels, as well as taxes and fees at the national level[89].

[87] DOF, 2013. *Op cit.*
[88] Bezaury-Creel, J. E. *et al.* 2011. *Op cit.*
[89] Ibid.

118. Ultimately, this project will contribute to decreasing the Mexican PA funding gap, allowing CONANP to (a) build a strengthened framework for safeguarding BD effectively from predicted CC impacts and address climate risks through institutional capacity building; (b) expand the PA system to protect important refugia through connectivity and increased resiliency; and (c) reduce climate-related threats to BD, through effective PA site management.

119. At the *national scale*, the project will contribute to:

- Strengthening the legal, institutional and policy framework (decision-making tools and instruments) to address predicted CC impacts and risks and increase resilience in PA.
- Strengthening multisectorial and multi-institutional financing framework and coordination.
- Expanding national PA in priority ecoregions, based on a landscape/seascape approach in order to safeguard globally-significant biodiversity from CC impacts and risks.
- Improving connectivity between PA and large habitat blocks outside PA, thereby decreasing the vulnerability of globally-important ecosystems and biodiversity to the impacts and risks associated with CC.

120. At the *local scale*, the project will contribute to:

- PA gazetting through Government declarations, including boundary demarcation and Management Programs; provision for public consultation; determination of governance arrangements, zoning plan and use rights for different zones with guidelines for implementing CC resilience and monitoring.
- Strengthened management of vulnerable PA based on participatory planning processes.
- Strengthened land use governance framework to guarantee PA conservation and increase resilience to CC risk.
- Community capacity programmes for planning, implementation and monitoring of site-specific co-managed strategies for increasing resilience in PA.
- Ordinances or other instruments that contribute to the reduction of forest fragmentation, and municipal action plans for environmental contingencies.
- Operationalization of PA management and surveillance/ enforcement with key stakeholders.

121. The main project responses that will be carried out under the GEF Alternative are summarized in Table 5, below.

Table 5. Specific project responses to identified threats and root causes.

Threat	Responses
Recession and/or degradation of coastal and marine ecosystems as a result of sea level rise	- Protection of additional areas to complement or replace the affected areas, including areas which are susceptible to future colonization by the ecosystems in question as conditions there become more favorable due to increases in humidity and salinity levels[90] - Protection of eroding edges from further erosion, assisting in leaf litter retention to enhance peat production and prohibitive management strategies, such as limiting the access of motor propellers to mangrove areas[91].
Coral mortality due to bleaching and swamping	- Intensification of controls on pollution and fishing in highest priority or most vulnerable sites in order to limit stress-related susceptibility to bleaching and protect populations of keystone functional groups [92] - Establishment of artificial reefs and coral nurseries[93]
Increased frequency of fires	- Introduction of integrated fire management practices (e.g. controlled burning, thinning and enrichment planting) in order to reduce risks of destructive fires[94] - Increased investment in fire control measures (equipment and early warning system)
Increased frequency of pests and diseases (e.g. Southern Pine Beetle *Dendroctonus frontalis* in forests affected by storm events[95])	- Modification of forest management regimes (e.g. sanitary fellings, informed by early warning system), to control outbreaks - Increased emphasis on protecting centers of genetic diversity (species and populations) as a resource for adaptation capacity
Regression and fragmentation of mountain ecosystems	- Active management of areas affected by regression in order to maintain effective sizes of habitats and populations, for example by maintaining broadleaved understory in pine forests adjoining cloud forest - Declaration and management of corridors in order to maximize connectivity[96]

[90] Titus, J.G. and M.S. Greene. 1989. An overview of the nationwide impacts of sea level rise. Pp. 5,1 - 5,54 *in*: J.B. Smith and D. A. Tirpak (eds.) The Potential Effects of Global Climate Change on the United States. Appendix B - Sea level rise. Environmental Protection Agency. U.S.A. .

[91] Ellison, J. C. 1992. Effects of sea-level rise on island mangrove swamps. Pp. 21-29 *in*: Coastal Resources and Systems of the Pacific Basin: Investigation and Step Toward Protective Management. United Nations Environmental Programme, Regional Seas Reports and Studies No. 147.

[92] Grimsditch G. D and R.V. Salm. 2006. Coral Reef Resilience and Resistance to Bleaching. International Union for Conservation of Nature. Resilience Science Group Working Paper Series 1. Switzerland.

[93] Healthy Reefs for Healthy People. 2010. *Op cit.*

[94] Rodríguez Trejo D.A. 2008. Fire Regimes, Fire Ecology, and Fire Management in Mexico. AMBIO: A Journal of the Human Environment 37:548-556.

[95] Moore, B. and G. Allard. 2008. Climate change impacts on forest health. Forestry Department, Food and Agriculture Organization of the United Nations, Forest Health and Biosecurity Working Papers FBS/34E.

[96] See e.g. "Nadkarni N. and Wheelwright N.T. (eds.). 1999. Monteverde: ecology and conservation of a tropical cloud forest. Oxfoord University Press. U.S.A." regarding corridors for neotropical cloud forest biota in Costa Rica, and how the management of ecosystems adjoining cloud forest in order.

Threat	Responses
Changes in productive dynamics of landscapes surrounding and linking PA	- Support to the development of production practices that are resilient to climate change (e.g. agroforestry) and landscape restoration, in order to stabilize processes of land use change
Changing demographic pressures	- Declaration of new PAs in priority areas vulnerable to future demographic pressures - Support to local environmental governance structures

122. *Incremental reasoning*: The baseline (without project) situation is described in paragraphs 98-104. Under the GEF alternative, existing PAs, complemented by new conservation areas that fill in key gaps in ecosystem coverage and connectivity, would be strengthened to confront climate change, increasing the resiliency of globally-important biodiversity and reducing ecosystemic and social vulnerability.

123. The GEF incremental contribution to the achievement of this alternative situation would be in the form of:

- The application of principles of geographical, inter-sector and inter-institutional integration into the planning instruments that govern PA, incorporating objective and scientifically valid considerations of conservation priorities, biological connectivity, population dynamics, ecosystem productivity, socioeconomic processes, livelihood support systems and the impacts of global climate change.
- Increased management effectiveness in the PA and adjoining productive seascapes and landscapes in the region, due to improved human and institutional capacities, increased access to management tools and information, and improved inter-institutional cooperation and coordination.
- The application of resilience-based mechanisms in the form of cost-effective management activities and projects piloted in priority PA within the 12 ecoregions, the results of which will feed into regional and national scale planning and information tools to be considered for replication in other PAs with similar ecosystemic characteristics and expected risks associated with climate change.

124. The project would lead to the consolidation of 6,486,509 ha of protected areas in 12 eco-regions to safeguard biodiversity from CC impacts through improved ecosystem connectivity and resilience. It would create a monitoring and information system to improve conservation and management of PA across Mexico in preparation of increasingly frequent climatic events and change. As such, it would improve the conservation status of a number of *globally*-important species.

125. The project would generate major benefits at the *national* and *local* levels by helping to pilot management and policy mechanisms to increase resilience and ultimately decrease the vulnerability of a large proportion of the country's natural resources, which are of importance for national food supply as well as for the livelihoods of the communities that depend upon them directly and indirectly.

126. National and local benefits would also include increased ability to cope with and adapt to the effects of global climate change. Improved protection of mangroves, for example, could serve to mitigate the impacts of hurricanes, to which sections of the coastal areas are particularly prone and which are expected to increase in frequency and intensity as a result of climate change. More generally, improved conservation of biodiversity and ecosystem health would increase the resilience of natural resources and associated livelihoods to changes in climatic conditions.

2.4 Project objective, outcomes and outputs/activities

127. The Objective of the project is to contribute to reducing the impacts of climate change on globally important biodiversity in Mexico by ensuring that the Mexican Protected Area System is spatially configured and managed to increase resilience. In order to achieve the Objective, and considering the barrier analysis presented in Section 1, the project's intervention has been developed around the following three Outcomes and their associated Outputs (in line with the approved PIF):

Outcome 1: Mexican PA system readiness framework effectively safeguards BD:

Total cost: US$ 6,995,402	**GEF: US$1,225,054**	**Co-financing: US$ 5,770,348**
Budget % of project:* 8.13%	**1.42 %**	**6.71 %**

* excluding management costs

128. CONANP is the institution responsible for protecting Mexico's natural heritage and ecological processes through the management and administration of natural protected areas (PA) and other conservation instruments, ensuring an adequate biodiversity representation and persistence through time. PAs offer advantages that other instruments do not (defined borders, legal clarity, governance frameworks, permanence, among others), and have been widely recognized by IUCN as a natural response to climate change through the capture and storage of carbon (mitigation), the maintenance and provision of ecosystem services, and the protection of populations and ecosystems (adaptation), while conserving biological diversity[97]. Resilience is defined as "the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change"[98]. It is a local process that results from adaptive capacity to the pressures or threats of a site in particular. However, due to the multidimensional character of PAs, resilience should be promoted at three levels (national, regional and local), and across three axes (Institutional, Socioeconomic and Ecosystemic; as portrayed below in Figure 6)[99].

129. To achieve this, four principal concepts are considered:

- Landscape / seascape planning[100]: Much of the threats that affect a PA have their origin outside of the PA's polygon, in the landscape that goes beyond CONANP's jurisdiction. By incorporating a landscape approach in the management and planning of the PA, these external influences are included to create an integral management of the territory. The landscape unit can be defined, for example, by a watershed, an ecoregion, a particular ecosystem, or other variables.

[97] Dudley, N., S. Stolton, A. Belokurov, L. Krueger, N. Lopoukhine, K. MacKinnon, T. Sandwith and N. Sekhran, eds. 2010. Natural Solutions: Protected areas helping people cope with climate change. IUCN/WCPA, TNC, UNDP, WCS, The World Bank and WWF, Switzerland and U.S.A.

[98] IPCC. 2007. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change (M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, eds.). Cambridge University Press. UK.

[99] Institutional: when institutional conditions have integrated policies and lines of action that reduce vulnerability to climate change, the Institution is considered to have high adaptive capacity; Socioeconomic: when social conditions are optimal, the population and sectors are organized and conscious of the risks, and have provided solutions to reduce their vulnerability to CC, the population is considered to have high adaptive capacity; Ecosystemic: when the ecosystem of a PA and its region are subject to plans and actions that regenerate or strengthen the conditions of ecosystem integrity, this has high adaptive capacity.

[100] Beier, P. and B. Brost. 2010. Use of Land Facets to Plan for Climate Change: Conserving the Arenas, Not the Actors. Conservation Biology 24:701–710.

- Connectivity[101]: With CC, species and ecosystems will tend to migrate latitudinally (northward) or altitudinally (to higher ground). Currently, many PAs are isolated, immersed in altered landscapes that do not permit the abovementioned movements. By connecting the PAs through corridors or stepping stones formed by other conservation instruments and productive matrices, the potential movement and adaptation of species and ecosystems will be facilitated when confronting changing conditions.

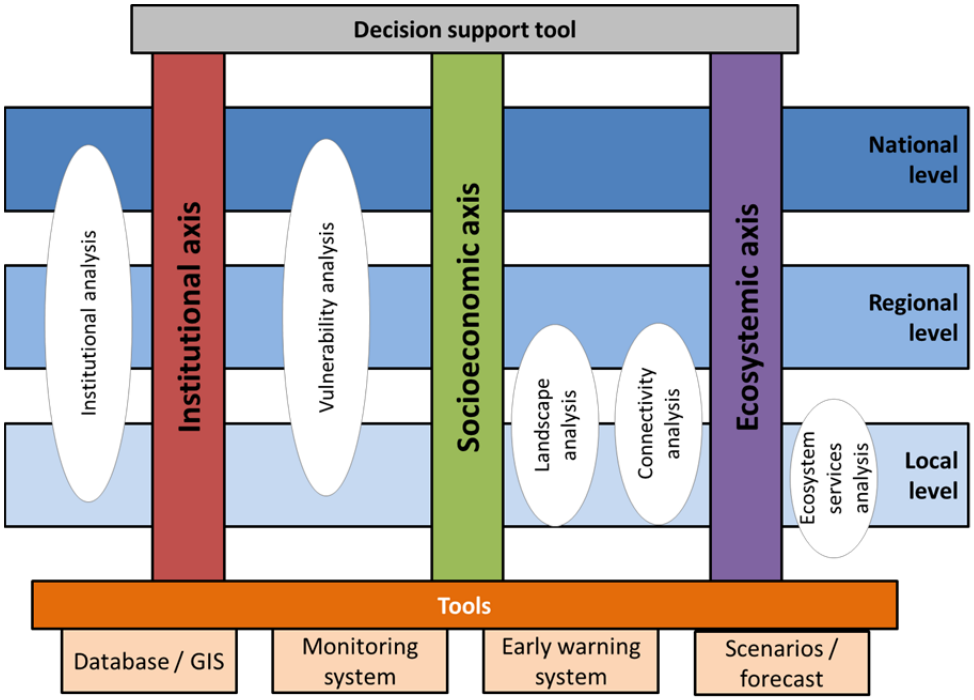
- Ecosystem-based Adaptation (EBA)[102]: This is a comprehensive approach to adaptation that considers not only the benefits to biodiversity but also to human communities. It recognizes that the loss of biodiversity directly influences the loss of ecosystem services that support human wellbeing, and values the role of ecosystems in providing a buffer from the impacts of CC on human communities and infrastructure. EBA uses sustainable resource management, conservation and restoration of ecosystem services to increase resilience to variability and climate change, and to reduce risks and vulnerability related to climate.

- Governance[103]: Governance plays a major role in conservation and working towards resilience. If it is not promoted, strategies applied will have little effect. To accomplish this, every decision must be made in a participatory manner, with every stakeholder involved, in order to take into account every point of view. This includes major organizations, such as national and local government, NGOs, academics, etc., as well as minority and groups under vulnerable conditions, such as women, indigenous people, and elders. The project will promote collaboration with the top environmental government institutions, CONABIO and CONAFOR, along with ENDESU (NGO) to promote national governance, and it is expected to accomplish cooperation and coordination with other sectors, such as central government (SEGOB), agriculture (SAGARPA), among others. It will also promote the participation of local populations in management decisions.

130. The Project will help CONANP develop this vision of three axes at three levels, to promote resilience in an integrated manner and through the strengthening of management effectiveness, beginning within and working outward, ultimately resulting in a Mexican PA system readiness framework that effectively safeguards BD. Management effectiveness refers to the degree that the planning and administration is protecting the PA values and objects of conservation and reaching the goals and targets[104]. It implies issues related with the design of the individual PA and the PA system, adequacy and appropriation of management systems, processes, and tools, as well as transmission of the PA goals and values of conservation. It depends on the human capacity (skills, knowledge and attitude), institutional capacity (institutional development), technology and methods, resources (human, financial and material), and a favorable environment (political, social)[105]. Strengthening these aspects will contribute to the consolidation of management effectiveness towards resilience.

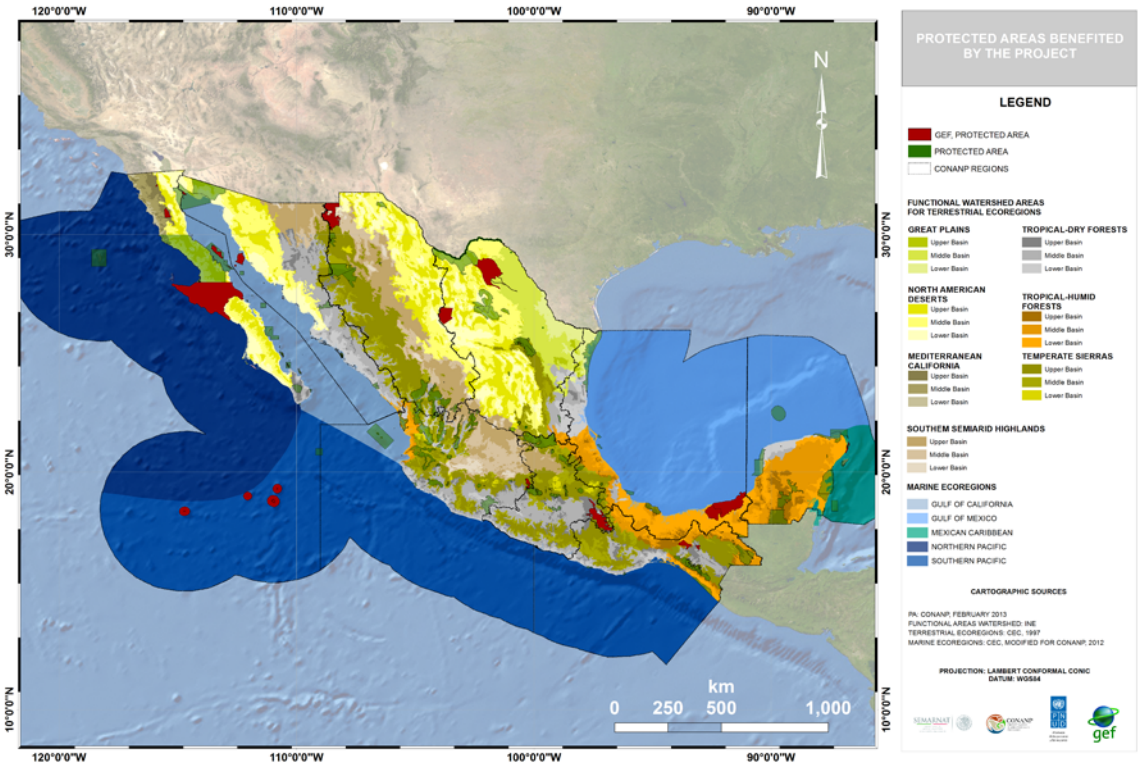
[101] Root, T. L. and S. H. Schneider. 2002. Climate change: overview and implications for wildlife. Pp. 1-56 in: Wildlife responses to climate change: North American case studies (S. H. Schneider and T. L Root, eds.). Island Press, U.S.A.
[102] Andrade, A; Córdoba, R; Dave, R.; Girot, P; Herrera-F., B; Munroe, R; Oglethorpe, J; Paaby, P; Pramova, E; Watson, E; Vergar, W. 2011. Draft Principles and Guidelines for Integrating Ecosystem-based Approaches to Adaptation in Project and Policy Design: a discussion document. IUCN- CEM, CATIE. Costa Rica.
[103] Meadowcroft J. 2009. Climate Change Governance. A paper contributing to the 2010 World Bank World Development Report. The World Bank.
[104] Hockings, M., Stolton, S., Leverington, F., Dudley, N. and Courrau, J. 2006. Evaluating Effectiveness: A framework for assessing management effectiveness of protected areas. 2nd edition. IUCN, Gland, Switzerland and Cambridge, UK. xiv + 105 pp.
[105] Bezaury-Creel J.E., et al. 2011. *Op cit.*

Figure 6. Readiness framework constructed by the project to achieve resilience



131. Under this scope, 17 PAs were selected for the local component of the project through a prioritization system. The system was based on the ecoregional distribution of PAs, and constructed using the spatial data from the 174 Mexican PAs (currently 176) on vulnerability drivers (e.g. demography, human development, hurricanes, fires, etc.) and other features (e.g. biodiversity, topography, etc.). The pre-selected PAs were then judged based on connectivity, operability (i.e. staff) and other sources of funding (for financial sustainability). Seventeen PAs were selected and will be managed as ecoregional landscape/seascape units (i.e. 12 ecoregional clusters; see Map 4 below). The robust quantifiable data compiled for this exercise allow this system to be completely replicable, as well as easily updated for use in further decision-making given that the original 174 PAs are all properly classified and accounted for.

Map 4. Protected areas selected through the priority system.



Output 1.1 Strengthened decision-making tools and instruments aimed at informing management and finance decisions to address CC risk to PA estate and promote resilience of ecosystems and communities against CC-induced threats.

132. Through Outcome 1, the project will work toward strategic level mainstreaming to address the organizational environment in which policies and programmes are developed and implemented. Several projects perform resilience activities in the field, but this is the first one that aims to increase institutional resilience in order to strengthen its response to threats and possible changes. By strengthening the institution, we ease the regional and local processes and favor long-term resilience. This can be done through activities such as building staff awareness and capacity, putting appropriate institutions or mechanisms in place and identifying entry points for resilience-based actions.

133. The project will support the mainstreaming of CC into national and institutional planning and management instruments and legislation. Mainstreaming is defined as "the integration of policies and measures to address climate change into ongoing sectorial planning and management, so as to ensure the long-term viability and sustainability of sectorial and development investments"[106]. In other words, climate change risks are not addressed through separate initiatives but inform ongoing development policy-making, planning and activities across all sectors[107]. Specifically, the project will work to mainstream the concept of safeguarding PAs and their BD as a vital tool to increasing resilience and decreasing vulnerability associated with CC risks. To do this, the project will build upon the Legal

[106] Klein, R. 2009. Impacts, adaptation, vulnerability and development: Key insights and challenges. Stockholm Environment Institute.
[107] Olhoff, A. and Schaer, C. 2010. Screening tools and guidelines to support the mainstreaming of climate change adaptation in development assistance- a stocktaking report. United Nations Development Programme. U.S.A.

Framework analysis conducted during the PPG in order to identify specific opportunities for mainstreaming resilience into national and institutional policy, as well as develop a strategy to be implemented during the project's lifetime to accomplish this.

134. Mexico's political and legal environment is beginning to realize the importance of resilience to climate change. The recently published General Climate Change Law (LGCC) already includes the importance of Protected Areas as instruments to promote resilience. For example, the General Climate Change Law includes the following:

> Art. 27 – The national policy on adaptation to Climate Change will be based on diagnostic, planning, measuring, reporting, verification and evaluation instruments which focus on:
>
> > I. Reducing the vulnerability of society and ecosystems to the effects of climate change;
> >
> > II. Strengthening the resilience and resistance of natural and human systems;
> >
> > IV. Identifying the vulnerability and capacity for adaptation and transformation of ecological, physical and social systems, and taking advantage of opportunities generated by new climatic conditions.
>
> Art. 29 – The establishment and conservation of protected areas and biological corridors is recognized as an adaptation strategy.
>
> Art. 34 – National, state and local governments and institutions shall reduce carbon emissions by preserving ecosystems and biodiversity, including the establishment of incentive schemes to absorb and store carbon in PA and conservation areas.

135. Nevertheless, neither the main environmental law, General Law of Ecologic Equilibrium and Environmental Protection (LGEEPA), nor its regulations (not even the Regulation on Protected Areas) include climate change or resilience information. While modifications to the Laws require lengthy processes that go beyond the scope of the project, the project will aim to participate actively in the elaboration of any pertinent legislation where appropriate, in order to mainstream PAs as an important instrument to promote resilience. CONANP's participation in the elaboration of the upcoming LGCC Regulation, for example, will pave the way for a national environment conducive to future updating of the LGEPPA and other important Laws. The National Strategy on Climate Change (ENACC 2007-2012) published in 2007, did not include the importance of PA as tools for resilience. Nevertheless, the most recent edition of the Strategy (now ENCC 2013-2018), published in June 2013 and aligned with LGCC, recognizes the importance of ecosystems as resilience and adaptation strategies. The project will contribute actively in the instrumentation of the ENCC 2013-2018 through participation in the elaboration of the new PECC, as well as supporting CONANP's efforts to accomplish the targets established by it.

136. Furthermore, the institutional policy is not entirely aligned regarding climate change and resilience. The ECCAP, published in 2010 (second edition in 2011), was the first institutional effort to include resilience to climate change, but was not included in the National Program for Protected Areas (PNANP, developed every six years). The project will contribute to the updating of ECCAP to align it with public and institutional policy (PNANP) and legal framework related to CC, as well as ensure coherence with the National CC policy and fund and to include a monitoring protocol that includes result-specific indicators. The project will also address mainstreaming CC and resilience into the CONANP Strategy for 2040 as well as into the PNANP for 2013-18, the two main instruments that will lead institutional actions in the short and long term.

137. The project will support CONANP in implementing its national strategy (ECCAP) for addressing the impacts of climate change on PA, their surrounding landscape, and constituent biodiversity. This will enable the ECCAP to be put into practice in harmony with recent laws (General Climate Change Law and its associated Regulation, currently under elaboration, as well as the Rural Sustainable Development Law and its 2012 Reform) and the national programs under development for this 6-year governmental period.

In addition, national plans and priorities for PAs will be reviewed in order to ensure that overall coverage figures for priority ecosystems and species are maintained under different climate change scenarios. Economic and spatial planning instruments and policies will also be reviewed so as to make certain that opportunities are provided for the required establishment or expansion of PAs and for addressing threats that may affect their viability (such as pollution and overfishing).

138. National and international legal and policy frameworks on gender, including GEF Gender criteria, and CC will be applied to PA Management Programs and guidelines. The project will increase institutional capacity to mainstream gender into PA Planning and Management.

139. Furthermore, the project will conduct an integrated vulnerability analysis (social and environmental) of the 12 ecoregional clusters through Outcome 3, which will feed into the analysis and strategy of this Output. This will include regional meteorological forecasts to determine potential CC impacts on priority sites within the Mexican PA system and their biodiversity, so as to inform decision-making with more localized data. The vulnerability analysis will be the basis of decision-making tools such as Management Programs and PACCs and will be upscaled for national-level decision-making. Each pilot PA will determine an ecosystemic plan in response to the regional scenarios and will act as models for possible strategies for other PAs with similar ecosystems across the Mexican PA estate.

140. The project will increase the institutional capacity through Planning and Management Instruments that mainstream CC into integrated land-use planning that increases resilience. Currently there are TORs on how to elaborate Management Programs with general CC considerations, and a Supporting Previous Study for decreeing new PAs with CC considerations. These TORs will be revised and modified in order to mainstream CC resilience in all of CONANP's institutional management and planning instruments, and a Guide on how to strengthen planning and management instruments to mainstream CC, reduce risk and promote management effectiveness will be created. This will ensure that future decreed PA and new Management Programs, as well as other instruments, are aligned with the ECCAP and the national policy, thereby strengthening the national environment for increasing resilience.

141. The current decision-making tools will be strengthened and complemented by the GIS BD database and map layers to be produced and updated during project implementation, as well as the national information system to be developed and implemented under Output 1.3 elaborated in coordination with CONABIO, CONAFOR, CONAGUA, SMN, and others. To date, the GIS database developed during the PPG contains information layers on the 176 PAs regarding meteorological data (rainfall and maximum temperature tendencies), social data (population number, Social Backwardness Index, which is inverse to Human Development Index), data on climate-aggravated threats and other impacts (fires, hurricanes, increase in sea level rise, change in vegetation cover), biological data (potential biodiversity, primary vegetation), topography data (slope, altitude above sea level). Also, the data for the 17 PAs has been systematized to provide basic analysis regarding zoning per Management Programs and land-use planning, other conservation instruments, current state of vegetation (as in INEGI series) and Land Use Change (currently available for 5 PAs). Additional data sets exist in isolation. It is expected that during project implementation, these additional data sets will be added to the system, including regional climate change scenarios, in order to make available all of this information for all of the PAs in a systematized and usable manner. Furthermore, Land Use Change analysis will be developed for the 12 remaining PAs. Finally, a connectivity map will be developed for use by CONANP stakeholders, to make informed decisions on where to decree new PAs and other conservation instruments.

142. The main planning and management instruments within CONANP to benefit from these tools are Management Programs and PACCs. Currently, a review and update of individual Management Programs is allowed once every 5 years, with an exception in the occurrence of an "extreme" event. The project will work to position CC as an "extreme event" so as to enable a review of current Management Programs that would not necessarily be eligible for reviews and updates within the project's planned implementation period. To accomplish this, the project will contribute to the modification of the terms of

reference of the Management Programs and will develop Official Guidelines for planning and management instruments in order to include climate change, resilience, landscape planning, gender equality and other important concepts into the main planning and management instruments.

143. Additionally, the PACCs will be adjusted to include a financial component to ensure that their actions and strategies are sustainable, and that the GEF contribution serves as a seed for promoting financial sustainability as set out in Output 1.2. The Project will also enrich the community participation component of the PACCs, analyzing current and potential actors that could play an important role in decision-making process as well as in the instrumentation of management strategies within and around the PA. Hence, the project will construct innovative and integral PACCs that include vulnerability analysis and adaptation measures, a business plan and governance strategy.

144. In order to ensure that the abovementioned instruments are adopted and effectively applied, the project will support the raising of awareness among policy makers and local stakeholders necessary to bring about such changes, regarding the nature, magnitude and implications of the impacts of climate change, and particularly regarding implications for human vulnerability to environmental extremes and climate change processes. To accomplish this, a consultative process with strong stakeholder engagement, including indigenous communities and women, will be implemented.

145. A communication strategy will be developed during the implementation phase, based on recommendations by CONANP's communication department and environmental-communication experts, as well as UNDP. The strategy must include a clear definition of communication targets (who), key messages (what), objectives of communication (why) and the strategy itself (how). Dissemination instruments to this end will include a major publication for stakeholders and policy makers that will consider PA management effectiveness in a climate change context, and shall include the benefits provided by PA, potential CC impacts in easily-understandable terms, possible adaptation strategies, case studies, and supporting maps. These will be complemented by extra materials for the use in the field, such as maps, infographs, and other publications in Spanish and indigenous languages, where appropriate. Smaller publications will be developed for the general audience, such as posters, infographs, videos, flyers and games suitable for mass distribution, conferences, media events, email postings and website(s). All of the instruments will be generated *ad-hoc* to the target public, and the communication strategy will take into account gender equality and non-discrimination criteria, and inclusive mechanisms for disseminating information will be designed.

Output 1.2 Multisectorial financing framework through institutional mainstreaming and coordination supports ecosystemic and community resilience through implementation of the ECCAP.

146. One of the key mechanisms that is missing to implement the ECCAP is a financial framework that recognizes the vulnerability of ecosystems and communities to climate change. The project will support CONANP's internal budgetary restructuring process to ensure finance and human capital is deployed to address specific risks associated with CC. While a financial gap concerning the PA system's general operations has already been defined and addressed by other projects[108], CC resilience is a new issue and its implications on CONANP's budget have never been assessed. To address this, the project will embark on a study to identify what is the financing gap specific to CC within the ecoregional clusters.

147. Business plans will be constructed for each ecoregional cluster. Each business plan will include a short term strategy to reduce the identified CC financial gap based on the following 4 steps: 1) Identification of current and historical funding sources related to CC within CONANP; 2) Identification of funding needs (financial gap) in each PA as well as in the institution itself based on current funding,

[108] Bezaury-Creel, J. E. et al. 2011. *Op cit*; CONANP et al. 2013. *Op cit.*

capacity and conservation gaps, social and gender vulnerability, and projections of change under different climate scenarios; 3) Evaluation of financing options and definition of a selection process; and 4) Development of a financial strategy and business plans (with ongoing interaction between Steps 3 and 4). Individual financial sustainability strategies in each of the 12 priority sites will be developed, which will define how to ensure the availability of the financial resources required for maintaining the conditions of resilience and adaptation capacity created by the project, under different scenarios of climate change and different assumptions regarding the time horizons and priorities of policy makers. Key elements of this strategy will include the generation of additional funds from Government and private sector sources in recognition of the economic costs that would result from failing to anticipate the impacts of climate change on the ability of PA to provide environmental goods and services; and the improvements in the efficiency with which existing funds are used, for example through the allocation of funds to regional clusters of PA, from where they can be redeployed to specific sites based on need. In addition, the project will support the development of specific programmes for promoting the resilience of the principal different ecosystems represented in the country that are likely to be at most risk from the effects of climate change, such as coral reefs[109], mangroves, cloud forest and pine forest[110].

148. By project end, a tool will be developed to calculate the financial gap for CC based on the experiences and lessons learned from the 12 business plans. This will build upon the institutional strategy to reduce the overall financial gap, already underway. Consequently, CONANP will have an integral and more complete strategy to reduce its financial gap including CC. The project will also identify opportunities and mechanisms to direct 10% of CONANP's operational and subsidies budget directly to resilience-based activities in PA. Subsidies programs like PET and PROCODES, and other programs such as PROMOBI and PET, could be modified in order to consider resilience activities as eligibility criteria or resilience indicators.

149. The project will engage in brokering CC finance from national budgets to address CC threats on the PA system by the inclusion of the idea of PA as climate change resilience instruments. In particular, the project will work with different federal entities to identify opportunities within existing programs and subsidies to adapt them to include resilience targets. The project will develop policy guidelines for a multisectorial coordination and communication platform to attain budgetary coordination between institutions and sectors (CONANP, CONABIO, CONAFOR; SEMARNAT, SAGARPA, SEDESOL, CIBIOGEM, CONAGUA, SINAPROC, SEGOB, SEP, etc.) and their instruments (PRONAFOR, UMAs, State Biodiversity Strategies, PES, among others), to ensure coherent investments and address threats in a cost-effective manner in the PAs and their zones of influence. Specifically, the project will seek out multisectorial agreements with SEDESOL, SAGARPA, INMUJERES, CDI and other governmental institutions, in order to develop a platform for continuous cooperation and coordination to align the instruments of the different entities and develop an investment framework for ECCAP. Furthermore, working groups will be established to deal with particular problems regarding the institutional framework or at a local level to direct multisectorial interventions in PAs based on ECCAP and develop the political will necessary among involved parties. In particular, inter-institutional agreements will be pursued with SAGARPA and SEDESOL to provide the basis for the elaboration of three pilot resilience-based BD conservation projects with multisectorial financing. The projects will be based in terrestrial, coastal and marine areas to demonstrate resilience in different scenarios, ecosystems and communities, and will serve as models of multisectorial co-investment in resilience. The cooperation mechanisms in these pilots might also be realized through direct interventions in the field, technology, infrastructure, training, publications and other non-financial support.

