PROJECT IDENTIFICATION FORM (PIF)

PROJECT TYPE: MEDIUM-SIZED PROJECT
TYPE OF TRUST FUND: GEF TRUST FUND

PART I: PROJECT INFORMATION

Project Title:	**Conservation and sustainable use of agricultural biodiversity to improve regulating and supporting ecosystem services in agriculture production in Uzbekistan**		
Country(ies):	Uzbekistan	**GEF Project ID:**	**5403**
GEF Agency(ies):	UNEP	GEF Agency Project ID:	01055
Other Executing Partner(s):	State Committee of Nature Protection of Uzbekistan Republic; Ministry of Agriculture of Uzbekistan Republic; Department of Forestry, Ministry of Agriculture and Water Resources of the Republic of Uzbekistan; Institute of Genetics and Plant Experimental Biology of the Academy of Sciences of of the Republic of Uzbekistan; Bioversity International, (regional office for Central Asia, Tashkent).	**Resubmission Date:**	11/12/2013
GEF Focal Area (s):	Biodiversity	**Project Duration(Months)**	36
Name of parent programme (if applicable): For SFM/REDD+	NA	**Agency Fee (US$):**	117,405

A. INDICATIVE FOCAL AREA STRATEGY FRAMEWORK:

Focal Area Objectives	Trust Fund	Indicative Grant Financing ($)	Indicative Co-financing ($)
BD-2	GEF TF	1,024,845	3,431,520
BD-4	GEF TF	211,000	718,480
Total project costs		**1,235,845**	**4,150,000**

B. INDICATIVE PROJECT FRAMEWORK

Project Objective: To mainstream the conservation and use of fruit tree biodiversity to enhance ecosystem services and thereby improve the resiliency of traditional agricultural production systems in water-scarce landscapes

Project Component	Grant Type	Expected Outcomes	Expected Outputs	Trust Fund	Indicative Grant Amount ($)	Indicative Co-financing ($)
1. Mainstreaming mechanisms that use agricultural biodiversity to enhance ecosystem	TA	**1.1** 3,000 hectars devoted to sustainably managed fruit treediversity is increased and ecosystem services are enhanced through greater use of	**1.1.1** Improved water use efficiency through increased presence of drought resistant fruit tree varieties in water-scarce agricultural	GEF TF	512,495	1,300,000

services in water scarce environments.		biodiversity in water-scarce agricultural production systems. **1.2** Policy and institutional framework mainstreaming biodiversity of local fruit species in water-scarce agricultural production systems are enhanced.	productionsystems **1.1.2** Enhanced level of pollination services through increased use of intra-specific fruit tree diversity. **1.1.3** Increased regulation of diseases and arthropod pests through greater use of local fruit tree genetic resources. **1.1.4** Restoration of water-scarce degraded land areas with locally adapted fruit tree genetic resources. **1.2.1** Analysis of gaps in national policies on agriculture development in water scarce environment and existing institutional framework. **1.2.2** Capacity built within the Uzbekistan agricultural extension service and government agencies to promote diversified fruit tree biodiversity in water scarce agricultural production systems. **1.2.3** Institutional framework of coordination and partnership among national extension, research institutes, civil society, private sector and policy making agencies at local and national levels established to support formulation and implementation of policies and strategies on use of diversified fruit trees biodiversity in water scarce production systems in Uzbekistan. **1.2.4** A revised Uzbekistan national biodiversity strategy provides a framework for mainstreaming fruit tree biodiversity conservation and use and ecosystem services into relevant			

			national regulatory decisions on agricultural production and food security. **1.2.5** Land use management plans are elaborated to include fruit tree genetic diversity at national, provincial, and district levels.			
2. Increasing the use of fruit tree biodiversity that enhances ecosystem regulating services in water-scarce environments.	TA	**2.1** Farmers benefit from having increased availablity of locally adapted materials to improve ecosystem resilience through better regulation of pollination service levels, diseases and arthropod pests, land degradation, and water use efficiency.	**2.1.1** Linkages enhanced among agricultural extension, local communities, suppliers of fruit tree seedlings (formal and informal), and national breeding systems and seed production authorities to maintain enhanced production of diversified seed sources. **2.1.2** Community biodiversity registries, and seedling biodiversity fairs linked to water management activities; **2.1.3** Community-based seedling production of diversified materials is enhanced and linked to local and national water management schemes for small scale farmers; **2.1.4** Information systems in place that enable local communities to easily access and and share data on local varieties and potential ecosystem services in water-scarce environments.	GEF TF	300,000	1,181,520
		2.2 Market mechanisms including trust are improved so that farmers have improved gains from increased production and ecosystem resilience, well-being, better cost-control e.g. reduced external inputs) from maintenance and use of the agrobiodiversity and increased returns for	**2.2.1** Trust and confidence in areas of quality and prices among value chain actors (such as farmers, food manufacturers, retailers, community organizations, and government agencies) generated through the market chain established. **2.2.2** Diversification of			

		specific products.	seedling suppliers and other stakeholders to provide locally adapted diverse fruit tree planting materials through market channels.			
3. Promoting an enabling environment for access and benefit-sharing mechanisms that recognize and enhance the custodians of ecosystem services.	TA	**3.1** Options for national access and benefit sharing laws identified to support the promotion of ecosystem services within agricultural production systems.	**3.1.1** Analysis of the existing laws and regulations related to ABS. **3.1.2** Awareness raised and capacity built to facilitate national ABS policy development including consideration of the Nagoya Protocol. **3.1.3** Recommendations developed to put in place ABS issues in national policies and laws that support the use of biodiversity to enhance ecosystem services and resilience in agricultural production systems. **3.1.4** Documentation drafted for ratification of Nagoya Protocol by Uzbekistan	GEF TF	211,000	718,480
4. Project monitoring and evaluation and knowledge managemen.	TA	**4.1** Project implementation based on results based management and application of project lessons learned in future operations facilitated.	**4.1.1** Project monitoring system operating providing systematic information on progress in meeting project outcome and output targets. **4.1.2** Midterm and final evaluation conducted. **4.1.3** Project-related "best-practices" and "lessons-learned" published. **4.1.4** Website to share the experience and information dissemination.	GEF TF	100,000	350,000
			Sub-Total		1,123,495	3,550,000
Project management cost				GEF TF	112,350	600,000
Total project costs					**1,235,845**	**4,150,000**

C. INDICATIVE CO-FINANCING FOR THE PROJECT BY SOURCE AND BY NAME IF AVAILABLE, ($)

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount ($)
National Government	Uzbekistan Government	In-kind	1,700,000
National Government	Uzbekistan Government	Grant	1,000,000

National Public Organization	Republican Union of Farmers	In-kind	300,000
Private	Company "Uzbegim LLC"	Grant	100,000
Other Multilateral Agency	Bioversity International	In-kind	700,000
Other Multilateral Agency	Bioversity International	Grant	200,000
GEF Agency	UNEP	In-kind	150,000
Total Co-financing			**4,150,000**

D. **INDICATIVE TRUST FUND RESOURCES ($) REQUESTED BY AGENCY, FOCAL AREA AND COUNTRY**

GEF Agency	Type of Trust Fund	Focal area	Country Name/Global	Grant amount ($) (a)	Agency Fee ($) (b)	Total ($) (a+b)
UNEP	GEF TF	BD	Uzbekistan	1,235,845	117,405	1,353,250
Total Grant Resources				**1,235,845**	**117,405**	**1,353,250**

E. **PROJECT PREPARATION GRANT (PPG)**

Please check on the appropriate box for PPG as needed for the project according to the GEF Project Grant

	Amount Requested ($)	Agency Fee for PPG ($)
• (up to)$100k for projects up to & including $3 million	50,000	4,750

PPG AMOUNT REQUESTED BY AGENCY(IES), FOCAL AREA(S) AND COUNTRY(IES) FOR MFA AND/OR MTF

GEF Agency	Type of Trust Fund	Focal area	Country Name/Global	(in $)		
				PPG (a)	Agency Fee(b)	Total c = a + b
UNEP	GEF TF	BD	Uzbekistan	50,000	4,750	54,750
Total PPG Amount				**50,000**	**4,750**	**54,750**

PART II: PROJECT JUSTIFICATION

A. PROJECT OVERVIEW

A.1.Project Description

The Global environment problems, root causes and barriers

Uzbekistan is located at the heart of Central Asia—one of the world's five most important centres of origin and diversity of cultivated plants. Among the many crops indigenous to the region are temperate fruit species of global importance, such as apple (*Malus domestica*), apricot (*Armeniaca vulgaris*), peach (*Persica vulgaris*), pear (*Pyrus communis*), plum (*Prunus domestica*), grape (*Vitis vinifera*), almond (*Amygdalus* sp.), pistachio (*Pistacia vera*), pomegranate (*Punica granatum*), and fig (*Ficus carica*), which are still conserved and managed by small scale farmers in the agriculture ecosystems. Over the course of several centuries, the diverse natural and climatic conditions have helped Central Asian farmers to produce traditional fruit tree varieties adapted to drought and resistant to a number of abiotic and biotic stress factors.

