GEF-6 PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: Full-sized Project
TYPE OF TRUST FUND:GEF Trust Fund

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PART I: PROJECT INFORMATION

Project Title:	**Securing the Future of Global Agriculture in the face of climate change by conserving the Genetic Diversity of the Traditional Agroecosystems of Mexico**		
Country(ies):	Mexico	GEF Project ID:[1]	9380
GEF Agency(ies):	FAO (select) (select)	GEF Agency Project ID:	640631
Other Executing Partner(s):	National Commission for the Knowledge and Use of Biodiversity (CONABIO)	Submission Date: Re-submission date:	2 March 2016 24 March 2016
GEF Focal Area(s):	Biodiversity	Project Duration (Months)	60
Integrated Approach Pilot	IAP-Cities ☐ IAP-Commodities ☐ IAP-Food Security ☐	Corporate Program: SGP ☐	
Name of parent program:	[if applicable]	Agency Fee ($)	506,298

A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK AND OTHER PROGRAM STRATEGIES[2]

Objectives/Programs (Focal Areas, Integrated Approach Pilot, Corporate Programs)	**Trust Fund**	**(in $)**	
		GEF Project Financing	**Co-financing**
BD-3 Program 7 (select) (select)	GEFTF	5,329,452	36,200,000
(select) (select) (select)	(select)		
(select) (select) (select)	(select)		
Total Project Cost		**5,329,452**	**36,200,000**

B. INDICATIVE PROJECT DESCRIPTION SUMMARY

Project Objective: To develop policies and mechanisms that support agro-biodiversity conservation, sustainable use and resilience, by promoting the knowledge of traditional agro-ecosystems and the cultural methods that maintain that agroBD in Mexico.

Project Components	**Financing Type[3]**	**Project Outcomes**	**Project Outputs**	**Trust Fund**	**(in $)**	
					GEF Project Financing	**Co-financing**
Component 1 Information and knowledge management	Inv	**Outcome 1.1** Globally-important agrobiodiversity, the traditional practices, the scientific and technological research and development activities, associated knowledge base and capacities that maintain the diversity in Mexico, have been collated and analysed and the resulting information	**Output 1.1.1:** New knowledge generated through participatory research **Output 1.1.2** Analyzed and published information on agrobiodiversity, the associated traditional practices and the scientific and technological research and development	GEFTF	1,672,915	11,363,180

[1] Project ID number will be assigned by GEFSEC and to be entered by Agency in subsequent document submissions.
[2] When completing Table A, refer to the excerpts on *GEF 6 Results Frameworks for GETF, LDCF and SCCF*.
[3] Financing type can be either investment or technical assistance.

		published. *Target species: maize, beans, amaranth, chilis, squashes, chayotes, green tomatoes, cacao, avocado, nopal, and particular local edible tender leaf vegetables (quelites[4])* *Target sites / priority geographies: Oaxaca, Michoacán, Chihuahua, and Mexico City Valley[5]*	activities and existing local capacities that support the management and use of agrobiodiversity in Mexico. **Output 1.1.3** Databases of species, varieties, traditional, research and development practices, crop ranges and key stakeholders, including community-based, civil society and research and development institutions involved in the conservation and sustainable use of agrobiodiversity in Mexico created. *Target: 11 databases hosted by CONABIO*[6].			
Component 2 Strenghtening of local capacities	TA	**Outcome 2.1** Local capacities have been strengthened to support long-term plans for agroBD conservation and sustainable use, to develop strategies for revaluating traditional knowledge, and to support continuous adaptation to climate change. *Target stakeholders:*	**Output 2.1.1** A mechanism of self-management[9] and information-sharing among farmers, aimed at strengthening local capacities, developed. **Output 2.1.2** Community and family seed banks (*ex-situ* and *in-situ* conservation), established.	GEFTF	1,705,774	11,586,373

[4] See more details in Annex I of this PIF. Crop wild relatives and native species are listed but may change during full project preparation analysis. The *quelites* can be considered as 'associated species' that grow next to cultivated crops in the *milpa* system (i.e. they are tolerated, consumed, and/or used in different ways).

[5] The targeted areas will be further defined in a participatory manner during full project preparation. These States have been selected by CONABIO given the existing work already conducted and the representativeness of their Agroecosystems. See Map in Annex II.

[6] One database per species.

[9] *Self-management* is the translation of the Spanish word "autogestión". *Self-management mechanism* in the project context is defined as the "generation of mechanisms through which traditional farmers, individually or community-based, carry out the management, conservation and use of their native phytogenetic resources, being empowered and improving their own capacities". *Self-management* comprehends planning and self-evaluation in order to assess their outcomes and goals achievement

		traditional peasants, indigenous peoples, local communities, and research and development institutions. *Target: 30% of female-led households* *Target sites: Oaxaca, Michoacán, Chihuahua, and Mexico City Valley* *Target species: maize, beans, amaranth, chilis, squashes, chayotes, green tomatoes, cacao, avocado, nopal, and particular local edible tender leaf vegetables (quelites[7])* *Indicator BD 7.1: Diversity status of target species: improved knowledge, conservation and monitoring of agroBD species, CWR and associated species[8]* (to be measured through the BD tracking tool)	**Output 2.1.3** Stakeholders[10] in farmer participatory plant breeding (based on the needs identified by the communities in coordination with research groups dedicated to agricultural improvement) identified and trained and priorities set.			
Component 3 Improvement of Public Policies	TA	**Outcome 3.1** The protection and promotion of traditional knowledge, practices and production systems have been mainstreamed into public policies and planning, generating effective partnerships with the communities, and disseminating values associated with agroBD and local cultures. *Target: agrobiodiversity considerations*	**Output 3.1.1** One inter-institutional strategy for agrobiodiversity conservation and use, agreed and implemented. **Output 3.1.2** One agreed synergy mechanism that ensures coherence between public policies, international projects and other initiatives directed towards the promotion	GEFTF	449,558	3,053,597

[7] See more details in Annex I of this PIF. Crop wild relatives and native species are listed but may change during full project preparation analysis. The *quelites* can be considered as 'associated species' that grow next to cultivated crops in the *milpa* system (i.e. they are tolerated, consumed, and/or used in different ways).

[8] See specific targets of species and CWR in Section 3 of this PIF.

[10] *Stakeholders* in this output are the local farmers, playing a role of empirical improvers, and the researchers, in the role of scientific improvers.

		mainstreamed into the National Development Plan and at least 2 Sectorial Plans by PY4. *Target institutions: CONABIO, SAGARPA, CONANP, SEMARNAT, SEDESOL, CDI* *Target systems:Traditional agroforestry systems in Mexico.*[11] *Target priority geographies: Oaxaca, Michoacán, Chihuahua, and Mexico City Valley.*	and conservation of the social and cultural processes that maintain agrobiodiversity. **Output 3.1.3** Inclusive public policies that value the role of the traditional farmers and have focus on the young people as the replacement generation for the maintenance of agrobiodiversity systems.			
Component 4 Valuation of agrobiodiversity and market linkages	Inv	**Outcome 4.1** The marketing of agro-BD products has been enhanced through new strategies of agroBD valuation and market incentives, with a *value chain*[12] approach *Target agroBD products: 11 (one per targeted species)* *Target markets: self-consumption and local markets* *Target labelling scheme: geographical indication* *Indicator BD 7.1: Diversity status of target*	**Output 4.1.1** Strategy of agrobiodiversity valuation. **Output 4.1.2** Strengthened market linkages between the small-scale farmers (family farmers and indigenous communities) and local and regional markets, to support the conservation through sustainable production of food and goods based on agrobiodiversity. **Output 4.1.3** Innovative market	GEFTF	1,247,422	8,473,043

[11] The *milpa*, including *chichipera* and *chinanpa*, are traditional agro-forestry multi-cropping systems of Mexico. See description in Section 1 of this PIF. Reference: Moreno Calles AI, Casas A, García Frapolli E, Torres García I. 2012. *Traditional agroforestry systems of multi-crop "milpa" and "chichipera" cactus forest in the arid Tehuacán Valley, Mexico: their management and role in people's subsistence.* Agroforest Syst, 84:207-226. See also: Moreno-Calles AI, Galicia-Luna VJ , Casas A, Toledo VM, Vallejo-Ramos M, Santos-Fita D & Camou-Guerrero C. 2014. *La etnoagroforestería: el estudio de los sistemas agroforestales tradicionales de México.* Etnobioogía 12(3): 1-16; and Moreno Calles AI, Toledo VM, & Casas A. 2013. *Los sistemas agroforestales tradicionales de México: Una aproximación Biocultural*. Botanical Sciences 91(4): 375-398.

[12] *Value chain* as per FAO's definition means: "all the stakeholders that participate in the coordinated production and value adding activities that are needed to make food products". A *value chain* approach in its complete description may not fit to all smallholders, since many of these farmers do not have access to all stages of a full value chain. In this case the concept of "market linkages" may be more appropriate than "value chain" even if a value chain approach would be used for the analisis and the strategy design in output 4.1.1. This is the approach adopted for Outcome 4.1. During full project preparation it will be defined if the small- and medium-scale entreprises and/or cooperatives that can access the national and export markets are also present in the project target areas. If it is the case, the value chain approach will also be included.

		species: improved knowledge, conservation and monitoring of agroBD species, CWR and associated species[13] *Target: 30% of female-led households*	incentives that promote the conservation of agroecosystems and generate a transformational change in business-as-usual rural production.			
				Subtotal	5,075,669	34,476,193
				Project Management Cost (PMC)[14]	253,783	1,723,807
				Total Project Cost	**5,329,452**	**36,200,000**

For multi-trust fund projects, provide the total amount of PMC in Table B, and indicate the split of PMC among the different trust funds here: ( )

C. INDICATIVE SOURCES OF CO-FINANCING FOR THE PROJECT BY NAME AND BY TYPE, IF AVAILABLE

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount ($)
Recipient Government	National Commission for the Knowledge and Use of Biodiversity (CONABIO)	In-kind	4,000,000
Recipient Government	National Commission of Natural Protected Areas (CONANP)	In-kind	8,500,000
Recipient Government	Ministry of Agriculture, Livestock, Rural Development, Fisheries and Food (SAGARPA)	In-kind	8,500,000
Recipient Government	Ministry of Social Development (SEDESOL)	Loans	6,000,000
Recipient Government	Ministry of Environment, Natural Resources and Fisheries (SEMARNAT)	In-kind	3,000,000
Recipient Government	Commission for the Development of Indigenous Peoples (CDI)	In-kind	2,500,000
Recipient Government	CONACyT through institutions and research centres	In-kind	500,000
Others	Diverse institutes and national research centres (UNAM, CICY, INIFAP, CP, UACh)	In-kind	3,000,000
GEF Agency	FAO	In-kind	200,000
Total Co-financing			36,200,000

[13] See more under Section 3 of this PIF and table of species in Annex I

[14] For GEF Project Financing up to $2 million, PMC could be up to10% of the subtotal; above $2 million, PMC could be up to 5% of the subtotal. PMC should be charged proportionately to focal areas based on focal area project financing amount in Table D below.

D. INDICATIVE TRUST FUND RESOURCES REQUESTED BY AGENCY(IES), COUNTRY(IES) AND THE PROGRAMMING OF FUNDS [a)]

GEF Agency	Trust Fund	Country/ Regional/ Global	Focal Area	Programming of Funds	(in $)		
					GEF Project Financing (a)	Agency Fee (b)[b)]	Total (c)=a+b
FAO	GEFTF	Mexico	Biodiversity	(select as applicable)	5,329,452	506,298	5,835,750
(select)	(select)		(select)	(select as applicable)			
(select)	(select)		(select)	(select as applicable)			
(select)	(select)		(select)	(select as applicable)			
(select)	(select)		(select)	(select as applicable)			
Total GEF Resources					5,329,452	506,298	**5,835,750**

a) Refer to the Fee Policy for GEF Partner Agencies.

E. PROJECT PREPARATION GRANT (PPG)[15]

Is Project Preparation Grant requested? Yes ☒ No ☐ If no, skip item E.

PPG AMOUNT REQUESTED BY AGENCY(IES), TRUST FUND, COUNTRY(IES) AND THE PROGRAMMING OF FUNDS

Project Preparation Grant amount requested: $150,000					PPG Agency Fee: **14,250**		
GEF Agency	Trust Fund	Country/ Regional/Global	Focal Area	Programming of Funds	(in $)		
					PPG (a)	Agency Fee[16] (b)	**Total** c = a + b
FAO	GEFTF	Mexico	Biodiversity	(select as applicable)	150,000	14,250	164,250
Total PPG Amount					150,000	14,250	**164,250**

F. PROJECT'S TARGET CONTRIBUTIONS TO GLOBAL ENVIRONMENTAL BENEFITS[17]

Provide the expected project targets as appropriate.

Corporate Results	Replenishment Targets	Project Targets
1. Maintain globally significant biodiversity and the ecosystem goods and services that it provides to society	Improved management of landscapes and seascapes covering 300 million hectares	*350,000 Hectares*
2. Sustainable land management in production systems (agriculture, rangelands, and forest landscapes)	120 million hectares under sustainable land management	*Hectares*
3. Promotion of collective management of transboundary water systems and implementation of the full range of policy, legal, and institutional reforms and investments contributing to sustainable use	Water-food-ecosystems security and conjunctive management of surface and groundwater in at least 10 freshwater basins;	*Number of freshwater basins*
	20% of globally over-exploited fisheries (by volume) moved to more sustainable levels	*Percent of fisheries, by volume*

[15] PPG requested amount is determined by the size of the GEF Project Financing (PF) as follows: Up to $50k for PF up to$2m (for MSP); up to $100k for PF up to $3m; $150k for PF up to $6m; $200k for PF up to $10m; and $300k for PF above $10m. On an exceptional basis, PPG amount may differ upon detailed discussion and justification with the GEFSEC.

[16] PPG fee percentage follows the percentage of the Agency fee over the GEF Project Financing amount requested.

[17] Provide those indicator values in this table to the extent applicable to your proposed project. Progress in programming against these targets for the projects per the *Corporate Results Framework* in the *GEF-6 Programming Directions*, will be aggregated and reported during mid-term and at the conclusion of the replenishment period. There is no need to complete this table for climate adaptation projects financed solely through LDCF and/or SCCF.

and maintenance of ecosystem services		
4. Support to transformational shifts towards a low-emission and resilient development path	750 million tons of CO_{2e} mitigated (include both direct and indirect)	*metric tons*
5. Increase in phase-out, disposal and reduction of releases of POPs, ODS, mercury and other chemicals of global concern	Disposal of 80,000 tons of POPs (PCB, obsolete pesticides)	*metric tons*
	Reduction of 1000 tons of Mercury	*metric tons*
	Phase-out of 303.44 tons of ODP (HCFC)	*ODP tons*
6. Enhance capacity of countries to implement MEAs (multilateral environmental agreements) and mainstream into national and sub-national policy, planning financial and legal frameworks	Development and sectoral planning frameworks integrate measurable targets drawn from the MEAs in at least 10 countries	*Number of Countries:*
	Functional environmental information systems are established to support decision-making in at least 10 countries	*Number of Countries:*

PART II: PROJECT JUSTIFICATION

1. *Project Description.* Briefly describe: 1) the global environmental and/or adaptation problems, root causes and barriers that need to be addressed

The global context of loss of plant genetic resources and the importance of Mexico as a Vavilov Centre

The confluence of climate change, modern agricultural practices characterized by monocultures, urbanization, grazing and development projects have narrowed the diversity of crops and their varieties on which our food systems depend. They have also led to the abolishment of the natural habitats of crop wild relatives and wild plants that are harvested for food. The *ex-situ* conservation of the genetic diversity of crops and their wild relatives has not kept up with the pace of this erosion of genetic diversity while *in-situ* conservation practices remain underfunded. In fact, in many countries, including Mexico, the conservation of plant genetic resources for food and agriculture (PGRFA) in their natural habitats, where they could continue to evolve adaptive traits, receives at best disjointed attention from disparate public institutions and civil society entities that intervene in concerted manners although not in a sufficient regular basis. The inevitable consequence therefore is that many sources of the traits that could be used to develop the resilient and nutritious crop varieties needed to feed an over-increasing population in the face of climate change are going extinct. Equally worrisome, the loss of these natural habitats and the PGRFA that populate them, rob our agricultural and food systems of the very vital ecosystem services that are needed to develop production systems that have minimal environmental footprints.