[109] Veron J. E. N., *et al.* 2009. The coral reef crisis: The critical importance of <350 ppm CO_2. Marine Pollution Bulletin 58:1428–1436.
[110] Villers-Ruíz, L. and I. Trejo-Vázquez. 1998. *Op cit.*

150. There are two important platforms that will work to promote these efforts. The first one is the Mexico Resiliente Alliance, an initiative formed by 23 representatives of Mexican government environmental institutions, NGOs, academics and international institutions that work together to promote resilience and adaptation in protected areas. The second is the Interministerial Commission for Climate Change, which involves several governmental sectors to make coordinated decisions regarding climate change. Of special interest is the Special Program for Climate Change Working Group (GT-PECC). The PECC includes a list of binding activities that government institutions must perform during the period (six years) in order to promote climate change adaptation, mitigation and long-term vision. Therefore it will be important to engage the PECC to effectively coordinate with "opposing" sectors (e.g. agriculture), in order to work together towards resilience.

Output 1.3 ECCAP implementation through mechanisms and monitoring systems of BD and CC in coordination with other actors.

151. The project will strengthen institutional access to and use of information to adapt management decisions through the construction of a national PA Information system. Through collaboration with CONABIO, CONAFOR, CONAGUA, SMN and other institutions, the project will work on the development and adaptation of a national system for information, monitoring, evaluation, disseminating and responding to information on the impacts of climate change on PA and on the effectiveness of resilience strategies, and early warning systems for detecting threats exacerbated by climate change. There are isolated efforts on biological monitoring, such as the PROMOBI (Program for Biological Monitoring in PA, of CONANP), the SNIB (National System of Biological Information, of CONABIO); and on geospatial data in separate unlinked sources (CONABIO; CONAFOR; INEGI). The project will work on the acquisition, analysis and management of available and new geospatial data on biological, physical, environmental, social, and other important variables. This will be the basis to build a monitoring and evaluation system constituted by environmental and biological variables that will serve as indicators of climate change effects, such as phenology, demography and other ecological processes. Together, these variables will provide the base for an integral indicator of ecosystem integrity that is more likely to reflect resilience than individual variables.

152. This system will play an essential role in allowing the application of an "adaptive management" approach to responding to climate change, which is particularly important given the levels of uncertainty that exist regarding the magnitude and nature of its impacts. This will build upon the considerable advances made by CONABIO to date in environmental monitoring and early warning of fires, and will focus in particular in developing mechanisms whereby the information generated is fed into decision-making through links between CONABIO, CONANP, CONAFOR, SAGARPA and other institutions. The moment to implement the PA Information System is ideal, since it will allow the project to align the methodology and type of indicators with a National Degradation Monitoring System (NDMS) currently under construction in CONABIO, making the data comparable. However, the PA Information System will be composed of more indicators, and variables will be measured in a more frequent manner than the NDMS, thereby responding to the institutional needs for detecting climate change impacts.

153. Currently, there are 53 meteorological towers in place throughout the Mexican PA system that are generating data regarding temperature, rainfall, soil moisture, wind speed and direction, combustibility, solar radiation, among others. CONANP is currently negotiating with CONAGUA and SMN to install additional towers in PAs during the project's lifetime. The project will support CONANP's efforts in designing and implementing a National Climate Information Portal to capture, digest and disseminate the information generated for individual PA to inform their decision-making processes. An important aim is to generate an early alert system, based on the identification of thresholds in different social, environmental or biological variables, specific to each ecosystem/ecoregion, to be available in real-time, in order to inform adaptive management decisions. The National Center for Disaster Prevention (CENAPRED) has set up a preliminary early alert system related to earthquakes, landslides, municipal flooding, tropical cyclones and hotspots in forests. The project will coordinate with CENAPRED to

determine if and how this system might be linked to the Portal. This Portal will act as a nationwide system for monitoring, analyzing, disseminating and responding to information on the impacts of climate change on PA and on the effectiveness of vulnerability reduction strategies. It will complement a National communication strategy to prepare PA managers and PA stakeholders to address in advance anticipated impacts from climate induced threats. The information will be made available in two ways: 1) processed and transformed into a user-friendly bulletin, and 2) raw data that can be used for deeper analysis or research. PA staff will be trained to develop the required capacity to not only read the data but to interpret it and translate it into management decisions.

154. The Project will also engage PA staff in capacity development regarding the interpretation and use of information generated by the Portal and other management capacities (e.g. on planning, management and evaluation of projects) to be determined during the implementation phase in order to homogenize the knowledge on threats, risk, effects of CC and adaptation measures. The project will support implementation of the PA Information System by strengthening human resources through training on adequate technologies and methodologies for monitoring.

155. The pilot programs implemented under Outcome 3 will provide initial steps toward the establishment of a long-term BD monitoring system for targeted species and ecosystems. During the PPG phase it was determined that each ecoregional cluster would monitor indicator species that are endemic, endangered, sensible to habitat quality and/or highly vulnerable to CC. The monitoring of these species will feed CONABIO's SNIB (National Information System on BD) and CONANP's SIMEC (System of Information, Monitoring and Evaluation for Conservation). CONANP will have direct access to SNIB, and with the information generated through the Portal will be able to manipulate different variables according to the needs of each PA, thus creating a national BD and CC monitoring system that goes beyond basic counting of species' populations, but also takes into account associated CC factors to enable more complete analyses for decision-making and adaptive management at individual PA, ecoregion and national levels.

Outcome 2: Expansion of PA system to protect important refugia through connectivity and increased resiliency:

Total cost: US$ 31,424,452	**GEF: US$2,938,180**	**Co-financing: US$ 28,486,272**
Budget % of project:* 36.53 %	**3.42 %**	**33.12 %**

* excluding management costs

156. Protected areas are recognized as one of the most efficient and effective tools for avoiding land-use change and achieving long-term conservation objectives for biodiversity and ecosystem services, as well as the cultural values associated with them[111]. International recognition is growing for PA as a tool for CC mitigation and adaptation, given their contribution to adaptive capacity of the ecosystems and populations that live within and around them, as well as their capacity for GHG mitigation and carbon sequestration. Furthermore, PA conserve important BD capital and ecosystem services so by maintaining ecosystem functions and integrity, the project will contribute to reduce ecosystemic and social vulnerability to CC risks. Consequently, it is vital to increase the ecosystemic and social resilience of PA in order to ensure their capacity to provide these important services and ultimately contribute to the conservation of globally-important biodiversity and reduction of social vulnerability across the nation.

157. By increasing resilience in species, ecosystems and human communities, the Project seeks to contribute to reduce their vulnerability to CC and allow for a greater capacity to adapt to potential

[111] Dudley, N., S. et al. 2010. *Op cit.*

changes in the future. In order to achieve this, the project will work through four basic concepts (described above):

- Landscape planning
- Connectivity
- Ecosystem Based Adaptation
- Governance

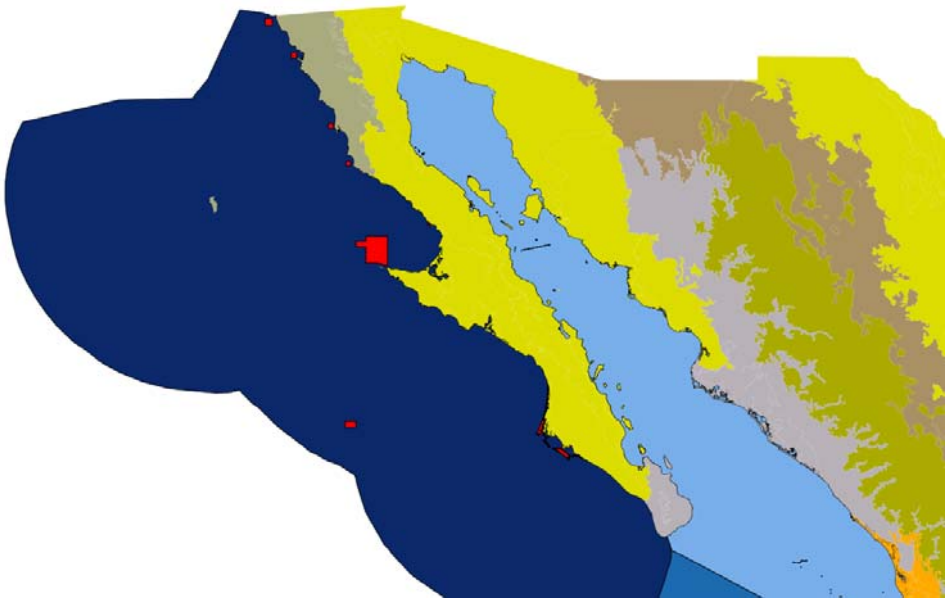
158. The project will support the application of the three concepts mentioned above to planning the expansion and establishment of conservation areas[112], and the modification of management regimes, in order to compensate the fragmentation of ecosystems that is expected to result from land use change and climate change and to anticipate the spatial migration of ecosystems that is expected from sea level rise, changes in moisture regimes and the upward movement of isotherms.

Output 2.1 National PA expansion in priority ecoregions based on a landscape approach and facilitated by GIS database and marine and terrestrial connectivity studies

159. The boundaries of key areas for PA expansion and landscape management will be defined per ecoregion and gazetted on the basis of information and GIS analyses from Outcome 1 that overlay the locations of priority species, ecosystems and areas of connectivity and management, and the implications on these of climate change. Definition of specific areas for expansion will occur during Year 1, but during the PPG it was determined that approximately 230,861 hectares will be added to Terrestrial areas, while a new Coastal-Marine PA might be established in the islands of the Pacific, covering an area of 369,139 hectares (blocked in red in Map 5 below) for a total of 600,000 hectares of new areas included in new or existing conservation areas nationwide:

[112] The term 'conservation area' reflects the landscape-level approach that the project will apply to biodiversity conservation and adaptation, which will go beyond protected areas in their strict sense to include areas of connectivity between them as other schemes of conservation, such as UMAs, PSA, voluntary and community-based conservation areas, among others.

Map 5. Location of possible new PA in the Pacific Islands[113]



160. The project will work toward the inclusion of representative ecosystems into conservation categories to enhance the PA condition. It will identify and include new ecosystems under mechanisms of conservation in order to create and enhance connectivity and landscape harmony of the 12 ecoregional clusters to strengthen their resilience and reduce ecosystemic and social vulnerability. Given that the creation of new areas strongly depends on the political will of local stakeholders, the project will engage in negotiations with the necessary actors once the priority areas are identified.

161. Expansion of the PA system will likely occur in three different ways: (i) expansion of the existing PAs in priority ecoregions, by the definition and gazetting of new influence zones based on a landscape approach; (ii) increasing connectivity between PAs through the establishment of new PAs or areas of conservation and community-based conservation areas that will work as the stepping stones towards constructing a well-connected resilient PA system; (iii) and upgrading the status of individual PAs or areas of conservation. By increasing the surface area of important ecosystems through the identification of new areas of conservation, the project will foster increased resiliency of the 17 PAs found in the 12 ecoregional clusters. The establishment of new areas of conservation will be determined by a consultative process with strong stakeholder engagement including the views of land owners (ejidos and communities, women and men), and will not affect indigenous people or women's interests and rights. New conservation areas could be established in several schemes: Federal protected areas, Estate or Municipal protected areas, voluntary and community-based conservation areas, Biodiversity Management Units (UMA of CONABIO), Payment for Ecosystem Services (CONAFOR's PES), among others. Coordination with CONAFOR's PES program is of particular interest, since it can be applied inside PAs to promote resilience, or outside PAs to promote connectivity, in addition to the benefits it provides to nearby communities through the economic profit derived from conservation.

Output 2.2 Incentive schemes in place

[113] CONANP, 2013

162. The project will support the elaboration of ecoregion-specific incentive schemes and initiatives to strengthen resilience and connectivity, thereby decreasing social and gender vulnerability. Attention will be paid to analyzing the financial, policy and governance frameworks that determine land use in these areas, in order to ensure that enabling conditions exist for the establishment, scaling-up and maintenance of sustainable production practices in the longer term, for example through the application of systems of payment for environmental services (an area in which CONAFOR is currently investing heavily) in its various forms. CONANP and CONAFOR have worked together in PES Concurrent Funds, and the presence of CONANP staff in the field is a key factor of success for PES program, as well as the synergies between two institutions which invariably widen the benefits in a temporal and/or spatial scale. In recognition of this, the project will foster collaboration between CONANP, CONAFOR and other partners in the pilot PAs to expand a system of incentives across the 12 ecoregions. This will not constitute a classic PES scheme based on markets that want to buy services and producers wanting to sell. Rather, incentives will be provided to farmers, fisherfolk and local/indigenous communities that commit to protect the biodiversity on their lands (e.g. forests, native grasslands, coast, mangroves, etc. according to the ecoregion). Priority will be given to areas with high threats of conversion/degradation, high ecosystem services value and high poverty levels. These incentives will therefore focus on safeguarding existing biodiversity assets rather than promoting land-use change. GEF support under this Output will consist of the identification of opportunities specific to each ecoregion as well as the provision of advice on the inclusion of resilience considerations related to biodiversity in the criteria used for the prioritization of applications for support. These considerations could include the location of set-asides in relation to actual or proposed biological corridors, as well as the ranges of priority species. It will also support the development of technical prescriptions for the cost-effective management activities to be executed in Outcome 3, such as the use of appropriate species, the promotion of specific and structural diversity, provisions for internal refuge areas and breeding sites for selected wildlife species, and mechanisms for engaging local communities. The detailed vulnerability analysis from Output 3.1 and BD & CC monitoring mechanism proposed in Output 1.3 will permit the identification of indicator species and the monitoring of the effectiveness of these incentives in terms of increasing resilience of this important biodiversity.

163. The project will engage the different actors (CONAGUA, CONAPESCA, SAGARPA, etc.) in the PA' zones of influence to identify plausible incentives for different users. The Project will engage the State and Municipal Institutes on Women and local gender organizations in order to ensure that attention is paid to gender and cultural needs and perspectives and promote a more active role in discussions and decisions about PA Management Programs, PACCs and incentive schemes. The pilot projects in the 12 ecoregional clusters in Output 3.1 will provide on-the-ground experiences in applying the incentives identified for their corresponding ecoregion. An effort will also be made to engage in the modification of CONANP's current incentive programs, in order to include resilience activities. The project will seek to strengthen collaboration with local small producers to increase connectivity and resilience via activities funded for Ecosystem Based Adaptation, ultimately resulting in economic remunerations for local populations, as well as ecological benefits.

Output 2.3 PA gazetting through Government declarations including boundary demarcation and Management Programs; provision for public consultation; determination of governance arrangements, zoning plan and use rights for different zones with guidelines for implementing CC resilience and monitoring.

164. As mentioned above, GIS will be used to determine the boundaries of key areas for PA expansion and landscape management. In addition to expansion of current PA, the project will determine the feasibility of developing appropriate studies, consultations, and support for the declaratory process of at least 1 new PA. The new PA would facilitate the protection of critical ecosystems in 369,139 hectares in and around some of the 30 islands of the Pacific, off the coast of Baja California. The protection of these islands is of high priority for several reasons. They have a high level of endemism, including reptiles,

birds, mammals and two plant families; there are several reproductive colonies of marine mammals, including one of the largest colonies of elephant seal, and several colonies of sea lions and harbour seals; there are several reproductive colonies of marine birds; they have representative ecosystems that are less disturbed than those in the continent, such as pine and cypress forest, coastal, desertic and xerofilous scrubland, mangrove, wetlands. The waters around the islands are highly productive, with several commercial species. Of utmost importance, however, is the protection of the interactive relationship between the ocean and the islands, represented through important trophic networks.

165. The declaration of each new PA in the Official Federal Diary (*Diario Oficial de la Federación)* and other conservation instruments such as municipal PA, voluntary conservation areas, community-based conservation areas among others, will include the following components: a) boundary demarcation and Management Programs; b) provision for public consultation; c) determination of governance arrangements, zoning plan and use rights for different zones; d) and the obligation to formulate Management Programs with guidelines for implementing CC resilience and monitoring, ensuring participation of inhabitants, property owners, as well as other competent dependencies of the Federal Public Administration, State and Municipal governments, social, private and public organizations and any other interested person. A systematic review may also lead to recommendations for status upgrades (e.g., from state to national status) and international designations (such as Ramsar sites or World Heritage Sites) in order to ensure higher levels of protection and investment for their infrastructure and operations.

Output 2.4 Functional connectivity improved between PA and large habitat blocks outside PA through stewardship (conservation compatible land use on public and private lands).

166. The cost-effective management activities and resilience-based activities to be piloted in Outcome 3 will lend, in part, to maintaining or increasing areas of functional connectivity between critical habitat blocks surrounding or inside PA to enhance resilience. The project will engage local actors (ejidos, communities, women and men, indigenous communities, private and public land owners) in activities, incentives or projects that promote good practices in connectivity, restoration and reduction of social/gender vulnerability in areas of conservation. Critical to this will be the development of the incentive schemes in Output 2.2.

167. For example, the project will support the introduction, into the landscape surrounding and linking the core zones of PAs, of production systems that are resilient to climate change and that restore the biological functioning of the landscapes and their capacity to provide biological and environmental services. This will serve to stabilize processes of land use change, thereby reducing the risk that climate change will oblige farmers to expand their areas under cultivation or to migrate into PAs. Given that the primary focus of this project is on the PAs themselves, investments of GEF funds outside PAs will be limited, focusing on those areas that are identified as being of particular importance for connectivity, or particularly vulnerable to productive collapse, and on the provision of advice to Government institutions and farmers in the development of resilient practices for production and restoration, for example through applied research and experimentation, rather than on major investments at field level. The project will build on ten years of experience of the Meso-American Biological Corridor implemented in the four southernmost states of Mexico (Campeche, Chiapas, Quintana Roo and Yucatan) and the recent efforts of CONANP and GIZ in the Ecological Corridor of the Sierra Madre Oriental (CESMO). All consultation mechanisms will ensure the principles of free, prior and informed consent and gender equality. Furthermore, the project will apply mechanisms to ensure Environmental and Social Safeguards. Stakeholders such as State and Municipal Institutes of Women will be engaged to contribute to establishing participative decision-making processes.

Outcome 3: PA site management effectively reduces climate-related threats to BD as demonstrated through pilot activities and improved METT scores:

Total cost: US$ 47,594,358	**GEF: US$5,542,990**	**Co-financing: US$ 42,051,368**	
Budget % of project:* 55.33 %	**6.44 %**	**48.89 %**	

* excluding management costs

168. The project will also carry out field level actions in protected areas which are identified, through the national level processes of analysis proposed under Outcome 1, as being particularly critical in terms of the potential impacts of climate change on globally important biodiversity and on flows of ecosystem goods and services. The project's actions under this component will mirror those proposed at national level under Outcome 1, but will be specific to individual PAs in the 12 ecoregional clusters. The process will start with analyses of the impacts and threats of climate change on each priority site, including maps indicating probable changes in ecosystem boundaries and conditions. On the basis of this information, it will support the development or modification, as appropriate, of Management Programs for existing, new or expanded conservation areas, reflecting the changed conditions expected as a result of climate change and including provisions for resilience and adaptation. The specific management strategies to be applied are described below and will be validated during the implementation phase.

169. In addition to the METT, an important indicator will be the GEF Capacity Development Scorecard scores, with specific emphasis on improvements in the following areas:

- for strategy, policy and legislation development (Q 9,11)
- for management and implementation (Q 13)
- to monitor and evaluate (Q 14)

Output 3.1 Strengthened management of vulnerable PA based on participatory planning processes, focused on the design and implementation of Programmes of Adaptation to Climate Change (PACC) for each site (based on site-specific information to address predicted CC threats; protection of erosion; integrated fire management and control practices; improved disease outbreak control; management of corridors and improved production practices) in order to reduce vulnerability.

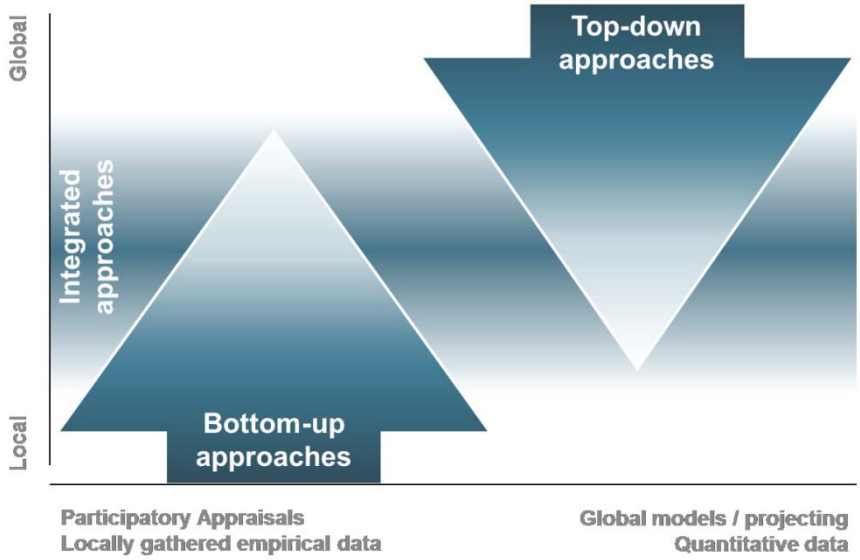
170. As mentioned in Outcome 1, the project will conduct an integrated vulnerability analysis on the 12 ecoregional clusters and a prioritization of the identified adaptation strategies (including cost-effective management activities). Vulnerability analysis helps to identify the nature and extent to which climate change may harm a country, region, sector or community, to identify measures and policies that reduce vulnerability and that will help to minimize or reduce harm (i.e. to adapt)[114]. The analyses will be constructed based on the existing institutional *Guide for the preparation of programs of adaptation to climate change in protected areas*, and after identifying the conservation objectives, will validate the proposed cost-effective management activities from this output or identify new strategies or projects to reduce vulnerability. Vulnerability assessment may be performed per socio-economic or biophysical exposure units[115] (or a combination of both), and at different scales depending on the purpose of the analysis. It may also be constructed in two ways: top-down or bottom-up. Top-down approaches are scenario-driven assessments, typically at a global or regional scale. They may be indicator-based (relying on available proxies) or model-based (requiring more data and deeper analysis). Bottom-up provides a more local analysis with emphasis on a short-term time scale, where vulnerability to current climate variability serves as a starting point for understanding vulnerability to future climate conditions. It may

[114] GIZ. 2013. A closer look at vulnerability assessment. Inventory of Methods for Adaptation to Climate Change, Germany.
[115] An exposure unit is an activity, group, region or resource exposed to significant climatic variations. Source: www.ipcc-data.org.

also be based on a set of available indicators. In integrated approaches, elements from both methods are combined to complement each other[116].

171. Vulnerability analyses of the 12 ecoregional clusters will be integral, with elements from both approaches, with deep analyses at a local/sub-regional scale (see Figure 7 below). Availability of information is not homogeneous across the clusters, so each analysis approach will be defined *ad-hoc*. The analyses will include regional meteorological forecasts to determine potential CC impacts on priority sites within the Mexican PA system and their biodiversity, so as to inform decision-making with more tailored data. The project will support detailed analyses of current ecological, biophysical, social, economic and cultural conditions, including gender implications, as well as the possible implications under different predicted CC scenarios, by national and international experts in each field. These analyses will examine, for example, likely reductions in the areas of priority ecosystems and species, based on considerations of their tolerance limits to environmental parameters; the implications of the climate change-related modification or loss of forest habitats for water yields; the implications of climate change for livelihood sustainability and consequently for demographic pressures on protected areas; and the economic implications of the loss of environmental goods and services from PAs as a result of climate change, compared to the costs of adapting to this situation or preventing it by investing in promoting the capacity of PAs to generate them.

Figure 7. Vulnerability assessment approaches[117].



172. The vulnerability analysis' forecasts and predictions will be the basis of decision-making tools such as Management Programs and PACCs and will be upscaled for national-level decision-making. Each pilot PA will determine an ecosystemic plan in response to the regional scenarios and will act as models for possible resilience strategies for other PAs with similar ecosystems across the Mexican PA system. Parallel to this, the project will contribute to the elaboration of 5 new Management Programs with specific management guidance related to CC components. Currently, two PAs have a Management Program with CC, 11 PAs have a basic Management Program without CC, and 4 PAs have no

[116] Ibid.
[117] Ibid.

Management Program at all. Given that the MP is a basic requirement for all PAs, the project will support the elaboration of the 4 missing MPs, ensuring that gender, ethnic and CC components are included. Two of these will complement the regional PACC in their ecoregions. Furthermore, 9 regional PACCs will be elaborated to provide CC components that are complementary to the 13 PAs' MPs already in existence. Institutional capacity to mainstream gender into PA Planning and Management will also be increased. These MPs will be adjusted based on results from the pilot strategies described below.

173. In order to improve the resilience and adaptation of biodiversity in PAs to climate change, the project will support specific management actions in a limited number of conservation areas selected as being of particularly high priority (in terms of their potential vulnerability and the significance of their biodiversity or the ecosystem services which they provide), or as having particularly high potential to act as pilots. The prioritization and feasibility of the activities will be verified through the vulnerability analyses described above, but *a priori* activities identified during the PPG are as follows (surface per ecoregional cluster and activity are available in Annex 7):

174. In the Mediterranean California ecoregion, the Project will work in the Sierra de San Pedro Mártir and Constitución 1857 PA. The resilience-based strategies to be employed and tested during project implementation could include the development and expansion of programs related to the eradication, control and monitoring of introduced/invasive species. For example, the project could expand upon the PA' plans to engage local communities and academia in awareness and training workshops to include potential impacts of CC on IAS and how to include it in programs for monitoring, prevention, control and eradication activities.

175. Another component might focus on integrated fire management through the application of integrated fire management programmes; establishment or restoration of firebreaks; training for community fire brigades; and monitoring exercises. Temperature increases are expected over most of the country, but particularly in the north-west where reductions in rainfall levels are also likely to be most pronounced, thus the occurrence of fires is likely to increase without proper management. Throughout, the pilot will encourage community participation in restoration activities as well as sustainable use of natural resources.

176. In the North American Desert ecoregion, the project will work in the Mapimí PA. The resilience-based strategies to be employed and tested during project implementation could include the promotion of sustainable land management practices that promote the restoration, conservation and sustainable use of ecosystems that benefit and increase the resilience of ecosystems and guarantee landscape stability. For example, a women's community group could be supported in its efforts to market salt, while a number of communities could be engaged in conservation activities in coordination with CIPET and PROCODES, leading to the certification of sustainably managed grasslands. The pilot might also support the restoration of degraded lands using native vegetation that minimizes soil loss and decreases the risk of landslides.

177. In the Southern semi-arid highlands ecoregion, the project will work in the Janos PA. The resilience-based strategies to be employed and tested during project implementation could include the removal of mesquite (an invasive species), and the restoration and conservation of native grasslands with strategies that might include seed dispersal, fencing, etc. The pilot might also engage communities in more sustainable livestock practices, thereby increasing the resilience of ecosystems and guaranteeing landscape stability.

178. In the Great Plains ecoregion, the project will work in the CADNR004 PA, Rio Sabinas portion. The resilience-based strategies to be employed and tested during project implementation could include restoration of ecosystems with native vegetation in order to increase resilience and landscape stability, specifically working through the rehabilitation (recovery of ecological functionality and integrity) of degraded forest gallery that runs along the river. The pilot could also develop and expand programs related to the eradication, control and monitoring of introduced/invasive aquatic species, particularly

through training workshops regarding the identification, control, prevention and eradication of CC-induced IAS and pests, and field actions.

179. In the Tropical-humid Forests ecoregion, the project will work in the Selva el Ocote and Cañón del Sumidero PA. The resilience-based strategies to be employed and tested during project implementation could include the development and expansion of programs related to the eradication, control and monitoring of introduced/invasive species. The pilot could also strengthen food security of local communities through extending the reintroduction of traditional systems of conserving creole maize *in situ*. Furthermore, it could promote the diversification of production in coffee areas with alternatives such as parlor palm (*palma camedor*), beekeeping, and others, as well as support the implementation of sustainable practices including coffee management. It could work at improving response to wildfires through the application of integrated fire management programs in ecosystems, municipalities, and communities in the region to avoid undesired fires and maintain ecosystem function and structure.

180. In the Tropical-dry Forests ecoregion, the project will work in the Tehuacán – Cuicatlán PA. The resilience-based strategies to be employed and tested during project implementation could include using native vegetation to reforest and restore degraded areas to minimize soil loss and decrease the risk of landslides. The pilot could also build upon PA activities designed to strengthen community greenhouses to propagate native species to be used in restoration activities. The pilot could develop and expand programs related to the eradication, control and monitoring of introduced/invasive species, particularly insect species that affect cacti belonging to the families *Tortricidae* and *Cerambycidae*. Furthermore, it could strengthen social structures in regional agrarian representations that permit the appropriation of the activities developed during the pilot.

181. In the Temperate Sierras ecoregion, the project will work in the Mariposa Monarca PA. The resilience-based strategies to be employed and tested during project implementation could include the development and expansion of programs related to the eradication, control and monitoring of introduced/invasive species, particularly related to the control of *Dendroctonus, Scolytus* and dwarf mistletoe. The pilot might also support the establishment of at least one fire brigade as well as aid in the creation of firebreaks and other IFM activities. Given recent declines in monarch butterfly numbers coming to winter in the PA (2012 was the lowest since 1975), the project would work with communities in the restoration of micro-watersheds, including the operations of a greenhouse for native plants.

182. In the Gulf of California ecoregion, the Project will work in the Islas del Golfo de California PA, Great Islands Region (comprising the states of Sonora and Baja California). The resilience-based strategies to be employed and tested during project implementation could include the development and expansion of programs related to the eradication, control and monitoring of introduced/invasive species. In particular, through actions to control and monitor the proliferation of cats and rodents. The pilot could also support awareness and training workshops directed at fisherfolk[118]. The pilot could engage in the restoration of mangroves, coastal dune vegetation and reef structure, marine grasses and *sargazo* forests to protect the coastal line and increase resilience.

183. In the Gulf of Mexico ecoregion, the project will work in the Pantanos de Centla and Laguna de Términos PA. The resilience-based strategies to be employed and tested during project implementation could include the restoration of coastal and marine vegetation to protect the coastal line and increase resilience. The pilot could also look at integrated fire management and training to develop capacities for fire management within the communities that live in the region, and implement a strategy designed to efficiently confront fires, building upon the current brigades, equipment and IFM activities. The pilot

[118] In compliance with Río +20, the project recognizes the need to ensure access to fisheries and the importance of access to markets, by subsistence, small-scale and artisanal fisherfolk and women fish workers, as well as indigenous peoples and their communities.

could also consider the restoration of water bodies with native species through incentives linked to aquaculture to encourage responsible fishing practices in both PA[119]. In particular, the pilot could engage in the restoration of fresh water habitats and estuaries (*Vallisneria* sp.).

184. In the Mexican Caribbean ecoregion, the project will work in the Manglares de Nichupté, Costa Occidental de Isla Mujeres, and the Arrecife de Puerto Morelos PA. The resilience-based strategies to be employed and tested during project implementation could include restoration of mangroves, coastal dune vegetation, reef structure, and marine grasses to protect the coastal line and increase resilience. Approximately 64 hectares of mangrove were restored/replanted and the project will support efforts to ensure a survival rate of at least 80%. Furthermore, sea turtles use the beaches to nest and lay their eggs, so the project could support efforts to conserve turtle nests along 21 km of beach.

185. Corals in the Mesoamerican reef on the eastern side of the Yucatan Peninsula have experienced bleaching events in at least 1995, 1998, 2003, 2005, 2008, 2009 and 2010; corals that are stressed by pollution and overfishing are less likely to recover from coral bleaching events. To address this, the project will consider opportunities for collaborating with CONAPESCA regarding sustainable fishing practices that could improve reef health and increase resilience.

186. The project could determine how to link the information system (Outcome 1) with the Belize-based Caribbean Community Climate Change Centre (CCCCC)'s project to monitor parameters that can affect corals from a climatological standpoint, such as increased acidification, sea temperature, and water quality. CCCCC's customized buoys will measure, record, and transmit in real-time meteorological and water quality data as the key components of five Coral Reef Early Warning Systems (CREWS) in the Caribbean Sea.

187. The pilot activities will also consider the development and expansion of programs related to the eradication, control and monitoring of introduced/invasive species. Furthermore, it could aim to conserve carbon sinks (forests, jungles, mangroves).

188. In the Northern Pacific ecoregion, the project will work in the El Vizcaíno PA. The resilience-based strategies to be employed and tested during project implementation could include the restoration and conservation of wetlands, mangroves and other important sites, for the protection and maintenance of populations of important species to the fishing sector, particularly clam beds of "mano de león" in Laguna Ojo de Liebre[120]. The pilot could also engage local communities in strengthening habitat conservation for the bighorn sheep.

189. In the Southern Pacific ecoregion, the project will work in the Archipiélago de Revillagigedo PA. The resilience-based strategies to be employed and tested during project implementation could include the development and expansion of programs related to the eradication, control and monitoring of introduced/invasive species, especially feral cats and rodents. The pilot could identify watersheds to restore, stabilizing channels and sandbanks, and using native vegetation that minimizes soil loss and decreases the risk of landslides. Particularly it may focus on the restoration of gullies damaged by feral sheep, which have already been eliminated.

190. For the development of these actions, integral plans will be developed, that cover capacity building, increasing awareness of stakeholders, and other activities as needed. Of utmost importance is the validation, prioritization and/or elimination of these activities to propose new, more beneficial ones as determined by the Vulnerability Analysis. Furthermore, the project will determine a portion of its impact by measuring the populations of key indicator species in each ecoregion's pilots. This is based on the assumption that these species will adequately reflect ecosystem health and resilience since most of them

[119] Ibid.
[120] Ibid.

are sensitive to habitat loss, with restricted distribution, or endangered. Two of the species identified are invasive or pests that are more likely to affect degraded ecosystems. All of these species were selected *a priori*, so deeper analyses must be performed to decide their appropriateness as indicators of ecosystem health, integrity and resilience. This will be verified during the vulnerability analyses of ecoregional clusters.