Although the Soviet centrally planning economy led to monoculture in vast irrigated areas significant diversity of local fruit varieties is maintained in household orchards where traditional agricultural practices

are applied and crop varieties are passed from generations to generations of farmers. Recent surveys of households and commercial orchards from 2006-2011 demonstrated that Uzbekistan is still the home of 83 traditional varieties of apricot, 43 – of grape, 40 - of apple, 30 of walnut, 21 of pomegranate, 15 of pear, grown within the farmers' production system. Wild almond, pistachio and walnut and other wild fruit and nut species are still concentrated in the forests and used by local people as sources of wild nuts and fruits for their food and income. This local diversity of fruit crops is the main source of nutrients for the inhabitants of both rural and urban areas since people here consumes fruit products as fresh fruits in the season and dried fruits in the off seasons. Local varieties of fruit crops and their wild relatives continue to form the basis of the livelihood of local people in Uzbekistan.

Key to the sustainability of this system has been the ecosystem regulating services provided by the high diversity of these important perennial fruit tree species to regulate diseases and arthropod pests, maintain of pollination service levels, and improve water use efficiency, all critical to the livelihoods of the poor. Many of local varieties of people's selection have high variation in globally significant traits such as frost and cold tolerance, drought and soil salinity tolerance, and pests and diseases resistance. These perennial fruit trees are the cornerstone to the sustainability and resilience of the production systems in the water-scarce environments of Uzbekistan, and their diversity has the potential to play a major role in enhancing and creating new such ecosystem regulating and support services.

Despite these conditions and the ongoing government efforts to restructure and diversify Uzbekistan's agricultural sector, the country faces serious problems of genetic erosion of this globally important traditional fruit tree diversity and the ecosystem services it provides particularly in water scarce environments. The main causes for this loss are summarized below:

(i) *Population increase* in these fragile water scare landscapes has contributed to decreased food availability and increased poverty for the people living in these s areas, resulting in extensive labor migration of farmers to urban areas, leaving areas of traditional varieties without the labor or economic incentives needed to maintain them.
(ii) *Limited national research funding* is channelled to developing technologies that support the use of local fruit tree genetic diversity and diversity rich solutions in the agricultural and development sectors. Government research has put its funding emphasis on breeding modern varieties for large scale single solutions that assume constant levels of temperature and precipitation, leaving almost no funds for exploiting the huge potential of the diversity of the *in situ* materials in these heterogeneous environments.
(iii) *Subsidies for modern varieties and associated agricultural inputs* mainstreamed by government extension services, because the value of local fruit tree genetic diversity to improve agricultural productivity and resilience in not fully recognized, causing the replacement of local crop biodiversity with modern varieties. This is a particular issue in areas where fruit tree diversity was lost during the Soviet Union period, to a large extent in water scare environments.
(iv) *Lack of access to quality and sufficient quantities of diverse planting materials*. Farmers are further hindered from maintaining current areas and increasing their farm land grown to traditional fruit tree resources when they need to replace trees, because of a lack of availability and access to quality and sufficient quantity of seedlings of traditional materials adapted to water scare environments.
(v) *The lack of research into the role that fruit tree genetic diversity plays in maintain ecosystem* services and sustainable production, means that conservers of ecosystem services provided by fruit tree genetic resources are not given their full value by agricultural and environmental agencies, leading to the replacement of traditional fruit tree varieties with other species.
(vi) *Access and benefit sharing agreements with farming communities* are not formally implemented, giving farmers little incentive to continue to conserve their traditional fruit tree genetic resources for the public good. Access and benefit sharing rules, laws and practices that would provide legal and administrative framework for developing and enforcing such access and benefit sharing agreements are not in place.

In addition, if local communities lose control over their rich heritage of traditional fruit tree diversity and associated knowledge, they will lose control of their production systems. This would increase their exter-

nal dependency on fruit tree planting materials and associated chemical inputs, promoting not only loss of cultural identity but also unsustainable production practices and also further environmental degradation, which could even cause social instability.

From this perspective, the project aims to address the following problems: a) loss of globally significant traditional fruit tree varieties and accompanied indigenous knowledge in water scare areas of Uzbekistan, b) loss of the ecosystem regulating and support services that these biodiverse production systems provide; c) lack of full valuation given to the ecosystem services provided and the local custodians who maintain this diversity and the ecosystem services they provide.

The Government of Uzbekistan notes the need to mainstream the use of the unique fruit tree diversity, a solution that not only protects the conservation and available use diversity locally, but one that expands the options for farmers to use more diversity within their agricultural ecosystems. In line with this, the Uzbekistan government recognizes that simplification has proven not to be the answer in highly heterogeneous water scare environments. In line with this the following barriers have been identified.

Barrier 1. The promotion by departments of agriculture and the private sector of unsustainable agricultural intensification practices in water scarce environment that do not value the role of fruit tree genetic diversity as a provider of ecosystem regulating services in land use management plans.

Water scarcity is a serious constraint to agricultural production in Uzbekistan, where fruit trees are an essential component of agricultural sustainability in many of the country's marginal, water-scarce lands. Agricultural intensification, including intensive tillage, irrigation, extensive monocropping and other unsustainable land management practices is resulting in increased soil erosion, salinization, desertification, and loss of soil structure and fertility. Government and private sectors are promoting intensification practices that focus on mono-cropping of uniform varieties. Not only do these systems increase dependence upon chemical fertilizers and pesticides, they reduce the resilience of the agricultural production system to unpredictable frost fronts during flowering leading to serious production losses and poor water management and retention in water-scarce environments. The promotion of unsustainable intensification practices are resulting in the loss of ecosystem regulating services provided by the biodiversity rich horticultural production systems, land degradation and the need for more and more chemical inputs to compensate for the loss of ecosystem resilience in the agricultural production system. Actions to conserve the diversity of temperate fruit tree crops are hampered by insufficient information about the value of these resources to enhance and create ecosystem services, particularly in terms of pest and disease regulation, pollination levels and water use efficiency. The ecological consequences of biodiversity loss on ecosystem functioning have been well-documented in natural ecosystems, but only recently have the consequences from the loss of agricultural biodiversity in the production landscape on the function of agroecosystems become known. Little national research funding is channeled to developing technologies that support the use of fruit tree genetic diversity to enhance ecosystem system services, as the majority of public and private sector funds are targeted to producing subsidized monoculture solutions with associated agricultural inputs, replacing fruit tree genetic diversity with uniform varieties. This loss of diversity is in turn diminishing farmers' capacity to cope with current pest and disease infestations, and limits their ability to adapt to migrations of new pathogens that have the potential to damage their crop in the future. Similarly, sustaining adequate densities of insect pollinators is also vital to crop production. There are well-documented cases where low fruit set of crops—and the resulting reduction in yield—has been clearly attributed to pollinator impoverishment.

Barrier 2. Smallholder farmers have limited access to adequate plant diversity (in the form of seedlings) needed to improve their resilience and response capacity to environmental change

Overall, the ability of the formal sector to provide seeds or other planting materials that meet the demands of smallholders fruit tree farmers has been compromised or placed at risk by the globalization, homogenization and reduction in numbers of companies combined with vertical integration, and by the loss of social institutions that sustain local seed systems (producers, networks etc.). Smallholders often have distinct needs for a wider range of diversity adapted to their vulnerable ecosystems and for managing risks. In this regard they face specific constraints in availability, access, and distribution that are not covered by existing

programmes and institutions and information to better market this diversity. Seeds systems exist, however the formal seed sector is not able to provide seeds or other planting materials that meet the demands of smallholders in the country and even less for smallholders living in vulnerable ecosystems. Local seed systems (producers, networks, etc.) that are essential for smallholders to maintain their planting material and to guarantee household food security, are gradually losing ground due to the weakening of social institutions and structures at the local level that support and sustain local seed systems and accompanying informal quality control mechanisms. Moreover, there is a lack of incentives to support small scale suppliers to provide materials that support the adaptation and evolution of the diverse planting materials that communities in vulnerable ecosystems need to meet the changing economic and environmental/climatic conditions that affect their agricultural production system.