An important extinction of species has been predicted by the year 2050, within which the loss of worldwide agricultural diversity or *agrobiodiversity* is implied. Climate change represents an unprecedented and immediate threat to subsistence and food security and is an important obstacle to achieving the 60% growth in world food production that will be necessary by the year 2050 (FAO, 2011). The trend can be reversed but not without a documentation of the extent of the problem; the mapping of the hotspots; the identification of stakeholders and the fostering of linkages between them; the definition of priority activities and the mainstreaming of validated practices as this project proposes.

Agrobiodiversity in Mexico

Mexico, with its complex topography, variety of climates and cultural richness, is a megadiverse country. Mexico is considered the center of origin and genetic diversity of a large number of species of great importance for food, agriculture and human development. The country – and its potential role in harnessing the traits inherent in this diversity – is therefore critically important in the quest for the sustainable food systems and nutrition required for mitigating the unprecedented challenge of producing significantly more

food without further damaging the environment for current and future generations of the inhabitants of planet Earth.

In 1935, Vavilov proposed eight **centers of origin** of cultivated plants corresponding to fundamental and ancient centers of agriculture in the world. One of these centers covers the region of Mesoamerica, which includes a large part of the territory of Mexico. Mexico is the center of origin, domestication and/or genetic diversity of more than 130 plant species, of which 25 are the most used commercially at the global level and form the basis of human and animal nutrition in hundreds of countries[18]: agave, amaranto (*Amaranthus spp*.), chili, squashes, cotton, beans, chayote (*Sechium spp*.), vanilla, maize, papaya, dahlias, poinsettia, sunflower, sweet potato, nettlespurge (*Jatropha spp*.), sapodilla (*Manilkara zapota*), tobacco, nopales and tunas (*Opuntia spp*.), avocado, tomatillo (*Physalis philadelphica*), mamey sapote (*Pouteria sapota*), guava, mexican marigold or cempasúchil (*Tagetes erecta*), cocoa and jicama (*Pachyrhizus erosus*). Natural distribution of the wild ancestors of these cultivated plants has also been documented in Mexico.
The country is also the center of secondary diversification of other species of global economic importance[19]. Among these are *Solanum spp*., *Ipomoea spp*., *Quercus spp*., *Bursera spp*., *Pinus spp*. Kindly see Annex I for a list of plant species addressed by this project proposal.

The evolution of these crops has taken place continuously through processes of **domestication and diversification** mediated by farmers using traditional production practices in many areas of Mexico. Many *domesticated* crop species have wild relatives with which they can be crossed, enabling the existence of intermediates between the completely domesticated species and the wild form, thus constituting a genetic continuum. By selecting forms that present characteristics of interest from among these intermediates, traditional farmers contribute to the furtherance of domestication. Participatory approaches – between these farmers enabled with their traditional knowledge and plant breeders and scientists leveraging powerful scientific tools and methods – can mimic this ongoing domestication, but in a concerted and focused manner, to develop the new hardy, input use-efficient and nutritious crop varieties that will underpin sustainable food systems and nutrition. The absences of data, incentives, the enabling policy environments and collaborative platforms prevent this all important paradigm from taking root.

The **genetic diversity** of agricultural biodiversity in Mexico provides a basis for food supply, is a repository for traits needed for adaptations to specific agroecological conditions and resistance to pests, diseases and particular abiotic conditions. The **continuing erosion** of the genetic diversity in Mexico prevent the international community from having access to unique sources of traits for improving crops that, though originated in Mexico, have become bulwarks of food security and nutrition and sources of livelihoods worldwide. Maize, for instance, is either a major food security crop or a vital component of livestock feeds, or substrate for bioenergy in almost every nation on Earth.

There are 220 botanical families present in Mexico, of which only 33% have been explored for ***in-situ* conservation**. In terms of projects, the situation is even more critical given that only 99 species have been reported without repetition in the last decade, representing only 0.33% of the total number of vascular and non-vascular species estimated to be found in Mexico. Few *in-situ* conservation projects have concentrated on crop breeding: only 24.8% developed participatory plant breeding, mostly involving edible species. Many projects did not consider any plant breeding activities.

Regarding the **threat level** faced by the studied species[20], the majority of the studies conducted in natural habitats have focused on species identified by the researchers as *abundant* or *stable* (19.6 and 70.3%

[18] Acevedo Gasman, F., et al. 2009. *La bioseguridad en México y los organismos genéticamente modificados: cómo enfrentar un nuevo desafío*, in Capital natural de México, vol. II : Estado de conservación y tendencias de cambio. Conabio, México, pp. 319-353.
[19] See: http://www.biodiversidad.gob.mx/genes/otrosCentros.html
[20] CONABIO, 2015

respectively), while little attention was paid to those *in decline* or *in danger of extinction* (10.1%). In contrast, studies conducted on traditional agricultural systems have showed a higher percentage of species that were under some category of *threat* (47.1% in total)[21].

At farm level

Agrobiodiversity in Mexico is mainly composed of local agricultural varieties managed by traditional methods of small-scale farmers[22], as well as crop wild relatives (CWR) and associated species that grow together within the *milpa* cultivation system. CWR not only grow within the milpa cultivation systema but in most cases far distances away. Agrobiodiversity also includes the elements that interact with these plant species, such as insects, microorganisms, birds, which are crucial to the functioning of agroecosystems.

The ***milpa*** is an agroforestry traditional system of pre-Hispanic origin whose principal crop is the maize. The maize is cultivated alongside with other utilized plants as beans, squash, chile. Other wild species of high food importance (e.g. *quelites*) are tolerated and promoted. The *milpa* is a complex agroecosystem that favours benefic ecological interactions. Multi-cropping management and composition may change depending on the geographical areas. *Milpa* system crops are well adapted to local climatic conditions. This production system has been the basis for food security in Mesoamerica since old times. Crop varieties or breeds are usually variants that have been generated by farmers through traditional management of their plots. This includes crop seed selection and improvement, as well as experimentation through the exchange of seeds among farmers, and the interaction with wild relatives[23]. *Germplasm* or genetic material is exchanged among human communities, and has led over the centuries to the development of local varieties in Mexico, as the ones mentioned above and detailed in Annex I.

The role of **local and indigenous communities** has been fundamental in holding the ancestral knowledge of these species, and has been responsible for their conservation, evolution and domestication. However, both *in-situ* and *ex-situ* conservation could be strengthened through the promotion of seed banks for community use, with a view to their exchange at local and regional levels as a further benefit of their promotion as well as a safeguard in case of climatic disasters.

The rich process of generating and conserving agrobiodiversity corresponds to an ***in-situ*** **conservation** modality. The majority of current *in-situ* agrobiodiversity sites is present in traditional plots and domestic gardens, and natural areas where wild crop ancestors live. ***In-situ*** **conservation** is based on the relationship man/plant, traditional farmer/native crops. In Mexico is used in rural and sub-urban areas[24]: approximately 2.5 million traditional farmers in 7.2 million hectares run *in-situ* conservation. In addition, some disperse efforts in Mexico promote *in-situ* conservation of cultivated species and wild relatives. Annex III of this PIF illustrates the Map of some *In-situ* conservation activities and their geographical location.

Underlying causes of agrobiodiversity loss in Mexico

- **Modern agricultural production is based on a limited range of crops:** In Mexico, the large-scale intensive agricultural production, characterized monocrops of a very narrow range of crops and varieties, has grown exponentially thereby displacing unique crop landraces in the last decades. Large-scale production relies on few agricultural crops. Consequently, genetic erosion is threatening agrobiodiversity species that could become obsolete or be lost. Native varieties are part of traditional diets, but the international food system does neither demand nor consume them. As a consequence, native crops, associated species and wild relatives survive only thanks to traditional communities that keep on cultivating them.

[21] CONABIO, 2015

[22] Mexico considers *small-scale farmers* those who have less than 5 hectares of land.

[23] Altieri et al 2012; Benitez et al 2014; Moreno Calles et al., 2014

[24] Sub-urban areas are transition areas bordering urban settlements.

- **Uniformality of crop varieties:** In Mexico, the context of uniform and large-scale agricultural production, with growing food demand pressures and climate change effects, is reducing agricultural biodiversity. Genetic resources constitute the raw material for plant breeders to develop new varieties, are key to meet food demand from a growing population, and are fundamental to face the pressure of pests, diseases and changing environmental conditions as a result of climate change. Plant genetic resources are being lost in Mexico due to the spread of monoculture systems, introduced organisms, excessive use of external inputs, and loss of traditional management systems and knowledge due to migration of young community members.
- **Lack of inclusiveness of modern value chains:** With globalization, food systems in Mesoamerica and Mexico are increasingly influenced by highly concentrated agro-industrial firms and retailers, and this trend is set to increase (OECD, 2011). It creates unequal power relations between upstream and downstream actors in the value chain, especially with regard to smallholders and family farmers. As recognized by the 2014 International Year of Family Farming (IYFF)[25], inclusiveness of smallholders is a key element for sustainability, and has big consequences on agricultural biodiversity, food security and social sustainability.
- **Urbanization and changes in diets:** Urbanization is a trend that transforms drastically food systems. Today, half the world's population lives in urban areas and that number is increasing rapidly (FAO, 2012). By 2050, about 70 percent of the global population of 9 billion is expected to live in cities, which will have important consequences on consumption patterns and food chains (Esnouf *et al.*, 2011). Indeed, urban consumers usually purchase everything they eat: this deeply influences local food systems, orientating them on new diet patterns or lead access to richer products, often imported, which replace traditional foods. In Mexico similar patterns exist, with a high migration rate from rural areas to cities, 78% of the population lives in urban areas[26].
- **The species representation in the ex-situ conservation modality is too limited:** A storage of approximately 7.4 million accessions was recorded in the germplasm banks worldwide in 2010 (FAO, 2011). However, these belong to a very limited number of plant species, meaning: i) only 1/3 corresponds to traditional farmers and/or obsolete varieties; ii) only 15% corresponds to wild taxa and plants related to the cultivated crops; iii) samples stored worldwide belong to around 100 plant species of the approximately 7000 utilized by man for food and agriculture. This means that only 1.4% of the commonly utilized species are safeguarded in germplasm banks. Among the species considered for *ex-situ* conservation, there are important gaps in terms of primitive cultivars and wild relatives that are related to the centers of origin and of genetic diversity. In Mexico, the lack of funds and long-term financing as well as the low interest from public and private sectors have hindered the increase of *ex-situ* conservation sites. Despite the creation of the National Genetic Resources Centre in Tepatitlan[27], the lack of an adequate infrastructure has also limited the representation of species in seed banks.
- **It is unknown how many crop species and varieties live in Mexico:** Domestic gardens present in tropical countries have been considered the epitome of sustainability, providing food to millions of people through multiple use of species. Despite their important role, gardens have been poorly studied by science. In addition, underutilized species receive little assistance in terms of research, plant breeding and/or development and are being increasingly marginalized by the farmers. These species offer great potential in the face of climate change, for ecoagriculture, food regime diversity and the sustainability of agricultural production systems (FAO, 2011). In Mexico, the lack of funds and long-term financing from public and private sources, as well as the great variety of species present in the country have limited the creation of

[25] http://www.fao.org/family-farming-2014/home/what-is-family-farming/en/
[26] Urban areas are those with more than 2500 inhabitants according to INEGI.
[27] http://www.inifap.gob.mx/SitePages/centros/cnrg.aspx

a standardized database and knowledge management system. Policies are not informed and the status of agrobiodiversity conservation in centres of origin and diversification is not duly monitored. Few agrodiversity species have been studied and even the most studied species need extra and intensive research.

- **Institutions poorly coordinate their efforts creating an information and policy gap**: Despite the large number of institutions, researchers and technicians that participate in work related to phytogenetic resources, and the high educational level, Mexico does not reach a satisfactory knowledge level on the actual conservation, use and access to plant genetic resources in the country. This is linked to the broad existence of state agencies and the limited coordination and harmonization between their strategies, work plans and research objectives.
- **Decision-makers are not fully aware of the importance of agrobiodiversity and have adopted contradictory policies that affect conservation:** Until present, decision-makers in Mexico have not recognized the importance of domestic gardens and traditional cultivation systems. This lack of awareness has induced major risks and negative pressures through the design of public policies that were contradictory or had undesired effects. The promotion of modern agricultural practices to feed global and national markets have created serious challenges to conserve traditional species and agroecosystems in rural areas. In addition, rural poverty and migration towards urban zones and abroad have deepened the effects of inter-generational loss of traditional knowledge and varieties management.

2) The baseline scenario or any associated baseline projects

Study of the plant genetic resources of Mexico

There are 205 institutions and research centers with almost 2000 personnel in Mexico that study the conservation and use of plant genetic resources. The majority (88%) of the these researchers are highly trained.
In Mexico, the following federal government agencies are leading the actions on the study and use of agrobiodiversity:

The **National System of Inspection and Certification of Seeds** (SNICS, by its Spanish acronym), a branch of the Secretariat of Agriculture, Livestock, Fisheries and Aquaculture (SAGARPA). SNICS launched the **National System of Phytogenetic Resources** (SINAREFI, by its Spanish acronym) in 2002, which has coordinated and organized more than 40 crop networks and/or agricultural processes.

Background information

In line with the *Law of Biosafety of Genetically Modified Organisms*[28] (2005) (see below), the **National Commission for the Knowledge and Use of Biodiversity** (CONABIO) has supported the compilation of studies on some crops born from centers of origin and genetic diversification since 2006[29]. CONABIO has also provided grants to projects related to a state-of-the-art of crops and associated species, in order to identify information gaps and areas lacking adequate analysis. Two emblematic projects have been the ***Global Maize Project*** and the ***Centres of Origin Project,*** aimed at compiling information and elements that could help decision-makers comply with the current legislation. In addition, both projects supported baseline data collection[30] - necessary to secure the future of agriculture in Mexico.

[28] See: http://www.diputados.gob.mx/LeyesBiblio/pdf/LBOGM.pdf
[29] Annex I is based on CONABIO's studies.
[30] Annex I is based on CONABIO's studies. As well, the 5th Report of Mexico to CBD is based on CONABIO's work on phytogenetic resources (2014): https://www.cbd.int/doc/world/mx/mx-nr-05-es.pdf

i. The ***Global Maize Project: Compilation, updating, and analysis of information on maiz genetic diversity and their wild relatives in Mexico***[31] was implemented in 2006-2010. It was financed by SEMARNAT, CONABIO, SAGARPA and the Inter-sectorial Commission on GMOs (CIBIOGEM). The project had 3 transversal action lines: i) generating documents about centres of origin and genetic diversity of the maize; ii) computerizing scientific collections of native maizes, *teocintles*, and *tripsacum*; iii) generating knowledge on native maize diversity including its wild relatives and current distribution,. As a result, the project generated the most complete information set that currently exists in terms of the status of the genetic reserve of maize in Mexico[32].

ii. The ***Centres of Origin Project***[33] opened the call for proposals in late 2008 and closed it in 2010. The Project was financed by the General Directorate of Primary Sector and Renewable Natural Resources (DGSPRNR, SEMARNAT) and technically supported by CONABIO. The call objective was to know the status of previously selected 16 crop genera in centres of origin and genetic diversity. Sub-projects were financed to study the following genera: *Amaranthus, Capsicum, Cucurbita, Sechium, Gossypium, Tagetes, Opuntia, Persea, Physalis* and *Vanilla*[34].