191. The project recognizes that species health does not necessarily reflect the resilience of the ecosystem, given that it represents just a small part of the entire functionality of the ecosystem. Environmental scientists have made important discoveries on the theme, and they have proposed several indicators that are more suitable to measure resilience, including species and populations but also other more complex indicators, such as the extension and diversity of habitats. Nevertheless, most of the PA do not monitor these other indicators or complex variables, rather they monitor species. Hence, the project will recommend and test an additional section to be considered in the METT to monitor the integrity and resilience of pilot ecosystems with regards to resiliency. This proposal will be developed based on the existing Ecosystem Health Index and information from other initiatives and studies, and will be applied in some of the priority sites to determine relevant indicators or define new ones if deemed necessary.

192. The national level systems for M&E and early warning proposed under Outcome 1 will also be mirrored at the local level: PA staff will be provided with the training, equipment and systems required to allow them to detect signs of the impacts of climate change, to monitor these impacts, and the effectiveness of strategies for resilience and adaptation, over time, and to respond to the results of monitoring through the definition and application of corresponding management strategies. These decision-support systems will be backed by concrete investments needed for the management strategies to be put into practice. Specific needs will be determined by the vulnerability and finance gap analyses from Output 1.2.

Output 3.2 Strengthened land use governance framework to guarantee PA conservation and increase resilience to CC risk.

193. Participation of local stakeholders will be a key determinant of the effectiveness of the proposed PA management strategies. This is particularly the case in Mexico where local stakeholders are represented by both municipal and agrarian authorities, and where there are widespread and promising models of community-based environmental governance, within the framework of the *ejidos* and agrarian communities established under agrarian law.

194. Local Advisory Councils are one of the organisms identified by the LEGEEPA and its Regulation on PA Issues (Reglamento en Materia de Áreas Naturales Protegidas) in order to ensure society's participation in the management of PA. Currently, there are 67 Local Advisory Councils constituted in 70 PA, of which 86% operate on a regular basis, while the rest are not functional due to a variety of reasons. More than 1,200 people participate in these Councils, 1,038 men and 190 women. Sector distribution is the following: 36% social sector (ejidos, communities, unions and cooperatives), 32% public sector (from all three levels of government), 13% academics, 12% civil society organizations/NGOs and 7% private sector (businesses). Approximately 11 Councils have representatives from indigenous communities.

195. Of the 17 PAs involved in the Project, the following have actively operating Local Advisory Councils: Arrecife de Puerto Morelos, Islas del Golfo de California, Archipiélago Revillagigedo, El Vizcaíno, Mapimí and Mariposa Monarca. Selva el Ocote has one that operates on an irregular basis, while Pantanos de Centla has a Council in name but not operational, and the rest have no Council at all. The project will support the establishment of functioning Local Advisory Councils in each of the 17 PAs, drawing upon lessons learned from across the PA system, and ensuring the inclusion of representatives of all population sectors, minority groups, and vulnerable or marginalized populations. The project will seek ways to increase women's engagement and to ensure that women are considered as equal partners in consultations and decision-making mechanisms. This is especially important at the local scale, where women's conditions can restrict effective participation.

196. The Mexico Resiliente Alliance was formed in 2011 and is comprised of 23 partners from different government institutions, international organizations, academia, civil society and community groups, among others. The Alliance has been recognized by the Adaptation Working Group of the Intersectorial Commission on Climate Change (GT-ADAPT) as a specialized consultative organism on matters of ecosystems, environmental services and biodiversity conservation. The principal objective of the Alliance is to promote coordination and connections among the partners that actively participate in the conservation of Mexico's PA and ecosystems, and facilitate the collaboration and exchange of experiences and knowledge on CC and biodiversity conservation. The Alliance actively participates in annual meetings and develops products that promote awareness and dissemination of its partners' activities. However, its activities have mostly been kept behind the scenes. The project will support the institutionalization of Mexico Resiliente Alliance as a national advisory council and guide its members in designing and co-implementing at least one project in the field. The project will foster the formation of working groups within the Alliance and in collaboration with local actors to resolve specific problems in the field. Furthermore, it will be promoted as a forum for exchange of experiences between other projects on CC and ecosystems within Mexico.

Output 3.3 Community capacity development programmes for planning, implementation and monitoring of site-specific co-managed strategies for increasing resilience in PA.

197. In priority protected areas, the project will support the development of the capacities among local institutions, including municipal and state governments, for monitoring and regulating natural resource use in PA and their influence zones, and will also assist agrarian authorities in selected communities in adapting their capacities and regulations to the changing demographic and environmental conditions resulting from climate change. To achieve this output, extensive training is necessary for regional planners and for PA staff; social, biodiversity and resilience monitoring protocols must be developed; and newly developed systems must be tested in the field according to real life conservation scenarios. Through this output, joint trainings and resilience survey activities will be operationalized across priority PA sites.

198. Currently there are no capacity development programs related to resilience in any of the PA. The project will work toward the development and implementation of an Institutional program through workshops or courses on resilience in the 12 ecoregional clusters. These capacity development activities will feed into the project's efforts to improve overall capacity at the three levels (national, regional and local) as reflected in the GEF Capacity Development Scorecard scores.

199. The project will addresses these weaknesses through inter alia the following improvements:

- PACCs and updated MPs made in coordination with local stakeholders and with financial gap identified (Outcome 3).
- Information system for adaptive management (Outcome 1).
- Institutional capacity development program and 3% of CONANP budget (from Outcome 1) reassigned to basic technological needs (radios, computers, SIG software, etc.)[121].
- National monitoring system with proper capacity building (Outcome 1).

200. Through these actions, the project will enhance the capacity of PA managers, staff and users.

Output 3.4 Ordinances or other instruments that contribute to the reduction of forest fragmentation, and municipal action plans for environmental contingencies.

[121] Capacity Development Report

201. In parallel to the harmonization process regarding national and institutional policy and planning instruments in Outcome 1, the project will support a harmonization process at the local level (municipal, ejidal) to ensure local ordinances and other instruments recognize and address CC risks through community involvement. The legal zoning of the PA is not always coherent with its conservation objectives and the surrounding zoning. In some cases, a core zone is not truly protected by a surrounding preserved or transitional matrix. Rather, the periphery of the PA and the legal limit is the only thing that separates it from a highly degraded zone, which negatively influences the biodiversity and ecosystem services inside the PA. Consequently, the project will perform a national study on ways to harmonize ecological land ordinances and zoning in PA. The study will then identify key municipalities/communities/ejidos that have a strong impact on the priority PA and determine opportunities for harmonizing local ordinances on land-use to work in a more coherent manner with BD conservation and resilience in and around the PA. This harmonization process will pursue the landscape vision of the project, and will be linked directly to the PA' Management Programs and PACCs, in order to contribute to decision making processes.

202. Furthermore, community participation (local populations, academia, municipal governments, sector actors that work in the area) will be key in reflecting the mapping and implementation of policy and planning instruments in new areas of conservation. As such, the project will engage local communities in and around the 12 ecoregional clusters to review current land-use ordinances or other instruments and determine ways to incorporate mechanisms to foster BD resilience and address CC risks at the local level (municipalities and ejidos). Community involvement is vital in this step to guarantee the appropriation and coherence of the instruments developed. As such, this will be implemented through public consultation processes, workshops, and other forums.

203. Landscape/seascape conservation and government planning for sustainable development will be influenced through this project to promote more intersectorial dialogue and consensus building and to integrate PA planning needs into the operationalization of State development planning instruments. The elaboration of State Development plans for conservation and sustainable development, inclusive of biodiversity and CC concerns, will provide the broad guidance and government support necessary for the proposed PA system expansion.

Output 3.5 Operationalization of PA management and surveillance/ enforcement with key stakeholders

204. The project will work with local actors to review current surveillance mechanisms and implement them in a collaborative fashion (e.g. surveillance councils or brigades formed by community members and ejidatarios). While CONANP is charged with the management and administration of the PA, it does not have the attributes necessary for inspection, surveillance and enforcement of these areas. Rather, the institution responsible for this is PROFEPA, both in and outside of PA and with regards to any and all environmentally-related illicit activities. When illicit activity is detected in a PA, it is CONANP's responsibility to denounce the corresponding case before PROFEPA, leaving the follow-up, investigation and resolution to PROFEPA. Consequently, while CONANP is not able to intervene directly in the reduction of illicit activities within PA, by strengthening the governance framework and increasing active participation of local actors, it can create more favorable conditions for surrounding communities and ultimately lend to the decrease of illicit activities.

205. To accomplish this, the project will seek to actively involve all key stakeholders through participatory planning during the first two years of the project. The project will also promote the capacity building of community surveillance brigades, and its operationalization in the priority sites. Moreover, the project will conduct a review to identify sections of existing policies or other legal instruments that need to be regulated or amended to ensure stricter compliance through stakeholder involvement.

206. The actions set out above will have incremental benefits in terms of improved conservation of globally important biodiversity in this megadiverse country and reductions in rates of carbon emissions resulting from the loss and degradation of terrestrial and coastal carbon sinks. The principal value added

of GEF support, in relation to the baseline, will be the introduction of climate change considerations into the planning and management of PA.

Global environmental benefits

207. The project will focus on strengthening the capacities of PA to withstand and adapt to the impacts of climate change and thereby to continue to yield ecosystem goods and services at national and international levels. This will have incremental benefits in terms of improved conservation of globally important biodiversity in this megadiverse country and reductions in rates of carbon emissions resulting from the loss and degradation of terrestrial and marine carbon sinks. It will, in addition, generate significant national benefits in terms of the maintenance of the capacity of natural ecosystems to yield products of importance for livelihood support and environmental services such as water supply, and to buffer the effects of climate change on the national population. These national benefits will in turn have indirect global benefits as they will help to stabilize the processes of internal and external migration which are motivated by climate change-induced collapse of rural livelihoods, and which act as drivers for ecosystem degradation in both expulsion and reception areas.

208. The Mexican government's conservation efforts are based on the PA system. Through Outcome 1, the project will contribute to the strengthening of the institutional framework for conservation, to ensure that PA receive sufficient resources, information and capacity to continue working as the country's main conservation tool.

209. Furthermore, as a megadiverse country, Mexico has a wide variety of ecosystems. Through Outcome 3, the Project will contribute to the consolidation of 6,486,509 ha covering 17 protected areas in 12 ecoregions, thereby protecting national and global-significant ecosystem diversity. This will strengthen PA resilience and help species, ecosystems, and people living within them to adapt to the potential changes and respond to them in an effective manner. Moreover, Outcomes 2 and 3 will increase connectivity through activities of active management such as integrated fire control and restoration, as well as engage with community members in sustainable development activities to increase resilience in all three abovementioned axes (ecological, socio-economic and institutional). Finally, the inclusion of 600,000 ha of new conservation areas will promote the conservation of unprotected ecosystems and habitats, such as sea bottoms, islands, cloud forest, among others.

2.5 Key indicators, risks and assumptions

210. Project indicators are detailed in the Results Framework, which is included in Section 3 of this Project Document. The risks that might prevent or hinder the project from achieving its objective are presented in Table 6.

Table 6: Risks facing the project and the risk mitigation strategy

Risk	Rating	Risk Mitigation Strategy
Institutional rigidity and resistance to inter-institutional collaboration	M	Within the context of the ECCAP, the project will support CONANP in raising awareness among diverse institutional stakeholders, of the implications that the impacts of climate change on biodiversity and PA will have for their institutional goals, and will actively promote and facilitate inter-institutional analyses of needs and mechanisms for cooperation.
Weak enforcement of land use stipulations in the landscape	L	The project will build on the considerable advances made to date by previous GEF projects in Mexico with the strengthening and financing of PA management (including enforcement). This project will seek to ensure that financial sustainability strategies

		take into account the additional requirements arising from issues and threats related to climate change, with the result that enforcement capacities will develop in parallel with the magnitude of threats.
Uncertainty in anticipated threat profiles: strengthening of the resilience of PA and BD is the central focus of the project, however the risk exists that rates of climate change, and associated pressures on PA and BD, will exceed the levels anticipated and the rates of adaptation achievable through the strategies proposed by the project.	L	The project will apply principles of adaptive management, updating its assumptions and strategies regularly on the basis of the most recent models of climate change that are available, keeping abreast of the latest advances with scientific knowledge and experiences regarding best practices for adaptation and resilience, and supporting the development of systems for monitoring and evaluation of the effectiveness of its strategies under evolving conditions of climate change (Component 1).
Gender inequality in project-promoted activities. Gender equality issues are not promoted as anticipated.	M	The project will adopt a strategy incorporating awareness-raising activities on this issue for men and women. It also anticipates the incorporation of women into decision-making processes and their increased access to natural resources.
Climate Change modifies habitat conditions in PA	M	The ecosystem restoration measures to be undertaken through the project will serve in part to reverse the habitat degradation which may be exacerbated by CC: the restoration strategies themselves will be designed to take into account a range of climate change scenarios, rather than solely the current conditions in the areas. Planning and management instruments will be introduced into each of the PA to increase the abilities of PA managers to respond effectively to CC-related risks, both in the short term (e.g. increased incidence of fires) and medium term (changes in levels of external threats and capacities of ecosystems to respond to them).
Change in government administration (at federal, state and/or municipal levels related to the project impact area) leads to a shift in priorities in policy and resources	M	The project will ensure consistent communication and coordination with public officers of the three levels of government administration (federal, state and municipal) to foster a sense of project ownership among new stakeholders and guarantee its continuity.
Delay in cofinancing causes interruptions in implementation.	L	Cofinancing commitment letters ensure the financial resources of the institutions involved in project execution and promote constant coordination/communication among partners/ cofinanciers.
Stakeholders have priorities that are inconsistent with the projects targets	M	The project will work towards the alignment of institutional and political frameworks and the coordination and participation of local stakeholders in order to promote appropriation and the synergy of priorities and objectives.

2.6 Financial modality

211. GEF funds will be provided as a grant to support the development of sustainable capacities among national institutions and local stakeholders. Table 7 summarizes how the project will be funded.

212. The project will be executed under National Implementation (NIM-modality), according to the standards and regulations for UNDP cooperation in Mexico. The costs of the incremental activities that are required to contribute to global benefits that will be financed by GEF total $9,691,224.24. A summary of the project's budget is presented in Table 7.

Table 7: Total Project Budget per Outcome

Project Components	GEF Financing		Co-Financing		Total ($)
	($)	%	($)	%	
1. Mexican PA system readiness framework effectively safeguards BD from predicted CC impacts and addresses climate risks through institutional capacity building.	1,225,054.36	18.24	5,492,880.00	81.76	6,717,934.36
2. Expansion of PA system to protect important refugia through connectivity and increased resiliency.	2,923,180.00	9.62	27,454,280.00	90.38	30,377,460.00
3. PA site management effectively reduces climate-related threats to BD as demonstrated through pilot activities and improved METT scores.	5,542,989.88	12.04	40,495,006.00	87.96	46,037,995.88
Total Project Costs	**9,691,224.24**	**11.66**	**73,442,166.00**	**88.34**	**83,133,390.24**

2.7 Cost-effectiveness

213. In line with the GEF Council's guidance on assessing the cost-effectiveness of projects, a qualitative approach to identifying the alternative of best value and feasibility for achieving the project objective was used.

- *Wide geographical scope*. The project will cover terrestrial, coastal and marine areas. An exclusive focus on either one ecoregion or the other would risk exclusion and/or disruption of vital processes of reproduction, migration and feeding.
- *Selectiveness in geographical extent*. At the same time, the project underwent a series of prioritization exercises to ascertain which of the 176 PAs were most vulnerable and important in terms of representativity, endemism and other factors to properly and feasibly address resilience in each of the 12 ecoregions. In keeping with the adaptive management approach that is to be applied, the specific strategies to be applied in each ecoregional cluster is subject to review during the implementation phase.
- *Location of new areas contiguous to existing areas*. The project has begun to identify potential areas to expand conservation efforts through the decreeing of at least one new PA as well as other conservation instruments to create contiguous areas under some form of conservation management between existing PAs. This means that the total costs of managing the PA system will increase at a rate that is less than proportional to the expansion in total area.

2.8 Sustainability

214. The project has several elements that will promote long-term sustainability. A landscape/seascape approach through integrated land management will allow the integration of diverse stakeholders and sectors; participative planning and implementation in every phase of the project will stimulate a sense of ownership among different stakeholders; and the execution of actions at three scales,

local, regional, and national, as well as addressing vulnerability at institutional, socio-economic and ecological levels, will help build integral long-term resilience. These elements will ensure the project's overall sustainability.

Ecological sustainability

215. The basis for the ecological sustainability of the actions to be developed by the project lies in the implementation of environmental safeguards against the negative effects of climate change in the 12 ecoregional clusters. Information about the current and potential impact of climate change in each of the clusters will be generated through the establishment of evaluation, monitoring, and resilience programs that will use indicators concerning the condition of key species and ecosystems in each of the ecoregions. This information will be used to make adjustments in the use and management of these areas and identify priority areas for expansion. The environmental safeguards, the acceptable limits of change, and the mechanisms for monitoring and evaluation will be defined and incorporated into the Management Programs of the 17 pilot PAs.

216. Ecological sustainability will also be ensured through the improved management effectiveness of each PA (improvements in planning, management, stakeholder participation—including communities and municipal governments—and monitoring). Improved management effectiveness of each PA will have a positive impact on the long-term viability of the ecosystems and species of the 12 ecoregional clusters. In addition, the project will help to improve connectivity between the existing PAs through the strengthening of incentives schemes in each cluster as well as the establishment and integration of new conservation areas.

Social sustainability

217. The social sustainability of the project will be achieved through the direct participation of the communities, the private sector, and local governments in the planning and implementation of resilience activities, as well as through the direct and indirect economic benefits that will result from them, such as the economic benefit derived from alternative production mechanisms to be promoted in the ecoregional incentive schemes. These activities will contribute in the short and long term to improving the quality of life of those communities living in proximity to the PAs, ultimately decreasing their vulnerability to climate change, while safeguarding the ecological integrity of the landscapes/seascapes where the project will be implemented. Social sustainability will also be achieved through greater inclusion and participation in decision-making by, for example, Community Advisory Councils. Consultation and participation by the local communities and municipal authorities in the creation of new conservation areas and other connectivity efforts and for the planning and management of the project's cost-effective management activities and resilience pilots will be fundamental to guarantee their continued support of the areas, the reduction of potential conflicts, and their cooperation in the implementation of resilience activities in the short, medium, and long term.

Institutional sustainability

218. The basis for institutional sustainability lies in the capacity of the project to push legal and policy reforms that will facilitate the mainstreaming of CC and resilience concepts into PA management across Mexico. Particularly through these reforms, CONANP's institutional capacity will be strengthened to manage the PAs based on the promotion and implementation of CC resilience in the PAs' landscapes/seascapes. Specific activities in the 12 ecoregional clusters will be carried out to this end, which will allow the identification of lessons learned and successful outcomes, allowing them to be replicated in other areas of the Mexican PA system.

219. In addition, institutional sustainability will be achieved through strengthening the skills of the PAs' administrators and users (CONANP, municipalities, and local community organizations) in

managing the PAs, implementing resilience-strengthening activities, and evaluating, monitoring, and mitigating impacts to biodiversity.

Financial sustainability

220. Financial sustainability for protected areas should consist of a combination of national and international resources and include the whole spectrum of possible funding instruments such as: public and private national and international funding, remuneration of services provided by protected areas, at the national and international levels, as well as taxes and fees at the national level[122]. Results of the funding gap analysis for Mexico's protected areas (obtained through the use of the FinapMex Planning Tool and utilizing criteria defined during the meeting convened by CONANP for this specific purpose) indicate that effective management requires a budgetary increase of 287% over the next eight years, representing an investment of US$ 2 billion over this timeframe.[123]

221. Financial sustainability will be achieved through the set of activities projected for the project in its three components. Outcome 1 includes regulatory reform to mainstream CC and resilience into the national legal framework, and to engage other institutions and sectors in the development of a coordinated financial framework. Outcome 2 considers the development of incentives mechanisms for private sector and communities to invest in resilience-based activities in the PAs. For example, the project will identify opportunities and mechanisms to direct 10% of CONANP's operational and subsidies budget to resilience-based activities in PA. Subsidies program like PET and PROCODES, and other programs such as PROMOBI and PES, could be modified in order to consider resilience activities as eligibility criteria or resilience indicators. Furthermore, the Climate Change Fund, emitted by the LGCC, will prioritize adaptation actions to finance. This could be an opportunity to increase PAs' access to external funding sources.

222. Component 3 includes activities to strengthen the capacities of CONANP in order to promote resilience as part of its financial sustainability strategy. The elaboration of business plans in each of the 12 ecoregional clusters will help define tools for determining the financial gap related to CC resilience within the individual clusters as well as to be up-scaled to the national level. Also, through the development of Business Plans for the 12 pilot clusters, strategies will be defined so that each ecoregional cluster will increase its ability to generate its own resources through resilience-based activities and potential interinstitutional financing networks, with the potential to obtain income through other mechanisms, including payment for ecosystem services, concessions, and contracts. The Business Plans have the potential to be a tool that can be of great use for the financial sustainability of the PA, since they will contribute to the diversification of financing sources and will help to guide financing activities for the PA in the short, medium, and long term.

2.9. Replicability

223. Mexico is a megadiverse country with a wide variety of ecosystems and a heterogeneous landscape. To address this complexity and diversity, the project will be implemented in 12 terrestrial and marine ecoregions. In this way, actions and specific strategies will be identified for each ecoregional cluster, which will help to protect and preserve biodiversity and environmental services in a climate change context. As such, each complex will work as a pilot site that will allow the identification of actions and strategies that could easily be adapted and replicated in other PA/clusters in the respective ecoregion. It is important to mention that the selected ecoregional clusters were identified as the most

[122] Bezaury-Creel J. E. *et al.* 2011
[123] Ibid.

vulnerable in each ecoregion according to the priority system, which was built with robust quantitative spatial data and designed to be replicated in any PA system.

224. By project end, a tool to calculate the financial gap for CC will be developed based on the experiences and lessons learned through the 12 business plans. This tool will enable an easy replication process for other sites. Moreover, efforts made at national and regional scales will allow the alignment of institutional and national public policy to strengthen the PA system. This will foster the replication of the project's vision in state PA systems and other conservation instruments.

225. The transfer of knowledge at the international level can occur through several means: a) linking with other similar projects; b) training seminars, conferences and other international fora; c) during the presentation of the BD and CC COPs, with the participation of the Mexican delegation and the execution of potential side events; d) through the formulation of new proposals that leverage resources and allow the transfer of knowledge.

226. Furthermore, the project will propose an additional section to the METT framework to account for the measuring of management capacity in PA with respect to CC [per the STAP request]. It will be constructed based on the experience and lessons learned with the project implementation and with the information of other initiatives such as the Ecosystem Health Index.

227. Finally, the project will make use of the tools made available by UNDP and GEF (e.g., information networks, forums, and documentation, and publications) for best practices and lessons learned, so that they may be used for the design and implementation of similar projects in the region. The cost to disseminate good practices and lessons learned has been incorporated into the project budget.

3. PROJECT RESULTS FRAMEWORK:

This project will contribute to achieving the following Country Programme Outcome as defined in CPAP or CPD: Mainstreaming environment and energy					
Country Programme Outcome Indicators: Strengthened national and local capacities for mitigation and adaptation to climate change					
Primary applicable Key Environment and Sustainable Development Key Result Area : 1. Mainstreaming environment and energy: Technical and institutional capacities to promote environmental sustainability developed					
Applicable GEF Strategic Objective and Program: SO 1 – Improve sustainability of protected area systems					
Applicable GEF Expected Outcomes: Outcome 1.1 - : Improved management effectiveness of existing and new protected areas.					
Applicable GEF Outcome Indicators: Indicator 1.1: Protected area management effectiveness score as recorded by Management Effectiveness Tracking Tool.					
Project Objective:	**Indicator**	**Baseline**	**Target**	**Means of Verification**	**Risks and Assumptions**
The Mexican Protected Area system is spatially configured and managed to increase resilience to the adverse impacts of climate change on biological diversity	CC resilience is mainstreamed into Mexico's PA system	CONANP has a Climate Change Strategy, but resilience to CC is not reflected in planning and management instruments:	CONANP planning and management instruments mainstream CC resilience	PA planning and management instruments and guidelines	<u>Assumptions:</u> Institutional stability and commitment throughout project implementation. Institutional insertion of CC Resource availability to invest in resilience-based BD management practices. Willingness within the GoM to commit funding/resources to resilience-based practices. National and international macroeconomic conditions remain stable. Consensus among local stakeholders for PA expansion and connectivity. <u>Risks:</u> Extreme weather events, Fires, Pests and
	Financial sustainability to increase resilience of Mexican PA system	CONANP budget does not address resilience activities. No multisectorial coordination platform exists regarding efforts and investments on PA at a subnational level.	Internal budgetary restructuring to allocate 10% of CONANP budget to resilience activities. Multisectorial platform to attain budgetary coordination.	CONANP budget documents	

					Invasive species, beyond predicted levels.

Outcome 1	**Indicator**	**Baseline**	**Target**	**Means of Verification**	**Risks and Assumptions**
1. Mexican PA system readiness framework effectively safeguards BD.	Institutional framework strengthened to increase PA resilience from CC impacts and risks.	CONANP framework includes: -National PA Program (PNANP) 2013-18 and CONANP Strategy for 2040 are under construction -ECCAP provides general guidelines towards resilience but not aligned with public and institutional policy - Communication strategy provides limited promotion of conservation areas as instruments of resilience	-CONANP Strategy for 2040 and other Institutional Plans include CC and resilience -PNANP 2013 – 2018 includes CC and resilience -ECCAP updated and aligned with public and institutional policy (PNANP) and legal framework related to CC -Communication Strategy (by Year 2) promotes the importance of conservation areas as instruments to (a) increase resilience of communities and ecosystems and (b) maintain integrity across the landscape/seascape	Planning and Policy Documents: PNANP 2013-18 ECCAP CONANP Strategy for 2040 Communication strategy and information materials	<u>Assumptions:</u> Institutional timing and political will are in line for the elaboration of a regulation There is high-level political will to institutionalize CC resilience in the national system of PAs.
	Planning, Management and Information System for decision making to mainstream CC into integrated land-use planning that increases biodiversity resilience	- No PA has CC resilience mainstreamed in its planning and management instruments - No National Climate Information Portal for Protected Areas exists - 0% PAs with access to Portal	- National Climate Information Portal for Protected Areas established with geospatial data, including an Early Alert System and linked to the already existing monitoring efforts (as SNIB, INFyS and SIMEC and other relevant initiatives). - 100% PAs with access to Portal and staff trained to use it to make effective resilience-based management	National Climate Information Portal	Availability of regional forecasts and predicted CC impacts on BD National and international macroeconomic conditions remain stable. Commitment among other institutions and sectors to invest in resilience.

	Baseline	Target	Means of Verification	Risks and Assumptions
		decisions.		

	Baseline	Target	Means of Verification	Risks and Assumptions
n of areas of ion in priority s and refugia by GIS database, by the increase in area servation to promote ity and protect refugia.	0 ha (total ANP 25,384,818 ha)	25,984,818 ha: At least 600,000 ha of new areas included in new or existing conservation areas nationwide: Coastal/marine: 369,139 ha Terrestrial: 230,861 ha By Year 2 a strategy will define distribution between the 12 ecoregions (linked to the information system and GIS from Outcome 1)	CONANP records Agreements with communities/ejidos Official Gazette; ANP documents and other certificates	Consensus among local stakeholders for PA expansion and connectivity.
unctional connectivity ritical habitat blocks ng and within PAs d or increased to cosystem resilience coregion-based schemes	0 ha General incentives exist for BD conservation	30,000 ha that enhance connectivity and ecoregion incentives schemes, as a partial result from management actions from Outcome 3 12 eco-region based incentive schemes/portfolios that enhance resilience	ANP documents and other certificates Portfolio of incentives	Local actors understand the role of conservation measures in reducing social vulnerability.

	Baseline	Target	Means of Verification	Risks and Assumptions
ned management of e PAs, based on site- nformation generated ts in order to address and threats, with a focus and sustainable				Continued GoM support for PA management improvement

Outcome 3	Indicator	Baseline	Target	Means of Verification	Risks and Assumptions
	a) Increased management capacity of priority PAs reflected in METT scores	- Average METT score 69%[124] - Current METT does not include a resilience component	- Increase of 10% in the METT scores ($\bar{x}$ = 79%) - Recommendation for inclusion of a resilience component in METT, based on EHI and other initiatives, by Year 3.	METT Scorecard with CC components applied at PPG, MTR and TE	
	b) Cost-effective management actions to reduce vulnerability, to be undertaken in ecoregional clusters (*based on 2012 data and to be confirmed by Vulnerability Analysis at end of Year 2*)[125]: These actions will contribute to the surface of improved connectivity in Outcome 2.	- 0 resilience-based projects or management actions to reduce vulnerability	- Resilience-based projects and management actions reduce vulnerability in 12 ecoregional clusters Target for Year 1 [*Final targets TBD based on Vulnerability Analysis at end of Year 2*]:		
	- Integrated fire management - Assisted terrestrial regeneration - Assisted coastal regeneration - Assisted marine regeneration - Sustainable land management - Prevention, control, eradication, and monitoring of introduced/ invasive species	- 0 - 0 - 0 - 0 - 0 - 100 ha	- 6,000 ha + 10 km firebreaks - 3600 ha +5km gallery forest - 400 ha - 200 ha - 600 ha - 650 ha		Risk: the country's security conditions could lead the government to decide that community brigades are inappropriate or unsafe.
	Improved capacity for planning, implementation and monitoring of site-specific co-managed strategies for increasing resilience in PAs.	0 programs/ workshops on resilience in PAs Average score on Capacity Development Scorecard[126]:	12 programs, workshops or courses on resilience in PAs (1 per ecoregional cluster) Average score on Capacity Development Scorecard	Training workshop documents GEF Capacity Development Scorecard	

[124] For additional information on individual PA METTs, please see Annex 2.
[125] For information on the surface of ecoregional clusters identified *a priori* for cost-effective management strategies, please see Annex 7.
[126] Q9 = Extent of the environmental planning and strategy development process.
Q11= Adequacy of the environmental information available for decision-making.
Q13= Availability of required technical skills and technology transfer.
Q14= Adequacy of the project/programme monitoring process.