Barrier 3: Inadequate legal and regulatory frameworks and administrative procedures to enable access to genetic resources and benefit sharing with farmer communities: Simplification has proven not to be the answer in highly heterogeneous marginal environments such as found in the water scarce areas of Uzbekistan. Yet the current legal and regulatory environment does not support diversified options to combat the threats of increased unpredictability of rain fall and cold fronts. A barrier to institutionalizing the integration of agricultural biodiversity rich practices, is the lack of laws and policies developed to regulate access to and use of genetic material and associated information; and sharing benefits derived from those uses. In particular, there is not a well-articulated legal and administrative framework to provide a basis for developing agreements with farmers and farming communities in ways that encourage them to enter into research and development partnerships involving the sharing, using and benefiting from genetic resources and associated knowledge. Nor are there mechanisms in place to engender confidence on the part of farmers and farming communities that their agreements can be enforced if down-stream users of their resources or associated knowledge fail to comply with important provisions. As a result, farmers and farming communities are not provided with incentives to engage in initiatives, involving a range of partners to investigate means of increasing the contributions of biodiverse farming systems to ecosystem supporting and regulatory services, resilience to climate change, enhanced food security and agricultural sustainability. Out of recognition of the need to provide such incentives, the international community recently finalized negotiations of the Nagoya Protocol to the Convention on Biological Diversity. It extends member states' commitments to promote and protect the interests of local communities and indigenous peoples vis-a-vis genetic resources, associated traditional knowledge, and the sharing of benefits associated with their use. The Nagoya Protocol also commits member states to putting mechanisms in place to enforce access and benefit sharing agreements that were developed in other countries. Uzbekistan has not ratified the Nagoya Protocol. Of course, it can develop laws that are consistent with the Protocol, but will not be able to enjoy the benefits that the protocol provides in terms of foreign recognition and enforcement of Uzbek access and benefit sharing agreements.

The baseline scenario and associated projects

The Government of Uzbekistan has made significant investment over the last 10 years in a collaborative regional project in Central Asia to addressed issues related to on farm maintenance of local diversity of fruit crops, *in situ* conservation of their wild relatives and protection of farmers' rights in national policy frameworks. Rich diversity of local fruit crops and wild fruit species was assessed in household orchards. The capacity of 16 fruit tree nurseries was strengthened to produce 146,600 saplings of target fruit crops and their wild relatives yearly. Fairs of fruit tree saplings were organized and more than 100,000 young seedlings were distributed among farmers every year. More than 600 new Uzbek farmers learnt technologies for their traditional fruit tree varieties of fruit trees grafting, selection of rootstocks and mother plants, fruit trees pruning, advanced technologies of fruit saplings cultivation. A broad collaboration across different sectors and strong partnership among stakeholders groups at national and regional levels, involvement of farmers in on farm/in situ conservation activities was carried out and model agreements across the five countries were developed on providing access and sharing the benefits were developed and memorandums on access and information sharing was signed to ensure exchange of information among partner countries.

In addition the International agencies such as JICA, USAID and IFAD have been assisting the Government of Uzbekistan with 240 million USD investments to shift agriculture development policy of Uzbekistan,

from one which for decades was based on monoculture of cotton and for past 20 years on cotton and wheat, to a more diverse agricultural ecosystems where fruit tree diversity plays an important role.

These ongoing initiatives listed below provide excellent entry points and work to build on.
Since 2009 the Ministry of Agriculture of Uzbekistan has been implementing the Agricultural Linkages (AgLinks) program with the support of the U.S. Agency for International Development (USAID). The project focuses on helping farmers in unlocking the potential for increasing productivity of fruit crops such as pear, apple, quince, apricot, cherry, peach and grapevine trough the adopting some simple new techniques in management practices and building the cold-storage facilities.

The Uzbek Government has been implementing also, since 2005, the Japan International Cooperation Agency (JICA) funding project "Improvement of Fruit Growing Technology in the Fergana Valley of Uzbekistan". The project worked to improvement of the fruit-growing technology in the Fergana Valley of Uzbekistan through transfer of certain technologies from Japan to Uzbek partners. These technologies were designed to facilitate the upgrading and development of gardening in Uzbekistan, as well as contribute to the promotion of international exchange of relevant technologies between the two countries. Within the framework of this project, Uzbek specialists learned from their Japanese colleagues the technologies of trimming and cutting-back of fruit. Despite its success, several issues arose during the course of this project: pest and disease control, measures against frost damage and spring frost damage, upgrading of reproduction technologies for fruit trees were not suitable for water scare environments of Uzbekistan**.** As a result, it was not possible to effectively apply the Japanese technologies.

The Government of Uzbekistan launched the "Horticulture support project" (HSP) in 2012 with sponsorship of International Fund for Agricultural Development (IFAD). This six year intervention will target small scale actors in the horticultural value chain through focus on the modernization of a privatized horticulture sector. The project target groups are: (i) small-scale horticulture producers operating on a maximum of six hectares, with special provision for those operating less than two hectares; (ii) horticulture-related small-scale services providers; and (iii) the rural unemployed. The project would directly benefit about 11,800 households. The project has a strong focus on rural finance, including improvement of access to appropriate financial products through the establishment of refinancing facilities to finance investments; 3) improved irrigation network in water supply infrastructure. The project is expected to seek synergies and coordinate its activities with the German Cooperation (GIZ) programme which will be launched in the project area and will provide technical assistance for the horticultural sector.

However, the main focus of these investments concentrates on importing commercial varieties and technologies for fruit tree and grape production despite of availability of rich local diversity of fruit trees and traditional technologies on its maintenance. The proposed project will mainstream the use of traditional fruit tree diversity into these large scale investments based on the earlier assessment and nursery multiplication work of traditional fruit tree genetic resources.

The proposed alternative scenario

While the water resources management is a principal environmental-resource issue in Uzbekistan the cotton and wheat production remains the main cash crops in national agriculture production system and the only crop sector getting support from the government for water management. At the same time, during the past two decades a number of researches demonstrated that fruit and nut trees can generate substantial environment benefits while meeting the immediate requirements in food and income. Moreover, the research findings also indicate that competition for water, nutrients and light between the crop and tree component is separated over the time in the integrated tree-crops ecosystems. This provides a unique opportunity to utilize the available resources of soil, water and nutrients to achieve maximum return in an economical and ecologically sustainable manner.

The proposed intervention will engage a broad stakeholder group, from farmers to policy-makers, in conservation and sustainable use of fruit species genetic resources. The project will target horticultural crop

species in 2 water-scarce agro-ecoregions in Uzbekistan. Priority crops are apricot (*Prunus armeniaca*), grape (*Vitis vinifera*), pomegranate (*Punica granatum*), pear (*Pyrus* sp.), almond (*Amygdalus* sp.), pistachio (*Pistacia vera*), and apple (*Malus* sp.), which are still conserved and managed by small scale farmers in the agricultural ecosystems.

Three systematic issues have been identified, they are (1) unsustainable agricultural intensification practices in water scarce environment that do not value the role of fruit tree genetic diversity (2) limited access by small holder farmers to adequate plant diversity (in the form of seedlings) needed to improve their resilience and response capacity to environmental stress factors and change and (3) Inadequate legal and regulatory frameworks to enable access to genetic resources and benefit sharing with farmer communities. While the third systematic issue is not site specific, the first two are. The project sites were selected to cover a range of soil, rainfall, temperature, and cultural management regimes, such that together they enable mainstreaming of the use of fruit tree diversity adapted to different ecological regimes. Moreover, a minimum of two sites are needed to accurately mainstreaming of fruit tree genetic diversity to regulate pest and diseases; different sites contain different pathotypes and insect biotypes of the same pest and diseases adapted to different ecological systems. Only through such a comparative site systematic approach can it be determined when and where the probability that the migration of new pathotypes or insect biotypes into a site will be reduced and regulated by the adopted fruit tree diversity. The two contrasting sites are described below.