Baseline initiatives conducted by CONABIO[35]

In addition, CONABIO has conducted the following key baseline initiatives related to agrobiodiversity:

iii. ***Local uses and consumption preferrences as diversity factors of native Maizes in Oaxaca (2014-2016)***. This Project has been executed by ECOSUR and financed by CONABIO. Its objective is to analyse the relationship between seed uses, selection and varieties carried out by women, and their connection to the diversity of varieties of native maiz in Oaxaca. This project is related to project components 2 and 4. Still on-going.

iv. ***Monitoring of landraces and geographical lineages of maiz in Mexico using a genomic approach.*** This initiative has been financed by SEMARNAT and executed by the Authonomous University of Mexico (UNAM) since 2011. The objective is to produce studies on the genetic diversity of native maizes by using microsatellites and SNPs at national level. Stage 2 is currently being started. This initiative is related to project components 1 and 3.

Lessons learned: CONABIO has extracted lesssons from the above-mentioned projects, which are being considered in the design of the present GEF proposal. A summary of those lessons follows below and will be further described in the full project document:

- Collaboration with researchers and their working groups, throughout academic institutions in the country, has been key to achieve progress during both projects implementation;
- The available information level may considerably vary from one plant genus to another. This includes the knowledge on the intra- or inter-specific diversity (existence, characterization of local races or variants), uses and management systems. This difference

[31] See: http://www.biodiversidad.gob.mx/genes/proyectoMaices.html
[32] See more at: http://www.biodiversidad.gob.mx/genes/proyectoMaices.html; and *Claridades agropecuarias* in September 2015 http://www.infoaserca.gob.mx/claridades/revistas/265especial/ca265especial-29.pdf
[33] See: http://www.biodiversidad.gob.mx/genes/centrosOrigen/proyectosCdeO.html
[34] Sub-project results and reports are detailed at: http://www.biodiversidad.gob.mx/genes/centrosOrigen/Convocatoria/Convocatoria.pdf
[35] This list is not exhaustive due to space limitations. It reflects the key initiatives conducted by CONABIO and related to the present project. It will be further developed in the full project document.

depends on the quantity of previus works and the number of research groups dedicated to the study of each plant genus in the country.

- The projects achieved the goal of collecting native maizes and their wild relatives in the whole national territory;
- It was confirmed that there is a large diversity of native maizes that are still being cultivated in Mexico;
- Although Mexico has invested more than a century in studying the genetic diversity of agricultural species and their wild relatives, the total of species is still unknown as well as their distribution, ecology, uses, among other features[36].

Baseline initiatives on the conservation and sustainable use of agrobiodiversity in Mexico

The **National Commission of Natural Protected Areas (CONANP)** has carried out the following key baseline initiatives to support the conservation of agroBD in areas under its mandate:

i. ***Maizes landraces conservation program*** (PROMAC) is focused on native maizes, and its wild relatives the teocintles. It has been under implementation since 2009 and is aimed at supporting *in-situ* conservation in natural protected areas and their buffer zones. This Program is related to the four project components.

The **National System of Phytogenetic Resources** (**SINAREFI**)[37] is implementing a set of initiatives financed by SAGARPA which are related to different project components. The following list reflects the most important projects, but it is not exhaustive due to space limitations. A full baseline initiative description will be included in the project document:

ii. ***Macro-network: Basic and Industrial Products*** has been implemented by the National Service of Control and Certification of Seeds (SNICS)/SAGARPA since 2002. The project works on agaves (*Agave* spp.), amarantos (*Amaranthus* spp.), beans (*Phaseolus* spp.), sunflower (*Helianthus annuus*), nettlespurge (*Jatropha* spp.), jojoba (*Simmondsia chinensis*), maize (*Zea mays* subsp. *mays*) and vanilla (*Vanilla* spp.). Thematic areas include: *in situ* and *ex situ* conservation, use and increase, capacity building, throughout the whole country.

iii. ***Macro-network: Vegetables*** has been implemented by SNICS/SAGARPA since 2002. The project works with the networks of: pumpkin and squash (*Cucurbita* spp.), sweet potato (*Ipomoea batatas*), chayotes (*Sechium* spp.), chili (*Capsicum* spp.), tomato (*Solanum lycopersicum*), potatoes (*Solanum* spp.), green tomatoes (*Physalis* spp). Thematic areas include: *in situ* and *ex situ* conservation, use and increase, capacity building, throughout the whole country.

iv. ***Macro-network: Impulse*** has been implemented by SNICS/SAGARPA since 2002. The project works with the networks of: *achiote* (*Bixa orellana*), *quelites* (these include several species of different genus), *romeritos* (*Suaeda* spp.), purslane (*Portulaca* spp.), and cassava (*Manihot esculenta*). Thematic areas include: *in situ* and *ex situ* conservation, use and increase, capacity building, throughout the whole country.

v. ***Macro-network: Fruits*** has been implemented by SNICS/SAGARPA since 2002. The project works with the networks of: avocados (*Persea* spp.), anonas (*Annona* spp.), cocoa (*Theobroma cacao*), *jobo* (*Spondia* spp.), guavas (*Psidium* spp.), nance (*Byrsonima*

[36] See as example the studies: J. J. Sánchez G. et al, 2011: http://www.amjbot.org/content/98/9/1537.full.pdf+html?sid=fa0bbdd2-a38b-484e-bcf1-32adeb663d19; and Acevedo et al., 2011: http://www.nature.com/nbt/journal/v29/n1/full/nbt.1752.html

[37] This list is not exhaustive due to space limitations. It reflects the key initiatives conducted by the SINAREFI and SAGARPA, and related to the present project. It will be further developed in the full project document.

crassifolia), pecan (*Carya illinoinensis*), prickly pears (*Opuntia* spp.), papaya (*Carica papaya*), pitahaya and pitaya (*Hylocereus* spp., *Stenocereus* spp.), Sapotaceae (several species), hawthorn (*Crataegus* spp.), and grapevine (*Vitis vinifera*). Thematic areas include: *in situ* and *ex situ* conservation, use and increase, capacity building, throughout the whole country.

vi. ***Network: Conservation centres*** has been implemented by SNICS/SAGARPA since 2002. The project works with targeted species of the SINAREFI. Its objective is to receive accessions collected by SINAREFI researchers, by including conservation centers of seeds, working collections, in vitro collections and community banks. Its geographical scope covers the States where the *ex situ* conservation sites are placed. This includes centres of orthodox seed conservation (Oaxaca, Jalisco, Coahuila, Mexico state), centres of recalcitrant seeds (Chiapas and Mexico State), working collections (Yucatán, Mexico State, Veracuz, Guanajuato, Coahuila, Aguascalientes, Guerrero, Baja California Sur, San Luis Potosí, Puebla and Zacatecas), and *in vitro* collections (Jalisco, Veracruz, Guanajuato)[38]. This project is related to project components 2 and 3.

The conservation status of agrobiodiversity species, associated species and wild relatives in the project areas

Current status

The status of species identified in Annex I may be variable, depending on factors as: i) if it is a cultivated species (and the features of the agricultural system where the species is cultivated, including management practices); ii) if the species has wild or arvenses forms; iii) the reproductive features and gene flux with[39] the wild relatives; iv) the situation in which the habitat of distribution of wild relatives is placed.

In Annex I, a list of cultivated species is detailed. These species are threatened by intensive agricultural production systems which tend to uniformize crops. This is visible in the low diversity of cultivated crops. On the opposite side, within the traditional production systems, as milpa sites, there is a larger diversity of those cultivated crops. Therefore, once the traditional systems are under pressure, their agroBD endurance is threatened as well.

In addition, Annex I shows a list of wild relatives, which have been included in risk categories according to national normative frameworks or international lists, as follows:

Zea perennis: In danger of extinction (NOM-059)
Zea diploperennis: Threatened (NOM-059)
Opuntia bravoana, Opuntia excelsa, Opuntia arenaria: Subjected to special protection (NOM-059)
Opuntia chaffeyi: Critically endangered (CR) (IUCN)
Opuntia megarhiza: Endangered (EN) (IUCN) (many species of the genus *Opuntia* are included in the Appendix II of CITES)
Persea schiedeana, Persea americana, Persea liebmanni: Vulnerable (VU) (IUCN)

The baseline status of conservation will be further analysed and described in the full project document.

[38] http://www.sinarefi.org.mx/redes/red_centros.html
[39] Conservation of International Trade of Endangered Species of Wild Fauna and Flora.

Institutional and legal framework of agroBD in Mexico

The Articles 86 and 87 of the *Law of Biosafety of Genetically Modified Organisms*[40] (2005) set the need of generating information for national authorities regarding the plant species whose centre of origin and centre of genetic diversity is Mexico, as well as the geographical areas where these species are located. In addition, the Law mandated elaborating proposals of species protection measures. However, there is not an specific legislation that regulates the use of agricultural biological diversity in Mexico.

Mexico has signed and ratified the Nagoya Protocol, in 2011 and 2012 respectively. At present, a working group in Mexico is designing the normative framework and instruments for its application at national level. Mexico has signed but not ratified the International Treaty of Genetic Resources for Food and Agriculture, and participates in the Commission on Genetic Resources for Food and Agriculture and Biodiversity, hosted by FAO.

In Mexico, the National Development Plan (NDP) is the guiding document in which national objectives, strategies and sustainable development priorities are determined. The NPD is developed during the first half of each government administration (6 years) and follows the recommendations of the National System of Democratic Planning, the state governments, social groups, indigenous peoples and communities, including a gender perspective. Furthermore, the Mexican population participates in the Plan preparation process by expressing ideas, suggestions and concerns. In addition, the Planning Law prescribes the organization of people consultation forums where the following stakeholders should be involved: i) organizations of workers, farmers, towns and civil society; ii) academic, professional and research institutions; iii) business organizations; iv) deputies and senators; and v) indigenous communities.

Once the preparation of the NDP is finalized, Sectorial Programs are delineated by each Ministry based on the NDP objectives, strategy and priorities. This leads public agencies to act in accordance with the NDP mandate. The mainstreaming of agrobiodiversity considerations in the NDP and related sectorial programs is directly related to this democratic planning process which will start in 2019.

Baseline scenario in the marketing of agrobiodiversity products

In Mexico traditional marketing channels, excluding malls, still account for 70% of the food systems. Most agricultural products are distributed to final consumers through local markets, flea markets (*tianguis*) and small shops. These distribution channels minimize intermediation between producers and consumers and promote the valuation of traditional and fresh food. This has been identified by FAO as an opportunity to use more short market circuits/ market linkages[41] (see also TCP description below).

The products covered by the project are widely sold in local distribution channels, especially in municipal markets, tianguis and even directly from the producer cooperatives / farms. In several States (such as Jalisco, Oaxaca and Chiapas), a process of participatory certification of agro-ecological production is in place with the participation of producers' associations and civil society institutions. Most participatory certifications started with maiz and expanded to other products such as cultivated and wild varieties of

[40] See: http://www.diputados.gob.mx/LeyesBiblio/pdf/LBOGM.pdf

[41] Red de mercados orgánicos http://tianguisorganicos.org.mx/wp-content/uploads/2014/12/RASAJILOTE.pdf
Sistematización de experiencias de la red de mercados orgánicos: http://tianguisorganicos.org.mx/wp-content/uploads/2012/07/ExperienciasREDAC.pdf
See more at: https://www.researchgate.net/publication/281112974_La_Red_Mexicana_de_Tianguis_y_Mercados_Organicos_-_Renovando_sistemas_de_abasto_de_bienes_de_primera_necesidad_para_pequenos_productores_y_muchos_consumidores
and
http://www.ifoam.bio/sites/default/files/page/files/la_case_studies_color_print_fc_0.pdf

beans, cucurbits, nopales, peppers, chayote and tomatoes. This process started with the intention to promote agro-ecological production systems, covering traditional crops and ancestral cultural practices; these crops are of great importance from the perspective of agro-biodiversity. Currently, these civil society initiatives integrate a network of organic markets (*Red de Mercados Organicos*).

Mexico has also traditional fairs, organized by producers' associations and civil society, featuring agricultural products and traditional foods. These fairs promote cultural activities to raise awareness among consumers about the importance of biodiversity and traditions. It is also relevant marketplace for producers to identify entrepreneurial opportunities and exchange seeds as well as production and manufacture best practices.

Geographical Indication

In a context of world climate change, population growth, globalization and specialization of agriculture (FAO 2012), food systems are facing challenges to their sustainability. Many problems could be partially resolved by a strategy based on the promotion of products with specific quality linked to geographical origin, and in particular through Geographical Indications (GI).

GI and GI strategy

A geographical indication (GI) is a name or sign used on certain products which corresponds to a specific geographical location that gives the product some specific qualities according to traditional methods or natural resources, or a certain reputation, as a consequence of the link to origin[42]. Defined internationally as an Intellectual Property Right (IPR), once specific quality or reputation linked to geographical origin can be demonstrated, a GI has to be protected. This protection is often based on official registration that confers exclusive rights of use to GI producers. GI is therefore primarily a market tool with economic benefits originating from the differentiation process and IP protection.

GI strategy is intended here as a plan designed and implemented locally by collective stakeholders, aiming to preserve and promote GI products and related resources, in particular through the definition of the link to origin and the related rules on production and processing methods, the management of the local GI system – including all the local resources involved in the GI product and their interactions – and the marketing strategy.

By preventing the disappearance of traditional food products, a GI strategy can help local populations to preserve traditional food systems and diets, and at the same time promote a diversified diet on a larger scale, countering the tendency towards global food homogenization. Thanks to their specific nutritional composition, specific quality products can contribute to more balanced and better nutritional quality of diets[43].

Although not included in the GI definition as an intellectual property right by the TRIPS agreement, the **preservation of biodiversity can often be an important effect of a GI strategy**, although it depends on the aims and actions of local actors. Specifying a local variety or breed as a requirement of the GI ensures the continuous use – and thus *in situ* conservation - of local biodiversity, as has been observed in many cases[44]. Urban markets, which include niche markets for high quality products, can therefore represent an opportunity for GI producers, and supply specific products for urban consumers in search of typicality.

[42] In particular, Article 22 of the World Trade Organization (WTO) Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) (1994) defines GIs as "*indications which identify a good as originating in the territory of a Member, or a region or locality in that territory, where a given quality, reputation or other characteristic of the good is essentially attributable to its geographical origin."*

[43] Bricas, 2013

[44] Larson 2007, Thevenot-Mottet, 2010

Smallholders, women and the elderly, as guardians of typical products, are very often closely involved in GI production. A GI strategy brings the opportunity to empower these categories of people and include them in the GI value chain, offering new forms of differentiation for products from small-scale and family farming[45]. GI is a strong driver of inclusion as the strategy implies both vertical and horizontal cooperation between stakeholders. GI products have a component of a public good, through the GI and reputation, and producers cooperate to build a shared GI strategy (establishment of the code of practice, possible official recognition, marketing strategy, etc.). In order to be coherent and send a strong signal to consumers, the GI strategy has to be built on vertical relations with downstream value chain actors, strengthening then backward linkages from a market point of view. The motivation for cooperation and collective action is even greater in the case of official recognition linked to the IPR, as official registration leads to recognition of GI producers as quality product providers and **contributors to a national food heritage**. Horizontal relations too can expand over the production sector, with public actors or other local economic actors, when an extended territorial strategy is developed[46].

FAO is supporting Mexico in implementing a similar approach through the project: TCP/MEX/3502/MEX: *Creating short-circuits of marketing of ecological and traditional agricultural products from the southern part of Mexico City* (2015-2017). This project is aimed at providing tools that encourage the creation of short circuits as follows: (i) business models; (ii) design of public policies; and (iii) participation of civil society. The TCP is supporting marketing platforms of ecological agricultural products; encouraging consumption habits and sustainable production methods; and promoting higher profitability in family farming production units.