Outcome 3	Indicator	Baseline	Target	Means of Verification	Risks and Assumptions
		Q 9: 1.625 Q 11: 1.625 Q 13: 1.6875 Q 14: 1.3125 <u>Areas to be improved:</u> (Q9) Most PAs have adequate Management Programs but are implemented partially or not at all. (Q11) Environmental information used to support decision making processes is unavailable, incomplete or out-of-date. (Q13) Capacity and technological needs are, when available, obtained through external financing. (Q14) Monitoring is done irregularly, with or without an adequate monitoring framework.	increases by at least 1 point: Q 9: 2.625 Q 11: 2.625 Q 13: 2.6875 Q 14: 2.3125 <u>Specific improvements:</u> Management instruments are implemented effectively in selected PAs. Information system for adaptive management (Outcome 1). Institutional capacity development program and 3% of CONANP budget (from Outcome 1) reassigned to basic technological needs. National monitoring system with proper capacity building (Outcome 1).	applied at PPG, MTR and TE	
	Governance framework regarding land-use is strengthened through coordination and gender- and indigenous -sensitive participation forums to consider PA conservation and increased risks associated with CC.	Mexico Resiliente Alliance provides an advisory role. Community Advisory Councils are not engaged in CC resilience. Only 8 of 17 PAs have advisory councils and 2 operate irregularly.	Mexico Resiliente Alliance institutionalized as a national advisory council and its members co-implementing at least one project in the field Strengthened Community advisory councils or ad hoc groups to enhance land use governance in 17 PAs contribute to CC resilience measures/activities.	Minutes from Mexico Resiliente Alliance meetings; project proposal Minutes from Community Advisory Council meetings	

Outcome 3	Indicator	Baseline	Target	Means of Verification	Risks and Assumptions
		0 Gender organizations and official institutions responsible for gender equality recognized as stakeholders and consulted in PA decision-making processes	TBD Gender organizations and official institutions responsible for gender equality recognized as stakeholders and consulted in PA decision-making processes	Agreements with gender organizations	

4. TOTAL BUDGET AND WORKPLAN

Award ID:	**00074960**	**Project ID(s):**	00087099
Award Title:	PIMS 4647 Managt. Effecctivenes & Resilience of PAs - CC		
Business Unit:	MEX10		
Project Title:	Strengthening Management Effectiveness and Resilience of Protected Areas to Safeguard Biodiversity Threatened by Climate Change		
PIMS	4647		
Implementing Partner (Executing Agency)	CONANP		

GEF Outcome/Atlas Activity	Responsible party	Source of funds	Atlas Budgetary Account Code	ERP/ATLAS Budget Description/ Input	Year 1	Year 2	Year 3	Year 4	Year 5	Total	Budget Note #
					US$	US$	US$	US$	US$	US$	
1. Mexican PA system readiness framework effectively safeguards BD from predicted CC impacts and addresses climate risks through institutional capacity building.	CONANP	GEF	71400	Contractual Services-Individual	25,920.00	25,920.00	25,920.00	25,920.00	25,920.00	129,600.00	1
	CONANP	GEF	71600	Travel	10,000.00	10,000.00	10,000.00	10,000.00	0.00	40,000.00	2
	CONANP	GEF	72100	Contractual Services-Companies	455,000.00	0.00	0.00	0.00	0.00	455,000.00	3-7
	CONANP	GEF	72399	Other equipment	106,000.00	15,000.00	15,000.00	15,000.00	15,000.00	166,000.00	8-9
	CONANP	GEF	72400	Communications and Audiovisual Equipment	163,760.00	0.00	0.00	0.00	0.00	163,760.00	10

	CONANP	GEF	72500	Supplies	1,000.00	1,000.00	1,000.00	1,000.00	1,000.00	5,000.00	11
	CONANP	GEF	72800	Information Technology Equipment	140,695.12	0.00	0.00	0.00	0.00	140,695.12	12-14
	CONANP	GEF	74200	Audio Visual & Print Prod Costs	0.00	31,249.81	31,249.81	31,249.81	31,249.81	124,999.24	15
	Subtotal GEF Outcome 1				**902,375.12**	**83,169.81**	**83,169.81**	**83,169.81**	**73,169.81**	**1,225,054.36**	
2. Expansion of PA system to protect important refugia through connectivity and increased resiliency.	CONANP	GEF	71200	International consultants	25,000.00	9,000.00	65,000.00	9,000.00	65,000.00	173,000.00	16-19
	CONANP	GEF	71400	Contractual Services-Individual	312,000.00	542,560.00	542,560.00	542,560.00	542,560.00	2,482,240.00	20-22
	CONANP	GEF	71600	Travel	18,957.60	18,957.60	18,957.60	18,957.60	18,957.60	94,788.00	23
	CONANP	GEF	72100	Contractual Services-Companies	94,000.00	24,000.00	0.00	0.00	0.00	118,000.00	24-26
	CONANP	GEF	72399	Other equipment	11,000.00	1,000.00	1,000.00	1,000.00	1,000.00	15,000.00	27-28
	CONANP	GEF	72500	Supplies	4,992.00	4,992.00	4,992.00	4,992.00	4,992.00	24,960.00	29
	CONANP	GEF	72800	Information Technology Equipment	7,596.00	0.00	0.00	0.00	0.00	7,596.00	30
	CONANP	GEF	73400	Rental & Maint of Equipment	1,519.20	1,519.20	1,519.20	1,519.20	1,519.20	7,596.00	31
	Subtotal GEF Outcome 2				**475,064.80**	**602,028.80**	**634,028.80**	**578,028.80**	**634,028.80**	**2,923,180.00**	
3. PA site management effectively reduces climate-	CONANP	GEF	71400	Contractual Services-Individual	70,080.00	240,080.00	240,080.00	240,080.00	240,080.00	1,030,400.00	32-35

related threats to BD as demonstrated through pilot activities and improved METT scores.	CONANP	GEF	71600	Travel	80,000.00	131,845.65	131,845.65	131,845.65	131,845.65	607,382.60	36
	CONANP	GEF	72100	Contractual Services-Companies	1,544,000.00	1,104,000.00	0.00	0.00	0.00	2,648,000.00	37-41
	CONANP	GEF	72300	Equipment	0.00	27,000.00	27,000.00	27,000.00	27,000.00	108,000.00	42
	CONANP	GEF	72400	Communications and Audiovisual Equipment	136,000.00	476,000.00	0.00	0.00	0.00	612,000.00	43
	CONANP	GEF	72800	Information Technology Equipment	13,207.28	0.00	0.00	0.00	0.00	13,207.28	44-46
	CONANP	GEF	74200	Audio Visual & Print Prod Costs	38,000.00	372,000.00	38,000.00	38,000.00	38,000.00	524,000.00	47-48
	Subtotal GEF Outcome 3				**1,881,287.28**	**2,350,925.65**	**436,925.65**	**436,925.65**	**436,925.65**	**5,542,989.88**	
Management	CONANP/UNDP.	GEF	71400	Contractual Services-Individual	77,760.00	77,760.00	77,760.00	77,760.00	77,760.00	388,800.00	49-51
	CONANP/UNDP.	GEF	72800	Information Technology Equipment	2,085.36	0.00	0.00	0.00	0.00	2,085.36	52
	CONANP/UNDP.	GEF	74100	Professional Services	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	15,000.00	53
	CONANP/UNDP.	GEF	74599	Direct Project Costs	26,466.09	26,466.09	7,561.74	7,561.74	7,561.74	75,617.40	54
	Management cost				**109,311.45**	**107,226.09**	**88,321.74**	**88,321.74**	**88,321.74**	**481,502.76**	
	Grand total				**3,368,038.65**	**3,143,350.35**	**1,242,446.00**	**1,186,446.00**	**1,232,446.00**	**10,172,727.00**	

Summary by Atlas category

Atlas Budgetary Account Code	ERP/ATLAS Budget Description/ Input	Year 1	Year 2	Year 3	Year 4	Year 5	Total
		US$	US$	US$	US$	US$	US$
71200	International consultants	25,000.00	9,000.00	65,000.00	9,000.00	65,000.00	173,000.00
72100	Contractual Services- Companies	2,093,000.00	1,128,000.00	0.00	0.00	0.00	3,221,000.00
71400	Contractual Services- Individual	485,760.00	886,320.00	886,320.00	886,320.00	886,320.00	4,031,040.00
71600	Travel	108,957.60	160,803.25	160,803.25	160,803.25	150,803.25	742,170.60
72300	Equipment	0.00	27,000.00	27,000.00	27,000.00	27,000.00	108,000.00
72399	Other equipment	117,000.00	16,000.00	16,000.00	16,000.00	16,000.00	181,000.00
72400	Communications and Audiovisual Equipment	299,760.00	476,000.00	0.00	0.00	0.00	775,760.00
72500	Supplies	5,992.00	5,992.00	5,992.00	5,992.00	5,992.00	29,960.00
72800	Information Technology Equipment	163,583.76	0.00	0.00	0.00	0.00	163,583.76
73400	Rental & Maint of Equipment	1,519.20	1,519.20	1,519.20	1,519.20	1,519.20	7,596.00
74100	Professional services	3,000.00	3,000.00	3,000.00	3,000.00	3,000.00	15,000.00
74200	Audio Visual & Print Prod Costs	38,000.00	403,249.81	69,249.81	69,249.81	69,249.81	648,999.24
74599	Direct Project Costs	26,466.09	26,466.09	7,561.74	7,561.74	7,561.74	75,617.40
Total		**3,368,038.65**	**3,143,350.35**	**1,242,446.00**	**1,186,446.00**	**1,232,446.00**	**10,172,727.00**

Summary of Funds by Outcome

Source	Amount	Amount	Amount	Total
	Outcome 1	Outcome 2	Outcome 3	
GEF	1,225,054.36	2,923,180.00	5,542,989.88	**9,691,224.24**
CONANP	4,692,880.00	17,454,280.00	26,323,046.00	**48,470,206.00**
UNDP	800,000.00			**800,000.00**
CONAFOR		3,000,000.00	6,000,000.00	**9,000,000.00**
CONABIO		500,000.00		**500,000.00**
ENDESU		500,000.00		**500,000.00**
FMCN			2,171,960.00	**2,171,960.00**
GIZ		6,000,000.00	6,000,000.00	**12,000,000.00**
Total	**6,717,934.36**	**30,377,460.00**	**46,037,995.88**	**83,148,390.24**

Budget notes

GEF Outcome/Atlas Activity	Budget note	Atlas Budgetary Account Code	ERP/ATLAS Budget Description/ Input	Total	Budget note
	Outcome 1			**US$**	
1. Mexican PA system readiness framework effectively safeguards BD from predicted CC impacts and addresses climate risks through institutional capacity building.	1	71400	Contractual Services-Individual	**129,600.00**	Output 1.3 BD and CC Monitoring system will benefit by covering 100% of salary of a full-time project Monitoring and Evaluation Specialist @ $25,920 / year, over project years 1-5
	2	71600	Travel	**40,000.00**	Domestic travel of staff and consultants to ecoregional clusters concerning the equipment and capacity building related to Output 1.3's Information System, over project years 1-4
	3	72100	Contractual Services-Companies	**50,000.00**	125 days @ $400/day in year 1 for consultancy to build on the political framework analysis conducted during the PPG phase, in order to mainstream climate change resilience in Mexican Laws, Regulations and Programs, including local ones affecting the 12 ecoregional clusters, ultimately resulting in Output 1.1
	4	72100	Contractual Services-Companies	**40,000.00**	160 days @ $250/day for consultancy to develop terms of reference of Management Programs and the Official Guidelines for planning and management instruments, ultimately resulting in Output 1.1
	5	72100	Contractual Services-Companies	**90,000.00**	225 days @ $400/day during year 1 for consultancy and studies for the design of the Information System in Output 1.3
	6	72100	Contractual Services-Companies	**100,000.00**	250 days @ $400/day during year 1 for consultancy to develop business plans for 12 ecoregional clusters and a tool to calculate the financial gap related to CC per Output 1.2
	7	72100	Contractual Services-Companies	**175,000.00**	218 days @$ 802.75/day during year 1 for consultancy to develop and implement the communication strategy that will contribute to all Outputs
	8	72399	Other equipment	**130,000.00**	Symposium for the construction of the Information System @ $70,000 during year 1, and 1 annual training workshop associated with capacity building of Output 1.3's Information System @ $15,000 each year during project years 2-5.
	9	72399	Other equipment	**36,000.00**	Output 1.3 will benefit from three consultation workshops with experts on the monitoring protocol of the Information System @ $12,000 each during year 1
	10	72400	Communications and Audiovisual Equipment	**163,760.00**	Ouput 1.3 will be achieved by monitoring 345 spots in selected PAs via 115 sets of equipment @ $1,424 each, each one consisting of: 1 gps @ $400, 1 trap-cameras @ $360, 1 binoculars @$180, 1 mammals guide @ $80, 1 print guide @ $20, 2 bird guides @$19 and $25, 1 big Sherman trap @$180 and1 small Sherman trap @$160

	11	72500	Supplies	**5,000.00**	Operationalization of Output 1.3 will require office supplies for the Information System Coordination Rooms @$1,000/year during project years 1-5
	12	72800	Information Technology Equipment	**85,000.00**	Operationalization of Output 1.3 will require computing equipment for 17 coordination rooms in ecoregional clusters @$5,000 each
	13	72800	Information Technology Equipment	**55,000.00**	Operationalization of Output 1.3 will require computing equipment for the Central Coordination Room @$30,000 and central server @$25,000
	14	72800	Information Technology Equipment	**695.12**	Desktop computer for Output 1.3 M&E Specialist @$695.12
	15	74200	Audio Visual & Print Prod Costs	**124,999.24**	The achievement of all Outputs will be enhanced via design and printing of information material from the communication strategy @$31,249.81/year during project years 2-5
	Outcome 2			**US$**	
2. Expansion of PA system to protect important refugia through connectivity and increased resiliency.	16	71200	International consultants	**48,000.00**	All Outputs will benefit from Measurement of Baseline Indicators and Means of Verification of project results @ $16,000/evaluation at start, mid and end of the project evaluation cycle
	17	71200	International consultants	**45,000.00**	All Outputs will benefit from Measurement of Means of Verification for Project Progress on *output and implementation*, annually @$9,000/year during years 1-5
	18	71200	International consultants	**40,000.00**	All Outputs will benefit from Mid-term Review, including update of METT and ESSP at the midpoint of the project implementation.
	19	71200	International consultants	**40,000.00**	All Outputs will benefit from Final Evaluation, including final METT and ESSP, three months before the end of the project.
	20	71400	Contractual Services-Individual	**91,200.00**	Outputs 2.1 and 2.3 rely on of a full-time technician to develop the activities related to the expansion and decree of new protected areas. 100% salary @$18,240/year during project years 1-5.
	21	71400	Contractual Services-Individual	**1,468,800.00**	Outputs 2.2 and 2.4 rely on 17 field officers to develop and coordinate the on-the-ground activities in PAs, including monitoring of species, cost-effective management activities, participation fora, etc. 100% of salary of 17 field officers through long-term consultancy @$17,280/year each for project years 1-5.
	22	71400	Contractual Services-Individual	**922,240.00**	Contribution toward the development of Output 2.2 incentive schemes in collaboration with CONANP and other project partners. The specific amount per PA will be determined during implementation based on the Vulnerability Analysis.
	23	71600	Travel	**94,788.00**	Domestic travel of staff and consultants to field sites for the expansion and decree of new PA and additional activities needed for Outputs 2.1 and 2.3
	24	72100	Contractual Services-Companies	**48,000.00**	Output 2.3 will rely on a consultancy to modify Terms of Reference of Supporting Previous Studies for decreeing new PAs with CC resilience considerations, at 96 days/year for 2 years (Years 1 and 2) @$250/day.

	25	72100	Contractual Services-Companies	**40,000.00**	The definition of 12 ecoregional incentive schemes for Output 2.2 will be produced through a consultancy of 160 days @250/day
	26	72100	Contractual Services-Companies	**30,000.00**	All Outputs will have greater social and gender impacts through a consultancy of 120 days @$250/day for the inclusion of gender perspective in management instruments.
	27	72399	Other equipment	**10,000.00**	All Outputs will benefit from an Inception workshop and report to be carried out during the first three months of project start up.
	28	72399	Other equipment	**5,000.00**	All Outputs will benefit from Technical Advisory Committee meetings, @$1,000 each, annually.
	29	72500	Supplies	**24,960.00**	Operationalization of Outputs 2.1 and 2.3 related to the expansion and decree of new PA and conservation areas will require Office supplies
	30	72800	Information Technology Equipment	**7,596.00**	Operationalization of Outputs 2.1 and 2.3 related to the expansion and decree of new PA and conservation areas will require Desktop @$3,696 and plotter @$4,000
	31	73400	Rental & Maint of Equipment	**7,596.00**	Operationalization of all Outputs will require maintenance of computing equipment @$1,519.2/year during project years 1-5
	Outcome 3			**US$**	**US$**
3. PA site management effectively reduces climate-related threats to BD as demonstrated through pilot activities and improved METT scores.	32	71400	Contractual Services-Individual	**129,600.00**	Output 3.1 will rely on a full-time project Natural Resources Management Specialist: 100% salary @ $25,920 / year, over project years 1-5
	33	71400	Contractual Services-Individual	**680,000.00**	Output 3.1 requires local day laborers to develop field activities for monitoring of species, $170,000/year for monitoring of species during years 2-5. Amount per PA will be determined during implementation based on the Vulnerability Analysis
	34	71400	Contractual Services-Individual	**91,200.00**	Outputs 3.1, 3.2 and 3.4 will rely on a full-time technician to develop the activities related to the generation of Management Programs. 100% salary @$18,240/year during project years 1-5
	35	71400	Contractual Services-Individual	**129,600.00**	Outputs 3.3 and 3.5 will rely on a full-time project Comunication and Capacity Development Specialist. 100% salary @ $25,920 / year, over project years 1-5
	36	71600	Travel	**607,382.60**	Outputs 3.1, 3.3 and 3.5 will require domestic travel of field-officers and day laborers to develop cost-effective management activities and monitoring of species. During year 1 $80,000 will be assigned to travel, and $131,845.65/year during years 2-5, once cost-effective mgt activities are defined.
	37	72100	Contractual Services-Companies	**204,000.00**	Output 3.1 will require 17 studies @$12,000 each (48 days @250/day) for the implementation of cost-effective management activities in year 2
	38	72100	Contractual Services-Companies	**400,000.00**	Outputs 3.1 and 3.2 will benefit from 2 studies to develop Management Programs @$200,000 (200 days @$1000/day) each in year 1

	39	72100	Contractual Services-Companies	**204,000.00**	Outputs 3.1 and 3.5 will build upon 17 studies @$12,000 each (48 days @250/day) necessary for the monitoring of species (including definition of species) in year 1
	40	72100	Contractual Services-Companies	**40,000.00**	Output 3.3 will use a consultancy in Year 1 to include the participation component in the Programs for the Adaptation to Climate Change of the 12 ecoregional clusters. 160 days @$250/day
	41	72100	Contractual Services-Companies	**1,800,000.00**	Outputs 3.1 and 3.4 will build upon 12 vulnerability analyses for the ecoregional clusters @ 150,000 each (333.33 days @$450/day) during project years 1-2. Each one includes analyses of the state, use and value of ecosystem services, degree of fragmentation and connectivity of landscape, institutional capacities, trends of climatic variables, identification of CC threats and impacts, generation of adaptation strategies
	42	72399	Equipment	**108,000.00**	Output 3.3 requires 3 capacity building workshops / year during years 2-5, @$9,000 each.
	43	72400	Communications and Audiovisual Equipment	**612,000.00**	Operationalization of Outputs 3.1 and 3.5 requires additional monitoring equipment including camera traps, binoculars, GPS; basic equipment for PA staff such as boots, coats, shovels, etc. according to particular PA needs. Each PA will receive $8,000 in equipment during year 1, and $28,000 in year 2 (based on the confirmed cost-effective mgt activities).
	44	72800	Information Technology Equipment	**11,817.04**	Operationalization of Output 3.1 requires Desktops for 17 field officers @$695.12 each
	45	72800	Information Technology Equipment	**695.12**	Operationalization of Output 3.1 requires Desktop for NRM Specialist @$695.12
	46	72800	Information Technology Equipment	**695.12**	Operationalization of Output 3.3 requires Desktop for CCD Specialist @$695.12
	47	74200	Audio Visual & Print Prod Costs	**352,000.00**	Output 3.3 requires the design and printing of 4 Management Programs (200 pages each) @$40,000 each and 12 PACCs (80 pages each) @$16,000 each
	48	74200	Audio Visual & Print Prod Costs	**172,000.00**	All Outputs will benefit from additional design and printing of information material generated ad hoc @34,400 during years 1-5
	Management			**US$**	**US$**
Management	49	71400	Contractual Services-Individual	**172,800.00**	100% of salary of full-time Project Coordinator @ $34,560 / year, over project years 1-5
	50	71400	Contractual Services-Individual	**129,600.00**	100% of salary of full-time projectAdminnistrative Assistant @ $25,920 / year, over project years 1-5
	51	71400	Contractual Services-Individual	**86,400.00**	100% of salary of full-time project Jr Administrative Assistant @ $17,280 / year, over project years 1-5
	52	72800	Information Technology Equipment	**2,085.36**	3 desktops @$695.12 each for Project Coordinator, Administrative Assistant and Jr. Assistant

	53	74100	Professional services	**15,000.00**	Audit cost of $3,000/year during years 1-5.
	54	74599	Direct Project Services	**75,617.40**	Estimated UNDP Direct Project Service/Cost recovery charges to UNDP for executing services. In accordance with GEF Council requirements, the costs of these services will be part of the executing entity's Project Management Cost allocation identified in the project budget. DPS costs would be charged at the end of each year based on the UNDP Universal Price List (UPL) or the actual corresponding service cost. The amounts here are estimations based on the services indicated, however as part of annual project operational planning the DPS to be requested during the calendar year would be defined and the amount included in the yearly project management budgets and would be charged based on actual services provided at the end of that year. See Annex 10 for more details.

5. MANAGEMENT ARRANGEMENTS

5.1 Arrangements and responsibilities

228. The project will be executed under NIM modality, with execution by the National Commission for Natural Protected Areas (CONANP) following UNDP's Programme and Operations Policies and Procedures, per its role as implementing agency. Execution of the project will be subject to oversight by a Project Steering Committee, detailed below. Day to day coordination will be carried out under the supervision of a Project Coordination Unit and corresponding staff, also detailed below. The executing agency will take responsibility for different outcomes/activities according to existing capacities and field realities, ensuring effective and efficient use of GEF resources.

Functions of the Participants

229. The *Ministry of Foreign Affairs (SRE)*. The Government of the United Mexican States has designated the Technical and Scientific Cooperation Directorate of the SRE as the official counterpart of UNDP in Mexico. Its main responsibilities are:

- As the entity responsible for technical cooperation in Mexico, to act as the Mexican government's official counterpart to UNDP; specifically, and in accordance with the National Development Plan, to formalize approval of the project cooperation documents presented to UNDP by federal, state and private entities.
- If necessary, to make a written request to UNDP for reports on the project.
- To approve the annual audit plan for the project and, in accordance with UNDP standards and procedures, to convene an information and consultation meeting prior to the audit.
- If considered necessary, to attend at least one meeting a year of the project's Project Steering Committee.
- As required, to participate in tripartite meeting or in any follow-up or reorientation sessions.

230. The *National Commission for Natural Protected Areas (CONANP)* is the National Implementing Partner responsible for the fulfillment of the project's results. Its main responsibilities are to:

- Lead the project implementation with the support of the PCU.
- Participate together with UNDP, in selecting the Project Coordinator.
- Designate a representative to act as a permanent liaison between UNDP, the Ministry of Foreign Affairs and the Project Coordinator, and to participate in the Project Steering Committee meetings, and others as required, to ensure that the necessary inputs are available to execute the project.
- Prove the technical and administrative capacity to develop the project.
- Monitor the project's work plan and progress.
- Provide the name and describe the functions of the person or persons authorized to deal with UNDP concerning the project's matters.
- Approve ToR for technical personnel and consultancies for project implementation.
- Participate in the selection process of the consultants and approve all hiring and payment request.

- Provide the name and describe the functions of the person or persons authorized to sign the project's budget and/or substantive revisions of the project.

231. *United Nations Development Programme (UNDP).* UNDP is the world development network established by the United Nations with a mandate to promote development in countries and to connect them to the knowledge, experience and resources needed to help people achieve a better life. Its main responsibilities are to:

- Designate a programme officer responsible for providing substantive and operational advice and to follow up and support the project's development activities.
- Advise the project on management decision making, as well as to guarantee quality assurance.
- Be part of the project's Steering Committee and other Committees or Groups considered part of the project structure.
- Administer the financial resources agreed in the revised work plan and approved by the project's Steering Committee, and inform the National Implementing Partner of its origin and destination.
- Co-organize and participate in the events carried out in the framework of the Project.
- Use national and international contact networks to assist the project's activities and establish synergies between projects in common areas and/or in other areas that would be of assistance when discussing and analyzing the project.
- Provide Support in the development and instrumentation of the project's gender strategy.

232. Implementation will be carried out under the general guidance of a *Project Steering Committee* (PSC) which will be responsible for making management decisions for the project by consensus, especially the operational plans, annual reports and budgets of the project. The PSC will be co-chaired by UNDP and CONANP and will meet no more than four times per year to review project progress and approve upcoming work plans and corresponding budgets. The PSC will be in charge of the overall supervision of the project, providing strategic guidance for its implementation, ensuring that this proceeds in accordance with a coordinated framework of government policies and programs, and in accordance with the agreed strategies and targets laid out above in this Project Document. The PSC will also approve and supervise the hiring and work of staff under the Project Coordination Unit, detailed below. In order to ensure UNDP's ultimate accountability, the PSC decisions should be made in accordance with standards that ensure development results, cost-effectiveness, fairness, integrity, and transparency.

233. The responsibilities of the PSC shall include, but not be limited to: (1) Review, approve and amend this project document, including the Monitoring and Evaluation (M&E) framework, and the implementation plan; (2) Monitor compliance with the Project's objectives; (3) Discuss progress and identify solutions to problems facing any of the project´s partners; (4) Review and approve the AWP and the consolidated financial and progress reports; (5) During the life of the project, review proposals for major budget re-allocation such as major savings or cost increases, or for use of funds for significantly different activities; (6) Review evaluation findings related to impact, effectiveness and the sustainability of the project; (7) Monitor both the budget and the prompt delivery of financial, human and technical inputs to comply with the work plan; (8) Ensure the participation and ownership of stakeholders in achieving the objectives of the project; (9) Ensure communication of the project and its objectives to stakeholders and the public; (10) Approve the project communication strategy and public information plans prepared by the PSC; (11) Facilitate linkages with high-level decision making; (12) Convene

ordinary meetings to consider the Technical Committee's proposals and recommendations, as well as the progress made by the project; and (13) Convene, if necessary, extraordinary meetings.

234. An *Operational Group* will be established to provide a forum for *ad-hoc* discussions amongst project partners regarding implementation of specific project activities. This is a technical operational group which includes project's partners and involved stakeholder organizations (*inter alia* CONAFOR, CONABIO and ENDESU). The OG will provide advice for the technical decision making of the project. The OG will meet twice a year to oversee the project's progress and to provide strategic guidance in operational decisions. The PCU should facilitate and work as the secretariat of the OG, and maintain constant coordination and communication with the OG.

235. The *National Project Director* (NPD), a senior staff member of CONANP, will be responsible for the overall coordination of the Project. He/she will keep the PSC updated on project advances and challenges as needed. The NPD will report to the PSC on progress made and issues to be resolved. The NPD will oversee the project and carries overall responsibility and accountability. She/he will establish and provide overall guidance to the PCU. The NPD is responsible for overseeing the work undertaken by the team. The NPD will submit relevant documentation to the PSC for endorsement.

236. Day-to-day management and coordination of the project will be under the supervision of the *Project Coordination Unit* (PCU). The PCU will be responsible for the general management actions of the project, such as the preparation of consolidated annual work plans and technical and financial reports to be presented to the PSC and the OG, with the aim of ensuring that advances in relation to the goals and key milestones of the project are achieved as planned. The PCU will report to the chair of DGDIP-CONANP (Project Director) and coordinate with the Director for Climate Change Strategies on a daily basis. The PCU will be comprised of a Project Coordinator, an Administrative Assistant, Junior Administrative Assistant, and three technical staff: a *Natural Resource Management (NRM) Specialist*, a *Communication and Capacity Development (CCD) Specialist*, and a *Monitoring and Evaluation (M&E) Specialist* tasked with charting project progress against targets presented in the Strategic Results Framework presented above. The Project Coordinator, Administrative Assistant, Junior Administrative Assistant and the technical Specialists will be full-time and contracted by UNDP. The *Project Coordinator*, will be responsible, under the supervision of the NPD, of the overall integration and follow-up of studies, research and project technical activities. He/she will assist in the supervision of project implementation, liaising directly with the NDP. He/she will undertake quarterly operational planning and provide guidance on its day-to-day implementation. The *Monitoring and Evaluation Specialist* will be in charge of the M&E of the project itself and of monitoring and information products from Outcomes 1 and 3. The NRM Specialist will supervise field-level projects and will be in close contact with the field-officers. The CCD Specialist will be in touch with field officers to promote social participation in local communities, to address gender-and-ethnic issues, to run capacity development programs and to acquire and generate information to enhance projects visibility. The PCU will ensure institutional coordination in each of the 12 ecoregional clusters where the project works.

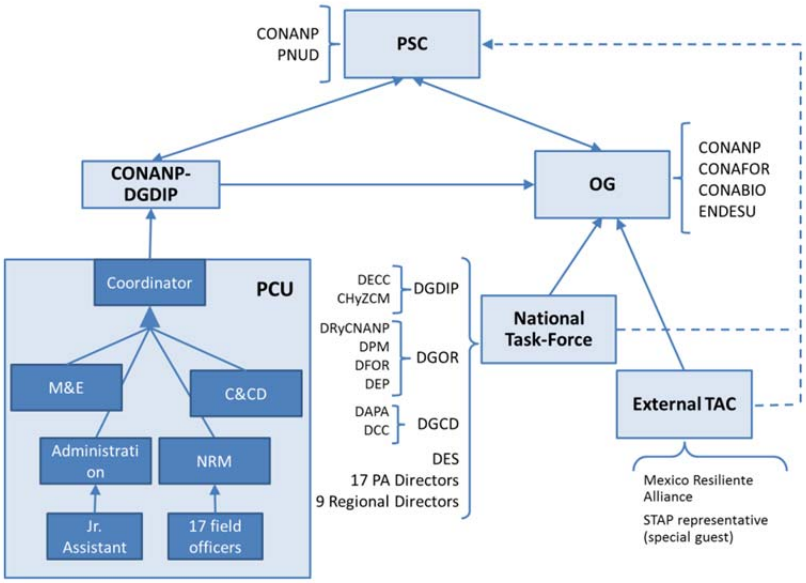
237. The PCU will be strengthened by field-officers assigned to the ecoregional clusters. These field-officers will be long-term consultants who will be tasked with specific results-based work, while also taking responsibility for coordinating field-level project work set out in annual work plans developed by the PCU, collaborating with technical consultants hired by the project, and above all ensuring close coordination between the project and national counterparts. The field officers will be contracted by the PCU and operate under the technical supervision of CONANP's PA Directors, in close coordination with the three technical specialists and report to the NRM Specialist. These individuals will be responsible for on-the-ground implementation of the project's resilience strategies in Outcome 3, as well as serve as focal points for engaging local communities and land-holders with respect to the expansion of conservation areas described in Outcome 2 CONANP's PA Directors will be responsible to report and coordinate with the PCU regarding the on-the-ground implementation of the project's resilience strategies.

238. Implementation of different outcomes/activities will be taken up by the executing agency (CONANP) with strategic support from key partners according to existing capacities with the aim of efficient use of GEF resources. CONANP through the DGDIP will take responsibility for the bulk of the activities related to coordination of policy and field-level technical inputs with national counterparts, institutional mainstreaming of CC resilience with the technical support of the PCU, and provide the overall technical oversight for programs and outputs of short-term consultants (with the support of the PCU) focused on such themes that may be contracted by the PCU. CONABIO will take responsibility for technical assistance activities needed with regards to the design and implementation of the BD Information System and Portal to support biodiversity management decisions and interventions to increase resilience, and to the field-level activities that involve restoration, conservation and monitoring. CONAFOR will be responsible of the incentives related to the forest conservation and payment for environmental services (PSA) that will help to strengthen connectivity inside and among protected areas, will provide information and advice on the monitoring activities related to carbon and forests (National Forest and Soil Inventories INFyS) and will give advice on forest-related activities. SMN-CONAGUA will contribute with infrastructure and capacity building and will hold the responsibility of the meteorological section of the Information System. Other stakeholders will provide support as described in Table 12 below.

239. Given the innovative and complex nature of this project, a *Technical Advisory Committee* (TAC) will provide scientific and technical backstopping to the project, as well as identify lessons learned that could be applicable to other projects within Mexico and around the world. The external TAC will be comprised of Mexico Resiliente Alliance, with 23 representatives from national and international organizations (universities, NGO, governmental institutions, as well as a member of the STAP). It will meet annually to discuss the project's progress and provide poignant advice to maximize the project's efforts to increase resilience. A national task-force formed by the 9 Regional Directors, the 17 Directors of benefited PA and technical directions from CONANP's central offices will meet at least once a year with the TAC to discuss regional progress. Ecoregional task-force subgroups could meet on a more frequent basis to share experiences and lessons learned. CONANP will lead the TAC meetings and the PCU will facilitate the process.

240. In addition to the long-term consultancies for the field officers / technical specialists in each ecoregional cluster, a series of short-term and medium-term consultancy contracts will also be necessary in order to back the technical inputs of the project. Such specialized inputs will be contracted to carry out targeted project activities under the technical supervision of the PCU and CONANP and advice by the OG (this advice can be provided through a meeting or virtually), and in coordination with the relevant field officer and PA Director. Terms of reference will be developed jointly by the PCU and CONANP and approved by the PSC during the first month of the implementation phase or annually, in accordance with approved work plans. Figure 10 below presents the project organigram, showing the relationships between the main institutions to be involved with project implementation and the bodies to be established by the project.

Figure 10. Organizational structure of the project



Administrative arrangements

241. The Government of Mexico has committed in-cash co-financing to the Project to an amount of US$ 52,000,000. These resources will mainly be used for salaries, travel expenses, equipment, programs and subsidies (e.g. Program of Temporary Employment, Program for Management Programs, Program for Conservation for Sustainable Development), and basic operation and management expenses of the 17 selected PA and involved offices.

242. To manage the resources, UNDP will make its installed capacity available to the Project, guaranteeing that their use is both transparent and prompt.

243. It should be mentioned that any services provided to the project by UNDP will be in accordance with its internal guidelines and regulations.

244. The project will be financed by the GEF with a total amount of US$ 10,172,727.

245. As an implementing agency, UNDP earns a fee (General Management Services – GMS) from the GEF upon approval of the project. The fee is used to cover the costs incurred by UNDP, both at the Headquarters and in the Country Office, in supporting substantive project development. The total fee that UNDP will receive is of US$1,017,273.

5.2 Key stakeholders involved in the project:

246. During the PPG phase, the executing agency of the project conducted regular meetings with a range of government partners as well as working with academics, NGOs and representatives of other initiatives to present the project and generate feedback from these stakeholders. In particular, the thematic consultancies commissioned during the PPG were specifically designed to solicit stakeholder input from an array of sources regarding experience with PA management, while seeking to propose innovative ways to remove barriers to mainstreaming climate change and increase resiliency. Moreover, the Strategic

Results Framework workshop was an important event that brought together a variety of stakeholders to discuss barriers, solutions, strategies, activities and priority regions for project intervention.