1. **North-western agro-ecoregion** includes Aral sea area (Khorezm and Karakalpakstan) with severe climate. The area is considered the secondary centre of melons and rich with local diversity of rice and sorghum adapted to soil salinity. Agriculture depends on availability of water for irrigation. Local varieties of apple, apricot, pear, grape are resistant to cold weather and frosts in winter (-25^{o}C) and high air temperatures (+50^{o}C) in summer. This zone is the most affected with negative consequences of Aral sea shrinking as soil salinity, water resources shortage and their low quality. Severe cold winters and hot summer with strong winds both in winter and summer, high soil salinity are the main ecological characteristics of the project sites (Shurakhon, Hazratbobo, Hujabulgan, Karvak and Sarapayan villages) in this agro-ecoregion.

2. **South agro-ecoregion** includes Surkhandrya and Kashkadarya areas and is characterized with richness of fruit and nut-bearing crops as apple, grape, pomegranate, pistachio and almond resistant to drought. Many local fruit trees varieties have been originated from this eco-region and were disseminated to other parts of Central Asia. The project sites (Soliobod and Dashnabad villages) selected in this eco-region are characterized with very hot and dry summer with relatively mild winter.

Sites were selected by the executing organizations and their partners because of (i) high intra and inter specific diversity of the target crops; (ii) agroecological diversity including altitude, aspect, land type, soil type, vegetation, availability of irrigation; (iii) the importance of target crops for food security and overall livelihood strategy of the households in the community; (iv) logistics, as high altitude sites have operational constraints in terms of costs, access, time and facilities, thus, project sites were selected where partner institutions already have their presence in the districts; and (v) the level of community interest.

The **project objective** is to mainstream the conservation and use of fruit tree biodiversity to enhance ecosystem services and thereby improve the resiliency of traditional agricultural production systems in water-scarce landscapes. The project will achieve this through the following three components:

Component 1. Mainstreaming mechanisms that use agricultural biodiversity to enhance ecosystem services in water-scarce environments targets the first barrier of unsustainable agricultural intensification practices.

The project will ensure that an appropriate diversity of globally significant traditional fruit tree varieties is widely deployed and integrated into water-scarce agricultural production systems of Uzbekistan. At the same time the conservation and management of these small scale traditional fruit tree production systems have added value in increasing the ecosystem resilience and services in these marginal environments. The

principal ecosystem services that the project seeks to enhance are: water use efficiency, pollination service levels, and regulation of pathogens and arthropod pests. The project also aims to ensure that the ecosystem services derived from the management of agricultural biodiversity are recognized and widely promoted as part of national agricultural extension packages.

Outcome 1.1 3,000 hectars devoted to sustainably managed fruit treediversity is increased and ecosystem services are enhanced through greater use of biodiversity in water-scarce agricultural production systems.

Output 1.1.1 *Improved water use efficiency through increased presence of drought resistant fruit tree varieties in water-scarce agricultural production systems.*

Key to the sustainability to water-scarce agricultural production systems is that farmers are able to maintain major adaptive traits for drought stress tolerance, while at the same time continuing to keep a large diversity of other traits within the different traditional varieties that they manage. By combining farmers' empirical knowledge about the relative drought tolerance of different varieties with a technical assessment of tolerance through on-farm and on-station evaluation, scientists and farmers will together test and implement approaches to use within-species diversity in different production situations to increase overall levels of water-use efficiency in water-scarce environments. This will result not only an increase in production but also an increase in the area planted to fruit trees, particularly in marginal, semi-arid lands.

Output 1.1.2 *Enhanced level of pollination services through increased use of intra-specific fruit tree diversity.*

Drought resistant varieties can also be employed to good advantage for enhancing pollination services. Increased crop genetic diversity within the agricultural ecosystems has the potential to sustain greater diversity and densities of pollinators, both temporally and spatially in the landscape, leading to more resilient and abundant fruit tree and annual crop production.

Output 1.1.3 *Increased regulation of diseases and arthropod pests through greater use of local fruit tree genetic resources.*

Practices for effectively using crop genetic diversity in response to diseases and arthropod pest pressures will be developed, starting with mixtures of varieties already being used by farmers. These practices and procedures will be tested and validated in farmers' fields at the different project sites, and will be compared to determine appropriate spatial and temporal scales to manage pests and diseases. Materials and methods will be mainstreamed through national food security and food safety initiatives. This will include providing different mixtures of local germplasm from project sites and earlier collected materials (including from *ex situ* collections) from similar agroecosystems, and promoting the exchange of resistant materials among farmers within as well as between project sites.

Output 1.1.4 *Restoration of water-scarce degraded land areas with locally adapted fruit tree genetic resources.*

A greater diversity of fruit tree species that include varieties more resistant to drought, pests and diseases will enable farmers in water-scarce environments to expand the area planted to fruit trees to more marginal or degraded lands. The canopy and root systems of perennial fruit trees can significantly reduce the effects of wind and water erosion of the soil, improve the penetration and retention of rainwater, and contribute to the restoration of organic matter, structure, and fertility of degraded soils. The project will enhance integrated natural resource management practices by including and scaling up the use of the intra-specific diversity among cultivars maintained by farmers. The project seeks to mainstream such diversification in Uzbekistan by working in partnership with the national farmers' association to develop a toolkit of best practices and procedures that enhance ecosystem services through the management of crop biodiversity on-farm, and include these practices and procedures as part of the agricultural extension package for water-scarce farming communities. Other approaches that the project will employ to mainstream the on-farm management of crop biodiversity for obtaining enhanced ecosystem services will be FarmerFieldSchools and Seedling Diversity Fairs. These approaches both provide forums for farmers to exchange ideas about

the use, management, selection and conservation of crop genetic diversity; and offer training opportunities that create a new paradigm for partnerships among farmers, researchers and extension services.

Outcome 1.2 Policy and institutional framework mainstreaming biodiversity of local fruit species in water-scarce agricultural production systems are enhanced.

Output 1.2.1 *Analysis of gaps in national policies on agriculture development in water scarce environment and existing institutional framework.*
The project will analyze the existing agriculture policies and regulations to identify the gaps related to providing support to farmers and local communities in mainstreaming diverse agricultural biodiversity to cope with water scarcity and other unfavorable environment stresses in their production systems. The project will also study the current status of linkages among all actors involved in agriculture production, land and water resources management and agrobiodiversity maintenance including decision makers, farmer communities, researchers, extension service, private agencies and civil organizations at local and national level. This will help to formulate sound proposals for strengthening policy and development of strategic alliance among stakeholders.

Output 1.2.2 *Capacity built within the Uzbekistan agricultural extension service and government agencies to promote diversified fruit tree biodiversity in water scarce agricultural production systems*.
The training of agricultural outreach and extension staff, together with staff of government agencies will be carried out to support the process and the development of active Research and Development programmes. Multidisciplinary project team will investigate the problems and provide government and private sectors with new knowledge and capacity on alternatives to the current practice of promoting intensification of agricultural production systems that focus on mono-cropping of uniform varieties.

Output 1.2.3 *Institutional framework of coordination and partnership among national extension, research institutes, civil society, private sector and policy making agencies at local and national levels established to support formulation and implementation of policies and strategies on use of diversified fruit trees biodiversity in water scarce production systems in Uzbekistan.*
The project will strengthen coordination and partnership framework among stakeholders involved in conservation and utilization of natural resources in the country, including land, water, biodiversity resources management at all levels: local, regional and national. Farmer groups and local communities, research institutions, civil society organizations, development agencies, local authorities and national ministries will be brought together to formulate sound policy supporting fruit tree diversity deployment, utilization of local fruit tree diversity for adaptation to changing environment and ensuring sustainable production, access to diversified germplasm, access to increased knowledge, application of better practices. Linkages will be strengthen among farming communities and local and national extension and research staff to support knowledge sharing and mainstreaming of these practices through the Uzbek agriculture extension system.

Output 1.2.4 *A revised Uzbekistan national biodiversity strategy provides a framework for mainstreaming fruit tree biodiversity conservation and use and ecosystem services into relevant national regulatory decisions on agricultural production and food security.*.
Uzbekistan has been revising its strategic plans on biodiversity conservation and use where the risks of agrobiodiversity loss will be recognized and aspects of its maintenance in the production systems will be addressed. This provides the appropriate framework for development of policy recommendations in Uzbekistan that use fruit tree genetic diversity and are relevant to farmers needs at local, regional and national level. In this area the project will build on, and further develop, recent work supported by UNEP-GEF on "*In situ*/on farm conservation of agricultural biodiversity (horticultural crops and wild fruit species) in Central Asia" on strengthening national policies on conservation of wild fruit species in natural habitat, supporting farmers in sustainable management of local diversity of fruit trees in their orchards, recognition of farmers' rights as custodians of agrobiodiversity. Specific policy recommendations will be developed for mainstreaming of diversified fruit tree portfolio into land use management plans that influence the production systems.