In addition, FAO is implementing the project MTF/MEX/124/FFD: *Developing short circuits schemes of ecological agricultural products in Mexico* (2015-2017). The project is aimed at increasing the knowledge of direct or indirect stakeholders on the functioning of short-circuits of agricultural ecological products and their benefits for the country.

FAO and UNEP are also implementing the project *Sustainable Food for the Mexico City,* financed by the Government of Mexico since 2014. This project has conducted a general survey of the production and consumption situation in Mexico City, and aims to *develop and scale-up the sales of ecological local products in the city and metropolitan area, raising consumers' awareness on the nutritional, social and environmental value and impact of their purchases, and fostering better trade opportunities for peri-urban producers to conserve their natural resources.* This project has 4 axes of work to promote urban agriculture and local consumption: i) Promotion of short-circuits local marketing of organic products in the MCMA; ii) Exchanges of experience with other countries in Latin America; iii) Certification and green labeling; iv) Communication, awareness and marketer development.

Remaining barriers that prevent the conservation and sustainable use of agricultural diversity in Mexico

Despite the efforts carried out by the state agencies, there are some barriers still present in the baseline scenario:

Barrier # 1: Limited systematization of scientific information and lack of reliable databases: Despite the long-standing knowledge present in local areas of Mexico, the scientific studies about those on-going processes have been scattered. The relationships among the domesticated diversity, wild or only semi-domesticated varieties, and human practices/uses that add value to these species have not been sufficiently

[45] CFS 2015, FAO
[46] FAO, 2009

analysed until present. Therefore, information is fragmented and unsystematized. Large groups of native species of local interest or used by rural communities are not recorded. At present, only 50 autochthonous species are registered in the Mexican agricultural statistics, including 24 annual crops and 26 perennial species. CONABIO has generated knowledge only on around 10 per cent of the total agroBD that exists in Mexico. If added to SAGARPA's actions, this percentage raises only to 15 per cent. This lack of standardized information has prevented these species from being protected through public policies. Decision-making has not always been adecuately informed. Understanding is key to maintain these species, CWR and associated traditional systems valid over time. There is a considerable information gap in Mexico, and therefore, at global level.

Barrier # 2: Deficient inter-institutional coordination affects the conservation, use and access of phytogenetic resources: Despite the efforts made, the *National Report on the Status of Phytogenetic Resources for Agriculture and Food Supply*[47] recognizes that while existing a great human and infrastructural potential in Mexico dedicated to the study of phytogenetic resources, coordination and communication among institutions and researchers is weak, limiting the efficiency of work in this area. Better organization of this work is required, with clear, transversal and well-defined policies that can drive effective actions directed towards the conservation, use and access of the phytogenetic resources in Mexico. Unless the existing capacities in Mexico work together towards a common objective, i.e. understanding and sustainably using the genetic resources, particularly the plant genetic resources, and the necessary instruments are provided the coming challenges will not be addressed.

Barrier # 3: Perverse incentives still cause degration of agroecosystems: Despite current initiatives, public policies are not harmonized and still generate perverse incentives. Some policies still promote "modern" technological packages, the use of improved seeds, agrochemicals, monoculture, generating incentives to abandon traditional agricultural production. The idea behind these policies is that modern agriculture increases yields at farm level. The perverse incentive is that when traditional farmers enter into these schemes of technical support or financing and resign their traditional practices. This causes that key landraces and varieties remain disused, increasing the risk of genetic erosion and even loss.

Barrier # 4: The persistence of unsustainable agriculture practices puts pressure on traditional agro-ecosystems: At farm level, many areas have been incorporated in large-scale production systems using farming practices and technologies that deplet natural resources and affect traditional agroecosystems. As a consequence, food security has been threatened given that important species are being lost or desused. Limited research or action has been taken to rescue them. Many potential edible species are being ignored or are only considered by local and indigenous communities.

Barrier # 5: Social problems in rural areas continue threatening the survival of traditional agricultural knowledge: Agrobiodiversity conservation and sustainable use depend on people. Poor rural areas are facing the problem of species desuse or abandonment. Rural families are discouraged by some political actions or omissions to continue with their traditional activities. Young people tend not to see rural production as a viable or valuable activity. The lack of alternative livelihoods is pushing young generations out of the rural areas. The migration of family farmers in age of working is affecting the survival of traditional knowledge, agricultural management and interest in cultivating existent lands. This is disturbing the maintenance of traditional systems as *milpa* and other agroforestry or multi-cropping models.

[47] Molina M., J. C y L. Córdova T. (eds.). 2006. *Recursos Fitogenéticos de México para la Alimentación y la Agricultura: Informe Nacional* 2006. Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación y Sociedad Mexicana de Fitogenética, A.C. Chapingo, México. 172p.

Barrier # 6: Lack of valuation of agrobiodiversity and the functional agroecostystems that maintain it: Many political, social and economic stakeholders are not aware of the contribution of traditional agroecosystems to plant genetic diversity in the country. Plant diversity generates current and potential benefits (see section 1) that tend to be ignored. The bulk of the crop diversification process occurs thanks to the traditional agricultural management (i.e. combination of diverse agroecological environments, frequently in marginalized lands that are under stress, generally in multi-cropping systems without irrigation, with low use of external inputs, use of genetic diversity intra and inter- specific, selection due to diverse and even adverse conditions, promotion of genetic exchange with wild relatives). This process takes place in more than 7 million hectares of agricultural use where around 2.5 million Mexican farmers produce mainly through the traditional agroforestry systems like the *milpa*. Small-scale farmers produce for self-consumption but also generate excedents that provide food for local and national markets. However, those markets do not usually recognize nor adequately valuate those agrobiodiversity-based products.

3) the proposed alternative scenario, GEF focal area[48] strategies, with a brief description of expected outcomes and components of the project, 4) incremental/additional cost reasoning and expected contributions from the baseline, the GEFTF, LDCF, SCCF, and co-financing;

The **Project Strategy** is based upon **four basic principles**:

i. Building trust through a renewed and more equitable way of interacting, that ensures an adequate dynamic feedback system, amongst scientists, small-scale farmers, local communities and indigenous peoples and decision-makers involved in the conservation and sustainable use of PGRFA.
ii. Supporting food security and consumption needs of the traditional farmer communities. Commercialize excedents in local markets that value and recognize agrobiodiversity-based food products.
iii. Ensuring that ongoing local and regional processes in support of agrobiodiversity are maintained, by promoting stakeholder engagement and self-management of agrobiodiversity by local communities.
iv. Halting the promotion of contradictory or counterproductive actions that affect or put into risk processes that support traditional farming systems, conservation and sustainable use of agrobiodiversity and their products, and local livelihoods.

The **project objective** is to develop policies and mechanisms that support agro-biodiversity conservation, sustainable use and resilience, by promoting the knowledge of traditional agro-ecosystems and the cultural methods that maintain that agroBD in Mexico.

The project will contribute to **Program 7, Objective 3 of the GEF Biodiversity Focal Area** by promoting biodiversity mainstreaming in agriculture while increasing the genetic diversity of globally significant cultivated plants, wild relatives and associated species in a Vavilov Centre of diversity as Mexico. In addition, the project will generate co-benefits for the International Treaty of Plant Genetic Resources for Food and Agriculture, hosted by FAO (see sections 5 and 6 below). The project will support in-situ conservation, agriculture practices based on local and traditional knowledge that allow continued evolution, and adaptation, will improve food security of local communities by supporting self-consumption of agroBD-based products, will promote policies that shift the balance in agricultural production in favor of agrobiodiversity, will strengthen the capacities of extension and research agencies and institutions for in-situ conservation, will

[48] For biodiversity projects, in addition to explaining the project's consistency with the biodiversity focal area strategy, objectives and programs, please also describe which Aichi Target(s) the project will directly contribute to achieving.

support climate change adaptation through sustainable agriculture and traditional knowledge, and will strengthen the capacities of community and family farmers to participate in the identification, development and implementation of plant breeding and other solutions to face genetic erosion. GEF resources will be invested in milpas and other traditional agricultural systems through Components 1, 2 and 4.

In order to remove the barriers detailed under section 2) and achieve global environmental benefits, GEF incremental financing will be invested in four components, as follows:

Component 1: Information and knowledge management

Component 1 will address barriers # 1 and # 2 described in section 2 above, by foestering linkages between the critical stakeholders, identifying, validating, documenting and promoting the knowledge base that underpin traditional agro-ecosystems and the traditional practices and research that maintain agrobiodiversity. The potential of agrobiodiversity in the face of climate change will be also evaluated.

Component 1 is aimed at identifying and recording the agrobiodiversity present in Mexico, along with the cultural processes that maintain and promote that agroBD. This data and related knowledge-management mechanism will inform public policies and appropriate field interventions for the conservation and sustainable use of agrobiodiversity. Data collection criteria[49] will be designed *ex profeso* during full project preparation, based on previous CONABIO experiences detailed in section 2 above, and with FAO technical support[50]. In addition, during full project preparation pilot study areas will be selected.

GEF incremental financing will support Component 1 aimed at achieving the following outcome:

Outcome 1.1: Globally-important agrobiodiversity, the traditional practices, the scientific and technological research, development activities, associated knowledge base and capacities, that maintain the diversity in Mexico, have been collated and analysed and the resulting information published for Mexico.

Target species: maize, beans, amaranth, chilis, squashes, chayotes, green tomatoes, cacao, avocado, nopal, and particular local edible tender leaf vegetables (quelites)

See more details in Annex I of this PIF. Crop wild relatives and native species are included but may change during full project preparation analysis. The *quelites* can be considered as 'associated species' that grow next to cultivated crops in the milpa system (i.e. they are tolerated, consumed, and/or used in different ways).

Target sites / priority geographies: Oaxaca, Michoacán, Chihuahua, and Mexico City Valley.

The targeted areas will be further defined in a participatory manner during full project preparation. These States have been selected by CONABIO given the existing work already conducted and the representativeness of their Agroecosystems. See Map in Annex II.

Component 1 will generate 3 outputs that are detailed in Table B above.

Output 1.1.1 (*New knowledge generated through participatory research*) is the main intervention of Component 1. This knowledge will serve to different stakeholders (academia, local agencies, and producer organizations) to support resource conservation. In this line, Component 1 will create confidence linkages between academic researchers, local producer organizations and traditional farmers to broaden the knowledge base over the

[49] This will include the definition of the relevant information associated with agrobiodiversity in terms of agricultural practices, uses, distribution and adaptability to particular climatic conditions, among other criteria to be defined.
[50] FAO's comparative advantage is more elaborated under sections 6) and 7) of this PIF

landraces and crop wild relatives that are poorly known at present in Mexico (see Barrier #1). Knowledge generation is a pre-condition to carry out field interventions that help conserve agro-biodiversity.

Component 1 will not work only on already existing information, but will gather new information on unknown or poorly known plant genetic resources in Mexico, addressing Barrier # 1. Information gathering will be conducted in a joint and participatory manner, by including academia and national agencies (e.g. CONABIO) and traditional farmers in four project sites. Exchange between researchers and farmers is the basic input to develop this project, given that is essential to know what should be conserved. Providing this Component will carry out a broad field work and Mexico is a large country, budget allocation is considerable.

Component 1 will also include: i) Identification, combination and testing of the existing methodologies for recording agrobiodiversity in order to adapt the methodologies to new requirements of scientific research; ii) Field and participatory-based research to collecting information on agroBD management and use at local level, and the role of traditional women farmers especially in domestic gardens or yards; iii) Analysis of existing local capacities for the management and use of agrobiodiversity. Identification of successful cases, and systems at risk of being abandoned; iv) Compilation, generation, systematization and analysis of information using the following processes: a) identification of existing (fragmented) information and involvement of relevant institutions to carry out the systemization process; b) compilation and systemization of new information; c) Analysis and dissemination of the systemized information. Component 1 will be further designed during full project preparation. The involvement of local communities will follow national legislation, the FAO *Policy on Indigenous and Tribal People*[51] and the FAO *Environmental and Social Managament Guidelines*[52], in particular Standard 9 referred to Indigenous Peoples.

Co-financing in Component 1 will be provided by the SINAREFI-SAGARPA; by CONANP through the *Conservation for Sustainable Development Program* and the *Promotion of Conservation of Native Maizes Program (PROMAC)*; by CDI through the projects of *starting productive activity;* by CONABIO through the *Conservation of wild relatives of the Gossypium genus Program*, and *the Program for Knowledge, Conservation, and use of Native Phytogenetic Resources in the long-term* and other research initiatives; by SEMARNAT through several research and biodiversity conservation initiatives; by CONACyT through the Project *Rescuing traditional undervalued species of the Mexican diet and its contribution to nutrition enhancement* and the Project *Chile, Bean, Pumpkins and Oyamel.* UNAM, CICY, INIFAP, ECOSUR, and others will also provide in-kind co-financing to Component 1.

CONANP will elaborate studies that will serve as planning and programming tools for conservation and sustainable development in project targeted regions. CONANP will also provide the systematized information generated by the PROMAC. he whole description of co-financing initiatives will be included in the full project document.

Component 2: Strengthening of local capacities

Component 2 will address barriers #4 and #5 described in section 2 above, by strengthening the local capacities of traditional farmers, indigenous and local communities, in selected pilot areas where initiatives are already present. The objective of Component 2 is to implement long-term schemes that ensure the conservation, use and sustainable management of agrobiodiversity, including crop wild relatives. Component 2 will develop strategies to rescue traditional knowledge and maintain its continuous evolution and adaptation.

GEF incremental financing will support Component 2 aimed at achieving the following outcome:

[51] http://www.fao.org/docrep/013/i1857e/i1857e00.htm
[52] http://www.fao.org/3/a-i4413e.pdf

Outcome 2.1: Local capacities have been strengthened to support long-term plans for agroBD conservation and sustainable use, to develop strategies for revaluating traditional knowledge, and to support continuous adaptation to climate change.

Target stakeholders: traditional peasants, indigenous peoples, local communities, research and development institutions..

Target: 30% of female-led households

Target sites: Oaxaca, Michoacán, Chihuahua, and Mexico City Valley.

The targeted areas will be further defined in a participatory manner during full project preparation. These States have been selected by CONABIO given the existing work already conducted and the representativeness of their Agroecosystems. See Map in Annex II.

Target species: maize, beans, amaranth, chilis, squashes, chayotes, green tomatoes, cacao, avocado, nopal, and particular local edible tender leaf vegetables (quelites)

Indicator BD 7.1: Diversity status of target species: improved knowledge, conservation and monitoring of agroBD species, CWR and associated species (to be measured through the BD tracking tool). (Baseline described in section 2 under Current status)

Component 2 will generate 3 outputs that are detailed in Table B above.

Component 2 is the field intervention component. The milpa is the 'production system' in the project target areas and therefore that its constituent agrobiodiversity will be the subject of these activities. Component 2 will support agrobiodiversity generation and conservation processes, and will set local self-management (*autogestión*) mechanisms, knowledge exchange networks at community level, seed banks, and participatory breeding activities. Proposed project activities are based upon field experiences conducted in the framework of previous projects[53].

Capacity development will be aimed to: a) institutions (i.e. academia, CONABIO, national agencies), and b) traditional farmers. In the case of institutions, the project will enhance their ability to understand what processes underlie the generation and maintenance of agrobiodiversity in Mexico. This is currently unknown or poorly explored in Mexico, as detailed in the PIF, and is a major threat that the globally-important plant genetic diversity is facing in the country. Institutions will then work with traditional farmers to better understand the traditional mechanisms applied to reproduce and create landraces. Mechanisms are not sufficiently studied for all species at present.