247. The project has benefited from high-level government support since its initiation, particularly from top-level policy makers in CONANP. The table below represents the expected roles of each of the key stakeholders during the implementation of the project:

Table 12: Stakeholders and their role in project implementation

Stakeholders	Project Implementation Role
SEMARNAT	Incorporate in all areas of the society and public administration criteria and tools to ensure optimal protection, conservation and use of natural resources. Include lessons learned and key messages in relevant international processes related to biodiversity and climate change. It is also the institution responsible of developing the National Climate Change Strategy and the Special Program on Climate Change.
CONANP	The Government agency with lead responsibility for the management of natural protected areas, and therefore most directly responsible for ensuring that appropriate strategies for adapting the management of PA to the effects of climate change are applied in an effective manner. It will be the executing agency of the project, in close coordination with CONABIO and CONAFOR.
CONABIO	Responsible for the promotion, coordination, support and realization of activities aimed at increasing knowledge of biological diversity and its conservation and sustainable use: the national institution with greatest capacities for the generation, management, analysis and communication of information on the magnitude, nature and implications of climate change for PA management. CONABIO is also responsible for promoting the implementation of biological corridors in the six southern states of Mexico: Campeche, Chiapas. Oaxaca, Quintana Roo, Tabasco and Yucatan.
CONAFOR	Responsible for the promotion of forest management, forest conservation and restoration, and the formulation of plans and programs for sustainable forest management. In the context of the project, responsible for developing strategies for the adjustment of forest management in conservation areas to climate change.
INECC	Generate, integrate and disseminate knowledge and information through applied scientific research and capacity building, to support the development of environmental policy and decision making to promote sustainable development
SAGARPA	Lead institution of the agricultural, livestock and fisheries sectors: will participate in the development and promotion of strategies for adjusting management activities in these sectors, in or adjoining conservation areas, to the effects of climate change.
Municipal governments	Responsible for overseeing natural resource management at local level, within their areas of jurisdiction, for ensuring that management strategies are appropriate to local needs and for ensuring that the needs of local stakeholders are taken into account in the definition of management strategies.
NGOs	Civil society organizations make an important contribution to the management of protected areas and to obtaining resources. In addition, they will be involved in providing technical assistance for the implementation of the project. They include The Nature Conservancy (TNC), the Mexican Fund for Nature Conservation (FMCN), the World Wildlife Fund (WWF), the AMBIO Cooperative and Mexican Fauna Protection (PROFAUNA), and members of the Gender and Environment Network (Red de Género y Medio Ambiente).
Universities and Research Centers	Several universities and research centers are actively involved through their academic and research programs in the use and management of natural resources in terrestrial, marine or coastal zones. These include: Universidad Autonoma de Mexico (UNAM) entities, such as the Biology Institute, the Atmosphere Sciences Center, the Geography College, the Geography institute, the Ecology Institute, among others. They will contribute to the consolidation of the resilience strategies through research related to biodiversity and climate change, especially through the external Technical Advisory Committee.
United Nations Development	UNDP-Mexico is the Project Implementing Agency that works to overcome poverty and promote sustainable development in Mexico. UNDP-Mexico offers guidance, technical support,

Programme (UNDP-Mexico	management tools, and theoretical and practical knowledge to national- and regional-level institutions to aid in implementing public policies, initiatives, and projects intended to overcome poverty. UNDP will support substantive project development and will make its installed capacity available to the Project, guaranteeing the accountability of the project.

248. The Project Coordination Unit (PCU) in coordination with the Project Director (CONANP-DGDIP) will be responsible for coordinating consultation and gathering inputs from all national level stakeholders (SEMARNAT, CONANP and departments), ensuring that the project is implemented within the context of an overall coordinated framework of government policies and programs, and maximizing synergies and efficiencies in project implementation. The Project Steering Committee (PSC) will evaluate and incorporate accordingly the comments and observations from national-level agencies that it considers relevant for the project's objective and expected outcomes during its quarterly meetings, as well as in the course of reviews planned as part of regular external project monitoring missions.

249. At the regional level the mechanisms for consultation, conciliation and approvals will be included in the responsibilities of the field officers, operating under coordinated efforts of CONANP and the NRM Specialist. This will include consultation with CONANP Regional Directors in the 12 project regions, key counterpart agencies in state and municipal level government, private sector partners, and the communities themselves.

250. During the first year of the execution of the project, the PCU will develop a Strategic Work Plan for the project. Participation of local stakeholders will be ensured through a series of workshops, consultations and other meetings with the PA Advisory Councils and other local participation forums, carried out in close coordination with PA directors and field-officers. As an overall work strategy for the project, the cost-effective management activities generated during the PPG phase for the specific PAs that the project will focus on, will be validated and expanded upon, identifying specific communities to partner with, where appropriate. Likewise, the strategies to be followed for the execution of the project and the roles of each of the stakeholders in the process will be validated and expanded upon.

251. The finalized plan will be reviewed and validated by all project implementation stakeholders (staff, long- and medium- and short-term consultants) in each of the 12 ecoregions and particular roles and responsibilities, in accordance with Terms of Reference, will be defined. This process will help minimize the duplication of responsibilities.

252. The CCD Specialist, with guidance from the Communication Strategy, will determine the most effective lines of communication to be actively sought between project implementation stakeholders and a range of other local development actors, including government rural support programs and projects operated by NGOs. Within this strategy, it is envisioned that a key role of project implementation stakeholders could be to act as 'translators' or 'go-betweens' among stakeholders at variable levels – from indigenous communities to government officials.

253. At the community level, existing structures for community participation (i.e. Local Advisory Council meetings) will be strengthened to ensure the dissemination of information related to the project. Such structures will also be used as channels for consultation with local communities and for the communication of their interests and concerns to decision-makers at higher levels.

5.3 Collaborative arrangements with related projects

254. Steps will be taken by the PC and OG to ensure close coordination and communication with other National Project Coordinators who are managing related projects to coordinate and synchronize efforts as well as promote cross-fertilization, where possible. CONANP has several projects related to climate change resilience that were constructed with a similar vision (based on the four concepts, three levels and

three axes mentioned above). In particular, strategic coordination with the following projects will lead to increased benefits for Mexican biodiversity and communities living in and around PAs.

255. The WB/GEF project "Coastal watersheds conservation in response to climate change", executed by CONANP and FMCN works toward the strengthening of integrated management of coastal watersheds in the Gulf of Mexico and the Gulf of California, as a way to increase resilience. It upholds the consolidation of management staff in PAs and the support to forest owners that promote conservation, especially of forest corridors that connect protected areas, through CONAFOR's PES. It follows the same landscape approach, engages sustainable development with community members, and one of the benefited PAs is Pantanos de Centla, thereby providing an opportunity for direct engagement with this project.

256. The project "Climate change and Management of Protected Areas" is executed by CONANP with support from GIZ. It works towards the strengthening of PAs and Priority Conservation Regions in the Sierra Madre Oriental (SMO) Region. Neither of the PAs in our project is benefited by this one, but it works towards building a resilient corridor in mountain habitats of SMO, with the participation of several local and national stakeholders, keeping a landscape approach that will indirectly complement the project.

257. The project "Capacity development to promote the climate change adaptation in the North and Sierra Madre Oriental Region", executed by CONANP and financed by Parks-Canada will implement adaptation strategies in PAs of this region through a landscape approach, including priority areas and corridors (connectivity). It will perform vulnerability analyses of benefited PAs, including Mapimí, to identify adaptation strategies and actions for mid-term.

258. The project "Conservation of biodiversity in the Sierra Madre Oriental and Gulf of Mexico", executed by CONANP and financed by KfW, works towards the strengthening of PAs in corridors of these regions through the promotion of local stakeholder participation, financial sustainability, and management effectiveness through the same scope as the other projects. One of the PAs benefited by this project is CADNR 004 Río Sabinas Portion and will provide important lessons to this project.

259. The project "Alignments of adaptation and mitigation to climate change in protected areas," executed by CONANP and financed by WWF, is developing an instrument to measure resilience based on institutional, socio-economic and ecological indicators. This project was the first one to recommend the three axes strategy. It will pilot these indicators in five PAs, including Mariposa Monarca.

260. The WB/GEF project "Adaptation measures in face of climate change impacts in coastal wetlands in the Gulf of Mexico" promotes the adaptation of wetlands to climate change through the implementation of pilot activities that will provide information on the costs and benefits of different resilience-promoting alternatives.

261. The "Conservation and sustainable use of marine and coastal biodiversity programme in the Gulf of California" will be implemented by the German Federal Ministry for Environment, Nature Conservation and Nuclear Safety (BMU), the Deutsche Gesellschaft für International Zusammenarbeit (GIZ) and CONANP in the Protected Areas in the Gulf of California, including El Vizcaíno and Islas del Golfo de California. The objective of the program is to improve the conservation of marine and coastal biodiversity in the Gulf and ensure its sustainable use. It also aims to replicate success stories throughout the Gulf of California in order to broaden the positive impacts of the efforts already undertaken.

262. The project "Valuation of ecosystem services in protected areas of Mexico" aims to increase the knowledge and recognition of the value of ecosystem services generated in PAs, and seeks to strengthen, develop and promote the implementation of innovative institutional mechanisms and tools to increase capacities and enhance the conservation of ecosystem services. It will be implemented in three PAs: one terrestrial, one coastal and one marine, in order to obtain experience to implement the program in other PAs. This project will build the basis from which PA staff, local communities, governmental institutions,

enterprises, NGOs and academics can increase their knowledge regarding the value of ecosystem services.

263. The project is directly benefited by the collaboration of the SMN-CONAGUA with CONANP, through the establishment of 53 Automatic Meteorological Stations (AMS) in PAs. CONANP and SMN-CONAGUA are already working together to enlarge this effort and install more AMS. The information of these stations is the basis of the Information System to be developed under Outcome 1.

264. The project will also benefit from Innovative Strategic Projects (PIE) of the FANP, which benefit three of the PAs in this project. PIE supports different actions in these PAs that will help increase resilience: in Islas del Golfo de California it will promote marine monitoring to identify conservation instruments, in Mapimí it will engage the protection and restoration of biodiversity, and in Selva el Ocote it will work with the recovery of landscapes used for coffee production.

265. The project "Capacity creation for forest monitoring in Mexico" is a joint effort of CONANP, CONABIO, CONAFOR, FMCN and the Gordon and Betty Moore Foundation, to determine the methods and technology to effectively monitor the deforestation and degradation of forests at national, regional and local levels. Monitoring protocols and capacity building will directly benefit the project information systems, and the results could be replicated in the whole PA system.

266. The Project will benefit from the UNDP/GEF project "Enhancing National Capacities to manage Invasive Alien Species (IAS) by implementing the National Strategy on IAS," executed by CONABIO. The Project will also benefit from the UNDP/GEF project "Strengthening Management of the PA System to Better Conserve Endangered Species and their Habitats," executed by CONANP.

5.4 UNDP Support Services

Commitments by UNDP and the Mexican government to provide support services

267. The support services required of UNDP will be provided in accordance with the conditions mentioned below.

268. UNDP Country Office can provide the necessary support services and assistance requested, whether to prepare reports or make direct payments. In providing these services, UNDP Mexico will check whether the capacity of the designated institution has been increased to enable it to directly carry out these activities.

269. UNDP, when asked to do so by the designated authority, may request support services for the programme of the project, including:

- National and international technical support provided by the United Nations System
- Project design and strategic planning
- Project administration by making technical and financial follow-up available, with a results-based approach.
- Develop international, national and local knowledge networks based on United Nations System experience.
- Select project personnel, assist in awarding contracts and suggest candidates (individuals or companies) for the project's substantive and administrative work
- Acquire goods and services, in accordance with its procedures and policies

270. The acquisition of goods and services as well as contracting personnel for the project are both the responsibility of the Executing Agency (CONANP) and of UNDP, and for its management UNDP's policies, standards and procedures must be complied with. It is important to mention that the candidates

for the posts of Project Coordinator, Administrative Assistant and M&E should be selected jointly by the Executing Agency (CONANP) and UNDP Mexico.

271. Should any demands or controversies arise concerning the provision of services by UNDP, they will be dealt with according to this document's basic assistance model.

272. If there are changes in the need for support services while the project is in force, the project document will have to be revised as mutually agreed by the UNDP Resident Representative and the counterpart institution.

Equipment

273. In accordance with UNDP's procedures and standards, all resources and equipment gained through project support remain the property of UNDP and will be transferred during the lifetime of the Project according to UNDP's Programme and Operation Policies and Procedures. The Project Coordinator will supervise the correct use and maintenance of these resources and equipment.

UNDP Cost Recovery Policy

274. As per Determination and Decision of UNDP's Executive Board on the Cost Recovery Policy over Regular and Other Resource-funded projects, the GEF contribution is subject to UNDP's cost recovery as follows:

275. (i) Direct Costs incurred in the provision of Direct Project Services (DPS) by UNDP. These costs shall be unequivocally related to specific activities and transactional services clearly identified, charged annually as per the UNDP Universal Price List. For more details, please see Annex 10.

Exchange rates

276. If payment is made in a currency other than United States dollars, its value will be determined by applying the United Nations operational exchange rate in force on the date of payment. If, before UNDP has used the total amount deposited, there is a change in the United Nations operational exchange rate, it will be adjusted in line with the value of the balance of unused funds. If this leads to a loss in the value of the balance, UNDP shall inform the donor with a view to determining whether the donor must provide additional funds. If these additional funds are not available, UNDP may reduce, or cancel its assistance to the project.

277. On the other hand, activities will also have to be adjusted to the cash funds available; also in this case, if there is a deficit because of exchange rate, UNDP has the obligation to inform the National Implementing Partner to determine whether it is necessary to transfer additional funds or simply to make budget changes.

278. In the event the project is suspended, reduced or cancelled, UNDP will return the unused funds at the United Nations operational exchange rate in force on the date they are returned; if there is an exchange rate loss, the deficit will be charged to the project.

279. In case of a surplus, the Project Steering Committee will decide how it is to be spent and what results are expected and will make the necessary work plan adjustments.

280. Because the Project Steering Committee will supervise and monitor the project based on a satisfactory and detailed work plan design, no unforeseen circumstances are expected that would imply administrative risks in its execution.

281. It is important to mention that any services provided by UNDP to the project will be performed under its internal policies and rules, as stated in the NIM guidelines.

Security

282. It is UNDP's priority to ensure basic minimum conditions of security within the project operation, and the project offices must comply with security requirements and operational standards established by the United nations Department of Safety and Security (UNDSS)

283. To achieve the above mentioned requirement, there will be regular meetings, workshops and training for project team and contracted personnel under the project in order to familiarize them with the regulations, procedures and training necessary to ensure compliance with such standards.

284. In consultation with the UNDSS, held on March, 2011, UNDP provides the following support:

285. Services to strengthen project team's security, through training courses via electronic means such as: 1) On-line basic security course, and b) advance security in the field course

286. In addition, to complement this training, UNDP provides project staff an induction session on security measures, current Operational Procedures (POV's), and brochure containing recommendations concerning specific issues. It is the responsibility of the Project Coordinating Unit to ensure that the personnel working on the project receive information that UNDSS develops.

287. UNDSS will review the facilities of the counterpart where project staff is based and issue recommendations to ensure compliance with MOSS.

288. UNDSS in Mexico will provide recommendations and, if necessary, assessment of venues in which events will be carried out under the project.

289. The staff recruited under the project will be working in the offices of the counterpart (CONANP). Access control and security of these facilities are responsibility of the counterpart. UNDP will request UNDSS to security-clear CONANP's project facilities before project staff start working there.

290. The recommendations of the UNDSS review will be shared with the counterpart to guarantee the security of the personnel. Project Offices are expected to be MOSS compliant.

291. The resources necessary to implement these measures will be reviewed by the Project Steering Committee and will seek co financing from the counterpart for such purposes.

292. If the project requires renting offices spaces outside CONANP's facilities, the project offices shall be checked and cleared by DSS according with the security principles and requirements established by UNDP (MOSS compliance). MOSS will be included in the terms of reference for office rental and spaces for workshops and hotels

293. All project workshops and activities promoted by the project will be held with external static security, ensuring safety of staff and participants.

294. Finally, UNDP regularly circulates a memo to those geographic areas that are considered at greatest risk for project staff. Project staff intended to travel to, or be stationed in the areas that are in a high security phase (indicated by UNDSS), most complete the Advance Course on Security the Field course and must obtain the security clearance by DSS.

5.5 Prior obligations and Prerequisites

N/A

5.6 Audit arrangements

295. The Government of Mexico will provide the UNDP Resident Representative with certified periodic financial statements, and with an annual audit of the financial statements relating to UNDP (including GEF) funds according to the established procedures set out in the Programming and Finance

manuals. The Audit will be conducted by the legally recognized auditor of the Government, or by a commercial auditor engaged by the Government. The firm will be selected through a bidding process and will be subjected to a rigorous evaluation within the principles of transparency, neutrality and cost benefit.

296. The project will be audited in accordance with the UNDP Financial Regulations and Rules and applicable audit policies. An audit to the Project is an integral part of UNDP financial and administrative management within the framework of UNDP's accountability, internally and with regards to the GEF. The project will be audited to ensure that resources are administered in accordance with the financial regulations of the project document, workplan and budget. The project's budget should contemplate the resources needed to carry out the audit. The firm selected by UNDP Mexico, through a bidding process and subjected to a rigorous evaluation within the principles of transparency, neutrality and cost benefit will take over this exercise in accountability.

5.7 Agreement on intellectual property rights and use of logo on the project's deliverables

297. The publications, research and products that are generated as part of the project are owned by CONANP and UNDP.

298. In order to accord proper acknowledgement to GEF and UNDP for providing funding, the GEF and UNDP logos should appear on all relevant project publications and project hardware, among other items. Any citation on publications regarding projects funded by UNDP and GEF should also accord proper acknowledgment to both UNDP and GEF and should give the corresponding credit to the authors.

299. In addition, all the publications produced as a consequence of this document must include the following inscription: "The opinions, analyses and policy recommendations do not necessarily reflect the point of view of the United Nations Development Programme, of its Executive Board or of its Member States".

Learning and Knowledge Sharing and Communication Strategy

300. Being a knowledge network, UNDP promotes the sharing of experiences and lessons learned from the projects, so that they can be shared with the international community to help its people to forge a better life.

301. Therefore, UNDP in coordination with the executing agency will promote the systematization of experience and dissemination of products arising from the framework of this project as a cross in the results. These activities are covered in the annual work plan of the project and will be allocated resources of its budget for this purpose.

302. The PSC will define the communication strategy and review it regularly to promote the visibility of lessons learned and best practices in the implementation of project activities. The committee will also determine the adjustments to the project budget to accomplish this goal.

303. As part of the communication strategy, a project launching event with key actors will publicize its scope and its linkages to other programs.

304. UNDP and CONANP will also be coordinated in promoting these results drawing spaces of dissemination of the United Nations (World Environmental Day) and other spaces of common interest that will be accorded in the PSC in order to ensure the visibility of the project and its objectives.

305. The project will identify, analyze and share lessons learned that may benefit the design and implementation of similar future projects. Identifying and analyzing lessons learned is an ongoing process and the need to communicate such lessons should be

306. Finally, UNDP will continue a policy of access to information related to the project, respecting information that CONANP considers confidential.

6. MONITORING FRAMEWORK AND EVALUATION

307. The project will be monitored through the following M& E activities. The M& E budget is provided in the table below.

308. Project start: The project will be officially launched no later than three months after the project start, in order to have visibility of the project's alignment with Mexico's efforts for biodiversity conservation and climate change resilience. This will include the Project Inception Workshop to with those with assigned roles in the project organization structure, UNDP Country Office (CO) and where appropriate/feasible regional technical policy and program advisors as well as other stakeholders. The Inception Workshop is crucial to building ownership for the project results and to plan the first year annual work plan.

309. The Inception Workshop will address a number of key issues including: (a) Assist all partners to fully understand and take ownership of the project. (b) Detail the roles, support services and complementary responsibilities of UNDP CO and RSC staff vis à vis the project team. (c) Discuss the roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. (d) The Terms of Reference (TOR) for project staff will be discussed again as needed. (e) Based on the project results framework and the relevant GEF Tracking Tool if appropriate, finalize the first annual work plan. Review and agree on the indicators, targets and their means of verification, and recheck assumptions and risks. (f) Provide a detailed overview of reporting, M&E requirements. The M&E work plan and budget should be agreed and scheduled. (g) Discuss financial reporting procedures and obligations, and arrangements for annual audit. (h) Plan and schedule Project Steering Committee (PSC) meetings. Roles and responsibilities of all project organization structures should be clarified and meetings planned. The first PSC meeting should be held within the first 2 months following the inception workshop.

310. An Inception Workshop report is a key reference document and must be prepared and shared with participants to formalize various agreements and plans decided during the meeting.

311. Project Implementation Workplan: Immediately following the inception workshop, the project will be tasked with generating a strategic workplan. The workplan will outline the general timeframe for completion of key project outputs and achievement of outcomes. The workplan will map and help guide project activity from inception to completion. To ensure smooth transition between project design and inception, the inception workshop and work planning process will benefit from the input of parties responsible for the design of the original project, including as appropriate relevant technical advisors.

312. Quarterly: Progress made shall be monitored in the UNDP Enhanced Results Based Management Platform. Based on the initial risk analysis submitted, the risk log shall be regularly updated in ATLAS. Risks become critical when the impact and probability are high. Based on the information recorded in Atlas, a Project Progress Report (PPR) can be generated in the Executive Snapshot. Other ATLAS logs can be used to monitor issues, lessons learned etc. The use of these functions is a key indicator in the UNDP Executive Balanced Scorecard.

313. Annually (Annual Project Review/Project Implementation Reports (APR/PIR)): This key report is prepared to monitor progress made since project start and in particular for the previous reporting period (30 June to 1 July). The APR/PIR combines both UNDP and GEF reporting requirements.

314. The APR/PIR includes, but is not limited to, reporting on the following: (a) Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative); (b) Project outputs delivered per project outcome (annual); (c) Lesson learned/good practice; (d) AWP and other expenditure reports; (e) Risk and adaptive management; (f) ATLAS QPR; (g) Portfolio level indicators (i.e. GEF focal area tracking tools) are used by most focal areas on an annual basis as well.

315. Periodic Monitoring through site visits: UNDP CO and the Regional Service Centre (RSC) will conduct visits to project sites based on the agreed schedule in the project's Inception Report/Annual Work Plan to assess first hand project progress. Other members of the PSC may also join these visits. A Field Visit Report/BTOR will be prepared by the CO and UNDP RSC and will be circulated no more than one month after the visit to the project team and PSC members.

316. Mid-term of project cycle: The project will undergo an independent Mid-Term Review during mid-point of project implementation (project months 28 – 29). The Mid-Term Review will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization and terms of reference of the mid-term review will be decided after consultation between the parties to the project document. The TOR for this Mid-term review will be prepared by the UNDP CO based on guidance from the RSC and UNDP-GEF. This independent expert will be recruited at least six months prior to the planned commencement of the mid-term review. The management response and the review will be uploaded to UNDP corporate systems, in particular the UNDP Evaluation Office Evaluation Resource Center (ERC). The relevant GEF Focal Area Tracking Tools will also be completed during the mid-term review cycle.

317. End of Project: An independent Final Evaluation will take place three months prior to the final PSC meeting and will be undertaken in accordance with UNDP and GEF guidance. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the mid-term review, if any such correction took place). The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals. The TOR for this evaluation will be prepared by the UNDP CO based on guidance from the RSC and UNDP-GEF.

318. The Final Evaluation should also provide recommendations for follow-up activities and requires a management response which should be uploaded to PIMS and to the UNDP Evaluation Office Evaluation Resource Center (ERC). The relevant GEF Focal Area Tracking Tools will also be completed during the final evaluation.

319. During the last three months, the project team will prepare the Project Terminal Report. This comprehensive report will summarize the results achieved (objectives, outcomes, outputs), lessons learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

320. Learning and knowledge sharing: Results from the project will be disseminated within and beyond the project intervention zone through existing information sharing networks and forums. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation through lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Finally, there will be a two-way flow of information between this project and other projects of a similar focus.

M& E workplan and budget

Type of M&E activity	Responsible Parties	Budget US$ *Excluding project team staff time*	Time frame
Inception Workshop and Report	▪ Project Manager ▪ UNDP CO, UNDP GEF	Indicative cost: 10,000	Within first two months of project start up
Measurement of Baseline Indicators and Means of Verification of project results	▪ UNDP/CONANP/PCU will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members.	Indicative cost: 45,000	Start, mid and end of project (during evaluation cycle) and annually when required.
Measurement of Means of Verification for Project Progress on *output and implementation*	▪ Oversight by Project Manager ▪ Project team	Indicative cost: 45,000	Annually prior to ARR/PIR and to the definition of annual work plans
ARR/PIR	▪ PCU ▪ UNDP CO ▪ UNDP GEF	None	Annually
Periodic status/ progress reports	▪ PCU	None	Quarterly
Project Steering Committee Meetings	▪ Project Coordinator ▪ UNDP CO	None	Following Project IW and subsequently at least Quarterly
Technical Advisory Committee Meetings	▪ Project Coordinator ▪ UNDP CO ▪ UNDP GEF	Indicative cost: 5,000	Annually
Mid-term Review, including update of METT and ESSP	▪ PCU ▪ UNDP CO ▪ UNDP RSC ▪ External Consultants (i.e. review team)	Indicative cost: 40,000	At the mid-point of project implementation.
Final Evaluation, including final METT and ESSP	▪ PCU ▪ UNDP CO ▪ UNDP RCU ▪ External Consultants (i.e. evaluation team)	Indicative cost : 40,000	At least three months before the end of project implementation
Project Terminal Report	▪ PCU ▪ UNDP CO ▪ local consultant	0	At least three months before the end of the project
Audit	▪ UNDP CO ▪ PCU	15,000 (indicative cost per year: 3,000)	Annually
Visits to field sites	▪ UNDP CO ▪ UNDP RSC (as appropriate) ▪ Government representatives	For GEF supported projects, paid from IA fees and operational budget	Annually
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses		US$ 200,000 (+/- 5% of total budget)	

7. LEGAL CONTEXT

321. This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of Mexico and the United Nations Development Program, signed by the parties on February 23rd, 1961. The host country implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government co-operating agency described in that Agreement.

322. The UNDP Resident Representative in Mexico City is authorized to effect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by the UNDP-GEF Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes: (i) Revision of, or addition to, any of the annexes to the Project Document; (ii) Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation; (iii) Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility, and; (iv) Inclusion of additional annexes and attachments only as set out here in this Project Document.

323. Consistent with Article III of the SBAA, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

324. The implementing partner shall:

325. Put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;

326. Assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

327. UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

328. The executing partner agrees to undertake all reasonable efforts to ensure that none of UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to Resolution 1267 (1999). The list can be accessed via http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

ANNEXES:

Annex 1. Protected areas targeted by the GEF intervention

	Name of Protected Area	Is this a new PA?	Area (ha)	Biogeographic Province[127]	Global designation or priority lists	Local designation of PA	IUCN Category					
							I	II	III	IV	V	VI
1	Archipielago de Revillagigedo	0	638,685-37-50	-	Biosphere Reserve, RAMSAR site							X
2	Arrecife de Puerto Morelos	0	9,066-63-11	Yucatecan Tropical Dry forests and woodlands	Ramsar site	National Park		X				
3	CADNR004 Porcion Rio Sabina, La Encantada, Santa Rosa, Burro	0	802500	Tamaulipan Desert	Ramsar Site							
4	Cañon Del Sumidero	0	21789	Madrean Cordilleran	Ramsar Site	National Park		X				
5	Constitución De 1857	0	5030	Sonoran Desert	Ramsar Site	National Park		X				
6	Costa Occidental de Isla Mujeres, Punta Cancun y Punta Nizuc	0	8,673-06-00	Yucatecan Tropical Dry forests and woodlands		National Park		X				
7	El Vizcaino	0	2546790	Sonoran Desert	Biosphere Reserve, World Heritage Site, RAMSAR site, Sitio Red Hemisferica de Aves Playeras (RHRAP), Man and Biosphere (MAB)							X
8	Islas del Golfo de California	0	300000	-	World Heritage Site, Ramsar Site, MAB	Flora and Fauna Protection Area					X	
9	Janos	0	526,482-42-66.83,	Madrean Cordilleran	Biosphere Reserve					X		
10	Laguna de Términos	0	705,016-51-25	Peten, Gulf of Mexico	Ramsar Site							X

[127] As in Udvardy, M. D. F. 1975. A classification of the biogeographical provinces of the World. IUCN Occasional paper 18. International union for Conservation of Nature and Natural Resources. Switzerland.

11	Manglares de Nichupte	0	4257	Yucatecan Tropical Dry forests and woodlands	Ramsar Site							X
12	Mapimi	0	342387	Chihuahuan Desert	MAB							X
13	Mariposa Monarca	0	56,259-05-07.275	Madrean Cordilleran	World Heritage Site, Biosphere Reserve, MAB-UNESCO	Biosphere Reserve						X
14	Pantanos de Centla	0	302706	Gulf of Mexico	Biosphere Reserve, Ramsar site, AICA, MAB	Biosphere Reserve						X
15	Selva El Ocote	0	101288	Madrean Cordilleran	MAB, Aica	Biosphere Reserve						X
16	Sierra de San Pedro Martir	0	72910	Sonoran Desert		National Park		X				
17	Tehuacan-Cuicatlan	0	490 186-87-54.7	Madrean Cordilleran	MAB	Biosphere Reserve						X

Annex 2. Management Effectiveness Tracking Tool

*Full Tracking Tool is annexed as an excel file.

Section One: Project General Information

1. Project Name: "Strengthening management effectiveness and resilience of protected areas to safeguard biodiversity from climate change"
2. Project Type (MSP or FSP): FSP
3. Project ID (GEF): 4763
4. Project ID (IA): 4647
5. Implementing Agency: UNDP
6. Country(ies): Mexico

   Name of reviewers completing tracking tool and completion dates:

	Name	**Title**	**Agency**
Work Program Inclusion	Sara Martinez (with contributions from PA Directors)	Project Analyst	CONANP
Project Mid-term			
Final Evaluation/project completion			

7. Project duration: ***Planned*** 5 years ***Actual*** _____ years
8. Lead Project Executing Agency (ies): CONANP
9. GEF Strategic Program: Improve Sustainability of Protected Area Systems
10. Project coverage in hectares:

Total Extent in hectares of protected areas targeted by the project by biome type (biogeographic province)	**Foreseen at project start**	**Achievement at Mid-term Evaluation**	**Achievement at Final Evaluation**
Tropical and subtropical moist broadleaf forests (tropical and subtropical, humid)	332001		
Tropical and subtropical dry broadleaf forests (tropical and subtropical, semi-humid)	172664		
Tropical and subtropical coniferous forests (tropical and subtropical, semi-humid)	57		
Temperate broadleaf and mixed forests (temperate, humid)	59106		
Temperate coniferous forests (temperate, humid to semi-humid)	473486		
Tropical and subtropical grasslands, savannahs, and shrublands (tropical and subtropical, semi-arid)	151628		
Temperate grasslands, savannahs, and shrublands (temperate, semi-arid)	712762		
Flooded grasslands and savannahs (temperate to tropical, fresh or brackish water inundated)	226149		
Mangroves	129825		

Mediterranean forests, woodlands, and scrub or Sclerophyll forests (temperate warm, semi-humid to semi-arid with winter rainfall)	72910		
Deserts and xeric shrublands (temperate to tropical, arid)	2188946		
Large lakes	243665		
Large river deltas	45000		
Temperate floodplain rivers and wetlands	405		
Temperate upland rivers	1400		
Tropical and subtropical coastal rivers	2635		
Tropical and subtropical floodplain rivers and wetlands	250641		
Xeric freshwaters and endorheic basins	3		
Oceanic islands	315782		
Coral reefs	8823		
Estuaries	59257		
Total	**6,070,047**		

Section Two: World Bank/WWF Site-Level Management Effectiveness Tracking Tool for Protected Areas: Summary of METT scores per protected area[128]

Protected Areas	METT	% of 96
Archipielago De Revillagigedo	43	45
Cadnr004 Porcion Rio Sabina, La Encantada, Santa Rosa, Burro	41	43
Cañon Del Sumidero	71	74
Constitución De 1857	65	68
Costa Occ. De I Mujeres, Pta Cancun y Pta Nizuc	75	78
El Vizcaino	87	91
Islas Del Golfo De California Baja California	72	75
Islas Del Golfo De California Sonora	70	73
Janos	64	67
Laguna De Terminos	65	68
Manglares De Nichupte	52	54
Mapimi	73	76
Mariposa Monarca	69	72
Pantanos De Centla	76	79
Pto Morales	59	61
Selva El Ocote	78	81
Sierra De San Pedro Martir	62	65
Tehuacan-Cuicatlan	72	75

[128] Based on http://www.gefweb.org/uploadedFiles/Focal_Areas/Biodiversity/Biodiversity_GEF_SO_1_Tracking_Tool%20GEF-4.doc for criteria for assignation of scores

Annex 3. Summary of Capacity Development Scorecards

1. Archipiélago de Revillagigedo
2. Arrecife de Puerto Morelos
3. CADNR004, Río Sabinas Portion
4. Cañón del sumidero
5. Constitución de 1857
6. Costa Occidental de Isla Mujeres, Punta Cancún y Punta Nizuc
7. El Vizcaíno
8. Islas del Golfo de Calfiornia
9. Janos
10. Laguna de Términos
11. Manglares de Nichupté
12. Mapimí
13. Mariposa Monarca
14. Pantanos de Centla
15. Sierra San Pedro Mártir
16. Selva el Ocote
17. Tehuacán-Cuicatlán

Capacity Result / Indicator	Staged Indicators	Rating	Score																
			1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
CR 1: Capacities for engagement																			
Indicator 1: Degree of legitimacy/ mandate of lead environmental organizations	Organizational responsibilities for environmental management are not clearly defined.	0	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**3**
	Organizational responsibilities for environmental management are identified.	1																	
	Authority and legitimacy of all lead organizations responsible for environmental management are partially recognized by stakeholders.	2																	
	Authority and legitimacy of all lead organizations responsible for environmental management recognized by stakeholders.	3																	
Indicator 2: Existence of operational co-management mechanisms	No co-management mechanisms are in place.	0	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
	Some co-management mechanisms are in place and operational.	1																	
	Some co-management mechanisms are formally established through agreements, MOUs, etc.	2																	