Output 1.2.5 *Land use management plans are elaborated to include fruit tree genetic diversity at national, provincial, and district levels.*

A situation analysis of existing land use plans will be carried out to document regulatory and knowledge barriers in order to elaborate land use management plans to include fruit tree genetic resources conservation and use. Compatible land use plans at the site and district levels will be formulated based on the analysis and consultation with stakeholders, including local communities. Staff at state agencies and local communities will be trained on the importance of fruit tree biodiversity use for sustainable development and ecosystem service maintenance in water scarce environments. Land use options that reinforce existing social and economic priorities, which use fruit tree genetic resources will be developed. This will include integrating land management plans with growing markets for organic and sustainable products, maintaining essential ecosystem services, such as provision of freshwater, soil conservation and climate stability, and increased resilience to stress (e.g. increased unpredictability of rainfall and frost) at district levels.

Component 2. Increasing the use of fruit tree biodiversity that enhances ecosystem services in water-scarce environments targets the second barrier of government and private sector organizations not valuing the role that fruit tree genetic resources place in the creation, enhancement and maintenance of ecosystem regulating services.

Outcome 2.1 Farmers benefit from having increased availablity of locally adapted materials to improve ecosystem resilience through better regulation of pollination service levels, diseases and arthropod pests, land degradation, and water use efficiency.

Output 2.1.1 *Linkages enhanced among agricultural extension, local communities, seedlings suppliers (formal and informal), and national breeding systems and seed production authorities to maintain enhanced production of diversified seed sources.*
Formal linkages already established from past projects between community-based organizations, agricultural extension agencies and national research and policy agencies. These linkages will be enhanced to expand direct linkages of agriculture and environmental agencies and research institutes to national and local seedlings suppliers to enable diversified materials to be mainstreamed through the national seedling supply system.

Output 2.1.2 *Community biodiversity registries, and seedling biodiversity fairs linked to water management activities.*
The diversity of local fruit tree varieties and the traditional knowledge associated with them will be documented through the development of community biodiversity registries, which will raise farmers' awareness of the available fruit tree diversity and facilitate the exchange of relevant information about the varieties. Biodiverse seedling fairs will be organized to improve farmers' access to planting material of local varieties, and provide an opportunity to improve their knowledge about the ecosystem services that can be gained by planting an increased diversity of local fruit tree varieties.

Output 2.1.3 *Community-based seedling production of diversified materials is enhanced and linked to local and national water management schemes for small scale farmers.*
Community-based seedling nurseries will also be established and/or enhanced to propagate drought-tolerant varieties and distribute them to local farmers and also to other nurseries around the country where similar water-scarce growing conditions prevail. These nurseries will propagate and make available a diversity of local varieties as well as drought-tolerant varieties received from other parts of the country so that they can be tested, evaluated and used by local small-scale farmers for the diversification of their water-scarce production systems.

Output 2.1.4 *Information systems in place that enable local communities to easily access and and share data on local varieties and potential ecosystem services in water-scarce environments.*

Farmers who have to access seed from other sources have to depend on information offered by the seed provider or on common shared knowledge on traits, consumption characteristics, environmental adaptation and seed quality etc. to manage their crops. Often their information about crop varieties is extremely limited. Knowledge empowerment will be undertaken throughvillage-based knowledge centers to provide timely and local-specific information related to scion and rootstock compatibility, and contact custodians of diversity of both mother plants (scion block) and rootstocks.This will include using solar power where electricity is not continuous linked to low cost cell phone text messages applicable to the farmer's local conditionswill be used to increase the capacity for rural farmers to access key climatic, market and agroecological information to help them make informed decision making.

Outcome 2.2 Market mechanisms including trust are improved so that farmers have improved gains from increased production and ecosystem resilience, well-being, better cost-control e.g. reduced external inputs) from maintenance and use of the agrobiodiversity and increased returns for specific products.

Output 2.2.1 *Trust and confidence in areas of quality and prices among value chain actors (such as farmers, food manufacturers, retailers, community organizations, and government agencies) generated through the market chain established.*

Value chain analysis will be used to identify obstacles to obtaining greater value for traditional fruit tree varieties, to map out relationships among market actors and bottlenecks in flows of crop genetic resources, and to provide insight into how prices behave in seed, seedling and product markets. The analysis will be used to quantify how traditional fruit tree varieties obtain market value as they move from producers to consumers. As a result of the movement of goods through the value chain, the series of transaction costs arise. These will be classified into information, negotiation, and monitoring or enforcement costs and use to help identify how to better link the various market actors (producers, processors, traders, consumers) into equitable partnerships.. The infrastructure, institutions, policies, and customary practices that influence the broader market and the institutions and policies shaping the enabling environment will also be mapped. This will be followed by participatory market chain stakeholder consultations, which combine interests of producers, traders, retailers, exporters, cultivation experts, NGOs, government ministry representatives, and others. These will help generate and establish joint ventures with private-sector firms.

Output 2.2.2 *Diversification of seed and seedling suppliers and other stakeholders to provide locally adapted diverse fruit tree planting materials through market channels.*

Access to desired planting material is often one of the most vulnerable components of diversity management at local level. Strong seedling supply systems will enable farmers to maintain a high level of crop genetic diversity over time, despite regular and unanticipated losses of crop genetic diversity that is an inevitable part of farming, and especially in marginal areas. The project will establish and organize supply systems linked to market channels for appropriate, genetically diverse planting materials with different resistances to pests and diseases, and different levels of pollination services and water use efficiency. This will include the testing of interventions that provide incentives for local private or public seed production entities that can make planting materials available in the long run, in a sustainable way through market channels and connect activities of organizations involved in the development of crop varieties and the dissemination of certified quality seed with regional and local informal initiatives with potential to multiply and disseminate diversified genetic material among smallholder, vulnerable farmers.

Component 3. Promoting an enabling environment for access and benefit-sharing mechanisms that recognize and enhance the custodians of ecosystem services targets the third barrier of inadequate legal and regulatory frameworks and administrative procedures that enable benefit sharing for the custodians of ecosystem services provide by fruit tree biodiversity. The project aims at increasing the benefits and incentives to farmers from conserving and using crop diversity in their production systems.

Outcome 3.1 Options for national access and benefit sharing laws identified to support the promotion of ecosystem services within agricultural production systems.

Output 3.1.1*. Analysis of the existing laws and regulations related to ABS.*
The project will review and analyze all laws and regulations in Uzbekistan that effect access to plant genetic resources and the sharing of benefits associated with their use. This work will build on related research already conducted in the context of the UNEP/GEF project "*In situ*/on farm conservation and use of agricultural biodiversity (horticultural crops and wild fruit species) in Central Asia". Among other things, it will identify and analyze existing policies (and policy gaps) that are creating disincentives for farmers to provide access to, and enjoy benefit associated from the use of, fruit tree genetic diversity in water scarce production systems of Uzbekistan. Activities will include determining which national laws and policies encourage benefit-sharing (monetary and non-monetary) with farming communities and the formulation of provisions or the practices for data sharing and access to planting materials. Not finished sentence It will also include an analysis of international laws concerning access and benefit sharing, the extent to which Uzbekistan is in compliance with its international obligations, and a comparative analysis of access and benefit-sharing laws and mechanisms developed in other countries.

Output 3.1.2 *Awareness raisied and capacity built to facilitate national ABS policy development including consideration of the Nagoya Protocol.*
Based on the results of Output 3.1.1 awareness will be raised about international and national access and benefit sharing frameworks in this context, workshops will be also held with a range of stakeholders, including policy makers who are currently considering ratification of the Nagoya Protocol. Capacity will be built for partners in local and national government agencies in institutional and policy analysis within the agricultural and environmental sectors to formulate sound access and benefit sharing policies based on outputs from local communities and national research institutes. The project will also raise awareness of farmers, and NGOs about access and benefit-sharing issues; it will strengthen their capacity to make contributions to national processes to develop access and benefit sharing rules and regulations. They will also analyze the additional potential benefits that can be gained through membership in the Nagoya Protocol in terms of international monitoring and enforcement of the access and benefit sharing agreements. In this context, it is worth noting that the Nagoya Protocol functions to extend, beyond the standards that exist under the CBD, the rights of indigenous and local communities as potential providers of genetic resources and associated traditional knowledge.