In the case of traditional farmers, they have been the custodians of agrobiodiversity for centuries. However, they are not always aware of the biological functioning of their species and CWR, nor of the reproductive biology of maize and other species. Socio-cultural studies in Mexico have demonstrated that the more people understand those processes and their social roles and importance, the more they are rooted in the territory especially in a context of threats against those practices. In this way, traditional farmers give social value to their own roles and overcome social stigma that it is still very common in Mexico against traditional and indigenous agriculture at present. In addition, climate change is posing challenges that advance faster than traditional adaptation capacities (e.g. droughts). FAO has worked through the PESA Program since 2003 with SAGARPA in promoting sustainable soil management to ensure that native seeds can give yields to farmers, because otherwise they may feel incentivized to change system and abandon the milpa. FAO has been

[53]E.g. INIFAP initiatives in community seed banks in Oaxaca, and the *Semillatón* initiatives in the Sierra Tarahumara de Chihuahua

supporting traditional farmers in improving their resilience to climate change and adopt preventive measures, especially regarding soil management, to avoid productivity decreasing and traditional system abandonment (i.e. agrobiodiversity loss). Furthermore, the project will support the exchange of experiences between communities living in different zones of the country, as PESA has shown this is really enriching for farmers.
Capacity development activities will also include the following activities: a) ensuring germplasm sources of communities in adverse situations; b) including formal academic knowledge in the local selection processes and genetic improvement; c) integrating sustainable soil and water management into traditional agricultural systems; d) identifying and sharing success stories.

In light of this, Component 2 will include: i) generating strategies and mechanisms of self-management[54] and information-exchange among traditional farmers through: a) Identification of local and external stakeholders (farmers, local businessmen, researchers, CSO) to be involved; b) Recruitment of agricultural technicians and/or local agronomists specialized in the management and conservation of agrobiodiversity with the aim of promoting their return to the communities and applying their acquired knowledge. Technicians will participate in the design and implementation of self-management and information mechanisms; c) Involvement of interested young people, especially girls, who are the replacement generation; d) Collective and periodic evaluation of the results obtained by the self-management and information-sharing mechanisms.

In addition, Component 2 will: ii) establish seed banks for community use by: a) holding training workshops on the benefits of conserving seeds of locally-cultivated agrobiodiversity; b) setting appropriate terms of seed conservation for the selected pilot regions (including rules and technical specifications – to be further designed during full project preparation on a participatory basis); c) building local infrastructure for the seed banks (based on previous experiences in Mexico and strongly co-financed by project partners).

Lastly, Component 2 will: iv) provide incentives for participatory plant breeding based on this assessment by: a) facilitating cooperative work between producers (especially women and young people) and researchers to carry out participatory plant breeding; b) developing evaluation criteria to assess the processes of participatory plant breeding; c) broadening the strategies that emerge from participatory plant breeding and promoting crop adaptation to changes.

As in Component 1, the involvement of local communities will follow national legislation, the FAO *Policy on Indigenous and Tribal People*[55] and the FAO *Environmental and Social Management Guidelines*[56], in particular Standard 9 referred to Indigenous Peoples.

Co-financing in Component 2 will be provided by SAGARPA through the *Agriculture Development Programme* (Component: Agrifood Innovation), the *Strategic Project for Food Security* (PESA); by SEDESOL through the *Support for Productive Impulse* project, and the INTEGRA program; by CONANP through the *Conservation Program for Sustainable Development* (PROCODES) and the PROMAC (see above); by CDI through the *Program for Improvement of Indigenous Production and Productivity*, the *Strengthening Productive Activity* Project, the *Consolidation Project* and the *Special Program for Indigenous Peoples 2014-2018;*, among other projects that will be further described during full project preparation.

The *Agriculture Development Programme* is aimed at supporting projects for the conservation of native plant genetic resources, and research on new uses. PESA is providing technical assistance to domestic gardens to

[54] *Self-management* is the translation of the Spanish word "autogestión". *Self-management mechanism* in the project context is defined as the "generation of mechanisms through which traditional farmers, individually or community-based, carry out the management, conservation and use of their native phytogenetic resources, being empowered and improving their own capacities". *Self-management* comprehends planning and self-evaluation in order to assess their outcomes and goals achievement.
[55] http://www.fao.org/docrep/013/i1857e/i1857e00.htm
[56] http://www.fao.org/3/a-i4413e.pdf

improve food security and nutrition. The *Special Program for Indigenous Peoples* is strengthening the production and commercialization capacities of small-scale indigenous farmers. The whole description of co-financing initiatives will be included in the full project document.

Component 3: Improvement of Public Policies

Component 3 will address barriers # 2, 3, and 6 described in section 2) above, by integrating the protection and promotion of the knowledge, practices and traditional systems of agricultural production into public policies, projects and planning, generating effective alliances with the communities. Barrier # 3 will be addressed by harmonizing public policies, maybe through a Code of Conduct[57] that government institutions should comply in front of the traditional communities. In addition, Component 3 will support the dissemination of agrobiodiversity and traditional knowledge values and will enhance government practices for their promotion.

GEF incremental financing will support Component 3 aimed at achieving the following outcome:

Outcome 3.1: The protection and promotion of traditional knowledge, practices and production systems have been mainstreamed into public policies and planning, generating effective partnerships with the communities, and disseminating values associated with agroBD and local cultures.

Target: agrobiodiversity considerations mainstreamed into the National Development Plan and at least 2 Sectorial Plans by PY4. (Baseline: at present, no explicit reference to agrobiodiversity is included in the NDP, and almost none in the Sectorial Plans of SAGARPA or SEMARNAT).

Target institutions: CONABIO, SAGARPA, CONANP, SEMARNAT, SEDESOL, CDI

Target traditional systems:agroforestry traditional systems[58]

Target priority geographies: Oaxaca, Michoacán, Chihuahua, and Mexico City Valley.

The targeted areas will be further defined in a participatory manner during full project preparation. These States have been selected by CONABIO given the existing work already conducted and the representativeness of their agroecosystems. See Map in Annex II.

The project will support the mainstreaming of agrobiodiversity considerations in the next National Development Plan (NDP), which consultation process will start in 2019 (approximately PY2), as well as in the Sectorial Plans of related Secretariats (e.g. Environment, Agriculture, Social Development, among others). This target is included under Outcome 3.1 and will be further developed along with project stakeholders during full project preparation.

Component 3 will generate three outputs that are detailed in Table B above.

Component 3 will include: i) the design of an inter-institutional strategy to manage initiatives for the conservation and use of agroBD through: a) the identification and involvement of public agencies with related mandates, and the implementation of transversal public policies with a harmonized approach; b) the identification of research centers and researchers experienced in Mexican agroBD, who will constitute a Technical Advisory Council. This Council will outline the technical aspects of the inter-institutional strategy; c) the establishment of a monitoring and evaluation system for the above-mentioned public policies.

[57] Institutions will have to support traditional practices and promote their productivity and profitability instead of their substitution.

[58] These are traditional agroforestry multi-cropping systems in Mexico. See description in Section 1 of this PIF. Reference: Moreno Calles AI, Casas A, García Frapolli E, Torres García I. 2012. *Traditional agroforestry systems of multi-crop "milpa" and "chichipera" cactus forest in the arid Tehuacán Valley, Mexico: their management and role in people's subsistence*. Agroforest Syst, 84:207-226

In addition, Component 3 will support: ii) the creation of synergies among public programs, international projects and other initiatives, focused on the conservation and promotion of social and cultural processes that maintain agroBD. In particular, Component 3 will support: a) the systematization of the information generated through institutional initiatives[59]; b) the design of an innovative scheme of policy harmonization among different government institutions to promote agrobiodiversity conservation. Component 3 will be further detailed during full project preparation.

Inter-institutional strategy is defined as: "a means of making a common compromise between the diverse institutions responsible for public policies in agriculture so as to assure the correct implementation of policies directed towards traditional agricultural systems". This output is aimed at addressing Barrier #2.

Synergy mechanism is defined as: "a national mechanism through which any agriculture initiative that may influence agrobiodiversity, financed either by international, national or regional sources, and promoted by any sector, seeks coherence and additionality to existing and future efforts to addressing the promotion and conservation of processes that maintain agrobiodiversity".

Inclusive public policies are defined as: "(new) policies for the protection and promotion of traditional knowledge, practices and production systems that effectively facilitate the inclusion of target population specially women, and by considering young people the priority as replacement generation".

Co-financing in Component 3 will be provided by SAGARPA through the *Arraigate project*, the *Fund for Productive Projects in Agrarian Nucleus* (FAPPA), and *Support for Productivity of Women Entrepreneurs* (PROMETE), by SEMARNAT through the Project *Protecting biodiversity with emphasis on the conservation of endangered species*, plus CONABIO, CONACYT and CONANP initiatives detailed in Component 1 (above), among other projects that will be further described during full project preparation.

The *Arraigate project* supports the roots of rural youth and repatriated people to their home communities with outreach, innovation and training for the management and implementation of territorial productive projects. PROMETE encourages entrepreneurial women living in rural towns to implementing productive projects that increase their productivity. The whole description of co-financing initiatives will be included in the full project document.

Component 4: Valuation of agroBD and market linkages

Component 4 will address barriers 5 and 6 described in section 2 above, by supporting agrobiodiversity valuation strategies and the role of agroBD in local and regional markets. Annex IV presents a list of potential products. Targeted regions, production systems and species/varieties will be fully determined during full project preparation, using criteria *ex profeso* based on CONABIO's expertise, FAO technical support and experts' advice. The involvement of local communities will follow national legislation, the FAO *Policy on Indigenous and Tribal People*[60] and the FAO *Environmental and Social Managament Guidelines*[61], in particular Standard 9 referred to Indigenous Peoples.

Outcome 4.1: The marketing of agro-BD products has been enhanced through new strategies of agroBD valuation and innovative market incentives, with a *value chain*[62] approach

[59] E.g.: the *National Digital Strategy of the Presidency of the Republic*, the employment plans and sustainable productive options of the *National Crusade Against Hunger* and the project *Valuation of Ecosystem Services of Protected Natural Areas in Mexico* of CONANP, among others. Projects and programs will be further defined during full project preparation.

[60] http://www.fao.org/docrep/013/i1857e/i1857e00.htm

[61] http://www.fao.org/3/a-i4413e.pdf

[62] *Value chain* defined in Table B above.

Target agroBD products:11
Maize (tortillas, totopos, tostadas), beans (processed products), amaranth (tamales, atole, green leaves), chilis (salsas, preserves), squashes (fruit, seeds, flower), chayotes (fruit, preserves), green tomatoes (salsas, preserves), cacao (seeds for chocolate, medicinal and cosmetic products), avocado (fruit, cosmetic and medicinal), nopal (fruits, flowers, leaves, medicinal), and particular local edible tender leaf vegetables (quelites).

Target markets: self-consumption and local markets

Target certification schemes: geographical indication (GI)

Indicator BD 7.1: Diversity status of target species: improved knowledge, conservation and monitoring of agroBD species, CWR and associated species (to be measured through the BD tracking tool). (Baseline described in section 2 under Current status)

Target: 30% of female-led households

Component 4 will generate 3 outputs that are detailed in Table B above.

Component 4 will help generate sustainable alternative livelihoods at local level. Component 4 will support farmers, local organizations and national stakeholders in the valuation of agrobiodiversity, from a social, cultural, economic, biological and environmental perspective (see definition below). The value chain approach will enable traditional farmers, once having ensured their self-consumption needs, to access local markets and commercialize their surpluses in regional/urban markets, in order to improve family incomes, and therefore, food security of family members.

In light of the above, Component 4 will promote agrobiodiversity for self-consumption and access to local and regional markets, through: a) a nutrition education program focused on local agroBD products and food security of family farmers[63]; b) the exchange or sale of agrobiodiversity-based products with *market linkages* and *value chain* approaches; c) mechanisms for local and regional distribution of agrobiodiversity-based products, especially those little known that could improve diets and increase the stock of edible species; d) a communication campaign to raise people's awareness on agroBD conservation and to promote a change in consumer behavior (radio, television, social networks, etc.); e) developing labels that evidence agrobiodiversity conservation and/or the use of its products through the GI approach with FAO's technical support.

In the project context, the concept of *valuation of agro-biodiversity* comprehends economic and non-economic valuation. By *economic valuation of agro-biodiversity* is meant that value will be added to the products because of their agro-biodiversity characteristics. The different ways of adding value are presented below under point ii), as well as market incentives. By *non-economic valuation of agro-biodiversity* it is meant the unveiling of social, cultural, biological and environmental importance given by the actors to the conservation and sustainable use of agrobiodiversity, including its cultural value and significance for food security of rural population.

There are many stakeholders that influence agrobiodiversity generation, conservation and promotion, i.e. farmers, decision-makers, consumers, among others. However, these stakeholders are not, in most cases, aware of what agrobiodiversity is, nor what the incidence of their decisions is over the species. The project

[63] This is based on the lessons learned from the *Special Program for Food Security* being implemented by FAO and SAGARPA since 2003.

will support an *agrobiodiversity valuation strategy* to: a) capture in simple and concrete terms what is the non-economic value of agrobiodiversity for Mexico and the world; b) disseminate those values; c) support awareness-raising among local and national stakeholders and on how their actions positively or negatively affect agrobiodiversity generation and conservation. This is based on an approach already being developed by CONABIO through a TEEB project on maize.

A socio-economic analysis, including stakeholder engagement, will be conducted during full project preparation for targeting traditional areas with potential to better conserve and sustainably use agroBD resources. Depending on the specific region, products, social and cultural conditions, several types of market incentives will be implemented. Examples of the proposed *market incentives* are: a) Geographical indication (see PIF page 16); b) Public procurement with local purchase from smallholders; and c) short market circuits. FAO has documented many experiences where developments in markets have enable farmers to maintain their sustainable practices[64].

Co-financing in Component 4 will be provided by SAGARPA through SINAREFI (see Component 1), the *Agriculture Development Programme* (Component: Agrifood Innovation), PESA, the *Commercial Development of Family Farming* project, the *Certification of food standards* program; by SEDESOL through the *Support for Productive Impulse* project, the INTEGRA project, the PROCODES, by CONANP through the PROMAC; by CDI through *Program for Improvement of Indigenous Production and Productivity* and the *Consolidation project*; by CONABIO through the TEEB (see Component 2); and by CONACyT through the project *Rescuing traditional undervalued species of the Mexican diet*, among other projects that will be further described during full project preparation.

The *Consolidation project* will support groups, companies or enterprises of indigenous people with operational and viable productive projects that require capital or training to support sustainability and scale-up. The *Rescuing traditional undervalued species* project is promoting the rescue of undervalued species to improving food security. It supports identification of important quelites, development of cultural innovation networks, promotion and dissemination of studies and food preference disclosure. The whole description of co-financing initiatives will be included in the full project document.

Geographical scope: the project will work at different scales (national, regional, local). Component 1 considers both a national and regional/local scale implementation. Components 2 and 4 will be implemented at regional/local levels, and Component 3 will span at the three levels of the State. The selected States following representative criteria (variety, agroecological system) are: Oaxaca, Michoacán, Chihuahua, and Mexico City Valley. Pilot areas will be further defined during full project preparation in coordination with CONABIO, experts, FAO and the local communities.

Target geographies have been identified in regions where ongoing projects are already carried out. Potential stakeholders have been identified as well. Species have been selected according to their importance in the agro-forestry systems of traditional agriculture of Mexico. The key axis of these agro-forestry systems is maize. That's why maize is included along with other important species that are part of the multi-cropping systems of Mexico. Kindly note that there are many information gaps in Mexico regarding mostly-known crops as maize and its crop wild relatives, as indicated on page 17.

Targeted species have been selected due to the following criteria: contribution to a balanced and nutritious local diet, including calories, proteins, vitamins, fiber and mineral intake; uniqueness of the varieties;

[64] See: http://www.fao.org/3/a-i5398e.pdf, and http://www.fao.org/fileadmin/templates/cfs/Docs1415/Events/HLF_Small/CFS_HLF_Smallholders_Markets_EN.pdf

importance of the traditional system; species and varieties which centre of origin is Mexico or Mesoamerica. Selected agro BD species are: maize, beans, amaranth, chilis, squashes, chayotes, green tomatoes, cacao, avocado, nopal, and particular local edible tender leaf vegetables (quelites). Annexes I and IV provide detailed information.