	Comprehensive co-management mechanisms are formally established and are operational/functional.	3																		
Indicator 3: Existence of cooperation with stakeholder groups	Identification of stakeholders and their participation/involvement in decision-making is poor.	0	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**
	Stakeholders are identified but their participation in decision-making is limited	1																		
	Stakeholders are identified and regular consultations mechanisms are established.	2																		
	Stakeholders are identified and they actively contribute to established participative decision-making processes.	3																		
Total score for CR1			**7**		**8**	**9**	**9**	**9**	**9**	**9**	**6**	**9**	**9**	**9**	**8**	**8**	**8**	**9**	**9**
CR 2: Capacities to Generate, Access and Use Information and Knowledge																				
Indicator 4: Degree of environmental awareness of stakeholders	Stakeholders are not aware about global environmental issues and their relevant possible solutions.	0	**2**	**2**	**2**	**2**		**2**	**2**	**2**	**1**	**1**	**2**	**3**	**3**	**1**	**2**	**3**	**2**
	Stakeholders are aware about global environmental issues, but not about the possible solutions.	1																		
	Stakeholders are aware about global environmental issues and the possible solutions, but do not know how to participate.	2																		
	Stakeholders are aware about global environmental issues, and are actively participating in the implementation of related solutions.	3																		
Indicator 5: Access and sharing of environmental information by stakeholders	The environmental information needs are not identified, and the information management infrastructure is inadequate.	0			**2**	**3**	**2**	**2**	**2**	**2**	**1**	**1**	**2**	**2**	**3**	**2**	**3**	**2**	**2**
	The environmental information needs are identified but the information management infrastructure is inadequate	1																		
	The environmental information is partially available and shared among stakeholders, but is not covering all aspects and/or the information management infrastructure is limited	2																		
	Comprehensive environmental information is	3																		

	available and shared through an adequate information management infrastructure																			
Indicator 6: Existence of environmental education programmes	No environmental education programmes are in place	0	**1**	**3**	**2**	**3**	**3**	**1**	**2**	**1**	**1**	**3**	**1**	**2**	**3**	**1**	**1**	**2**	**3**
	Environmental education programmes are partially developed and partially delivered	1																	
	Environmental education programmes are fully developed but partially delivered	2																	
	Comprehensive environmental education programmes exist and are being delivered	3																	
Indicator 7: Extent of the linkage between environmental research/science and policy development	No linkage exist between environmental policy development and science/research strategies and programmes	0	**1**	**2**	**2**	**2**	**2**	**3**	**2**	**3**	**1**	**2**	**3**	**2**	**2**	**2**	**2**		**2**
	Research needs for environmental policy development are identified but are not translated into relevant research strategies and programmes	1																	
	Relevant research strategies and programmes for environmental policy development exist but the research information is not responding fully to the policy research needs	2																	
	Relevant research results are available for environmental policy development	3																	
Indicator 8: Extent of inclusion/use of traditional knowledge in environmental decision-making	Traditional knowledge is ignored and not taken into account into relevant participative decision-making processes	0	**1**	**2**	**1**	**2**		**1**	**1**	**1**	**1**	**3**	**1**	**1**		**1**	**2**	**3**	**2**
	Traditional knowledge is identified and recognized as important, but is not collected and used in relevant participative decision-making processes	1																	
	Traditional knowledge is collected but is not used systematically into relevant participative decision-making processes	2																	
	Traditional knowledge is collected, used and shared for effective participative decision-making processes	3																	
Total score for CR2			**5**	**9**	**9**	**12**	**7**	**9**	**9**	**9**	**5**	**10**	**9**	**10**	**11**	**7**	**10**	**10**	**11**
CR3: Capacities for Strategy, Policy and Legislation Development																			
Indicator 9: Extent of the environmental planning and strategy development	The environmental planning and strategy development process is not coordinated, and does not produce adequate environmental plans and strategies	0	**2**	**2**	**1**	**2**	**2**	**2**	**1**	**2**	**1**	**2**	**2**	**1**	**1**	**1**	**2**	**2**	**2**

process	The environmental planning and strategy development process does produce adequate environmental plans and strategies but they are not implemented or used	1																		
	Adequate plans and strategies are produced but there are only partially implemented because of funding constraints and/or other problems	2																		
	The environmental planning and strategy development process is well coordinated by the lead environmental organizations and produces the required environmental plans and strategies; which are being implemented	3																		
Indicator 10: Existence of an adequate environmental policy and regulatory frameworks	The environmental policy and regulatory frameworks are insufficient; they do not provide an enabling environment	0	**2**	**2**	**3**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**2**
	Some relevant environmental policies and laws exist, but few are implemented and enforced	1																		
	Adequate environmental policy and legislation frameworks exist, but there are problems in implementing and enforcing them	2																		
	Adequate policy and legislation frameworks are implemented and provide an adequate enabling environment; a compliance and enforcement mechanism is established and functions	3																		
Indicator 11: Adequacy of the environmental information available for decision-making	The availability of environmental information for decision-making is lacking	0	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**2**	**1**	**1**	**1**	**2**	**1**	**2**
	Some environmental information exists, but it is not sufficient to support environmental decision-making processes	1																		
	Relevant environmental information is made available to relevant decision-makers, but the process to update this information is not functioning properly	2																		
	Political and administrative decision-makers obtain and use updated environmental information to make environmental decisions	3																		
Total score for CR3			**6**	**6**	**6**	**6**	**6**	**7**	**6**	**7**	**5**	**6**	**7**	**5**	**5**	**5**	**6**	**6**	**6**
CR 4: Capacities for Management and Implementation																				
Indicator 12: Existence and	The environmental organizations don't have adequate resources for their programmes and	0	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**2**	**2**	**2**	**1**	**2**	**2**	**2**

mobilization of resources	projects, and the requirements have not been assessed																			
	The resource requirements are known but are not being addressed	1																		
	The funding sources for these resource requirements are partially identified, and the resource requirements are partially addressed	2																		
	Adequate resources are mobilized and available for the functioning of the lead environmental organizations	3																		
Indicator 13: Availability of required technical skills and technology transfer	The necessary required skills and technology are not available and the needs are not identified	0																		
	The required skills and technologies needs are identified as well as their sources	1																		
	The required skills and technologies are obtained but their access depend on foreign sources	2	**2**	**2**	**1**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**2**	**2**	**1**	**1**	**2**	**2**	**2**
	The required skills and technologies are available and there is a national-based mechanism for updating the required skills and for upgrading the technologies	3																		
Total score for CR4			**3**	**4**	**3**	**4**	**4**	**4**	**4**	**4**	**2**	**2**	**4**	**4**	**3**	**2**	**4**	**4**	**4**
CR5: Capacities to Monitor and Evaluate																				
Indicator 14: Adequacy of the project/programme monitoring process	Irregular project monitoring is being done without an adequate monitoring framework detailing what and how to monitor the particular project or programme	0																		
	An adequate resourced monitoring framework is in place but monitoring is irregularly conducted	1																		
	Regular participative monitoring of results is being conducted, but this information is only partially used by the project/programme implementation team	2	**1**	**2**	**1**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**1**	**2**	**1**	**2**
	Monitoring information is produced timely and accurately and is used by the implementation team to learn and possibly to change the course of action	3																		
Indicator 15: Adequacy of the project/programme evaluation process	None or ineffective evaluations are being conducted, with no adequate evaluation plan or the necessary resources	0	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
	An adequate evaluation plan is in place, but	1																		

	evaluation activities are irregularly conducted																			
	Evaluations are being conducted as per an adequate evaluation plan, but the evaluation results are only partially used by the project or programme implementation team	2																		
	Effective evaluations are conducted timely and accurately and are used by the implementation team and the Agencies and GEF Staff to correct the course of action, if needed,and to learn for further activities.	3																		
Total score for CR5			**2**	**3**	**2**	**3**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**2**	**3**	**2**	**3**
TOTAL SCORE CR1-CR5			**23**	**22**	**28**	**34**	**28**	**31**	**30**	**31**	**20**	**29**	**31**	**30**	**30**	**24**	**31**	**31**	**33**

Annex 4. Climate Change and Biodiversity in Mexico

Sara T. Martinez Chapital, Biologist

Mexico's bio-geographical, orographical, and climate features provide a broad range of microclimates and ecosystems and a wealth of endemisms, making it one of the 5 countries with the largest biodiversity in the world. Mexico is divided into 7 terrestrial and 5[129] marine ecoregions that encompass a great variety of ecosystems throughout the country, which can be distinguished for their particular climatic, geological, and biological characteristics.

The 7 terrestrial eco-regions are based on climatic conditions, geology and edaphology (CEC 1997, 2009; INEGI *et al.* 2008; Wiken *et al.* 2011):

- The Mediterranean California is the smallest eco-region and is found in northwestern Baja California Peninsula. It has mild Mediterranean climate with annual temperature ranging from 14°-18°C and annual precipitation from 200-1,400 mm, as well as chaparral vegetation associated with patches of oak forest, grassland and coniferous forest. It is home to several endangered arthropods, reptiles, birds, and mammals. Principle economic activities include irrigation agriculture and several industries (maquiladora manufacturing and assembly).
- The North American Deserts comprise the largest eco-region in Mexico, found along the Baja California Peninsula, part of Sonora and north central Mexico. It is distinguished by flat relief, arid weather with high temperature and annual precipitation less than 400 mm, and an abundance of cactus, shrubs and succulents. Birds, small mammals and reptiles are common. Irrigated agriculture is found in the areas close to large rivers, and cattle grazing is prevalent. Mining is also an important activity in the area.
- The Southern semi-arid highlands are limited by the Temperate Sierras to the west and south, and by the North American Desert to the east. They are formed by hills, bottom valleys and plains, and their vegetation is composed of grasslands as well as some scrublands and forests in the transition zones. This eco-region is home to about 8% of Mexico's population, and main activities include livestock grazing, agro-industries, and irrigated agriculture.
- The Great Plains ecological region is found in northeast Mexico and is distinguished by little topographic relief, sub-humid to semiarid climate, abundance of grasslands and almost no forests, and vegetation dominated by prickly shrub, with salt-tolerant communities being common. It provides habitat for migrant waterfowl and several threatened species. It is highly used for agriculture and grazing.
- Tropical-humid forests are found along the Gulf Coastal Plain, the Yucatán Peninsula, a patch of the Pacific Coastal Plain and part of the Sierra Madre lowlands in Chiapas. They consist mainly of rainforest with high mean temperatures (20°-26°C) and high annual precipitation evenly distributed around the year (1,600-1,800 mm) or seasonally distributed (2,000 mm). Tropical-wet forest is the richest terrestrial ecosystem in terms of number of species, and has a high local (α) diversity, but there is a small variation in species composition among sites (low β diversity—

[129] Wilkinson et al. 2009. Op cit.; Most literature refers to eight coastal and marine ecoregions, but during the PPG phase it was decided to merge the three smallest ones into other similar marine ecoregions so as to ease management, and because the smaller ecoregions have very few PA. Northern Pacific includes Monterrey Pacific Transition and Southern Californian Pacific; Southern Pacific covers Mexican Pacific Transition and Middle American Pacific; and Gulf of Mexico combines Northern and Southern Gulf of Mexico.

Challenger and Soberón 2008). Tropical-humid forests are threatened mainly by deforestation, changes in land use and fires.

- The Tropical-dry Forests eco-region covers 13% of Mexican territory and runs in an interrupted strip along the Pacific slope, from Eastern Sonora south to Chiapas, including the Balsas Basin, surrounding the Temperate Sierras of Guerrero and Oaxaca and embracing the Central Chiapas Depression. There are also areas of Tropical-dry forests in the Northern Gulf Coastal Plain, the north of Yucatán Peninsula and the south of Baja California. It is characterized by steep relief, high average annual temperatures (20°-29°C), a highly seasonal rain period with up to 8 months of dry season, and annual precipitation from 600-1,600 mm. Dry forests mainly consist of deciduous vegetation dominated by trees and bushes, with high endemism for vascular plants. They are high in local (α) diversity and also show a high variability in species composition among sites (β diversity—Trejo 2005). This eco-region is highly used for agriculture and grazing, producing one third of Mexico's total agricultural products.
- The Temperate Sierras eco-region comprises the majority of Mexico's mountains (including Eastern and Western Sierra Madre, the Trans Mexican Volcanic Belt, and the Escudo Mixteco), and covers around 25% of the nation's territory. Most major cities are located within this region (approximately 40% of the nation's population). Vegetation can be perennial or semi-deciduous, conformed mainly of conifers and oaks, and sometimes associated with shrubs and herbaceous plants. Mexico is known as the prime diversity center of pine trees, with up to 50% of known species (Challenger and Soberón 2008). Cloud forests are present in this region, covering 1,844,354 ha, and are a very rich and diverse ecosystem with several endemic species (SEMARNAT 2011). Temperate Sierras have been highly transformed for agriculture, forestry and industry.

In addition to these terrestrial ecoregions, Mexico is characterized by 5 Marine and Coastal eco-regions (Wilkinson et al., 2009):

- The Southern Pacific —largely free from mixing with colder waters from farther north and therefore a year-round tropical sea—supports important fisheries such as yellowfin and skipjack tuna, as well as shrimp. It also experiences high seasonal variability due to upwelling, and is strongly influenced by freshwater discharge from coastal lagoons and river systems present in coastal areas in Chiapas, as well as winds from the Gulf of Mexico. It acts as a nutrient and phytoplankton carbon pump, enriching adjacent offshore waters. Many of the region's communities are characteristic of those found in upwellings. At least 153 species of marine algae have been found on the seafloor. At least 178 species in 103 genera and 52 families constitute the demersal fish community. The highest diversity is found offshore of the estuarine systems during the rainy season. Mangrove communities are also found in the region and are more developed in Chiapas than in Oaxaca. The Oaxacan coast presents limited coral reef structures (in Bahia de Huatulco, La Entrega and Puerto Angel) in relatively good condition. Fishing and coastal industrial development based on oil, sugar and transportation are placing pressures on the region.
- The North Pacific is a fairly complex region, with a narrow shelf that drops off steeply to great ocean depths close to the coast. It is incised by several canyons and the Mesoamerican Trench that plunges to depths between 4,000 and 5,000 m. In addition, the region is dotted by numerous submarine hills and mountains, and includes a rift system and volcanic cones that have emerged from the depths of the ocean. It also has a great diversity of coastal systems and subsequently high species diversity. Tourism has contributed to shaping many of the coastal communities in the region.
- The Gulf of California (also known as the Sea of Cortez or Mar de Cortés) is a semi-enclosed sea known for its exceptionally high levels of biodiversity and rates of primary productivity due to a combination of its topography, warm climate, and upwelling systems. It is also home to the endemic

vaquita porpoise—the most endangered cetacean in the world—and the large, corvina-like totoaba. Upstream damming and diversion leading to decrease of fresh water input from the Colorado River has drastically changed the ecological conditions of the Upper Gulf—now a hypersaline estuarine system important for fish reproduction. Fishing, especially with gillnets, is a key activity for coastal communities of the region. The Gulf of California contributes to approximately 50 percent of Mexico's national fisheries production by volume. However, decreases in abundance of several species of fish and changes in gear types have caused much concern. Moreover, mega-resort/tourism/vacation properties developments have commenced, including new marinas for increased recreational watercraft, and are rapidly proceeding with little ecological oversight.

- The Gulf of Mexico is a semi-enclosed sea basin with tropical currents that has a distinct sea surface temperature gradient from north to south (up to 7^{o} C) in winter. A prominent feature in the Gulf of Mexico is the Loop Current, which brings oceanic water into the greater Gulf, entering through the Yucatan Channel and exiting through the Straits of Florida to become the Florida Current and later the Gulf Stream. It is characterized as semi-tropical due to the seasonal pattern of its temperature regime, which is influenced mainly by tropical currents in the summer and temperature continental influences during the winter. Hurricanes greatly affect the physical, biological and human systems of the region. The passage of strong wind and storm events are thought to be important to the ecology of this otherwise low-energy region because these episodic inputs of energy rework sediments, redistribute biological seed material and remove accumulated toxics, promoting healthier communities. The region is considered semi-tropical to tropical, and consequently the coastal communities range from salt marshes to seagrasses, and mangrove systems to salt pans, with scarce and isolated coral reef formations. Habitats of the Gulf of Mexico, such as coastal lagoons, estuaries, and dunes to mangroves, seagrass beds and some coral reefs help to support the more than 1,000 species of fish that occur in the Gulf of Mexico. The region also supports oil and gas production, fisheries, and tourism.
- The Caribbean Sea region is a semi-enclosed tropical sea that includes the Yucatan Peninsula. The Caribbean Sea Region is a tropical, nutrient-poor sea that lies over primarily mixed sediments. The major flow of the Caribbean Current passes around the southern part of the Caribbean toward the Yucatan Channel, through which water leaves the Caribbean and enters the Gulf of Mexico. The region is characterized by strongly seasonal rainfall patterns and stochastic, large-scale disturbances, in the form of tropical storms and hurricanes. Coral reefs, mangrove forests and seagrass meadows form large coastal systems or complexes that can provide important habitat—such as feeding and breeding areas for the more than 1,300 fish species, numerous marine mammals and sea turtles found in the region. Mangroves also provide additional environmental services, such as erosion control, nutrient retention, and storm buffering. The Caribbean Sea is showing signs of stress, particularly in the shallow waters of coral reefs. Habitat and biodiversity loss results from intensive coastal tourism, urbanization, land-based sources of pollution, artisanal fisheries.

The most important causes of megadiversity in Mexico are its topography, its variety of climates and its complex geological, biological and cultural history, which have contributed to the formation of a mosaic of environmental conditions that have enabled the evolution of a large variety of habitats and lifeforms[130]. The country covers a wide latitudinal range and has complex and highly diverse topography, with an altitudinal range extending from below sea level to 5,700 m.a.s.l. These factors give Mexico one of the world's most diverse weather systems. Areas south of the twenty-fourth parallel with elevations up to 1,000 m (the southern parts of both coastal plains as well as the Yucatán Peninsula) have a yearly median temperature between 24 and 28°C. Temperatures here remain high throughout the year, with only a 5°C difference between winter and summer median temperatures. Both Mexican coasts, except for the south

[130] http://www.vivanatura.org

coast of the Bay of Campeche and northern Baja, are also vulnerable to serious hurricanes during the summer and autumn. Although low-lying areas north of the twenty-fourth parallel are hot and humid during the summer, they generally have lower yearly mean temperatures (20 to 24°C) because of more moderate conditions during the winter. Many parts of Mexico, particularly the north, have a dry climate with sporadic rainfall while parts of the tropical lowlands in the south average more than 2,000 mm of annual precipitation. Temperatures in the Sonoran desert may reach 50°C or more. With increasing altitude come variations in the intensity of solar radiation, atmospheric humidity, diurnal oscillation of temperature and the amount of available oxygen.

Climate change models based on green house gas (GHS) emission scenarios predict that precipitation in Mexico will continue to follow a seasonal pattern, but with expanded anomalies. Winter precipitation will significantly decline in most of the country. Flooding and drought will increase, and temperatures will rise from 2.5-4 °C in the summer and 1.5-2.5 °C in the winter. These changes threaten biodiversity already exposed to human activity. Species may respond to these changes in their distribution, phenology o physiology; otherwise they will considerably decline or become extinct. The general trend in global climate change is for species to migrate from a lower to a higher altitude or latitude.

Changes among various plant and animal groups have been projected. In plants, noticeable changes will range from increased sensitivity to pests and water stress-induced disease to lower fruit production for lack of cooler temperatures. The types of vegetation foreseen to be most affected include temperate plants such as pine forests, mixed forests, cloud forests, and temperate grasslands, while tropical and dry vegetation, like tropical deciduous forests, xeric shrubland, and tropical grasslands will expand. Plant species restricted to certain temperature and rainfall conditions, many of which have a high degree of endemism, will also decline.

In animals there will be changes in the phenology of pollinating insects, and the plants they pollinate, with potential impacts on economically relevant crops. Some pest-forming species or carriers of disease like dengue carrying mosquitoes could take advantage of such conditions to spread. Just as with plants, taxa that will be most affected are those highly sensitive to modifications in their habitat, like some specialized birds; or with physiological restrictions, like amphibians; or taxa confined to certain temperatures and precipitations, such as certain lizards.

Oceans are expected to rise in temperature, sea levels and water acidity. This will have a special impact on shell-forming or calcareous skeleton bodies such as corals and mollusks. Coral reefs act as sea guardians, so their decline will affect marine biodiversity, with consequences for some economically important species.

Examples of regression, fragmentation and degradation of ecosystems

A number of ecosystems are expected to be affected by shifts in the locations of the limits of the environmental conditions which they are able to tolerate, including increased wave erosion of coastal ecosystems due to rising sea levels and increasingly frequent and intense storms and hurricanes, among others.

Coral Reefs

Increases in sea level are expected to cause mortality of coral reefs due to reduced photosynthesis, as sea levels rise above the coral faster than the coral is able to grow and light penetration is reduced due to increased phytoplankton production.

Corals are also likely to suffer from increased levels of bleaching, as rising sea temperatures force corals to expel their symbiotic algae that provide much of their food. Corals in the Mesoamerican reef on the eastern side of the Yucatan Peninsula have experienced bleaching events in at least 1995, 1998, 2003,

2005, 2008, 2009 and 2010; corals that are stressed by pollution and overfishing are less likely to recover from coral bleaching events[131].

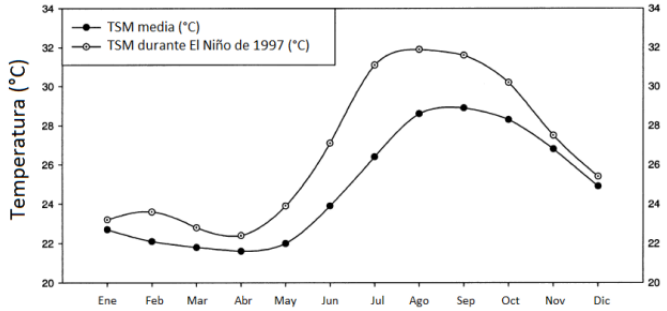


Figure 1a—Increase in sea surface water temperature (TSM) in Baja California Sur during the El Niño event of 1997, compared to historical means (Reyes Bonilla et al. 2002).

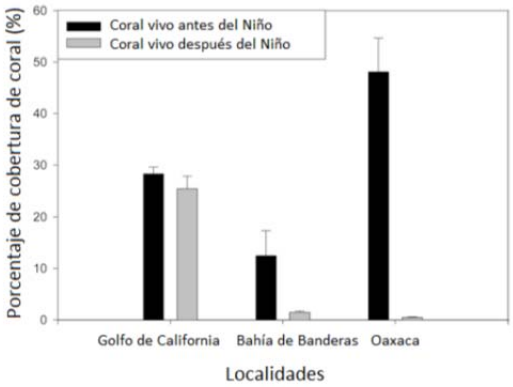


Figure 1b— The black columns represent the percentage of coral present before the El Niño event in 1997 while the grey columns represent the percentage of coral that survived that event (Reyes Bonilla et al. 2002).

Furthermore, reductions in pH levels in sea water, and corresponding reductions in the availability of carbonate ion (CO_3^2), are expected to lead to reduced calcification rates in reef-building corals and algae. This in turn directly impacts the abundance and diversity of fish, including economically-important species (Graham et al. 2007). In the Gulf of California, for example, models indicate that reef fish will react in different ways to increased water temperatures with some species increasing their extension while others will decrease, thereby changing the overall composition of the reef populations (Ayala-Bocos and Reyes-Bonilla 2008).

Mangroves

Mangroves are likely to be particularly affected by rises in sea levels: in the Gulf of Mexico, current relative rates of sea-level rise (since 1930) are higher than those during the 5500-3200 years BP period, and are about 10 times the rate during the past 3200 years. Mangroves may show various potential responses to sea-level rise: they may retreat at the shoreline, which could be either accompanied by compensatory mangrove expansion on the landward margin (relocation), or without any replacement, yielding net mangrove loss and shoreline recession. Alternatively, there could be some expansion of the seaward margin (progradation) or on the landward side, producing a net gain in mangrove extent. Retreat of the coastal margin would be due to submergence or to erosion (loss of sediment or peat from around the roots) of seaward margin due to sea-level rise and/or the disappearance of protective barriers in the seaward front. Mangroves would retreat inland as a slow rate of sea-level rise induces changes in salinity gradients and flooding regimes, resulting in mangrove encroachment into inland areas.

Migration landward might be prevented, however, by steep slopes, or human barriers such as embankments or sea walls. Under this scenario, a shift in species composition along the flooding gradient could also occur, leading to a change in mangrove forest structure. Mangroves may expand landward or seaward by colonizing current *salinas* (bare sand or mud flats in the center of mangrove ecosystems, where salinities are extremely high), increasing its abundance in current scrub mangrove sites, and/or colonizing new inland zones due to saline water inundation. This will depend on the rate of sedimentation

[131] Report Card for the Mesoamerican Reef. An evaluation of ecosystem health 2010. Healthy Reefs for Healthy People.

and on the species-specific characteristics of propagules (e.g., size, buoyancy)[132]. It is predicted that mangroves would increase in some areas of the Gulf of Mexico with sea-level rises up to approximately 1.5 m by the year 2100, if dry land areas are not protected by levees or similar structures, but for higher rates of predicted sea-level rise, mangroves would decline[133].

Mangroves may also be affected by variations in precipitation and fresh-water runoff, especially in the case of peat-forming mangrove environments[134]. If reductions occur in the input of fresh water to mangrove forests, results could be similar to those of subsidence observed for areas of salt marshes in the eastern coast of the U.S. Mangrove productive potential would decrease, and the increased availability of sulfate from sea water could accelerate anaerobic decomposition with subsequent loss of peat mass.

Mangrove responses to sea-level rise cannot be generalized, however, and depend on local environmental settings, such as geomorphology, sedimentology, hydrology, and also the biological nature of the species involved. Historical studies on the development of mangroves under sea-level rise conditions seem to indicate that high islands and continental coastlines will be more prepared to cope with rising sea-level than low carbonate coastlines (such as those of the Yucatán Peninsula). Macrotidal and river-dominated deltaic mangrove systems are expected to persist with sea-level rise, although erosion of the seaward margin is also expected. In the case of low islands, in carbonate settings, where sedimentation is mainly autochthonous (from calcareous sediment or mangrove peat), mangroves are most vulnerable to sea-level rise[135].

Forests

Climate change will modify vegetation cover, and as a consequence, species will shift their distribution and abundance (Peterson et al. 2002). A series of models have been used to predict species distribution in different climate scenarios and while results vary depending on the model, most agree that temperate vegetation, such as temperate forest and cloud forest, will be reduced significantly, and that warm and arid vegetation, such as tropical deciduous forest and xerophilous scrubland will increase its distribution (Arriaga and Gomez 2005; Gomez-Díaz et al. 2007; Villers-Ruíz and Trejo-Vázquez 1997, 1998). However, it is important to consider that while tropical forests are likely to expand, they are the ecosystem with the highest rate of deforestation. The increase in temperature will affect mainly plant species with distribution restricted by temperature and precipitation parameters, such as Pinus, Quercus and Abies in temperate forests, and Euphorbia, Mimosa and Acacia in deciduous forests and scrubland (Gómez et al. 2008). Two very vulnerable genus, Pinus and Quercus, will reduce their geographic range

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[132]Sea-level Rise and Coastal Forests on the Gulf of Mexico. Kimberlyn Williams, Zuleika S. Pinzon, Richard P. Stumpf, and Ellen A. Raabe. U.S. Department of the Interior: U.S. Geological Survey. http://coastal.er.usgs.gov/wetlands/ofr99-441/OFR99-441.pdf

[133]Park, R.A., M.S. Trehan, P.W. Mausel and R.C. Howe. 1989a. The effects of sea level rise on U.S. coastal wetlands. In: J. B. Smith and D. A. Tirpak (eds.) The Potential Effects of Global Climate Change on the United States. Appendix B - Sea Level Rise. U.S. Environmental Protection Agency, Washington D.C. pp. 1,1 -1,55.

[134]Snedaker, S.C. 1982. Mangrove species zonation, why? In: D. N. Sen and K. S. Rajpurohit (eds.) Ecology of Halophytes. Tasks for Vegetation Science 2. Dr. W. Junk Publishers, The Hague. pp. 111-125.

[135]Woodroffe, C.D. 1990. The impact of sea-level rise on mangrove shorelines. *Progress in Physical Geography* 14 (4): 483-520. Ellison, J.C. and D.R. Stoddart. 1991. Mangrove ecosystem collapse during predicted sea-level rise: Holocene analogues and implications. *Journal of Coastal Research* 7 (1): 151-165. Parkinson, R.W., R.D. DeLaune and J.R. White. 1994. Holocene sea-level rise and the fate of mangrove forests within the Wider Caribbean Region. *Journal of Coastal Research* 10 (4): 1077-1086.

by 0.2-64% and 7-48% respectively, which is of particular importance given that Mexico is a diversity center for pine trees (Gómez-Mendoza and Arriaga 2007).

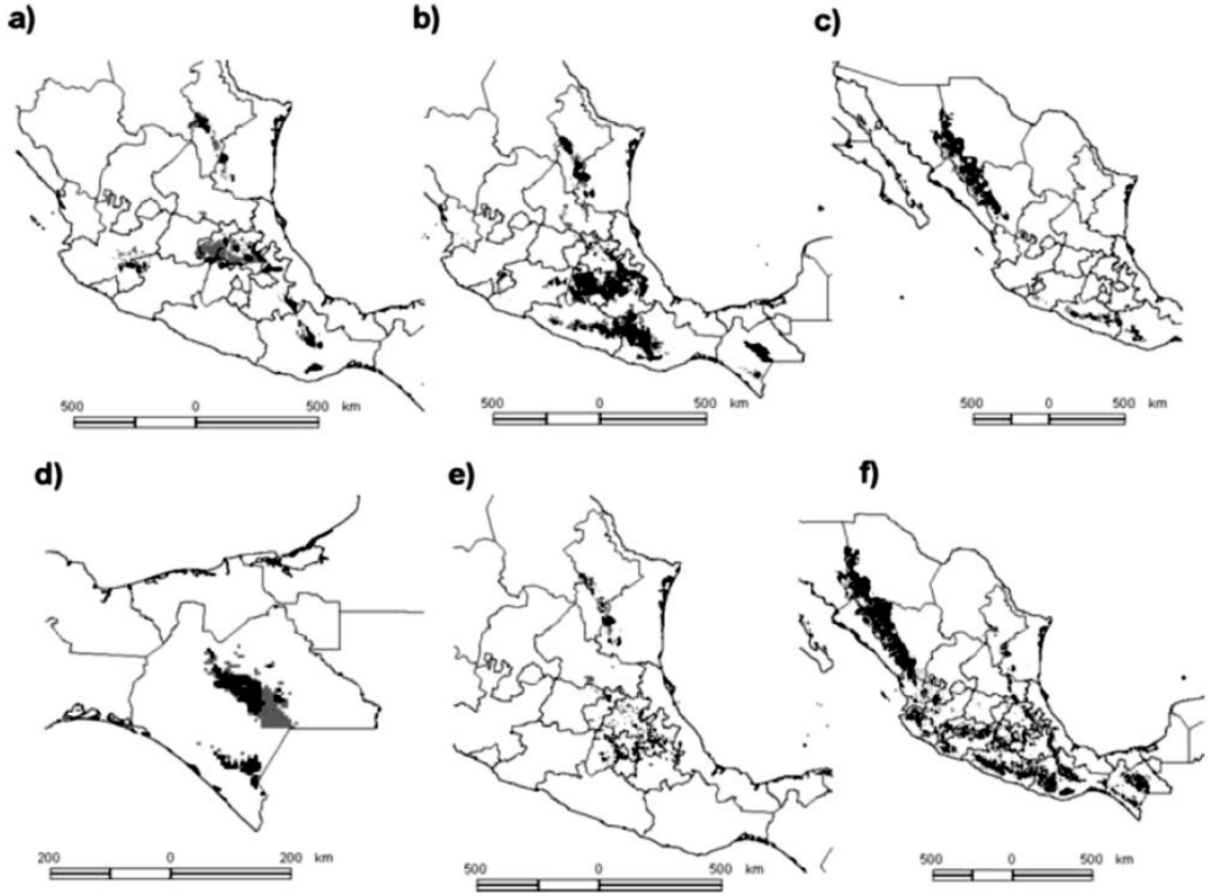

Figure 2.—Changes in distribution of pine species in Mexico under the severe climate change scenario HHGGAX50Mex; a) Pinus rudis, b) P. montezumae, c) P. herrerae, d) Quercus crispipilis, e) Q. mexicana, y f) Q. obtusata. The grey areas indicate the current potential distribution while the black areas indicate the predicted distribution (Gómez-Mendoza and Arriaga 2007).

Cloud forests are expected to be severely impacted by climate change, because of their delicate dependency on local climate. In Mexico, cloud forests cover less than 1 per cent of the country, but contain about 12 per cent of the country's 3,000 plant species (Rzedowski, 1996). Up to 30 per cent of these are endemic to the country. A number of climate models suggest that the low-altitude cloudiness will be reduced, which means that the optimum climate for many cloud forest habitats will shift to higher altitudes. Specifically, a predicted 2°C increase in temperature and 20% reduction in rainfall in cloud forests of eastern Mexico are likely to result in a drastic contraction in the distribution of the tree species *Fagus grandifolia* var. *mexicana,* meaning that most of the remaining populations will inhabit restricted areas located outside the boundaries of the surrounding reserves[136]. The complete loss of some sites and increased fragmentation of others, could result in possible extinction of mountain-top endemics, while reductions in the areas of cloud forest in other sites will lead to negative impacts on gene flow and population viability. For example, cloud forest taxa tend to become reduced during intervals of

[136] http://www.springerlink.com/content/u818n4x853137683/

aridity[137]due to changes in their hydrologic cycle when cloud moisture immersion decreases and temperatures increase, resulting in the drying out of the system. Consequently, epiphytes that rely on high humidity will wilt and die. Furthermore, the upward migration of the upper limits of cloud forest on other sites will cause the marginalization of grasslands and moorlands at higher altitudes. Ultimately, the results of the climate change will be a loss in biodiversity, altitude shifts in species ranges and community reshuffling and, in some areas, complete loss of cloud forests[138].