Output 3.1.3 *Recommendations developed to put in place ABS issues in national policies and laws that support the use of biodiversity to enhance ecosystem services and resilience in agricultural production systems.*
Based on the forgoing activities, the project will sponsor participatory activities to develop recommendations for Uzbekistan to ratify international laws concerning access and benefit sharing, including the Nagoya Protocol, and to identify/recommend the primary elements/components that need to be built into national access and benefit sharing laws in Uzbekistan while fulfilling their international obligations. It will include a particular focus on implementing options and mechanisms that respond to, and promote the use of crop diversity for the benefit of farmers.

Output 3.1.4 *Documentation drafted for ratification of Nagoya Protocol by Uzbekistan.*
The project will assemble the documentary record necessary to support the ratification of the Nagoya Protocol by Uzbekistan. The project will bring leading researchers in contact with competant national authorities responsible for promoting the ratification of the Nagoya Protocol, to help sensitize them about the perspectives of farmers and national researchers about fruit tree genetic diversity in water scarce production systems of Uzbekistan. It will also allow the competent authority to inform the researchers about the kinds of documentary record and summary information that is most useful. The project will draw upon, and use where appropriate, documentary records established for this purpose in other countries.

The incremental cost reasoning and expected baseline contributions
The Government of Uzbekistan has a strong commitment to sustainable agricultural development using fruit trees. Building on past work, the Uzbek Government has been committing a significant amount of resources

to sustainable agricultural development of fruit tree diversity in water scarce environments. In 2011 the Uzbek Government allocated 244 million USD for the national programme on strengthening and modernization of fruits production, storage and processing in 2011-2015. In addition, the Government of Uzbekistan allocates 270,000 USD annually for running costs of the National Agricultural Genetic Resources Centers for Plants, Animals and Microorganisms which supports the conservation of crop genetic resources in the medium and long term. However, much of these resources will be allocated for salaries and operational costs. The Government of Uzbekistan has a commitment to mobilize local agricultural biodiversity for sustainable agricultural production, but on-going government support is not sufficient to support the methods and knowledge learned through earlier projects, nor to fully capitalize on the collaborative partnerships developed among formal and informal sectors to enable the use of agricultural biodiversity and diversity-rich management practices to overcome the above barriers and achieve the Global Environmental goals.

Without the project research, funding to develop technologies that support the conservation and use of traditional fruit varieties and the ecosystem services they proved could not be carried out. These technologies are important to be able to conserve and use the huge potential of the diversity of local fruit tree varieties and ecosystem services they provide to reduce the vulnerability of farmer communities in water scarce environments. The activities carried out with GEF resources will also allow the development of indicators to measure utility of fruit tree biodiversity to support ecosystem regulating services to regulate soil and water processes, pests and diseases, enhance levels of pollinator efficiency in water scarce systems and to conserve intraspecific diversity through exploiting its potential to reduce productive losses from unpredictable changes in temperatures and rainfall patterns.

Without the components proposed in this project, Uzbekistan risks losing an opportunity for a globally relevant, systematic mainstreaming of fruit tree biodiversity into Regional and International protocols. In the absence of this project, fruit tree biodiversity conservation will remain removed from development goals and receive less support from public policy and these ecosystems, particularly rich in unique diversity, will continue to face the threat of genetic erosion and the loss of valuable genetic resources In addition to this global consequence, implementation of the project will also help meet national priorities and will provide means for the country to benefit through shared best practices and experiences in the sustainable management of biodiversity. Without this project, an opportunity to enhance the conservation and sustainable use of valuable resources to meet environmental and development goals will be lost.

In the absence of the proposed project, Uzbekistan risks losing the opportunity to implement an innovative, globally relevant systematic mainstreaming of biodiversity and the ecosystem approach into regional and international protocols. Without this project, fruit tree biodiversity conservation will remain removed from development goals and receive less support from public policy, and these ecosystems, rich in unique crop diversity, will continue to suffer the effects of genetic erosion and the irreparable loss of valuable genetic resources. In addition to averting this global consequence, implementation of the project will also help meet national priorities and will provide means for the country to benefit through shared best practices and experiences in the sustainable management of fruit tree biodiversity. Without this project, an opportunity to enhance the conservation and sustainable use of valuable genetic resources to meet environmental and development goals will be lost in the water-scarce agricultural production systems of Uzbekistan.

Global environmental benefits

The expected global environmental benefits of the project include: (i) Conservation of globally important biodiversity adapted to water-scarce agricultural landscapes (ii) increased number of hectares in the target sites in three agro-ecoregions of Uzbekistan where external inputs are replaced with a biodiversity-rich solution in this globally important ecosystem, (iii) traditional fruit tree genetic diversity of apricot (*Prunus armeniaca*), grape (*Vitis vinifera*), pomegranate (*Punica granatum*), pear (*Pyrus* sp.), almond (*Amygdalus* sp.), pistachio (*Pistacia vera*), and apple (*Malus* sp.) and ecosystem services conserved through a set of globally applicable technologies to increase the resilience of water-scarce agricultural ecosystems (iv) globally applicable, community-based conservation models and tools that support indigenous and local

communities – as well as the scientific and development communities – to conserve and use local fruit tree biodiversity to regulate pests and diseases, increase pollination services, and improve soil conservation and water use efficiency in water-scarce production systems.

The expected global environmental benefits of the project include: (i) conservation of globally important biodiversity adapted to water-scarce agricultural landscapes (ii) increased number of hectares in the target sites in three agro-ecoregions of Uzbekistan with biodiversity rich solutions as a substitute for external inputs in these globally important ecosystems, (iii) conservation of traditional fruit tree genetic diversity of apricot (*Prunus armeniaca*), grape (*Vitis vinifera*), pomegranate (*Punica granatum*), pear (*Pyrus* sp.), almond (*Amygdalus* sp.), pistachio (*Pistacia vera*), and apple (*Malus* sp.) and the ecosystem services they provide through a set of globally applicable technologies to increase the resilience of water-scarce agricultural ecosystems (iv) globally applicable, community-based conservation models and tools that support indigenous and local communities – as well as the scientific and development communities – to conserve and use local fruit tree biodiversity to regulate pests and diseases, increase pollination services, and improve soil conservation and water use efficiency in water-scarce production systems.

Innovativeness, sustainability and potential for scaling up

Water scarcity is a major problem in the agriculture development in Uzbekistan. Considering that this issue is becoming more serious over the last decades the project is aimed to use local fruit tree varietal diversity and its functional traits and facilitative interactions for pest, disease and pollinator regulation, nutrient cycling, and soil-water retention to support ecosystem regulating services and promote long-term stability of agricultural production systems in the water scarce environments of Uzbekistan. This innovative approach of use of fruit tree genetic resources to combat the destruction of ecosystem regulating services (reduced water quality and pollination efficiency, and the increased vulnerability to disease and arthropod pests and natural hazards (floods, droughts) and ecosystem supporting services – (slower hydrological cycling, soil nutrient cycling and soil formation) will be promoted through activities under the Outputs1.1.4, and 2.1.3.Additionally, sustainable use of fruit trees diversity adapted to water scarce environment will help to reduce application of chemical fertilizers and pesticides and contribute to the food safety and health. Although in natural ecosystems, the relationship between biological diversity and ecosystem regulating and supporting services has been given economic value, in cultivated systems the potential role of agricultural biodiversity to provide ecosystem services has not been harnessed, Activities for Output 1.1.1, 1.1.2 and 1.1.3 support this. This innovative approach will be scaled up to overcome the Barriers presented earlier through a paradigm shift of the Uzbekistan partners under Outputs 1.1.4, 2.1.1 and 2.1.4 that will move away from single solutions in agricultural production systems by creating 'insurance' portfolios comprised of multiple ways to better use agricultural biodiversity to enhance ecosystem services. Activities leading to Outputs 2.1.2 and 2.1.3 will build capacity of natural resource managers to support and create partnerships with small scale farmers who use agrobiodiversity management methods that reduce vulnerability in the production system while at the same time maintaining productivity through the activities under Component 1, thus contributing to overcoming Barrier I. Activities under Outputs 2.1.1., 2.1.2 and 2.1.4 will work to change consumer and retailer norms that support the use of agricultural biodiversity in agricultural production systems that reduce vulnerability with continued productivity through enhanced ecosystem services and thus allowing Barrier II to be overcome. Under Outputs 3.1.1, 3.1.2 and 3.1.3 activities support innovative policies towards legal measures and incentives that support production systems with less dependence on external inputs, and wiser management of agricultural biodiversity.