5) Global environmental benefits (GEFTF) and/or adaptation benefits (LDCF/SCCF)

The federal, regional and local governmental agencies, the local communities, traditional farmers (especially women and young people), the academia and FAO will help deliver the following Global Environmental Benefits (GEBs) through this project: i) securing species and varieties that constitute a reservoir of genetic resources and knowledge for the whole mankind, both for global future security and future agricultural research (see Annex I); ii) ensuring the conservation of agrobiodiversity (through ensuring the continuity of the domestication and diversification process and local seed banks), and reducing the uniformity of global crops and their vulnerability to extreme situations; iii) conserving genetic diversity which is fundamental to face future challenges - like food supply and adaptation of crops to upcoming social and environmental pressures (i.e increase of global population and climate change); iv) reintroducing and improving traditional landrace cultivars with potential for food use, which can broaden the range of products arising from agrobiodiversity; v) providing tested methodologies, innovative mechanisms and lessons learned that can be scaled up in Mexico, in the Mesoamerica region, and adapted to other centres of origin around the world, through South-South Cooperation, the FAO network and the Commission on Genetic Resources for Food and Agriculture and Biodiversity[65]; vi) generating systematized documentation on species and varieties, including crop wild relatives, that are poorly known or threatened to be disused at present due to their invisibility; vii) generating agroecological knowledge of these species, including their ranges, the environmental conditions under which they thrive and resistance to pests, diseases or drought. This may support species exchange or promotion in appropriate zones, and eventually in plant breeding programs; viii) increasing the valuation of agroBD products and incentivizing the access of poor farmers to local and regional markets in Mexico to reduce the abandonment of traditional systems and migration; ix) providing support through targeted public policies; x) increasing the status of conservation of targeted species: improved knowledge, conservation and monitoring of agroBD species, CWR and associated species (to be measured through the BD tracking tool); xi) securing 350,000 hectares of globally significant landraces.

This proposed project will also generate GEBs by contributing to Aichi Targets #1, 2, 13,18 & 19 through the following outputs:

Aichi Biodiversity Target	**Project Outputs**	**Selected SMART Indicators[66]**
Target 13 By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity.	**2.1.1, 2.1.2, 2.1.3**	• Trends in genetic diversity of cultivated plants and their wild relatives • Trends in genetic diversity of selected species • Trends in integration of biodiversity into planning, policy formulation and implementation • Trends in number of effective policy mechanisms implemented to reduce genetic erosion and safeguard genetic diversity related to plant and

[65] http://www.fao.org/nr/cgrfa/cgrfa-home/en/
[66] The intermediate milestones to be achieved during project implementation will be established in the full project formulation phase.

		animal genetic resources
Target 19 By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.	**1.1.1, 1.1.2**	• Trends in accessibility of scientific/technical/traditional knowledge and its application
Target 1 - By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.	**2.1.1, 4.1.1, 4.1.2, 4.1.3**	• Trends in awareness, attitudes and public engagement in support of biodiversity • Trends in identification, assessment and establishment and strengthening of incentives that reward positive contribution to biodiversity and ecosystem services penalize adverse impacts
Target 18 By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels.	**1.1.1, 1.1.2**	• Trends in accessibility of scientific/technical/traditional knowledge and its application
Target 2- By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.	**3.1.3**	• Trends in integration of biodiversity and ecosystem service values into integrated in sector and development policies

6) Innovation, sustainability and potential for scaling up

Innovation: The novelty of this proposal is that it is based mainly on the knowledge and use of the abundant agrobiodiversity present in Mexico. The project strategy is to address the problems of feeding the most vulnerable social groups in the country, while acquiring knowledge of the species, their features, plasticity, ranges of resistance and tolerance to drought and other problems, as well as their food quality and potential for cultivation. The application of the GI approach is also innovative in rural areas of Mexico.

This project is especially innovative in three dimensions: i) knowledge generation; ii) at agro-ecosystem level; iii) at policy level. Components 1, 2 and 4 will support on-the-ground actions. Crop species and wild relatives are detailed in Annex I. The project innovativeness is related to the object, i.e. the management of *agro-ecosystems*. The project is based upon a holistic approach that comprehend genes, species and agro-ecosystems. Agro-biodiversity received much attention in Mexico, but most past projects neglected the consideration of agro-ecosystems in an integral manner. The anthropogenic dimension of agro-biodiversity is fundamental in fulfilling its conservation. In this project, agro-ecosystems are defined as *ecosystems that have been modified by human actions, including habitats where wild relatives are present*. As such, agro-biodiversity is one of the outcomes of this man/nature interaction.

At the same time, agro-ecosystems are inserted in institutional frameworks and environments that in Mexico may not be "enabling" and generate perverse incentives for agro-biodiversity conservation by traditional farmers. The project is, therefore, innovative in promoting the mainstreaming of agrobiodiversity in the National Development Plan and Sectorial Plans, which is currently absent (see Component 3 on pages 24-25). In addition, the proposal to develop complementary policy instruments to serve as enabling environments to sustain project outputs is innovative. The project aims to use the catalytic action of GEF resources and FAO's role as neutral forum, to bring together different institutions and disciplines with a long-term strategic vision.

Project field actions and related policies will be supported by knowledge generation from participatory research. Component 1 reflects this output (see Table B), which will help understand the processes underlying the generation of genetic diversity within traditional agricultural systems so as to enable their long-term conservation. A main innovative aspect of Component 1 is the systematic recording of empirically generated information for posterity. There are not enough searchable databases on Plant Genetic Resources for Food and Agriculture (PGRFA) that are endemic to Mexico, as proposed for creation through this project. Scale is another innovative dimension to the proposal. While there have been mainly individual isolated effort – conducted by disparate public sector and civil society entities – on the conservation and sustainable use of indigenous PGRFA in the country this proposal seeks to convene all stakeholders, including research and development organizations, policy makers and indigenous communities, to implement activities in concert.

The project will also address the economic and non-economic valuation of agrobiodiversity (Component 4). The former will be done by applying the value chain (VC) approach to help generate sustainable livelihoods for vulnerable communities and farmers that are the custodians of agrobiodiversity in Mexico (see Component 4 on pages 25-27). This VC approach has been piloted with FAO technical assistance in many centers of origin worldwide[67] but not yet in Mexico. This project will help Mexico generate good practices to be shared through the FAO network as well as through Mexican South-South cooperation mechanisms. This is also innovative.

Sustainability: this project is designed in line with the three pillars of sustainability: i) Social sustainability: the project approach is people-centered and aims at recovering the great traditional knowledge of the indigenous people and local communities regarding the management of their phytogenetic resources in a participatory manner. Full project design will follow and respect the guidelines of Free Prior and Informed Consent as set by the FAO Policy on Indigenous and Tribal Peoples, as well as national legislation. Project sites will be selected in consultation with the local stakeholders. Gender mainstreaming is part of the project design, given the key role of women in sites where men have migrated and the extensively documented role of women in the implementation of agroecological practices in local communities. This will be further discussed with women's groups during full project preparation; ii) Environmental sustainability: the project is aimed at supporting the natural potential of elements of the agrobiodiversity that are now being lost or pressured by

[67] See as example: http://www.fao.org/3/a-i5398e.pdf

production models that are unsustainable. The project will protect and recover species and varieties that are currently being abandoned and disused, facing a risk of erosion or disappearance. A social and environmental risk analysis will be conducted during full project preparation, in line with FAO Environmental and Social Management Guidelines; iii) Economic sustainability: the project will promote the generation of incentives, market linkages and organizational support to allow traditional farmers to reinforce their livelihoods through the valuation of their agroBD-based food products. An economic analysis will be conducted during full project preparation once the local intervention sites will be defined in a participatory way. The type of production system and geographical location will be included as variables of the analysis.

CONABIO will cover the recurrent costs related to databases, meaning systematization, review and quality assurance of collected information. Box 1 illustrates a reference cost structure, based on a seed bank project led by INIFAP in Oaxaca in 2014.

Box 1: Estimated cost structure of a community seed bank in Mexico[68]

The establishment of Community Seed Banks (CSB) involves the building or adaptation of facilities, furniture (shelves and furniture), equipment (scales), materials (airtight containers, drying material, etc.), staff (a technician trained to provide assistance to farmers and take over the seed bank administration), and operating expenses (services and consumables).

This GEF project will support the initial investment in building and equipment, which will take place in PY1. Its estimated cost is approximately USD 6,000 (considering about 50 farmers per bank). The technician would have an annual cost of USD 7,000. Technician time will be covered 100% by the project in PY1. Then, the project support will gradually decrease (PY2: 75%; PY3:50%; PY4: 0%).

Operating expenses are estimated at USD 1,000 per year. Costs will be covered with the same dynamic as for technical staff. By PY4, the CSB will operate under its own-generated resources coming from the sale of seeds to non-member customers. Globally, it is estimated that each seed bank be financed by the project by USD 24,250 USD during the three years of operation in which the project will provide support.

This project-specific economic analysis, including recurrent costs, will be refined during full project preparation. The analysis of costs, incomes and investments related to in-situ and ex-situ conservation of landraces should be conducted based on specific socio-economic and environmental variables - which in turn determine the outcome of such contextualized analysis. In order to respect the participatory approach that the project is proposing, no selection of targeted areas (i.e. communities or indigenous areas) will be determined without due consultation with local stakeholders.

Scaling-up: The project has a great potential for expansion, in Mexico and Mesoamerica, as detailed above (see section 5). The project is expected to have an indirect effect in 7 million hectares managed through traditional systems in Mexico, as well as in their bordering areas influenced by genetic fluxes. Project methodologies and lessons learnt could serve as a reference for other countries that are also centers of origin, diversification and domestication of plant species and that have an associated cultural background. FAO, especially through its Commission on Genetic Resources for Food and Agriculture[69], will serve as the forum to share this information at regional and global levels. The Commission is the only permanent forum for governments to discuss and negotiate matters specifically relevant to the conservation and sustainable use of

[68] This experience has been developed with great success by INIFAP (National Institute of Forestry, Agricultural and Livestock Research) in the State of Oaxaca, where there are 10 CSB with 400 union member farmers (F Aragon, 2014)
[69] http://www.fao.org/nr/cgrfa/cgrfa-home/en/

genetic resources for food and agriculture and the fair and equitable sharing of benefits derived from their use. In particular, its Intergovernmental Technical Working Group on Plant Genetic Resources for Food and Agriculture[70] will provide the forum for peer review of methodologies and data and for the exchange of information with other FAO member countries on this subject. The scalability will be further analysed and described during full project preparation and will certainly benefit from lessons being learned from the activities of the *Global Crop Diversity Trust*[71]; IUCN, CBD and the centres of the Consultative Group for International Agricultural Research (CGIAR), including the International Maize and Wheat Improvement Center (CIMMYT[72], its Spanish acronym) with its headquarters in Mexico. FAO collaborates actively with all these entities and their expertise will also be brought to bear upon the implementation of this project.

***2. Stakeholders*. Will project design include the participation of relevant stakeholders from civil society and indigenous people? (yes ☒ /no☐) If yes, identify key stakeholders and briefly describe how they will be engaged in project design/preparation.**

At local level, project beneficiaries and key stakeholders are: traditional farmers, indigenous groups and local communities. Within these groups, women have a key role particularly regarding the management of domestic family gardens and the associated agrobiodiversity. These groups have traditional knowledge of agrobiodiversity and have guaranteed the continuity of the evolution processes through species and varieties domestication. The Project will promote the participation of young people to securing the replacement generation.

At second level, key stakeholders are the social organizations that have worked in the communities and have already acquired recognition and prestige. These organizations can serve as catalyzers to facilitate the dialogue between the communities and the academic and governmental agencies that will participate in the project.

In third place, academic actors from the universities and research centers will be responsible for the classification and documentation of the agrobiodiversity. As well, academia centres will manage and provide technical support to, where appropriate, conservation schemes and participatory plant breeding programs with local farmers.

At national level, governmental agencies with competence in agrobiodiversity or protected natural areas will play a key management role. Table 1 below illustrates the list of main institutional stakeholders. A socio-economic analysis will be conducted during full project preparation to identify local stakeholders. As well, a stakeholder mapping exercise will be conducted to further describe the present list.

Table 1: Project Stakeholders

Institution	Mandate	Role in the Project
National Commission for the Knowledge and Use of Biodiversity (**CONABIO**)	**Conabio's** mission is to coordinate actions and studies related to the knowledge and preservation of biological species, and to promote and encourage scientific research activities to explore, study, protect and use biological resources aiming to conserve the ecosystems of the country and generate criteria for sustainable management.	Main project executing partner. CONABIO has technical departments that will provide support to the different project components, as well as carrying out its coordination, and monitoring.
FAO	FAO's three main goals are: the eradication of hunger, food insecurity and malnutrition; the elimination of poverty	FAO is the GEF agency for this project, and will provide technical assistance during the

[70] http://www.fao.org/agriculture/crops/core-themes/theme/seeds-pgr/itwg/en/
[71] https://www.croptrust.org/
[72] http://www.cimmyt.org/en/

	and the driving forward of economic and social progress for all; and, the sustainable management and utilization of natural resources, including land, water, air, climate and genetic resources for the benefit of present and future generations**.**	full project cycle
National Commission for Natural Protected Areas (**CONANP**)	**CONANP 's** mission is to conserve the natural heritage of Mexico through Protected Areas and other forms of preservation, by promoting a culture of conservation and the sustainable development of communities living in their own environment.	Given that one part of the agrobiodiversity, particularly that relating to the wild relatives of the cultivars, can be found best conserved in protected areas, CONANP will play an important role under Component 1 and 2.
National Institute of Ecology and Climatic Change (**INECC**)	**INECC** aims to generate scientific and technical information on environmental issues as well as the training of human resources, in order to inform society, support decision-making, encourage the protection of the environment, promote the sustainable use of natural resources, and support SEMARNAT.	INECC is an institution with experience in biodiversity and climate change and will provide its technical expertise during project implementation
Secretariat of Agriculture, Livestock, Rural Development, Fisheries and Food (**SAGARPA**)	**SAGARPA** is responsible for the inspection and certification of seeds through the National System of Inspection and Certification of Seeds (SNICS), which in turn manages the National System of Phytogenetic Resources (SINAREFI). SINAREFI is aimed at harmonizing actions and efforts among different agencies linked to phytogenetic resources for food supply and agriculture, with the objective of securing their conservation and sustainable use. SAGARPA is also responsible for coordinating the institutions involved in rural development.	SAGARPA and its dependencies will provide technical support to the four technical components, within their mandates.
Secretariat of Social Development (**SEDESOL**)	SEDESOL is a government agency that heads the *National Crusade Against Hunger*.	SEDESOL will provide support to improving livelihoods activities during project design and execution
National Institute for Forestry, Agricultural and Livestock Investigations (**INIFAP**)	**INIFAP** contributes to the productive, competitive, equitable and sustainable development of agricultural and forestry chains, through the generation and adaptation of scientific knowledge and technological innovations and the development of human resources to meet the demands and needs to benefit the sector and society in a institutional cooperation frame with public and private organizations.	INIFAP is a research institution with wide experience in the research of phytogenetic resources. INIFAP will provide its knowledge and expertise under Components 1 and 2.
Commission for the Development of Indigenous Peoples (**CDI**)	**CDI** is intended to guide, coordinate, promote, support, encourage, monitor and evaluate programs, projects, strategies and	A portion of the social groups that will participate in the project are indigenous peoples

	public actions for comprehensive and sustainable development of indigenous peoples and communities in Mexico.	(IP). CDI is the agency in charge of IP development. Its participation will support linking the project with these groups.
Autonomous University of Chapingo (**UACh**)	**UACh's** mission is to provide education of high school and college level; developing scientific and technological research linked to teaching; preserve, promote and enhance the culture; fight for a timely transfer to the rural sector scientific and technological innovations; and ensure proper planning of agriculture and the services it requires.	As an university with vast experience in the characterization and improvement of phytogenetic resources, UACh will provide technical support to project implementation.
Postgraduates College (**CP**)	The **CP** is an educational institution that generates, disseminates and applies knowledge for the sustainable management of the natural resources, production of nutritious and safe food and improving the quality of life of society.	As a research center with experience in the development of projects on phytogenetic resources, CP will provide technical support to project implementation.
The College of the Southern Border **(ECOSUR**)	**ECOSUR** seeks to contribute to the sustainable development of the southern border of Mexico, Central America and the Caribbean through the generation of knowledge, human resources training and linking from social and natural sciences.	As a research center with experience in the development of projects on regional phytogenetic resources, ECOSUR will provide technical support to project implementation.
National Autonomous University of Mexico (**UNAM**)	The **UNAM** has the primary purpose to train professionals, organizing and conducting investigations, mainly about the national conditions and problems, and spread as widely as possible, the benefits of culture	As a key institution with wide experience in the research of species and varieties related to the agroecosystems of Mexico, UNAM will provide technical support to project implementation.
Other Universities or Research Centers	Institutions with regional experience in the characterization and documentation of agrobiodiversity	Provide technical support at local and regional levels.