In addition to changes in temperature and rainfall, climate change-induced severe weather is expected to increase damage to forest systems. El Niño / La Niña cycles, which are associated with severe climatic events such as droughts, storms, and floods, are becoming shorter. The impacts are also becoming more severe according to UNDP. "In 2005 the number of cyclones reported broke the country's historic record. According to the National Meteorological Service, not only were more cyclones reported, but in addition, they were more intense than in previous years and had a greater impact on Mexico" (Manson and Jardel, 2007). Hurricanes have positive and negative effects on forests and biodiversity. They renew the structure and composition of ecosystems and facilitate natural regeneration, allowing an increased diversity of species. However, high-intensity cyclones or high hurricane frequency may affect an ecosystem to the point that it may take centuries to recover. This is because hurricanes cause a considerable loss of soil and vegetation, as well as the destruction of special sites for nesting or feeding animal species.

Intertwined with this is the issue of increased vulnerability to forest fires. The amount of dead matter left in forests after a hurricane turns into fuel, increasing the risk and intensity of fire. An ecosystem weakened by harmful human practices will be more vulnerable to this kind of disaster and its capacity for subsequent recovery (or to benefit from the positive effects) will be diminished[139]. Furthermore, increased stresses imposed by climate change and severe weather events lead to increased susceptibility of ecosystems to pests and diseases, which in turn is a source of loss of biodiversity as well as increased dead biomass to fuel fires. Ultimately, escalating ambient temperatures, falling humidity and additional amounts of dead biomass due to pests and diseases increase the susceptibility to fire of terrestrial ecosystems, such as pine forests, which in turn release enormous amounts of greenhouse gases (GHGs), further contributing to climate change in a vicious cycle.

Extinction, range reduction and population decline of species

Models to date under two climate scenarios[140], using data managed by CONABIO, predict that although extinctions and drastic range reductions of fauna species are likely to be relatively few, species turnover in some local communities may be high (>40% of species), suggesting that severe ecological perturbations may result. 0–2.4% of species are predicted to lose at least 90% of their present distributional area, and 5.1–19.5% are predicted to lose at least 50% of the present distributional area by 2055, under three different assumptions of dispersal capacity.

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[137] Figueroa-Rangel, B.L., Willis, K.J. and Olvera-Vargas, M. 2010. Cloud forest dynamics in the Mexican neotropics during the last 1300 years. *Global Change Biology* **16**: 1689-1704

[138]Foster, P., 2001, The potential negative impacts of global climate change on tropical montane cloud forests, Elsevier Science/ Earth-Science Review. Bubb, P., May, I., Miles, L., Sayer, J., 2004, Cloud Forest Agenda, UNEP-WCMC, Cambridge, UK, http://www.unep.wcmc.org/resouces/publicashions/UNEP_WCMC_bio_series/20.htm

[139] Assessment of Tropical Forest and Biodiversity Conservation in Mexico. FAA sections 118-119 report. USAID Mexico.

[140] Townsend Peterson A, Ortega-Huerta MA, Bartley J, Sánchez-Cordero V, Soberón J, Buddemeier RH and Stockwell DRB (2002): Future projections for Mexican faunas under global climate change scenarios. *Nature* Vol 416, 627-7. http://www.ibiologia.unam.mx/vscscience/Naturepaper.pdf

Some species' ranges (e.g. birds) are already changing, but their success is only possible if there is habitat available. The west Mexican chachalaca (*Ortalis poliocephala*), for example, is likely to encounter between 29.7% and 33.7% less habitable area by 2055 as a result of climate change, depending on the climate change scenario used. The main foci of species turnover are expected to be the Chihuahuan desert of northern Mexico, interior valleys extending south to Oaxaca, and the Baja California peninsula (with predicted species turnover rates as high as 45%). Upward regression of mountain ecosystems, such as cloud forest, due to the upward movement of the isotherms that define their limits, will result in reductions in their areas and increased fragmentation, to the detriment of the viability of the populations of their biota. For example, frogs and lizards are expected to suffer from increased drought in cloud forests.

An analysis of the impact of climate change on the distribution of amphibians in the American continent showed that, even under the mildest scenario, when the limited dispersion capacity of this taxa is considered, distribution of 95% of the species will be reduced. In Mexico, the projections show a shift of <690% of species (Lawler et al. 2009). Salamanders comprise 30% of mexican amphibious species, and the majority occur at altitudes higher than 1,200 m.a.s.l. *Pseudoerycea leprosa* and *P. cephalica* are two species associate with pine and evergreen forests in altitudes more than 2,000 m.a.s.l. along the Neovolcanic belt (Sierra Nevada). The models suggest that as a result of climate change, their distribution will contract by15-74% in 2050 (Fig. 3—Parra-Olea et al. 2005).

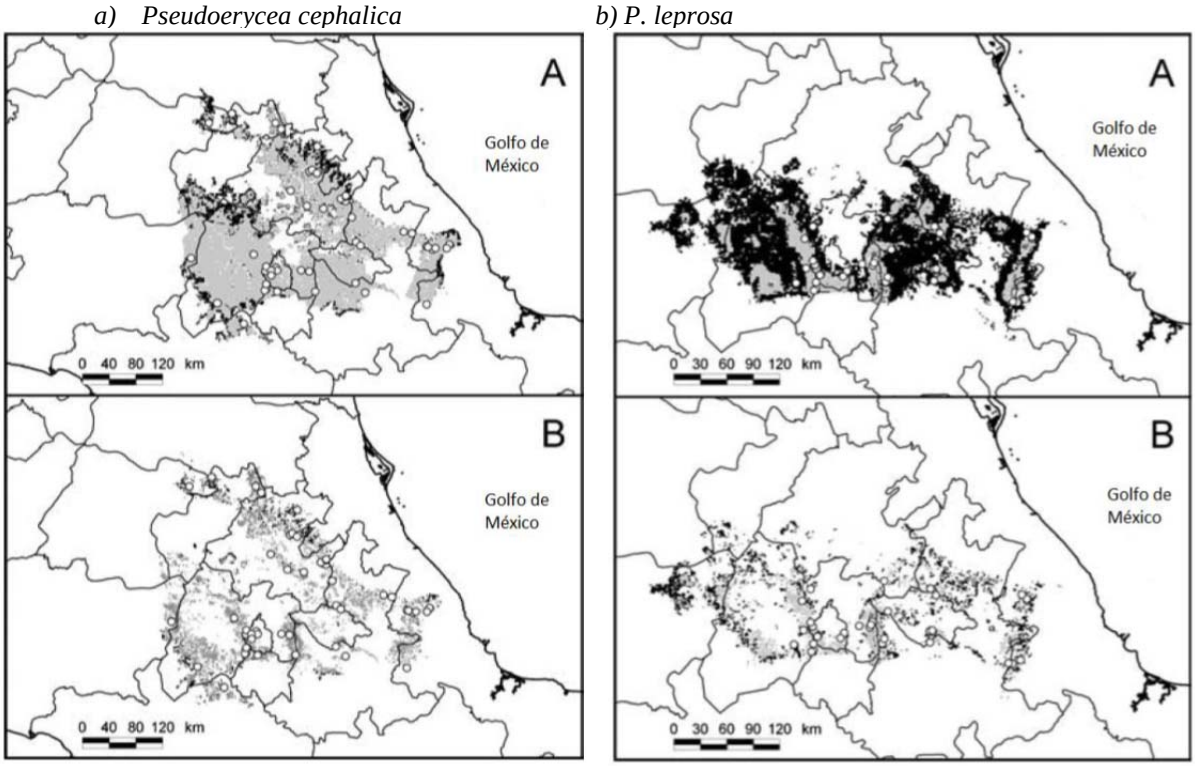
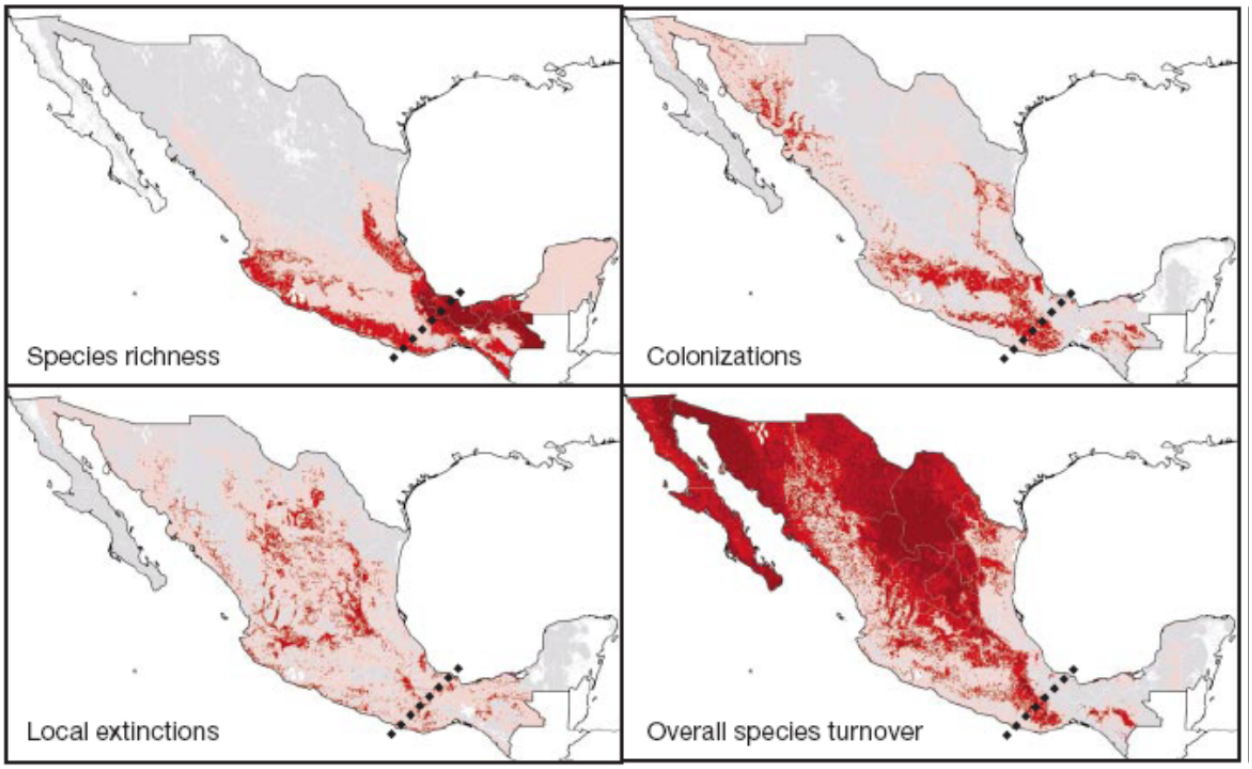


Figure 3.—Changes in species distribution of salamandras pletodóntidas in Mexico (2050): a) *Pseudoerycea cephalica* b) *P. leprosa* according to scenarios A) sin tomar en cuenta la deforestación actual y B) tomando en cuenta la deforestación actual y asumiendo no más deforestación futura. Los círculos son las localidades de ocurrencia de la especie, las zonas en gris claro son las áreas donde se espera que se mantenga su distribución, en gris oscuro las nuevas áreas de distribución potencial y en negro las zonas de pérdida (Parra-Olea et al. 2005).

The rate at which plants can adapt and disperse into new areas lags markedly behind faunal communities. Thus, although only limited numbers of fauna species will face entirely unsuitable conditions for

persistence, others will experience drastic reductions and fragmentation of distributional areas, or extend their distributions, creating new natural communities with unknown properties. Endemic species are likely to be at highest risk given their limited range.

Figure 4. - Modeled species turnover in biological communities (1,870 species) across Mexico[141].



Note: Modeled current species richness: white, <155 species; grey, 155–306 species; pink, 307–458 species; red, 459–610 species; dark red, 611–763 species. Local extirpations: white, <29 species; grey, 29–56 species; pink, 57–84 species; red, 85–112 species; dark red, 113–140 species. Colonizations: white, <25 species; grey, 25–48 species; pink, 49–71 species; red, 72–95 species; dark red, 96–119 species. Species turnover: white, <10%; grey, 10–20%; pink, 20–30%; red, 30–40%; dark red, >40%. The southern quarter of these maps (indicated by dashed line), however, may be subject to some bias, and thus should be interpreted with caution.

Some marine species are likely to be affected by changes in water temperature. For example, the marine turtles that nest on Mexican beaches have temperature-dependent sex determination, meaning that an increase in global temperatures could change the proportion of female and male turtle hatchlings and could result in marine turtle populations becoming unstable.

This vegetation shift is further reflected in alternations of animal distribution. For example, the rufous-bellied chachalaca (*Ortalis wagleri*) is common and widely distributed along tropical deciduous forest, and models predict a range extension. On the other hand, the horned guan (*Oreophasis derbianus*), an endangered species restricted to cloud forests, will suffer significant shrinkage of its distribution and the risk of extinction will increase (Arriaga and Gomez 2005).

[141] Townsend Peterson A, Ortega-Huerta MA, Bartley J, Sánchez-Cordero V, Soberón J, Buddemeier RH and Stockwell DRB (2002): Future projections for Mexican faunas under global climate change scenarios. *Nature* Vol 416, 627-7. http://www.ibiologia.unam.mx/vscscience/Naturepaper.pdf

The above mentioned impacts on organisms will affect their composition, wealth and dynamics of communities and ecosystems, and ultimately the services they provide us. Therefore, actions to reduce such impacts are urgent. Adaptation to climate change consists in reducing the vulnerability of species, ecosystems, and human communities to such changes to promote resilience. A comprehensive vision to achieve this goal includes ecosystem-based adaptation (EBA), which recognizes that biodiversity provides services that benefit man. EBA brings together biodiversity management, restoration and sustainable use strategies to promote resilience in natural ecosystems, productive landscapes and human populations facing climate change.

Annex 5. Fact Sheets for each Ecoregional Cluster (separate file)

Annex 6. Environmental and Social Screening Checklist

UNDP ESSP Checklist

Question 1: Has a combined environmental and social assessment/review that covers the proposed project already been completed by implementing partners or donor(s)?

Select answer below and follow instructions:

X **NO** → Continue to Question 2 (do not fill out Table 1.1)

☐ **YES** → No further environmental and social review is required if the existing documentation meets UNDP's quality assurance standards, and environmental and social management recommendations are integrated into the project. Therefore, you should undertake the following steps to complete the screening process:

1. Use Table 1.1 below to assess existing documentation. (It is recommended that this assessment be undertaken jointly by the Project Developer and other relevant Focal Points in the office or Bureau).
2. Ensure that the Project Document incorporates the recommendations made in the implementing partner's environmental and social review.
3. Summarize the relevant information contained in the implementing partner's environmental and social review in Annex A.2 of this Screening Template, selecting Category 1.
4. Submit Annex A to the PAC, along with other relevant documentation.

TABLE 1.1: CHECKLIST FOR APPRAISING QUALITY ASSURANCE OF EXISTING ENVIRONMENTAL AND SOCIAL ASSESSMENT	**Yes/No**
1. Does the assessment/review meet its terms of reference, both procedurally and substantively?	n/a
2. Does the assessment/review provide a satisfactory assessment of the proposed project?	n/a
3. Does the assessment/review contain the information required for decision-making?	n/a
4. Does the assessment/review describe specific environmental and social management measures (e.g. mitigation, monitoring, advocacy, and capacity development measures)?	n/a
5. Does the assessment/review identify capacity needs of the institutions responsible for implementing environmental and social management issues?	n/a
6. Was the assessment/review developed through a consultative process with strong stakeholder engagement, including the view of men and women?	n/a
7. Does the assessment/review assess the adequacy of the cost of and financing arrangements for environmental and social management issues?	n/a
Table 1.1 (continued) For any "no" answers, describe below how the issue has been or will be resolved (e.g. amendments made or supplemental review conducted).	

Question 2: Do <u>all</u> outputs and activities described in the PIF or Project Document fall within the following categories?

☐ Procurement (in which case UNDP's Procurement Ethics and Environmental Procurement Guide need to be complied with)

☐ Report preparation

☐ Training

☐ Event/workshop/meeting/conference (refer to Green Meeting Guide)

☐ Communication and dissemination of results

Select answer below and follow instructions:

X **NO** → Continue to Question 3

☐ **YES** → No further environmental and social review required. Complete Annex A.2, selecting Category 1, and submit the completed template (Annex A) to the PAC.

Question 3: Does the proposed project include activities and outputs that support *upstream* planning processes that potentially pose environmental and social impacts or are vulnerable to environmental and social change (refer to Table 3.1 for examples)? (Note that *upstream* planning processes can occur at global, regional, national, local and sectorial levels)

Select the appropriate answer and follow instructions:

NO → Continue to Question 4.

√ **YES** →Conduct the following steps to complete the screening process:

1. Adjust the project design as needed to incorporate UNDP support to the country(ies), to ensure that environmental and social issues are appropriately considered during the upstream planning process. Refer to Section 7 of this Guidance for elaboration of environmental and social mainstreaming services, tools, guidance and approaches that may be used.
2. Summarize environmental and social mainstreaming support in Annex A.2, Section C of the Screening Template and select "Category 2".
3. If the proposed project ONLY includes upstream planning processes then screening is complete, and you should submit the completed Environmental and Social Screening Template (Annex A) to the PAC. If downstream implementation activities are also included in the project then continue to Question 4.

TABLE 3. 1 **EXAMPLES OF UPSTREAM PLANNING PROCESSES WITH POTENTIAL DOWNSTREAM ENVIRONMENTAL AND SOCIAL IMPACTS**	Check appropriate box(es) below
1. Support for the elaboration or revision of **global- level** strategies, policies, plans, and programmes. *For example, capacity development and support related to international negotiations and agreements. Other examples might include a global water governance project or a global MDG project.*	
2. Support for the elaboration or revision of **regional-level** strategies, policies and plans, and programmes. *For example, capacity development and support related to transboundary programmes and planning (river basin management, migration, international waters, energy development and access, climate change adaptation etc.).*	
3. Support for the elaboration or revision of **national-level** strategies, policies, plans and programmes. *For example, capacity development and support related to national development policies, plans, strategies and budgets, MDG-based plans and strategies (e.g. PRS/PRSPs, NAMAs), sector plans.*	X
4. Support for the elaboration or revision of **sub-national/local-level** strategies, polices, plans and programmes. *For example, capacity development and support for district and local level development plans and regulatory frameworks, urban plans, land use development plans, sector plans, provincial development plans, provision of services, investment funds, technical guidelines and methods, stakeholder engagement.*	X

Question 4: Does the proposed project include the implementation of *downstream* activities that potentially pose environmental and social impacts or are vulnerable to environmental and social change?

To answer this question, you should first complete Table 4.1 by selecting appropriate answers. If you answer "No" or "Not Applicable" to all questions in Table 4.1 then the answer to Question 4 is "NO". If you answer "Yes" to any questions in Table 4.1 (even one "Yes" can indicated a significant issue that needs to be addressed through further review and management) then the answer to Question 4 is "YES". If you are "unable to answer" more than a few of the questions in Table 4.1 then conduct further studies, consultation, or revision before selecting the appropriate answer:

☐ **NO** → No further environmental and social review and management required for downstream activities. Complete Annex A.2 by selecting "Category 1", and submit the Environmental and Social Screening Template to the PAC.

X **YES** → Conduct the following steps to complete the screening process:

1. Consult Section 8 of this Guidance, to determine the extent of further environmental and social review and management that might be required for the project.
2. Revise the Project Document to incorporate environmental and social management measures. Where further environmental and social review and management activity cannot be undertaken prior to the PAC, a plan for undertaking such review and management activity within an acceptable period of time, post-PAC approval (e.g. as the first phase of the project) should be outlined in Annex A.2.
3. Select "Category 3" in Annex A.2, and submit the completed Environmental and Social Screening Template (Annex A) and relevant documentation to the PAC.

TABLE 4.1: ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT		
1.	**Biodiversity and Natural Resources**	**Answer**(Yes/No/ Not Applicable)
1.1	Would the proposed project result in the conversion or degradation of modified habitat, natural habitat or critical habitat?	No
1.2	Are any development activities proposed within a legally protected area (e.g. natural reserve, national park) for the protection or conservation of biodiversity?	No
1.3	Would the proposed project pose a risk of introducing invasive alien species?	No
1.4	Does the project involve natural forest harvesting or plantation development without an independent forest certification system for sustainable forest management (*e.g. PEFC, the Forest Stewardship Council certification systems, or processes established or accepted by the relevant National Environmental Authority*)?	No
1.5	Does the project involve the production and harvesting of fish populations or other aquatic species without an accepted system of independent certification to ensure sustainability (*e.g. the Marine Stewardship Council certification system, or certifications, standards, or processes established or accepted by the relevant National Environmental Authority*)?	No
1.6	Does the project involve significant extraction, diversion or containment of surface or ground water? *For example, construction of dams, reservoirs, river basin developments, groundwater extraction.*	No
1.7	Does the project pose a risk of degrading soils?	No
2.	**Pollution**	**Answer**(Yes/No/ Not Applicable)
2.1	Would the proposed project result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and transboundary impacts?	No
2.2	Would the proposed project result in the generation of waste that cannot be recovered, reused, or	No

	disposed of in an environmentally and socially sound manner?	
2.3	Will the propose project involve the manufacture, trade, release, and/or use of chemicals and hazardous materials subject to international action bans or phase-outs? *For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Convention on Persistent Organic Pollutants, or the Montreal Protocol.*	No
2.4	Is there a potential for the release, in the environment, of hazardous materials resulting from their production, transportation, handling, storage and use for project activities?	No
2.5	Will the proposed project involve the application of pesticides that have a known negative effect on the environment or human health?	No
3.	**Climate Change**	**Answer**(Yes/No/ Not Applicable)
3.1	Will the proposed project result in significant[142] greenhouse gas emissions? *Annex E provides additional guidance for answering this question.*	No
3.2	Is the proposed project likely to directly or indirectly increase environmental and social vulnerability to climate change now or in the future (also known as maladaptive practices)? You can refer to the additional guidance in Annex C to help you answer this question. *For example, a project that would involve indirectly removing mangroves from coastal zones or encouraging land use plans that would suggest building houses on floodplains could increase the surrounding population's vulnerability to climate change, specifically flooding.*	No
4.	**Social Equity and Equality**	**Answer**(Yes/No/ Not Applicable)
4.1	Would the proposed project have environmental and social impacts that could affect negatively indigenous people or other vulnerable groups?	No
4.2	Is the project likely to significantly impact gender equality and women's empowerment[143]?	Yes
4.3	Is the proposed project likely to directly or indirectly increase social inequalities now or in the future?	No
4.4	Will the proposed project have variable impacts on women and men, different ethnic groups, social classes?	Yes
4.5	Have there been challenges in engaging women and other certain key groups of stakeholders in the project design process?	No
4.6	Will the project have specific human rights implications for vulnerable groups?	No
5.	**Demographics**	
5.1	Is the project likely to result in a substantial influx of people into the affected community(ies)?	No
5.2	Would the proposed project result in substantial voluntary or involuntary resettlement of populations? *For example, projects with environmental and social benefits (e.g. protected areas, climate change adaptation) that impact human settlements, and certain disadvantaged groups within these settlements in particular.*	No
5.3	Would the proposed project lead to significant population density increase which could affect the environmental and social sustainability of the project? *For example, a project aiming at financing tourism infrastructure in a specific area (e.g. coastal zone, mountain) could lead to significant population density*	No

[142] Significant corresponds to CO_2 emissions greater than 100,000 tons per year (from both direct and indirect sources). Annex E provides additional guidance on calculating potential amounts of CO_2 emissions.

[143] Women are often more vulnerable than men to environmental degradation and resource scarcity. They typically have weaker and insecure rights to the resources they manage (especially land), and spend longer hours on collection of water, firewood, etc. (OECD, 2006). Women are also more often excluded from other social, economic, and political development processes.

	increase which could have serious environmental and social impacts (e.g. destruction of the area's ecology, noise pollution, waste management problems, greater work burden on women).	
	1. Culture	
6.1	Is the project likely to significantly affect the cultural traditions of affected communities, including gender-based roles?	Yes
6.2	Will the proposed project result in physical interventions (during construction or implementation) that would affect areas that have known physical or cultural significance to indigenous groups and other communities with settled recognized cultural claims?	No
6.3	Would the proposed project produce a physical "splintering" of a community? *For example, through the construction of a road, powerline, or dam that divides a community.*	No
2.	**Health and Safety**	
7.1	Would the proposed project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions? *For example, development projects located within a floodplain or landslide prone area.*	Yes
7.2	Will the project result in increased health risks as a result of a change in living and working conditions? In particular, will it have the potential to lead to an increase in HIV/AIDS infection?	No
7.3	Will the proposed project require additional health services including testing?	No
3.	**Socio-Economics**	
8.1	Is the proposed project likely to have impacts that could affect women's and men's ability to use, develop and protect natural resources and other natural capital assets? *For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their development, livelihoods, and well-being?*	Yes
8.2	Is the proposed project likely to significantly affect land tenure arrangements and/or traditional cultural ownership patterns?	No
8.3	Is the proposed project likely to negatively affect the income levels or employment opportunities of vulnerable groups?	No
9.	**Cumulative and/or Secondary Impacts**	**Answer**(Yes/No/ Not Applicable)
9.1	Is the proposed project location subject to currently approved land use plans (e.g. roads, settlements) which could affect the environmental and social sustainability of the project? *For example, future plans for urban growth, industrial development, transportation infrastructure, etc.*	Yes
9.2	Would the proposed project result in secondary or consequential development which could lead to environmental and social effects, or would it have potential to generate cumulative impacts with other known existing or planned activities in the area? *For example, a new road through forested land will generate direct environmental and social impacts through the cutting of forest and earthworks associated with construction and potential relocation of inhabitants. These are direct impacts. In addition, however, the new road would likely also bring new commercial and domestic development (houses, shops, businesses). In turn, these will generate indirect impacts. (Sometimes these are termed "secondary" or "consequential" impacts). Or if there are similar developments planned in the same forested area then cumulative impacts need to be considered.*	No

ENVIRONMENTAL AND SOCIAL SCREENING SUMMARY

Name of Proposed Project: PIMS 4647 Strengthening Management Effectiveness and Resilience of Protected Areas to Safeguard Biodiversity Threatened by Climate Change

A. Environmental and Social Screening Outcome

Select from the following:

☐ Category 1. No further action is needed

☐ Category 2. Further review and management is needed. There are possible environmental and social benefits, impacts, and/or risks associated with the project (or specific project component), but these are predominantly indirect or very long-term and so extremely difficult or impossible to directly identify and assess. See Section 7 of the UNDP ESSP.

√ Category 3. Further review and management is needed, and it is possible to identify these with a reasonable degree of certainty. If Category 3, select one or more of the following sub-categories:

✓ Category 3a: Impacts and risks are limited in scale and can be identified with a reasonable degree of certainty and can often be handled through application of standard best practice, but require some minimal or targeted further review and assessment to identify and evaluate whether there is a need for a full environmental and social assessment (in which case the project would move to Category 3b). See Section 8 of the UNDP ESSP.

☐ Category 3b: Impacts and risks may well be significant, and so full environmental and social assessment is required. In these cases, a scoping exercise will need to be conducted to identify the level and approach of assessment that is most appropriate. See Section 8 of the UNDP ESSP.

B. Environmental and Social Issues (for projects requiring further environmental and social review and management)

Description:

This project will transform management and coverage of terrestrial and coastal protected areas in Mexico to alleviate the direct and indirect impacts of climate change on globally significant biodiversity. This will be achieved through a three-pronged approach: development of management systems (monitoring and early warning systems, management decision making tools and sustainable financing) in order to optimize readiness at the national level to address the anticipated implications of climate change for the PA system as a whole; expanding PAs in landscapes that are particularly sensitive to climate change, in order to protect refugia and corridors; and building readiness to address specific climate change impacts in vulnerable PAs through ecoregion-specific interventions in 17 priority PAs.

4.1 Would the proposed project have environmental and social impacts that could affect indigenous people or other vulnerable groups? The project is designed to provide positive impacts on vulnerable groups namely rural and indigenous communities. The identification of specific indigenous people and other vulnerable groups with which the project will work is pending the execution and completion of the Vulnerability Analysis for the 12 ecoregional clusters. Once the project's Vulnerability Analysis is complete (expected end of Year 1), the project will have confirmed intervention sites and the

corresponding communities (indigenous and non-indigenous) will be consulted and engaged throughout implementation. It will work with these groups located in and around the 12 ecoregional clusters to promote sustainable use of biodiversity and resilience activities which have the potential to contribute to economic development, generation of employment and income for these communities while conserving the native habitat. For example, in forested clusters, production of NTFP will be promoted as a more favorable forest use compared to other land uses/conversion and will incentivize conservation of forests as well as improvement of their livelihoods. This, in turn, will ensure not only the conservation of the native forest but also the permanence of the communities in their places of origin reducing migration to urban centers and poverty belts. In coastal/marine clusters, the project will work with traditional fisher folk to prevent over-fishing and engage them in resilience-building activities that will decrease their vulnerability to climate change. Consultations with these stakeholders will be documented and reflected in the project's MTR and TE.

4.2 Is the project likely to significantly impact gender equality and women's empowerment? Women can play a significant role in conservation and resilience activities. The project has included specific indicators and opportunities to promote women's participation in Community Advisory Councils, community brigades, as well as NTFP harvesting, fishing and processing of BD products that aggregate value. The social and gender analysis conducted during the PPG phase identified areas of opportunity for project intervention to improve gender equality within government institutions involved in the project, as well as encourage women's involvement in project site activities. In Outcome 3, the project will include training for conservation and resilience-based activities and this will include training of women and ensure that it is adapted to women's needs. Furthermore, as part of Outcome 2, the project will engage gender organizations and official institutions responsible for gender equality and consult them in PA decision-making processes. The impacts from these activities will be documented and included in annual M&E reports as well as the project's MTR and TE.

4.4. Will the proposed project have variable impacts on women and men, different ethnic groups, social classes? The project will be working in 12 ecoregions with a variety of communities whose compositions differ with regards to ethnic groups, gender distribution, social classes, etc. Some of these clusters have dense human settlements while others have very few communities so the engagement and impact will vary according to the reality of each cluster. As such, the impacts on gender, ethnic groups and social classes may vary between clusters, however this is a result of intrinsic differences of the ecoregions and not of project design. As mentioned in 4.1, once the project's Vulnerability Analysis is complete (expected end of Year 1), the project will have confirmed intervention sites, and the corresponding communities will be consulted and engaged throughout implementation to ensure that ethnic, social and gender variables are integrated in the site-specific interventions. As a preliminary step to ensure this, social indicators have been included in the project's design and will be evaluated annually per UNDP and GEF M&E requirements, as well as the project's MTR and TE.

6.1 Is the project likely to significantly affect the cultural traditions of affected communities, including gender-based roles? As noted above in 4.2, the project should have a positive impact regarding the participation and empowerment of women. In terms of cultural traditions, small scale producers and indigenous groups already rely to some extent on biodiversity based products. The project will work with these groups to ensure greater resilience of the biodiversity and ecosystems they rely on, thereby decreasing their vulnerability to climate change. As such the project is not expected to negatively affect cultural traditions but rather impacts are expected to be positive.

7.1 Would the proposed project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions? Yes the project is susceptible to climate change but will not lead to increased vulnerability, rather it is designed to increase resilience and thereby decrease vulnerability. Climate change will be mainstreamed into management and conservation instruments used by CONANP and project partners to increase awareness and capacity regarding PAs as a tool for safeguarding BD from CC impacts. When facing climate change, social and economic vulnerability translates into increased ecological vulnerability across the nation, especially given current agricultural, forestry and land-titling policies that encourage "development" of forested areas. The resilience-based activities to be implemented in the 12 ecoregional clusters will pilot restoration, conservation and sustainable use models to minimize the vulnerability of biodiversity to climate change, ultimately contributing to increased ecosystem and social resilience.

8.1 Is the proposed project likely to have impacts that could affect women's and men's ability to use, develop and protect natural resources and other natural capital assets? Yes. The project is designed to have positive impacts on women's and men's ability to use, develop and protect natural resources and other natural capital assets through direct and indirect capacity building. Participation of local stakeholders will be a key determinant of the effectiveness of the proposed PA management strategies. This is included in Output 3.2 of the ProDoc, which deals with strengthening the governance framework through community participation in PA management. In Output 3.3, the project will support the development of the capacities among local institutions, including municipal and state governments, for monitoring and regulating natural resource use in priority PAs and their areas of influence, and will also assist agrarian authorities in selected communities in adapting their capacities and regulations to the changing demographic and environmental conditions resulting from climate change. The impacts from these activities will be documented and included in annual M&E reports as well as the project's MTR and TE.

9.1 Is the proposed project location subject to currently approved land use plans (e.g. roads, settlements) which could affect the environmental and social sustainability of the project? ***For example, future plans for urban growth, industrial development, transportation infrastructure, etc.*** The project will support the mainstreaming of CC into national and institutional planning and management instruments and legislation. Specifically, it will work to mainstream the concept of safeguarding PA and their BD as a vital tool to increasing resilience and decreasing vulnerability associated with CC risks. To do this, the project will build upon the Legal Framework analysis conducted during the PPG in order to identify specific opportunities for mainstreaming resilience into national and institutional policy, as well as develop a strategy to be implemented during the project lifetime to accomplish this. The project will also support a harmonization process at the local level (municipal, ejidal) to ensure local ordinances and other instruments recognize and address CC risks through community involvement. The legal zoning of the PA is not always coherent with its conservation objectives and the surrounding zoning. In some cases, a core zone is not truly protected by a surrounding preserved or transitional matrix. Rather, the periphery of the PA and the legal limit is the only thing that separates it from a highly degraded zone, which negatively influences the biodiversity and ecosystem services inside the PA. Consequently, the project will perform a national study on ways to harmonize ecological land ordinances and zoning in PA. The study will then identify key municipalities/communities/ejidos that have a strong impact on the priority PA and determine opportunities for harmonizing local ordinances on land-use to work in a more coherent manner with BD conservation and resilience in and around the PA. This harmonization process will pursue the landscape vision of the project, and will be linked directly to the PA' Management Programs and PACCs, in order to contribute to decision making processes.