A.2. Stakeholders

The proposed project will build on and strengthen past, present and proposed future activities supported by the Uzbekistan Government and its long term partnerships with 10 national institutions and NGOS, to mainstream the conservation and use of fruit tree diversity in water scarce environments of Uzbekistan to improve ecosystem resilience, ecosystem services and access and benefit-sharing capacity for small scale farmers.

Uzbek Institute of Genetics and Experimental Plant Biology will be the main execution and coordination agency for the project. The project will closely work with a diverse group of stakeholders including research institutions, policy making agencies of national and local levels, farmers and local communities, farmers associations and other non-governmental organizations and unites them in an effective project implementation team. Ministry of Agriculture, State Committee of Nature Protection and Republican Association of Farmers will contribute to formulation of the enabling policy for access and benefit-sharing mechanisms that recognize and enhance the custodians of ecosystem services, conservation and sustainable use of agro-biodiversity for the benefit of the nation and global community. Technical support will be provided to the project team by research institutions (Uzbek Research Institute of Plant Industry, R.R. Shreder Institute of Horticulture, Viticulture and Winemaking, Tashkent State Agrarian University, Samarkand State University, Mamun Academy) in analysis and testing of approaches and practices. Male and female farmers and community based organizations will conduct participatory research and analyze, manage and improve their own fruit tree genetic resources together with project partners. Lead male and female farmers in Zarkent and Sukok communities (Central agro-ecoregion) , Soliobod, Hujabulgan and Dashnabad communities (South agro-ecoregion), Shurakhon, Hazratbobo, Karvak and Sarapayan communities (North-western agro-ecoregion) will be identified and involve in the project to enhance community capacity in management and sustainably utilization of fruit tree biodiversity in high water stress environments. Capacity and leadership will be built so that male and female farmers have the ability to participate in local and national decision making forum concerned with access and use of genetic resources.

Stakeholder participation arrangements during project preparation

An informal coordination team involving Ministry of Agriculture of the Republic of Uzbekistan, State Committee of Nature Protection of the Republic of Uzbekistan, research institutes of Academy of Sciences, Farmers' Association, Bioversity International and UNEP has already been established for this project to oversee project preparation and ensure full participation of stakeholders during this process. The coordination team will ensure that all relevant stakeholders are consulted and involved in the development of the project proposal. Consultation with stakeholders will be made on regular manner. At least two workshops with stakeholders will be organized during the project preparation stage to consult, generate information, validate the approach and develop stakeholders' partnership strategy for implementation of the project. In addition, separate consultation and discussion will be organized with stakeholders to develop co-financing plan and ensure its implementation. The most importantly consultation with local communities at the project sites will be undertaken. These consultations will utilize the already established Multifunctional Site Committees (MSC) and Coordination Committees (CC) mechanisms that have developed within the UNEP-GEF project "*In situ*/on farm conservation and use of agrobiodiversity in Central Asia".

A.3. Risks

The potential risks to project implementation and mitigation measures that will be taken are as follows:

Risk	Level	Mitigation Strategy
Climate change or other environmental events remove diversity and lead to expansion of desert and arid zones in Uzbekistan	M	Necessary mitigation measures and good practices of mitigation will be identified and included in the National Agricultural Biodiversity Strategy and national policies to be developed within framework of the project. Emphasis will be placed on the active participation of local communities in the identification and implementation of adaptation measures. This will help the proposed project design measures aimed at increasing the resilience and adaptability of important agroecosystems in Uzbekistan.
The political and security environment deteriorates	L	Uzbekistan has a stable government system in place.
The Government of Uzbekistan does not uphold supportive polices for the use of traditional	L	Given the interest of the Government of Uzbekistan to increase local fruits and grape production which is confirmed by recently adopted national programmes this risk is deemed low.

fruit tree diversity for ecosystem services		
There is failure of the private sector and NGOs to engage	L	Past experience has shown that it is difficult to engage the private sector in production of crops without, or little, monetary value. This might be aggravated by inadequately developed markets for potential agricultural biodiversity products. However, there is growing demand for products that can demonstrate a sustainable production base, particularly in the case of fruit trees.
Communities and farmers do not wish to participate	L	Farmers and local communities will be involved in a participatory manner at all stages of project development so that their problems and concerns are realistically identified and measures are embedded to address these. Project implementation experiences from over 20 countries have shown this risk is overcome by adoption of appropriate participatory approaches during project planning and implementation phases
Commitment to *in situ* and on-farm conservation of agricultural biodiversity may not be desirable to all farmers and communities.	M	To mitigate this, the project will explore the use of incentive measures to make this more attractive to farmers.
The national agriculture and environment sectors do not cooperate and do not demonstrate effective coordination	L	National stakeholders have expressed a strong desire for this project and project development will rely on significant representative partnerships comprised of stakeholders at all levels.

A.4. Coordination.

The project will be based on the main outputs and lessons learned from UNEP/GEF project "In situ/on farm conservation and use of agricultural biodiversity (horticultural crops and wild fruit species) in Central Asia", implemented in Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan in 2006-2012 and aimed on exchange and provision of knowledge, methodologies and enabling policies to help farmers, institutes and local communities to ensure sustainable in situ/on-farm conservation and utilization of local diversity of apple, apricot, almond, grape, cherry-plum, mulberry, peach, pear, pomegranate, pistachio, sea-buckthorn and walnut in Central Asia. The project resulted in policies that support sustainable management of fruit species genetic diversity (cultivated and wild resources), better knowledge on fruit crops diversity level and its distribution, traditional knowledge of farmers on management practices, participation of farmers and local communities in conservation actions, and improved capacity of stakeholders to implement legal, scientific, and social aspects of fruit species genetic diversity conservation. At global level the project will continue collaboration and exchange of expertise with the UNEP/GEF project "Conservation and sustainable use of cultivated and wild tropical fruit diversity: promoting sustainable livelihoods, food security and ecosystem services" which aims at strengthening sustainable livelihoods through improved management and utilization of tropical fruit genetic diversity by strengthening the capacity of farmers, local communities and institutions in Indonesia, India, Malaysia, Thailand. The proposed project will also closely collaborate with the recently started "Horticulture support project" (HSP) funded by IFAD in area of enhancing the resilience of rural livelihoods to climate change and reducing their vulnerability to extreme weather events through mainstreaming adapted traditional fruit tree diversity into productions systems and increasing ecosystem services in marginal environments. The project will collaborate with the new GEF-UNDP projects "Sustainable agriculture and climate change mitigation project" in area of improving knowledge and skills of farmers and local communities in water use efficiency and agricultural productivity and "Reducing pressures on natural resources from competing land use in non-irrigated arid mountain, arid semi-desert and desert landscapes in Uzbekistan" in area of development of integrated policy, legal and institutional framework for applying integrated landscape management, ensuring that the ecosystem services derived from the management of agricultural

biodiversity are recognized and included in the national agricultural extension packages. The project will closely work with national government agencies, private organizations, research centres and local communities to ensure that local fruit crops diversity is deployed in fruit trees nurseries and promoted in 22,000 ha of new orchards and vineyards to be established in the target agro-ecoregions according to the national programme "On measures on further viticulture development in the Republic of Uzbekistan for 2013-2015" (President's Decree #1937 of 13 March 2013).Options for coordination with ongoing international and national initiatives in the country will be further investigated during the project preparation phase to ensure complementarity of these initiatives and benefiting from each other.

B. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

B.1.National strategies and plans or reports and assessments under relevant conventions, if applicable, i.e. NAPAs, NAPs, NBSAPs, National Communications, TNAs, NCSAs, NIPs, PRSPs, NPFE, Biennial Update Reports, etc:

The project is fully consistent with National Strategy and Action Plan on Biodiversity Conservation (1998) which underline sustainable use of biodiversity resources to meet economic, research and cultural needs of people in Uzbekistan, and ensuring biodiversity conservation and ecosystems health as one of the national priorities in biodiversity conservation. In 2013, the State Committee on Nature Protection of Uzbekistan has started the development of the new version for the NBSAP of Uzbekistan for 2011 -2020 in which mainstreaming of agricultural biodiversity to ensure ecosystem resilience is one of the priority areas, in recognition that Uzbekistan is part of the Central Asian centre of diversity and domestication of globally important crops including temperate fruit trees and has fragile (mountains) and vulnerable (Aral Sea area) ecosystems (Addressing Environmental Risks in Central Asia, 2003, Environment, Water and Security, 2005; EU Regional Strategy Paper for 2007-2013). These globally important crops are the target biodiversity of this proposed project and therefore directly in line with the direction of the new NBSAP.
Considerable efforts to strengthen the national policy and legislative framework on biodiversity conservation have been undertaken by the government of Uzbekistan. National laws on "Nature protection" (1992), "Protection and utilization of plant resources" (1997), "Natural protected areas" (2004), "On strengthening control on sustainable use, import and export of biological resources in Uzbekistan" (2004) stipulate actions on biodiversity and ecosystems conservation in the country. National Strategy for Sustainable Development (1999), National Agenda on Millennium Development Goals (2000), National Environment Protection Action Plan (2008), National Programme on Environment Monitoring (2011) consolidate the country's actions on conservation of biological resources, eradication of poverty and environment sustainability. Development of National Program on protection and sustainable use of agrobiodiversity and its mainstreaming in agricultural production systems is also indicated as a priority measure in the Third CBD report of Uzbekistan.

The project is fully in line with Uzbekistan's development of policies on Access and Benefit sharing under Article 4 "Strategic priorities" of the National Strategy on Biodiversity Conservation (1998) which includes "Assessment and development of measures on sustainable utilization of biodiversity and ensuring fair benefit sharing" as one of three national priorities, and under Article 3.1.3 "Determine new potential instruments and mechanisms on sustainable utilization of biological resources and fair benefit sharing." The Uzbekistan Action Plan on Biodiversity Conservation (1998) also includes the actions to analyze international experience in sustainable utilization of biological resources and fair benefit sharing and develop proposals based on obtained results and international experience on implementation of new approaches, instruments and mechanisms, optimizing biodiversity utilization and ensuring benefit sharing.

The project is in line with Uzbekistan's contribution to the CBD's Strategic Plan, and the Aichi Targets adopted at the 10th Conference of the Parties of the CBD, and the Nagoya Protocols. Most directly it will contribute to the Aichi Target 7 on sustainable management of areas under agriculture and to the maintenance of the diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically, as well as culturally valuable, species (Target 13). However,

the work of the project will also make material contributions to other targets through for example integrating biodiversity values into national and local development and poverty reduction strategies (Target 2), seeking to reduce pollution from excess nutrients (Target 8) and improving the provision of essential services from ecosystems (Target 14) of global significance.

B.2. GEF Focal area and/or fund(s) strategies, eligibility criteria and priorities:

The proposed project is consistent with **FA Objectives 2 and 4 of the GEF-5 Biodiversity Results Framework**. In particular, the project will contribute to **Outcomes 2.1** by mainstreaming the enhanced use of agricultural biodiversity tosupport ecosystem regulating services in the water-scarce production landscapes of Uzbekistan. Component 1 of this proposal will address this by mainstreaming community-based activities and technologies that enable farmers to benefit from the use fruit tree biodiversity to increase pollination service levels, regulate diseases and arthropod pests, reduce soil erosion, and improve water use efficiency. The project will contribute to **Outcome 2.2** by developingrecommendations for policy and regulatory frameworks that allow for an enabling environment for local and national agencies to move away from recommending that farmers yield to economic pressures of cultivating only one variety, towards recommending a diversification of varieties to increase ecosystem regulating services, and thus increasing the resilience and coverage of the production system without incurring losses in ecosystem services. Component 2 of this proposal specifically addresses **Outcome2.2**by increasing access to local agricultural genetic resources that will enhance ecosystem services targeted toward the poor (pollination service levels, pest and disease regulation, soil conservation, and water use efficiency) in water-scarce environments. **Outcome 4.1** is specifically addressed by Component 3 which will promote an enabling environment for access and benefit sharing mechanisms that recognize and enhance the regulating ecosystem services provided by biodiverse agricultural production systems

The project will support awareness raising about the status of international access and benefit-sharing laws, including the Nagoya Protocol, and identification of national options for the development of legal and regulatory frameworks, and administrative mechanisms that enable access to genetic resources and benefit sharing (ABS). These options will include developing CBD and Nagoya Protocol-consistent procedures for acquiring Prior Informed Concent (PIC) on Mutually Agreed Terms (MAT) with local farming communities and farmers, ensuring that the benefits derived from the use of genetic resources contributes to the sustainable management of biodiversity by local farmer communities. Model agreements will be developed and tested in consultation with farmers organizations and national competant authorities.

B.3. The GEF Agency's comparative advantage for implementing this project:

UNEP's comparative advantage derives from its mandate to coordinate UN activities with regard to the environment, including its convening power, its ability to engage with different stakeholders to develop innovative solutions and its capacity to transform these into policy- and implementation-relevant tools. The organization has the mandate of advancing global environmental protection, particularly with its current Medium Term Strategy and its strategic framework for 2010-2011 and 2012-2013 for Subprogramme 3 (Ecosystem Management) and Subprogramme 4 (Environmental Governance). Subprogramme 3 focuses on facilitating cross-sectoral, integrated approaches to ecosystem management; Subprogramme 4 on ensuring that environmental governance at country, regional and global levels are strengthened to address agreed environmental priorities. The proposed project will benefit from UNEP's extensive work on conservation and management of natural resources within the ecosystem context, and building capacity in access and benefit sharing (ABS). The Project will establish synergies with UNEP's Programme of Work, sub-programme 3: *Ecosystem Management* through Projects 4 and 9. Project 4, *Biodiversity and Ecosystem Functioning*, which seeks to develop practical tools to improve understanding of the relationship between biodiversity, ecosystem functioning and ecosystem services and apply this knowledge to ecosystem management. It also aims to develop biodiversity targets and indicators that link biodiversity and ecosystem services and integrate them into sectoral management plans. Project 9, *Evaluating the Trade-offs and Benefits of Sustainable Food Production Systems*, which aims to strengthen the capacity of national policy makers and planners to understand the linkages between food security and environmental degradation, undertake economic valuation of ecosystem services relevant to food security and analyse the trade-offs and distributive impacts of food security policies. as well as other relevant UNEP-hosted on-going

initiatives such as TEEB, IPBES, the UNEP/UNDP PEI (Poverty and Environment Initiative) and providing linkages with the broader portfolio of UNEP/GEF projects focusing i.e. on Ecosystem Services (e.g. ProEcoServ, Danube PES, etc.).

The United Nations Environment Programme (UNEP) will implement the Project and bring to bear its combined body of scientific and empirical experience of critical relevance to the objectives of the project. UNEP has provided global leadership and encourages partnership in biodiversity conservation including agricultural biodiversity conservation as well as a wealth of experience on mainstreaming biodiversity into policies, programmes and practice. Over the last decade, UNEP through the Global Environment Facility (GEF) has partnered with national and international organizations on a set of national and multi-country projects, focusing on different components of agricultural biodiversity[1].As the GEF Agency for this project UNEP will provide a platform for a collaborative partnership between several national and international organizations which will bring the best available expertise in science and knowledge from the scientific community to partners who are working at the development interface at the national level, with the overall aim of mainstreaming biodiversity into sustainable development and specifically climate change planning and management.

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

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

NAME	POSITION	MINISTRY	DATE*(MM/dd/yyyy)*
Dr. Sergey Myagkov	Deputy Director	NIGMI, Uzhydromet	08/23/2012

B. GEF AGENCY(IES) CERTIFICATION

This request has been prepared in accordance with GEF/LDCF/SCCF/NPIF policies and procedures and meets the GEF/LDCF/SCCF/NPIF criteria for project identification and preparation.					
Agency Coordinator, Agency name	**Signature**	**DATE***(MM/dd /yyyy)*	**Project Contact Person**	**Telephone**	**Email Address**
Maryam Niamir-Fuller, Director, GEF Coordination Office, UNEP, Nairobi		12/11/2013	Marieta Sakalian, UNEP Senior Programme Management /Liaison Officer (CGIAR/FAO), Biodiversity	+39 06570 55969	Marieta.Sakalian @unep.org

[1] See '*Securing sustainability through the conservation and use of agricultural biodiversity – the UNEP-GEF contribution*' http://www.unep.org/dgef/Portals/43/AgBD_publication_FINAL.pdf)