***3. Gender Considerations.* Are gender considerations taken into account? (yes ☒ /no☐). If yes, briefly describe how gender considerations will be mainstreamed into project preparation, taken into account the differences, needs, roles and priorities of men and women.**

Project design is gender-focused. The role of women is fundamental in a context of men migration, poverty and need for maintaining livelihoods for children and elders who have remained in rural areas of Mexico. Women are key in leading the following activities: i) Managing and sustainably using agroBD in home gardens; ii) Organizing themselves in self-management groups; iii) Diversifying crops, using multi-cropping systems, and domesticating animals; iv) Reducing the use of external inputs, and therefore, their dependency; and v) Applying Agroecology principles[73].

[73] There is plenty of bibliography and case studies worldwide that support these finding on the role of women to conserve and use agroBD. See for example: http://www.agriculturesnetwork.org/images/homepage/magazine-covers/314women1.pdf

In light of this, the project will engage women in the following actions: a) assessing local capacities in order to identify successful and risky cases; b) participatory plant breeding - based on community needs identified along with research groups; c) promotion of market linkages and GI activities.
A gender analysis, as part of the socio-economic analysis, will be conducted during full project preparation. Gender indicators will be built with stakeholders. At least 30% of female-led households will be project beneficiaries.

4 Risks. **Indicate risks, including climate change, potential social and environmental risks that might prevent the project objectives from being achieved, and, if possible, propose measures that address these risks to be further developed during the project design (table format acceptable).**

Probability	Potential risks	Mitigation measures provided
Medium	**Environmental / climate:** Accelerated loss of elements of agrobiodiversity due to drastic climate change.	During full project preparation, special attention will be given to the identification, with expert help, of those zones in which the effects of climate change are likely to be most drastic (i.e. areas with prolonged drought) in order to give these areas priority of attention and to establish the mechanisms that allow conservation of the most threatened elements of agrobiodiversity.
Medium	**Environmental:** Genetic erosion and loss of agroBD conservation will likely reduce the capacity to face extreme situations caused by climate change	The project will contribute to protect genetic resources to address CC challenges in Mexico
Low	**Social:** Target communities lack disposition towards participation in the project.	Involvement of social organizations with prestige and trusted links with the target communities so that, through them, the components of this project can be implemented. As part of the project design, the diverse social organizations that work in the target areas of the project will be mapped, in order to involve them from the preparation stage of the project.
High	**Social:** Lack of young farmers participating in the activities of the project and thus forming the replacement generation	The participation of young people is fundamental to achieving a generational replacement of farmers who hold the knowledge of the agrobiodiversity and who live within the communities in which the project will be implemented, or in other regions. This aspect will be duly considered during full project preparation. Young people will be invited to participate in the project desing, thus ensuring their permanence during the implementation phase.
Medium	**Political/institutional:** The government agencies lack disposition towards participation in the project and sharing information.	The role that will be performed by all of the participating agencies in the project will be set during full project preparation and agreed through the Project Document. This role will be assigned according to the legal attributes and capacities of each agency. An agreement will be subscribed in which the commitments of each agency are clearly established.

Medium	**Institutional:** Researchers lack disposition to share information and form exchange networks.	The most important researchers in the theme of agrobiodiversity will be identified, and involved through meetings and workshops, where each researcher will agree on the extent and nature of their participation in the project. These agreements will be subscribed with a commitment to participation.

5. Coordination. **Outline the coordination with other relevant GEF-financed and other initiatives.**

The urgent need to conserve, characterize and evaluate the threatened agrobiodiversity, promote its sustainable use and address the future needs for providing food for the world population has led to a marked change in the legislative environment over the last 15 years, especially with the coming into force of the International Treaty on Plant Genetic Resources for Food and Agriculture which is hosted by FAO. Also, FAO, which will support the coordination of the present project and link it with other agrobiodiversity initiatives worldwide, hosts the Commission. Established in 1983 to deal with PGRFA has since 1995, the Commission had its mandates broadened to encompass all components of biodiversity of relevance to food and agriculture, namely Animal, Forest and Aquatic genetic resources.

Since its establishment, the Commission has overseen global assessments of the state of the world's forest, plant and animal genetic resources for food and agriculture and negotiated major international instruments, including the International Treaty. The *Second Report on the State of the World's Plant Genetic Resources for Food and Agriculture*[74] for instance, was published under the auspices of the Commission in 2010. The monitoring of the implementation of the *Second Global Plan of Action for Plant Genetic Resources for Food and Agriculture*[75] also agreed under the auspices of the Commission in 2011 is yielding data that are being collated towards the publication of the Third Report. FAO also hosts the Secretariat of the *Globally Important Agricultural Heritage Systems* (GIAHS)[76]; its mandates are also critically important for the current project and, like the Commision and the International Treaty, lessons that have been learned therefrom will be fed into the implementations of the activities being proposed under this project. FAO has also developed a track record of success leveraging its South-South Cooperation platform to share information, leverage expertise and pool resources for supporting activities in its member countries. Mexico participates actively in, and in the implementation of this project, stands to gain from, the activities of the Commission, the International Treaty, GIAHS and FAO's South-South Cooperation platform.

In addition, the project will coordinate actions with the following GEF-financed projects:

- *Sustainable Land Management Promotion* (PROTIERRAS) (GEF ID 5785), which is starting implementation with FAO. Actions regarding local capacity development and traditional knowledge will be communicated through the FAO Representation in Mexico, to take advantage of synergies.
- *Strengthening of National Capacities for the Implementation of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity* (GEF ID 5738): coordination between the two related projects will be ensured through CONABIO which is a main partner and member of the Project Steering Committees of both of them.

[74] http://www.fao.org/agriculture/crops/core-themes/theme/seeds-pgr/sow/sow2/en/
[75] http://www.fao.org/docrep/015/i2624e/i2624e00.htm
[76] http://www.fao.org/giahs/en/

- *Strengthening Management Effectiveness and Resilience of Protected Areas to Safeguard Biodiversity Threatened by Climate Change* (GEF 4763): lessons on how to cope with climate change effects will be brought by CONABIO to the full design of the present project.

Coordination with project partners and related initiatives will be further analysed and described in the full project document.

***6. Consistency with National Priorities*. Is the project consistent with the National strategies and plans or reports and assessements under relevant conventions? (yes ☒ /no☐). If yes, which ones and how: NAPAs, NAPs, ASGM NAPs, MIAs, NBSAPs, NCs, TNAs, NCSAs, NIPs, PRSPs, NPFE, BURs, etc.**

The project is aligned with:

i) The ***National Strategy on Biodiversity*** in all its thematic axes (Knowledge; Use; Factors of Pressure and Threat; Education and Culture and Governance).

ii) The ***5th National Report to CBD*** **(2014)** which recognizes the need for setting efficient mechanisms or tools that generate updated and systematized information on genetic diversity of native species, in coordination with academic centres. In addition, the Report indicates that the role of scientific institutions and entities financing research needs to be strengthened to better inform decision-making processes and public policies design. The Report considers as urgent the need of conducting periodic assessments on the sustainability level of agrobiodiversity resource use, given that information about the production and consumption cycles is neither systematized nor clear. This project is also aligned with the CBD Decision XI/5 Financial Mechanism / Global Strategy for Plant Conservation.

iii) the ***National Development Plan 2013-2018,*** transversal approach (iv) Prosperous Mexico: (Objective 4.10) "To construct a productive agricultural and livestock production sector that guarantees the food security of the country"; (Strategy 4.10.4) "To drive the sustainable use of the natural resources of the country", and in its Action Line: "To establish instruments to rescue, conserve and strengthen genetic resources";

iv) The ***Environment and Natural Resources Program 2013-2018***, its Objective 4: "To recover the functionality of basins and landscapes through conservation, restoration and sustainable use of the natural heritage", Strategy (4.3) "To promote the sustainable use of the natural heritage in priority regions for conservation and/or with marginalized and impoverished inhabitants", and (4.5) "To promote the integration of different conservation schemes, promote good productive practices and sustainable use of the natural heritage".

v) The ***Sectorial Program of Agricultural and Livestock Production, Fisheries and Food 2013-2018***, National Goal: Prosperous Mexico (Objective 4) "To drive the sustainable use of the natural resources of the country", and its Strategy 4.3: "To establish instruments to rescue, conserve and strengthen genetic resources"; in Action Line: (4.3.1.) "To promote the conservation and use of genetic resources, as well as conserve natural protected areas", (4.3.2.) "To articulate public and private institutions in order to characterize and legally protect strategic genetic resources for the food and industrial sector", (4.3.3.) "To develop research on non-traditional genetic resources in order to identify new uses", and (4.3.4.) "To generate new value chains based on local genetic resources".

vi) The ***Presidential Program of the National Crusade Against Hunger***, especially in its strategic axe: "Increasing Food Supply and Productive Inclusion".

vii)The work of the **Commission on Genetic Resources for Food and Agriculture** (CGRFA), hosted by FAO. Mexico periodically submits a national report on the status of its PGRFA, which is used by FAO to prepare its periodic Report on the State of the World´s Plant Genetic Resources for Food and Agriculture, a document that reflects the global situation of this theme. The present project will enhance the capacity of Mexico to implement the Second GPA and report periodically on the progress as a contribution to the *Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture* envisaged to be published in about five years time.

7. Knowledge Management. **Outline the knowledge management approach for the project, including, if any, plans for the project to learn from other relevant projects and initiatives, to assess and document in a user-friendly form, and share these experiences and expertise with relevant stakeholders.**

One of this project objectives is to support the generation of improved information and to share this knowledge in Mexico, in Mesoamerica, and worldwide especially through FAO's World Information and Early Warning System on Plant Genetic Resources for Food and Agriculture (WIEWS)[77]. Snapshots of information available on WIEWS will feed into the preparation of the *Third Report on the State of the World's Plant Genetic Resources for Food and Agriculture*. Mexico has commitments to provide data for this report and this poroject enhances the country's capacity to fulfill this commitment – in addition to the more immediate and direct benefit of providing data on these irereplaceable resources in the country for posterity. Component 1 is supporting this objective. The project design and implementation phase will be based on a participatory approach. Knowledge will be systematized in collaboration with the communities that hold and have protected it throughout the centuries. Academia and FAO officers will work at field level, by cooperating with grassroot organizations who speak the language of the communities, to ensure that traditional knowledge is valued and protected. CONABIO, as main project partners, has been coordinating actions with previous and existing projects, and is aimed at establishing synergies with future projects in the agroBD thematic, to avoid duplications and contradictory incentives. The project approach recognizes the potential of agrobiodiversity being a key solver of future challenges. Knowledge management is key for this purpose. During this design of this PIF, CONABIO, FAO and other partners have already mapped and promoting discussion amongst different approaches already undertaken or underway in Mexico. Component 1 will be fully designed during the full project preparation.

PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)

A. RECORD OF ENDORSEMENT[78] OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):

(Please attach the Operational Focal Point endorsement letter(s) with this template. For SGP, use this SGP OFP endorsement letter).

NAME	POSITION	MINISTRY	DATE *(MM/dd/yyyy)*
CARLOS RAUL DELGADO ARANDA	Deputy General Director	**MINISTRY OF FINANCE (SHCP)**	**1 MARCH 2016**

B. GEF AGENCY(IES) CERTIFICATION

[77] http://www.fao.org/wiews/en

[78] For regional and/or global projects in which participating countries are identified, OFP endorsement letters from these countries are required even though there may not be a STAR allocation associated with the project.

This request has been prepared in accordance with GEF policies and procedures and meets the GEF criteria for project identification and preparation under GEF-6.					
Agency Coordinator, Agency name	**Signature**	**Date** *(MM/DD/YYYY)*	**Project Contact Person**	**Telephone**	**Email Address**
Gustavo Merino Director, Investment Centre Division Technical Cooperation Department FAO Viale delle Terme di Caracalla (00153) Rome, Italy TCI-Director@fao.org		2 March 2016 Re-submission:24 March 2016	Valeria Gonzalez Riggio & Eduardo Benitez		Valeria.gonzalezriggio@fao.org Eduardo.benitez@fao.org
Jeffrey Griffin Senior Coordinator GEF FAO Email: jeffrey.griffin@fao.org					faogef@fao.org

C. ADDITIONAL GEF PROJECT AGENCY CERTIFICATION (APPLICABLE ONLY TO NEWLY ACCREDITED GEF PROJECT AGENCIES)

For newly accredited GEF Project Agencies, please download and fill up the required **GEF Project Agency Certification of Ceiling Information Template** to be attached as an annex to the PIF.