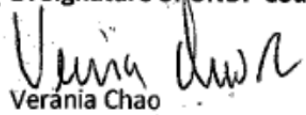
C. Next Steps

Social-economic: This project is designed to provide significant socio-economic benefits to communities and indigenous groups within and around the 12 ecoregional clusters. Once the project's Vulnerability Analysis is complete (expected end of Year 1), the project will have confirmed intervention sites, and the corresponding communities will be consulted and engaged throughout implementation to ensure that socio-economic variables are integrated in the site-specific interventions. As a preliminary step to ensure this, social indicators have been included in the project's design and will be evaluated annually per UNDP and GEF M&E requirements, as well as the project's MTR and TE.

Benefits are expected to include mainly the reduced risk vulnerability and a greater adaptive capacity in face of climate change. Additional benefits include the continuous access to ecosystem services and goods, profit from sustainable productive activities and incentives, and participation in the local decision-making process. Through capacity development at national and state and local levels, up-scaling of experiences and lessons learned is expected to positively impact the communities influenced by the 6.4 million ha in the selected clusters and in the long term dissemination of BD resilience and sustainable use to other vulnerable areas of the country.

Environment: The project will lead to the consolidation of 6,486,509 ha of protected areas in 12 eco-regions to safeguard biodiversity from CC impacts through improved ecosystem connectivity and resilience. It would create a monitoring and information system to improve conservation and management of PA across Mexico in preparation of increasingly frequent climatic events and change. As such, it would improve the conservation status of a number of globally-important species. The project will also generate major benefits at the national and local levels by helping to pilot management and policy mechanisms to increase resilience and ultimately decrease the vulnerability of a large proportion of the country's natural resources, which are of importance for national food supply as well as for the livelihoods of the communities that depend upon them directly and indirectly.

D. Signature of UNDP Country Office Environmental Focal Point



Verania Chao

Programme Officer

Annex 7. Surface of ecoregional clusters for cost-effective management strategies.

Activities and surfaces were identified *a priori*. Verification and prioritization of activities will be provided by the vulnerability assessment.

Cost-effective management strategies	Ecorregional cluster	Baseline	End of the project target
Integrated fire management (IFM)	Mediterranean California	IFM program under operation	6,000 ha of IFM 10 km of firebreaks
Assisted terrestrial regeneration	NA Desert	30,000 ha of degraded land	100 ha in active restoration
	Temperate Sierras	6,452 ha determined suitable for restoration	500 ha under restoration
	Southern semi-arid highlands	3,000 ha of native grasslands degraded	Removal of mesquite and restoration of native grassland in 3,000 ha.
	Great Plains	10 km of gallery forest degraded	5 km of gallery forest under actions of rehabilitation
Assisted coastal regeneration-	Gulf of Mexico	70,000 ha need restoration, of which 281 ha of coastal and terrestrial ecosystems and 15 km of channels have been restored, but no efforts on lagoons yet.	400 ha of lagoons restored
	Mexican Caribbean	63.83 ha restored mangrove	80% of survival of 63.83 ha of restored mangrove
Assisted marine regeneration	Northern Pacific	2,5000 ha inhabited by lion-hand clam colonies, 600 ha need restoration	Restoration 200 ha of lion-hand clam colonies
Sustainable management of the territory (agriculture)	Tropical-humid forests	1,409 ha with sustainable management projects (beekeeping, crops, irrigation systems, native corn and agrobiodiversity)	600 ha of sustainable use projects, including 480 ha of native corn
Prevention, control, eradication, and monitoring of introduced/ invasive species	Tropical-dry Forests	100 ha with pest insect species (*Tortricidae Cerambicidae*) that affect cacti, 100 ha with control, eradication and monitoring actions	200 ha with actions to control, eradicate and monitor pest insect species that affect cacti.
	Gulf of California	Actions implemented for monitoring and eradication of cats and rodents	450 ha of monitoring for preventing the proliferation of invasive species
	Southern Pacific	Gullies damaged by feral sheep	Restoration of gullies damaged by feral sheep

Annex 8. Indicator species

Indicator species were selected *a priori*. The appropriateness of the use of these species as indicators of climate change will be confirmed during the vulnerability assessment, and the list will be adjusted accordingly.

Ecoregion	PA	Indicator species
Gulf of California	Islas del Golfo de California, Great Islands Region	California Sea Lion (*Zalophus californianus*)
		Brown pelican (*Pelecanus occidentalis californicus*)
Gulf of Mexico	Laguna de Términos	Hawksbill turtle (*Eretmochelys imbricata*)
	Pantanos de Centla	Manatee (*Trichechus manatus*)
		Central American river turtle (*Dermatemys mawii*)
		Sargazo freshwater grasses (*Vallisneria* sp)
Mediterranean California	Sierra de San Pedro Mártir	California Condor (*Gymnogyps californianus*)
Mexican Caribbean	Costa occidental de Isla Mujeres, Punta Cancun y punta Nizuc and Arrecife de Puerto Morelos	Corals: *Acropora palmata, Acropora cervicornis, Montastraea* sp. Whale Shark *Rhincodon typus*
	Costa occidental de Isla Mujeres, Punta Cancun y punta Nizuc	Finger coral (*Porites porites*)
	Manglares de Nichupté	Red mangrove (*Rhisophora mangle*)
	Arrecife de Puerto Morelos	Sea turtles (*Chelonia mydas*)
		Seagrass (*Thalassia testudinum*).
		Lionfish (*Pterois* spp), **invasive**
North American Deserts	Mapimí	Bolson tortoise (*Gopherus flavomarginatu*)
		Grassland bird communities
Northern Pacific	El Vizcaíno	Grey whale (*Eschrichtius robustus*)
Southern Pacific	Archipiélago de Revillagigedo	Townsend's shearwater (*Puffinus auricularis auricularis*)
		Socorro mockingbird (*Mimodes graysoni*)
		Clarion angelfish (*Holacanthus clarionensis*)
Southern Semiarid Highlands	Janos	Prairie dog (*Cynomys mexicanus*)
		Pronghorn (*Antilocapra americana peninsularis*)
Temperate Sierras	Mariposa Monarca	Bark beetle (*Dendroctonus* sp.), **pest**
		Monarch butterfly (*Danaus plexippus*)
Tropical-dry forests	Tehuacán-Cuicatlán	Green Guacamaya (*Ara militaris*)
Tropical-humid forests	Cañón del Sumidero	River crocodyle (*Crocodylus acutus*)
		Jungle Bird communities
	Selva el Ocote	

Annex 9. Terms of Reference for Key Project Staff

Terms of Reference for Key Project Staff

1. The following are the indicative ToRs for the project management staff. The PCU will be staffed by a full-time PC and a full-time Project Administrator/Finance Assistant, both of which will be nationally-recruited positions. ToRs for these positions will be further discussed with UNDP-CO and will be fine-tuned during the IW so that roles and responsibilities and UNDP GEF reporting procedures are clearly defined and understood. Also, during the IW the ToRs for specific consultants and sub-contractors will be fully discussed and, for those consultancies to be undertaken during the first six months of the project, full ToRs will be drafted and selection and hiring procedures will be defined.

Project Coordinator (PC)

2. CONANP, in coordination with the UNDP CO, will select the PC to carry out the duties specified below, and to provide further technical assistance as required by the project team to fulfill the objectives of the project. He/she will be responsible for ensuring that the project meets its obligations to the GEF and the UNDP, with particular regard to the management aspects of the project, including supervision of staff, serving as stakeholder liaison, implementation of activities, and reporting. The PC will be responsible for the day-to-day management of project activities and the delivery of its outputs, including the implementation of CONANP's quality management system and planning process (in the framework of the project). The PC will support and coordinate the activities of all partners, staff, and consultants as they relate to the implementation of the project. The PC will report to the Project Director (within CONANP-DGDIP) and will be responsible for the following tasks:

Tasks:

- Prepare detailed work plan and budget under the guidance of the PSC;
- Make recommendations for modifications to the project budget and, where relevant, submit proposals for budget revisions to the PSC, CONANP, and UNDP;
- Facilitate project planning and decision-making sessions;
- Organize the contracting of consultants and experts for the project, including preparing ToRs for all technical assistance required, preparation of an action plan for each consultant and expert, supervising their work, and reporting to the Project Director at CONANP and UNDP;
- Provide technical guidance and oversight for all project activities;
- Oversee the progress of the project components conducted by local and international experts, consultants, and cooperating partners;
- Coordinate and oversee the preparation of all outputs of the project;
- Foster, establish, and maintain links with other related national and international programs and national projects, including information dissemination through media such as web page updates, etc.;
- Organize SC meetings at least once every 3 months as well as annual and final review meetings as required by CONAP and UNDP, and act as the secretary of the SC;
- Organize required consultations or meetings with the technical group at CONANP, CONABIO, CONAFOR, NGOs, local communities, and other entities, in accordance with the requirements of each project component;
- Coordinate and report the work of all stakeholders under the guidance of CONANP;
- Prepare PIRs/APRs in the language required by the GEF and the UNDP-CO and attend annual review meetings;
- Ensure that all relevant information is made available in a timely fashion to CONANP regarding activities carried out nationally, including private and public sector activities, which impact the project;

- Prepare and submit quarterly progress and financial reports to CONANP and UNDP in line with GEF requirements;
- Coordinate and participate in M&E exercises to appraise project success and make recommendations for modifications to the project;
- Prepare and submit technical concepts and requirements about the project requested by CONANP, UNDP, or other entities;
- Perform other duties related to the project in order to achieve its strategic objectives;
- Ensure the project utilizes best practices and experiences from similar projects;
- Ensure the project utilizes the available financial resources in an efficient and transparent manner;
- Ensure that all project activities are carried out on schedule and within budget to achieve the project outputs;
- Resolve all scientific and administrative issues that might arise during the project;

Outputs:
- Detailed work plans indicating dates for deliverables and budget;
- Documents required by the control management system of CONANP;
- ToRs and action plan of the staff and monitoring reports;
- List of names of potential advisors and collaborators and potential institutional links with other related national and international programs and national projects;
- Quarterly reports and financial reports on the consultant's activities, all stakeholders' work, and progress of the project to be presented to CONANP and UNDP (in the format specified by UNDP);
- A final report that summarizes the work carried out by consultants and stakeholders during the period of the project, as well as the status of the project outputs at the end of the project;
- Minutes of meetings and/or consultation processes;
- Yearly APR/PIRs;
- Adaptive management of project;
- Document with technical guidelines and operational tools for the application of the regulation of the collection and reinvestment of gate /concession fees in PAs;
- Field visits to PAs to provide technical support for the piloting of the gate and concession fees system and monitoring reports;

All documents are to be submitted to the Project Director and UNDP CO in MS Word and in hard copy.

Qualifications (indicative):
- A graduate academic degree in areas relevant to the project (e.g., PAs/natural resource management, conservation, and climate change);
- Minimum 10 years of experience in project management with at least 3 years of experience in PA management;
- Experience facilitating consultative processes, preferably in the field of natural resource management;
- Working knowledge of PA management and planning;
- Proven ability to promote cooperation between and negotiate with a range of stakeholders, and to organize and coordinate multi-disciplinary teams;
- Strong leadership and team-building skills;
- Self-motivated and ability to work under the pressure;
- Demonstrable ability to organize, facilitate, and mediate technical teams to achieve stated project objectives;
- Familiarity with logical frameworks and strategic planning;
- Strong computer skills;

- Flexible and willing to travel as required;
- Excellent communication and writing skills in Spanish and English;
- Previous experience working with a GEF-supported project is considered an asset;

Project Administrator/Finance Assistant

3. The Project Administrator/Finance Assistant is responsible for the financial and administrative management of the project activities and assists in the preparation of quarterly and annual work plans and progress reports for review and monitoring by CONANP and UNDP. This position also provides support to the PC for the day-to-day management of the project and secretarial or assistance functions. The Project Administrator/Finance Assistant will have the following responsibilities:

Financial management:

- Responsible for providing general financial and administrative support to the project;
- Take own initiative and perform daily work in compliance with annual work schedules;
- Assist project management in performing budget cycle: planning, preparation, revisions, and budget execution;
- Assist the PC in all project implementation activities;
- Provide assistance to partner agencies involved in project activities, performing and monitoring general administrative and financial aspects to ensure compliance with budgeted costs in line with UNDP and GoM policies and procedures;
- Monitor project expenditures, ensuring that no expenditure is incurred before it has been authorized;
- Assist project team in drafting quarterly project progress reports concerning financial issues;
- Ensure that UNDP procurement rules are followed during procurement activities that are carried out by the project and maintain responsibility for the inventory of the project assets;
- Perform preparatory work for mandatory and general budget revisions, annual physical inventory and auditing, and assist external evaluators in fulfilling their mission;
- Provide assistance in all logistical arrangements concerning project implementation;
- Prepare all outputs in accordance with the CONANP administrative and financial office guidance.

Administrative management:

- Make logistical arrangements for the organization of meetings, consultation processes, and media;
- Provide secretarial support for the project staff;
- Carry out the process to request international/local consultants and all project staff, in accordance with UNDP policies and procedures, and after approval of CONANP;
- Draft agreements for entities related to the project, in accordance with instructions by the Contracts Office at CONANP and in line with UNDP policies and procedures;
- Draft correspondence related to assigned project areas; provide clarification, follow up, and responses to requests for information;
- Assume overall responsibility for administrative matters of a more general nature, such as registry and maintenance of project files;
- Perform all other administrative and financial related duties, upon request;
- Provide support to the PC and project staff in the coordination and organization of planned activities and their timely implementation;
- Assist the PC in liaising with key stakeholders from the GoM counterpart, co-financing agencies, civil society, and NGOs, as required;
- Ensure the proper use and care of the instruments and equipment used on the project;
- Ensure the project utilizes the available financial resources in an efficient and transparent manner;

- Ensure that all project financial and administrative activities are carried out on schedule and within budget to achieve the project outputs;
- Resolve all administrative, financial, and support issues that might arise during the project;

Qualifications and skills:

- At least an Associate's Degree in finance, business sciences, or related fields;
- Experience in administrative work, preferably in an international organization or related to project implementation;
- A demonstrated ability in the financial management of development projects and in liaising and cooperating with government officials, NGOs, etc.;
- Self-motivated and ability to work under the pressure;
- Team-oriented, possesses a positive attitude, and works well with others;
- Flexible and willing to travel as required;
- Excellent interpersonal skills;
- Excellent verbal and writing communication skills in Spanish and English;
- Good knowledge of Word, Outlook, Excel, and Internet browsers is required;
- Previous experience working with a GEF-supported project is considered an asset;

Natural Resource Management Specialist

4. The Natural resource Management Specialist coordinates and supervises all the field-level activities, and keeps close contact with the field-officers. He or she will be responsible for the collection, analysis and reporting of information related to the goals and planned results for the NRA in pilots, the vulnerability analyses and other related activities.

Tasks

- Collection, analysis and reporting of information related to the field-level activities such as NRA, vulnerability analyses and other related activities of the local component of the project;
- Preparation of ToRs and developing methodology in the execution of various technical studies to be carried out through the project in the ecoregional cluster, as well as assuring quality of technical reports compiled by consultants and link with project outputs and outcomes;
- Provide technical support and monitoring of the implementation of the NRA and resilience strategies in pilot PAs (Component 3);
- Report directly to the PC with the aim of incorporating results and indicators related to field-level activities into the project management system;
- Receive and evaluate reports from field-officers, watching that the activities in the field follow the work plan and that proper local management is happening;
- Supervise and/or directly implement activities necessary to collect key information related to field-level indicators in the project area; strong coordination must be established with CONANP PA Directors and Regional Directors, as well as OG to maximize efficiencies for data collection and sharing;
- Support technical consultancy procurement process, reviewing technical proposals and applications;
- Ensure the linkage between different consultancies in the ecoregional clusters, or different periods of the consultancy services continuing over several years;
- Report on lessons documented in the field from project implementation and ensure that the recommendations make at a local level reach the PC and CONANP;
- Assist in the production of Annual Operational Plans as well as the general project workplan, and will be directly responsible for all reporting on field-level activities;

- Provide technical inputs to the Inception Report, Project Implementation Review, technical reports, quarterly financial reports for submission to UNDP, the GEF, other donors and Government Institutions, as required by the PCU;
- Establish close coordination with M&E specialist to work on biodiversity monitoring activities;

Outputs

- Detailed annual work plans on field-level activities;
- Periodical reports on the field-level actions and on the field-officers activities;
- ToRs for the vulnerability analyses consultancies and other technical studies to be carried out at the field-level;
- Validation of the NRA and reports on their implementation and impacts;
- Reports on the species monitoring from the information from the field-officers;
- Revision of the products and technical reports from the vulnerability analyses consultancy and other technical studies;
- Biodiversity and resource management activities as needed;
- Technical inputs as required by PC and PSC;
- Annual and three-month reports;

Qualifications (indicative)

- Bachelor or graduate degree in biology, ecology, natural resource management, environmental sciences or related fields;
- Experience in natural resource management, preferably protected areas, ecosystem services and environmental indicators for monitoring biodiversity;
- Self-motivated and ability to work under the pressure;
- Team-oriented, possesses a positive attitude, and works well with others;
- Flexible and willing to travel as required;
- Excellent interpersonal skills;
- Excellent verbal and writing communication skills in Spanish and English;
- Excellent knowledge on Office, database software, and SIG;
- Previous experience working with a GEF-supported project is considered an asset;

Monitoring and Evaluation Specialist

5. The M&E Specialist will be responsible for all aspects related to designing, planning and implementing activities to monitor the project progress against indicators designed to assess project impacts and assist in strategic decision making about project interventions. It will also provide manage the monitoring activities related the PA information system.

Tasks

- Report directly to the Project Coordinator (PC) in the Project Coordination Unit (PCU) and be responsible for the development of periodic monitoring reports from the project regions summarizing field activities funded with GEF resources according to Annual Operational Plans (AOPs);
- Manage all the activities related to the PA Information System, including reports, technical assistance, contact with providers, consultancies, etc.
- Supervise and directly implement activities necessary for data collection key to project monitoring in project intervention areas and for strategic planning; strong coordination must be established with CONABIO, CONAGOR, CONAGUA-SMN and other government and non-government organizations to maximize efficiencies for data collection and sharing;

- Organize and facilitate training courses on the collection, analysis, storage and use of data derived from project activities financed by GEF; design specific formats for periodic data collection on project indicators and impacts; ensure quality in data collection in the field;
- Provide technical inputs to the Inception Report, Project Implementation Review, technical reports, quarterly financial reports for submission to UNDP, the GEF, other donors and Government Institutions, as required by the PCU;
- Assist in the production of AOPs as well as the overall project workplan; take responsibility for all reporting on project progress against agreed indicators;

Outputs

- Terms of Reference for the design of the monitoring and evaluation system for the project, including a GIS platform to be linked with activities under the impact studies; take responsibility for implementation of the M&E systems including the PA information system;
- AOP and work plans for the M&E system and advance practical approaches for the periodic collection of data in the field;
- Participatory methodologies and formats for use in the field by project personnel in conducting monitoring activities; regional field workshops with project partners, government agencies, NGOs and community forest producers will use M&E formats for setting baselines and follow-up monitoring;
- Training courses and materials to build capacities in RO staff in M&E methods, application, analysis and follow-up;
- Reports on indicator-based data generated in the field and prepare three-month reports and annual reports tracking progress under the project M&E system;
- System that will secure the sustainability of project achievements beyond the 5-year GEF investment based on the experiences of the activities carried out in the four project regions, making project-designed indicators available for permanent use in national institutions;
- Three-month and annual progress reports detailing results of monitoring work in relation work plans and present such reports to the PSC;
- Periodcal reports on progress in committed co-financing from co-executing agencies;

Qualifications (indicative)

- Bachelor or graduate degree in social or environmental sciences; project management and monitoring; information management; communications; administration; rural development or related areas;
- Experience in information management; in designing, planning, monitoring and evaluating projects; databases, information technologies and monitoring tools;
- Experience with the design and application of participatory methodologies and field tools for assessing impacts of rural development initiatives;
- Proven ability to work with multi-disciplinary teams and multi-theme indicators;
- Self-motivated and ability to work under the pressure;
- Team-oriented, possesses a positive attitude, and works well with others;
- Flexible and willing to travel as required;
- Analytic and synthesis skills;
- Comfortable working both in the office and in the field;
- Excellent verbal and writing communication skills in Spanish and English;
- Excellent knowledge on database software packages, Office, and SIG;
- Previous experience working with a GEF-supported project is considered an asset;

Field officers

The field officers (one full-time for each of the PA) will be technical experts in the field of biodiversity conservation and protected areas management, and recruited through an open selection process. Working closely with the Project Coordinator on a half-time basis during the lifespan of the project s/he will be responsible for overall technical leadership, coordination and support of the project activities and timely and quality delivery of project outputs at the ecoregional cluster/PA level.

Tasks:

- Being responsible for technical quality and timely delivery of outputs and ensuring the project progress in the PA. Close coordination among PA of the same ecoregional cluster must be established to concur in field-level activities and meetings;
- Report to the PC through and with the approval of the NRM Specialist:
- Coordinate closely with the PC and NRM Specialist to ensure maximum synergy and effectiveness in project delivery;
- Provide technical inputs to the Inception Report, Project Implementation Review, technical reports, quarterly financial reports for submission to UNDP, the GEF, other donors and Government Institutions, as required by the PCU;
- Provide lead technical support to all project implementation activities in the assigned ecoregional cluster(s) that are not supported by a specialist consultant, including facilitating and supporting workshops, task forces and training programmes, and developing technical documents:
- Support in the preparation of ToRs and developing methodology in the execution of various technical studies to be carried out through the project in the ecoregional cluster, as well as assuring quality of technical reports compiled by consultants and link with project outputs and outcomes. Close coordination with the NRM Specialist must be established to ensure effectiveness;
- Support technical consultancy procurement process, reviewing technical proposals and applications;
- Work with the NRM Specialist to ensure the linkage between different consultancies in the ecoregional clusters, or different periods of the consultancy services continuing over several years;
- Ensure the development and implementation of project monitoring and evaluation plans, and annual update of the progress towards project impact indicators for the ecoregional cluster;
- Provide capacity building support to the PCU and the demonstration sites in the ecoregional cluster;
- Document lessons from project implementation and make recommendations to the PCU and CONANP for more effective implementation and coordination of project activities, provision of technical input to preparation of project work and budget plans, quarterly and annual progress reporting;
- Provision of technical support to seminars, public outreach activities and other project events;
- Coordination with project partners and stakeholders at the local levels, linking the project with complementary international and national programmes and initiatives;

Outputs

- Detailed annual work plans on field-level activities, built in coordination with NRA Specialist and PC;
- Technical inputs as required by PCU;
- Periodical reports on the field-level actions, tbd with the NRM Specialist;
- ToRs for the vulnerability analyses consultancies and other technical studies to be carried out through the project ecoregional cluster;
- Revision of technical reports compiled by consultants;
- Reports on the species monitoring implementation and results;

Qualifications

- Bachelor or graduate degree in biology, ecology, natural resource management, environmental or social sciences or related fields;
- Professional experience in conservation planning and management of natural resources, with a regional focus and experience with local communities;
- Proven ability to work with multiple stakeholders and engaging with communities;
- Demonstrable experience in project organization and ability to serve as effective communicator and negotiator with excellent oral presentation skills;
- Good knowledge of national and international best practice in PA planning and management, and conservation in general, is desirable;
- Excellent verbal and writing communication skills in Spanish and English;

Communication and Capacity Development Specialist

The CCD Specialist will be responsible for all the activites related to sharing of lessons learned and construction of capacity building programs. He or she will also be the social link with PAs, ensuring participation and appropriation.

Tasks

- Construction of capacity development programs, in close coordination with M&E Specialist and Field Officers;
- Preparation of ToRs and developing methodology in the execution of any studies needed related to capacity building and for the communication strategy from outcome 1;
- Revision and approval of products made under the communication strategy consultancy, to ensure that the products adjust to UNDP, CONANP and GEF requirements in terms of format, content, gender aspects, etc.
- Approve and edit as necessary information instruments developed to communicate the projects objectives, results, etc.
- Represent the social sector in the project. Close coordination with field officers must be established to connect with local stakeholders and ensure participation;
- Develop participation methodologies in order to make local stakeholders part of the adaptive management of PA;
- Report directly to the PC with the aim of incorporating results of community participation and social processes developing in PA, as well as results of capacity building activities;
- Respond to reports from field-officers regarding social aspects and capacity needs in PA;
- Work with field officers and PCU members to ensure the linkage between different consultancies in the ecoregional clusters, or different periods of the consultancy services continuing over several years;
- Design and analyze monitoring data with special attention to gender data, with the aim of orienting activities to generate greater gender equity between women and men in terms of access to opportunities provided by the project, applying both qualitative and quantitative indicators
- Report on lessons documented in the field from project implementation and ensure that the recommendations make at a local level reach the PC and CONANP;
- Assist in the production of Annual Operational Plans as well as the general project workplan, and will be directly responsible for all reporting on field-level activities;

Outputs

- Detailed annual work plans on field-level activities;
- Periodical reports on the capacity development programs developed in PA;

- ToRs for the communication strategy consultancy and any necessary study regarding the development of capacities in PA;
- Products of the communication strategy consultancy approved;
- Information instruments according to UNDP, CONANP and GEF requirements;
- Participation methodologies to enhance local stakeholder involvement in PA;
- Capacity building programs according to individual PA/cluster needs;
- Participatory gender equity indicators to integrate in the M&E system. Close coorination with M&E expert must be established;
- Periodical reports on the capacity building activities, communication instruments and social processes, including gender data;

Qualifications (indicative)

- Bachelor or graduate degree in social sciences, communication, natural resource management, or related fields;
- Experience in capacity development programs involving different sectors of the population;
- Experience in designing and/or supervising information instruments regarding to natural resources conservation;
- Proven ability to work with local communities and stakeholders;
- Knowledge on gender and equality international commitments;
- Self-motivated and ability to work under the pressure;
- Team-oriented, possesses a positive attitude, and works well with others;
- Flexible and willing to travel as required;
- Excellent interpersonal skills;
- Excellent verbal and writing communication skills in Spanish and English;
- Good knowledge on Office and communication software;
- Previous experience working with a GEF-supported project is considered an asset;

Annex 10. Letter of Agreement for UNDP Direct Project Services

Letter of Agreement

STANDARD LETTER OF AGREEMENT BETWEEN UNDP AND THE GOVERNMENT OF MEXICO FOR THE PROVISION OF SUPPORT SERVICES

Dear Mr. Luis Fueyo Mac Donald.

Commissioner - National Commission for Natural Protected Areas

1. Reference is made to consultations between officials of the Government of *Mexico* (hereinafter referred to as "the Government") and officials of UNDP with respect to the provision of support services by the UNDP country office for nationally managed programmes and projects. UNDP and the Government hereby agree that the UNDP country office may provide such support services at the request of the Government through its institution designated in the relevant programme support document or project document, as described below.

2. The UNDP country office may provide support services for assistance with reporting requirements and direct payment. In providing such support services, the UNDP country office shall ensure that the capacity of the Government-designated institution is strengthened to enable it to carry out such activities directly. The costs incurred by the UNDP country office in providing such support services shall be recovered from the administrative budget of the office.

3. The UNDP country office may provide, at the request of the designated institution, the following support services for the activities of the programme/project:

(a) Identification and/or recruitment of project and programme personnel;

(b) Identification and facilitation of training activities;

(c) Procurement of goods and services;

4. The procurement of goods and services and the recruitment of project and programme personnel by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. Support services described in paragraph 3 above shall be detailed in an annex to the programme support document or project document, in the form provided in the Attachment hereto. If the requirements for support services by the country office change during the life of a programme or project, the annex to the programme support document or project document is revised with the mutual agreement of the UNDP resident representative and the designated institution.

5. The relevant provisions of the Standard Basic Assistance Agreement (SBAA) between the Government of Mexico and the United Nations Development Programme, signed by the parties on 23 February 1961, including the provisions on liability and privileges and immunities, shall apply to the provision of such support services. The Government shall retain overall responsibility for the nationally managed programme or project through its designated institution. The responsibility of the UNDP country office for the provision of the support services described herein shall be limited to the provision of such support services detailed in the annex to the programme support document or project document.

6. Any claim or dispute arising under or in connection with the provision of support services by the UNDP country office in accordance with this letter shall be handled pursuant to the relevant provisions of the SBAA and the project document.

7. The manner and method of cost-recovery by the UNDP country office in providing the support services described in paragraph 3 above shall be specified in the annex to the programme support document or project document.

8. The UNDP country office shall submit progress reports on the support services provided and shall report on the costs reimbursed in providing such services, as may be required.

9. Any modification of the present arrangements shall be effected by mutual written agreement of the parties hereto.

10. If you are in agreement with the provisions set forth above, please sign and return to this office three signed copies of this letter. Upon your signature, this letter shall constitute an agreement between your Government and UNDP on the terms and conditions for the provision of support services by the UNDP country office for nationally managed programmes and projects.

Yours sincerely,

_____

Signed on behalf of UNDP

Marcia de Castro

Resident Representative

_____

For the Government

Mr. Luis Fueyo Mac Donald.

Commissioner

National Commission for Natural Protected Areas

[*Date*]

DESCRIPTION OF UNDP COUNTRY OFFICE SUPPORT SERVICES

1. Reference is made to consultations between the National Commission for Natural Protected Areas (CONANP), the institution designated by the Government of Mexico and representatives of UNDP with respect to the provision of support services by the UNDP country office for the nationally managed programme or project 87099 **Strengthening Management Effectiveness and Resilience of Protected Areas to Safeguard Biodiversity Threatened by Climate Change** (award 74960) "the Project".

2. In accordance with the provisions of the letter of agreement signed on *Date of signature (LOA)* and the project document, the UNDP country office shall provide support services for the Project as described below.

3. Support services to be provided:

Support services* (insert description)	**Schedule for the provision of the support services**	**Cost to UNDP of providing such support services (where appropriate)**	**Amount and method of reimbursement of UNDP (where appropriate)**
1. Payments, disbursements and other financial transactions	During project implementation	Universal Price List	Support Services
2. Recruitment of staff, project personnel, and consultants	During project implementation	Universal Price List	Support Services
3. Procurement of services and equipment, and disposal/sale of equipment	During project implementation	Universal Price List	Support Services
4. Organization of training activities, conferences, and workshops, including fellowships	During project implementation	Universal Price List	Support Services
5. Travel authorizations, visa requests, ticketing, and travel arrangements	During project implementation	Universal Price List	Support Services
6. Shipment, custom clearance, vehicle registration, and accreditation	During project implementation	Universal Price List	Support Services

* UNDP direct project support services will be defined yearly, and for those executed during the period, direct project costs will be charged at the end of each year based on the UNDP Universal Pricelist (UPL) or the actual corresponding service cost

4. Description of functions and responsibilities of the parties involved:

As described in the Project Document (Management Arrangements), the project will be executed under national implementation modality, with execution by the National Commission for Natural Protected Areas (CONANP) following UNDP's Programme and Operations Policies and Procedures, per its role as implementing agency. Execution of the project will be subject to oversight by a Project Steering Committee (described in the Project Document). Day to day coordination will be carried out under the supervision of a Project Coordination Unit and corresponding staff. The CONANP will take responsibility for different outcomes/activities according to existing capacities and field realities, ensuring effective and efficient use of GEF resources.

As described in the Project Document, the functions of the Participants are the following:

The Ministry of Foreign Affairs (SRE). The Government of the United Mexican States has designated the Technical and Scientific Cooperation Directorate of the SRE as the official counterpart of UNDP in Mexico. Its main responsibilities are:

- As the entity responsible for technical cooperation in Mexico, to act as the Mexican government's official counterpart to UNDP; specifically, and in accordance with the National Development Plan, to formalize approval of the project cooperation documents presented to UNDP by federal, state and private entities.
- If necessary, to make a written request to UNDP for reports on the project.
- To approve the annual audit plan for the project and, in accordance with UNDP standards and procedures, to convene an information and consultation meeting prior to the audit.
- If considered necessary, to attend at least one meeting a year of the project's Project Steering Committee.
- As required, to participate in tripartite meeting or in any follow-up or reorientation sessions.

The National Commission for Natural Protected Areas (CONANP) is responsible for the fulfillment of the project's results. Its main responsibilities are to:

- Lead the project implementation with the support of the PCU.
- Designate a representative to act as a permanent liaison between UNDP, the Ministry of Foreign Affairs and the Project Coordinator, and to participate in the Project Steering Committee meetings, and others as required, to ensure that the necessary inputs are available to execute the project.
- Prove the technical and administrative capacity to develop the project.
- Monitor the project's work plan and progress.
- Provide the name and describe the functions of the person or persons authorized to deal with UNDP concerning the project's matters.
- Approve Terms of Reference for technical personnel and consultancies for project implementation.
- Participate in the selection process of the consultants and approve all hiring and payment request.
- Provide the name and describe the functions of the person or persons authorized to sign the project's budget and/or substantive revisions of the project.

United Nations Development Programme (UNDP) has the responsibility to:

- Designate a programme officer responsible for providing substantive and operational advice and to follow up and support the project's development activities.
- Advise the project on management decision making, as well as to guarantee quality assurance.
- Be part of the project's Steering Committee and other Committees or Groups considered part of the project structure.
- Administer the financial resources agreed in the revised work plan and approved by the project's Steering Committee, and inform the National Implementing Partner of its origin and destination.
- Co-organize and participate in the events carried out in the framework of the Project.
- Use national and international contact networks to assist the project's activities and establish synergies between projects in common areas and/or in other areas that would be of assistance when discussing and analyzing the project.
- Provide Support in the development and instrumentation of the project's gender strategy.