Annex I: AgroBD plant groups addressed by the Project

Annex I : AGROBIODIVERSITY					
Cultivated Species			**Wild Species**		
Common name	Scientific Name	Geographic location	Common name	Scientific Name	Geographic location
maize	*Zea mays mays*	Chihuahua, Mexico City, Michoacán, Oaxaca	teocintles	*Z. mays mexicana* *Z. mays parviglumis* *Z. Luxurians*	Chihuahua, Mexico City, Michoacán Michoacán, Oaxaca Oaxaca
bean, ayocote, tépari, ib,	*Phaseolus vulgaris* *Phaseolus coccineus* *Phaseolus lunatus* *Phaseolus acutifolius* *Phaseolus dumosus*	Chihuahua, Mexico City, Michoacán, Oaxaca Chihuahua,Mexico City, Michoacán, Oaxaca Michoacán, Oaxaca Chihuahua, Michoacán, Oaxaca Oaxaca	diverse names associated to wild beans	Approx. 70 wild species of *genus Phaseolus*	Chihuahua, Mexico City, Michoacán, Oaxaca
amaranto	*Amaranthus cruentus* *Amaranthus hypochondriacus*	Chihuahua, Mexico City, Oaxaca Chihuahua, Mexico City, Michoacán, Oaxaca	quintoniles	*A. powellii, A. hybridus,* plus other 30 wild species	Chihuahua, Mexico City, Michoacán, Oaxaca

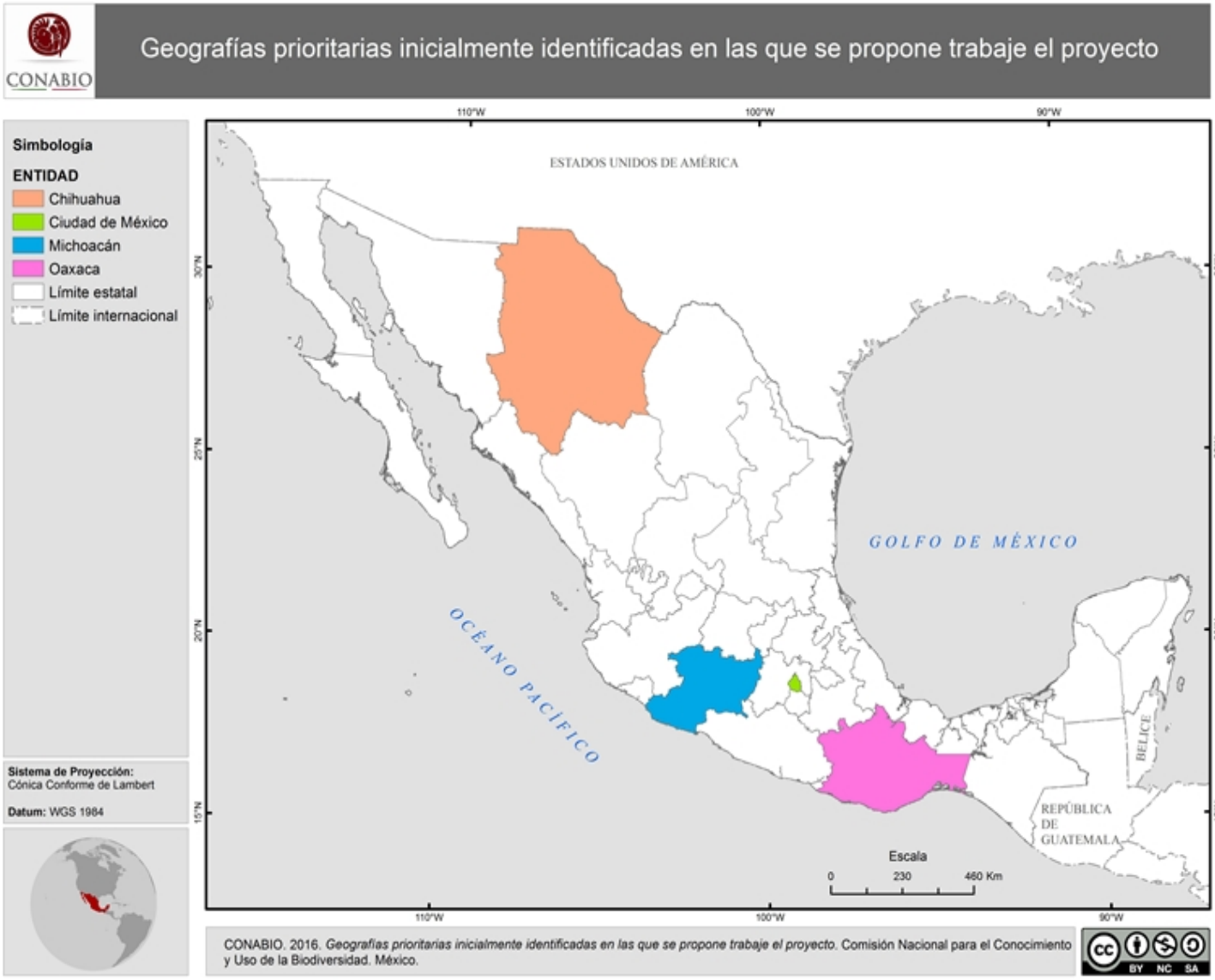
chile	*Capsicum annuum annuum* *Capsicum frutescens* *Capsicum pubescens*	Chihuahua, Mexico City, Michoacán, Oaxaca Michoacán, Oaxaca Michoacán, Oaxaca	wild chiles	*C. annuum glabriusculum* *C. frutescens* *C. lanceolatum* *C. rhomboideum*	Chihuahua, Oaxaca Michoacán, Oaxaca Oaxaca Michoacán, Oaxaca
Cultivated Species			**Wild Species**		
Common name	Scientific Name	Geographic location	Common name	Scientific Name	Geographic location
pumpkin, chilacayote	*Cucurbita pepo pepo* *Cucurbita argyrosperma argyrosperma* *Cucubita ficifolia* *Cucurbita moschata*	Chihuahua, Mexico City, Michoacán, Oaxaca Chihuahua, Mexico City, Michoacán, Oaxaca Chihuahua, Mexico City, Michoacán, Oaxaca Chihuahua, Mexico City, Michoacán, Oaxaca	diverse names associated to wild beans	*C. argyrosperma sororia* *C. digitata* *C. foetisissima* *C. okeechobeensis martinezii* *C. pedatifolia* *C. radicans*	Chihuahua, Mexico City, Michoacán, Oaxaca Chihuahua Chihuahua, Michoacán Oaxaca Michoacán, Oaxaca Mexico City, Michoacán
chayote	*Sechium edule edule*	Chihuahua, Michoacán, Oaxaca	chayote de monte, chayote de caballo, chayotillo	S. chinantlense S. hintonii	Oaxaca Mexico City

green tomato	*Physalis philadelphica*	Chihuahua, Mexico City, Michoacán, Oaxaca	tomatillo	Approx. 50 wild species of *Physalis*	Chihuahua, Mexico City, Michoacán, Oaxaca
cocoa	*Theobroma cacao*	Michoacán, Oaxaca	pataste, cocoa de montaña, wild cocoa	Theobroma cacao	Oaxaca
aguacate	*Persea americana*	Chihuahua, Michoacán, Oaxaca	aguacate silvestre, aguacatillo, chinini	*P. cinerascens, P. pallecens, P. schideana, P. steyermarkii* and approx. 10 more wild species	Chihuahua, Michoacán, Oaxaca
nopal, tunas & xoconostles	Opuntia spp. (various species)	Chihuahua, Mexico City, Michoacán, Oaxaca	nopal, tunas & xoconostles	Opuntia spp. (various species)	Chihuahua, Mexico City, Michoacán, Oaxaca

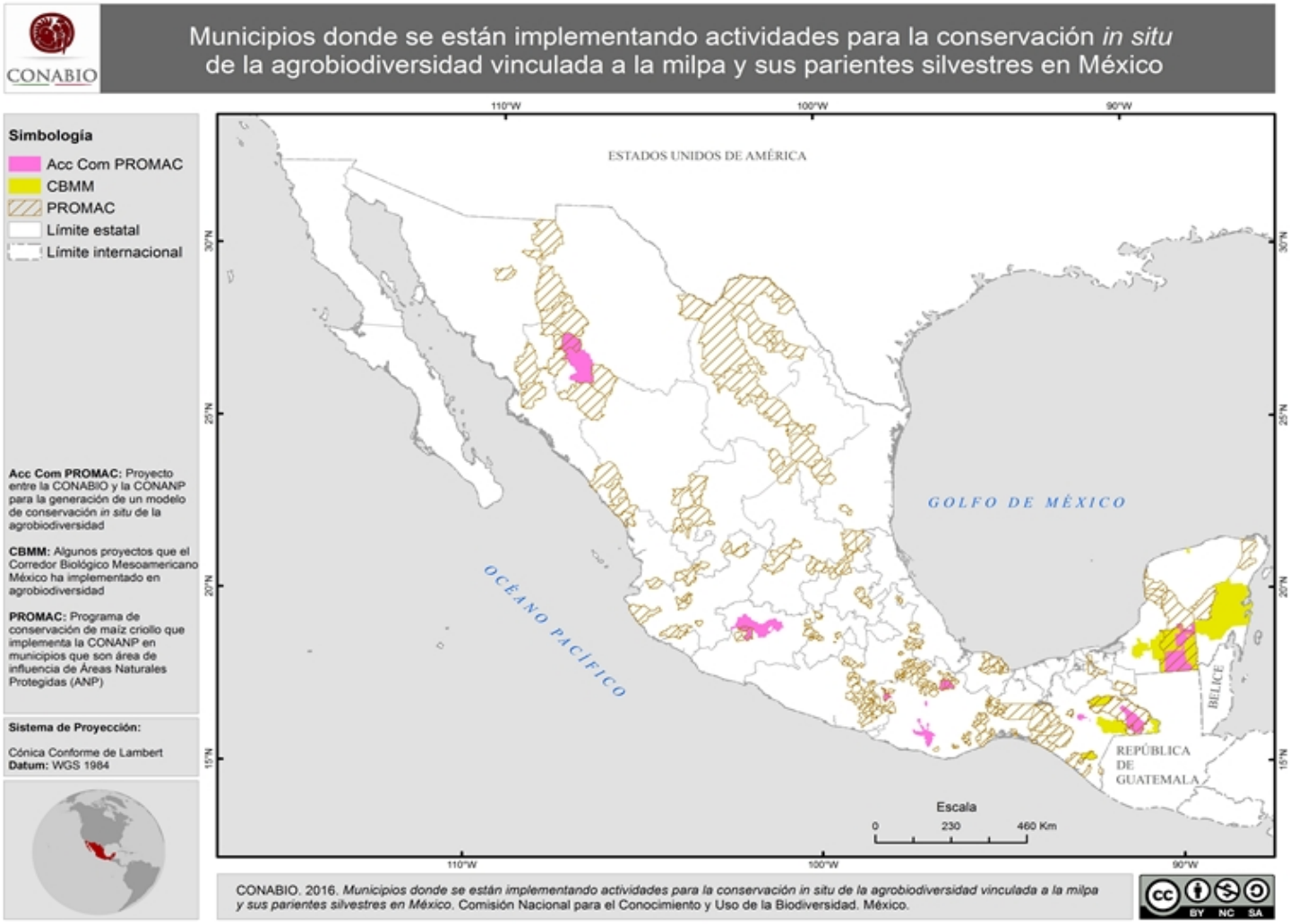
Associated plants of milpa (quelites*)		
Common name	Scientific Name	Geographic location
verdolaga	*Portulaca oleraceae*	Chihuahua,Mexico City, Michoacán, Oaxaca
quintoniles	*Amaranthus hybridus, A. cruentus, A. palmeri, A. retroflexus, A.scariosus, A. crassipes, A.spinosus*	Chihuahua, Mexico City, Michoacán, Oaxaca
epazote	*Dysphania ambrosioides*	Chihuahua, Mexico City, Michoacán, Oaxaca
pápalo	*Porophyllum ruderale*	Chihuahua, Michoacán, Oaxaca
huauzontle/quelite cenizo	*Chenppodium berlandieri*	Chihuahua,Mexico City, Michoacán, Oaxaca
alache o violeta	*Anoda cristata*	Chihuahua,Mexico City, Michoacán, Oaxaca
chepiles	*Crotalaria incana, C. longirostrata, C. pumila*	Chihuahua, Ciudad de México, Michoacán, Oaxaca

* Word that comes from náhuatl *quilitl* which means vegetable or tender edible plan and has its equivalente in different languages. This term may be applicable to tender leaves, flowers, or tender bulbs as well as to tree saplings.

Annex II: Project target geographical sites
(to be further refined during full project preparation)



Annex III : Municipalities where *in-situ* conservation activities are being implemented.
Agrobiodiversity linked to *milpa* traditional system and wild relatives



Annex IV: Agrobiodiversity-based food products potentially to be selected by the Project

Cultivated species		Products and/or derived uses	Priority geographic area	Production system of interest for the project	Market (local, national, international) of interest for the project
Common name	Scientific name				
corn	*Zea mays mays*	Basic human food in the country (Basic staple food) Elaboration of approximately 600 courses (i.e Tortillas, tamales, cookies, drinks, etc) Forage Multiple indutrial uses	Mainly in Michoacán, Oaxaca and Mexico City Valley. Furthermore in Chihuahua	Traditional agroforestry systems and small producers	Personal consumption, local, regional, national
bean, ayocote, tépari, ib, etc	*Phaseolus vulgaris* *Phaseolus coccineus* *Phaseolus lunatus* *Phaseolus acutifolius* *Phaseolus dumosus*	Basic human food in the country (Basic staple food). Essential for protein intake Processed and canned foods Medicinal use Extraction of active chemical compounds	Mostly in Michoacán, Oaxaca and Mexico City Valley. Furthermore in Chihuahua	Traditional agroforestry systems and small producers	Personal consumption, local, regional, national
amaranth	*Amaranthus cruentus* *Amaranthus hypochondriacus*	Historically for tamales and atole, greens Typical sweets Its flour is incorporated in the production of bread in order to improve nutritional quality Consumption of its leaves and the plant generally as greens (quelites, quintoniles)	Mainly in Oaxaca, Mexico City Valley, and Michoacán. Furthermore in Chihuahua	Traditional agroforestry systems and small producers	Personal consumption, local, regional, national

chilli pepper	*Capsicum annuum annuum* *Capsicum frutescens* *Capsicum chinense* *Capsicum pubescens*	Direct consumption of its fruit Preserves Sauces Capsaicin extraction	Mostly in Oaxaca and Mexico City Valley. Furthermore in Chihuahua and Michoacán	Traditional agroforestry systems and small producers	Personal consumption, local, regional, national
pumpkin, chilacayote	*Cucurbita pepo pepo* *Cucurbita argyrosperma argyrosperma* *Cucubita ficifolia* *Cucurbita moschata* *Cucurbita maxima*	Direct consumption of its fruit, its seed, sprouts and flowers Forage Medicinal use Preserves and sweets Soap substitute Containers	Mostly in Michoacán, Oaxaca, and Mexico City Valley. Furthermore in Chihuahua	Traditional agroforestry systems and small producers	Personal consumption, local, regional, national
chayote	*Sechium edule edule*	Direct consumption of its fruit and occasionally its root as greens Preserves Source of saponins (root)	Mostly in Oaxaca and Mexico City Valley. Furthermore in Michoacán and Chihuahua	Traditional agroforestry systems and small producers	Personal consumption, local, regional, national
green tomatoe	*Physalis philadelphica*	Direct consumption of its fruit and as a vegetable for the elaboration of sauces Preserves and medicinal use	Mainly in Michoacán and Mexico City Valley. Furthermore in Chihuahua.	Traditional agroforestry systems and small producers	Personal consumption, local, regional, national
cacao	*Theobroma cacao*	Consumption of cocoa obtained from seeds in	Mainly Oaxaca and Mexico City Valley.	Traditional agroforestry	Personal consumption,

		order to obtain chocolate Consumed as sweet, jam, ice cream and drinks Cosmetic and medicinal use of different parts of the plant	Secondly in Michoacán	systems and small producers	local, regional, national
avocado	*Persea americana*	Direct consumption of its fruit as food Cosmetic and medicinal use of different parts of the plant	Mainly in Oaxaca, and Mexico City Valley. Furthermore in Chihuahua, Michoacán	Traditional agroforestry systems and small producers	Personal consumption, local, regional, national
nopal, tunas and xoconostles (types of prickly pears)	*Opuntia* spp. (varias especies)	Consumption of its fruits (tunas and Xoconostles) Consumption of cladodes, occasionally its flowers as vegetable Processed and canned foods Forage, hedgerows and mitigation of soil erosion processes Cosmetic and medicinal uses Industrial derivatives	Mainly in Chihuahua,Oaxaca, and Mexico City Valley. Furthermore in Michoacán	Traditional agroforestry systems, home gardens, small producers and exploitation of wild populations subject to handling	Personal consumption, local, regional, national

Some associated plants in the maize field (quelites*)					
Common name	Scientific name	There are more than 500 registered species of which around 15 are registered at a bibliographic level (nevertheless an inventory for quelites is non existent) Edible tender vegetables Medicinal use	Mainly in Michoacán, Oaxaca, and Mexico City Valley. Furthermore in Chihuahua	Traditional agroforestry systems and small producers	Personal consumption, local, regional, national
purslane	*Portulaca oleraceae*				
quintoniles	*Amaranthus hybridus, A. cruentus, A. palmeri, A. retroflexus, A.scariosus, A. crassipes, A.spinosus*				
epazote	*Dysphania ambrosioides*				
pápalo	*Porophyllum ruderale*				
huauzontle/quelite cenizo	*Chenopodium berlandieri*				
alache or violet	*Anoda cristata*				
chepiles	*Crotalaria incana, C. longirostrata, C. pumila*				