PROJECT IDENTIFICATION FORM (PIF)

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

PART I: PROJECT IDENTIFICATION

Project Title:	Transforming Management of Protected Area/Landscape Complexes to Strengthen Ecosystem Resilience		
Country(ies):	Peru	GEF Project ID:	5080
GEF Agency(ies):	UNDP	GEF Agency Project ID:	5152
Other Executing Partner(s):	MINAM	Submission Date:	September 4 , 2012
GEF Focal Area (s):	Multi-focal Biodiversity, Land Degradation, Sustainable Forest Management	Project Duration (Months):	60
Name of parent program (if applicable): ➢ For SFM/REDD+ ☐	N/A	Agency Fee ($):	899,143

A. FOCAL AREA STRATEGY FRAMEWORK:

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Indicative Grant Amount ($)	Indicative Co-financing ($)
BD-1	**Outcome 1.1:** Improved management effectiveness of existing and new PAs.	**Output 1.1.1**. New PAs (5, to be confirmed during PPG phase) and coverage of unprotected ecosystems (100,000 hectares). **Output 1.1.3.** Sustainable financing plans (9)	GEFTF	4,281,634	23,821,193
LD-3	**Outcome 3.1:** Enhanced cross-sector enabling environment for integrated landscape management	**Output 3.1.1.** Integrated land management plans developed and implemented **Output 3.2.1.** INRM tools and methodologies developed and tested	GEFTF	2,140,818	11,910,596
SFM-REDD-1	**Outcome 1.3:** Good management practices adopted by relevant economic actors.	**Output 1.3 (a):** Services generated in forests. **Output 1.3 (b):** Services generated in the wider landscape.	GEFTF	2,140,818	11,910,596
		Sub-Total		8,563,270	47,642,385
		Project Management Cost (BD-1: 214,082; LD-3: 107,041; SFM-REDD-1: 107,041)	GEFTF	428,164	2,382,119
		Total Project Cost		**8,991,434**	**50,024,504**

B. PROJECT FRAMEWORK:

Objective: to enhance the resilience of vulnerable ecosystems to the impacts of climate change in PAs and surrounding landscapes , and thereby to secure their biodiversity and ecosystem functionality and derivative ecosystem services including greenhouse gas sequestration and emissions reduction.

Project Component	Grant type	Expected Outcomes	Expected Outputs	Trust Fund	Indicative Grant Amount ($)	Indicative Co-financing ($)
Component 1: Core PAs with increased resilience to CC		**Improved effectiveness of PAs in protecting vulnerable ecosystems** as measured by: - Effective PA governance protects major habitat blocks, and biodiversity patterns and process, in the face of the modified threats resulting from CC, resulting in increased effectiveness of enforcement (prosecution per unit effort) 9 PAs covering 6 million ha, representative of vulnerable ecoregions including the Peruvian yungas, Southwest Amazon moist	**1.1 Additions to areas under conservation, including:** • Regional Conservation Areas • Private Conservation Areas • Areas covered by Conservation Concessions given to NGOs • Areas covered by Management Agreements with local communities **1.2 Management regimes for PAs, which enhance the resilience of forest ecosystems and their contribution to the country's REDD strategy,** including: • Integrated fire management	GEFTF	4,855,978	18,561,011

		forest and Central Andean wet puna. -Increase in METT scores (baseline and target figures tbd) - Improvement in conservation status of vulnerable species in PAs including giant anteater (*Myrmecophaga tridactyla*), Pacarana (*Dinomys branickii*), South American tapir (*Tapirus terrestris*), Andean spectacled bear (*Tremarctos ornatus*), Dwarf Brocket deer (*Mazama chunyi*) and Goeldi's marmoset (*Callimico goeldii*) (species and targets tbd) **Increased area of PAs to protect core refugia**: 100,000ha (to be confirmed during PPG phase) of additional area included in diverse models of PAs including regional conservation areas, private conservation areas, conservation concessions and management agreements.	• Enrichment planting and/or selective thinning to maintain ecosystem structure and connectivity • Low impact production systems (e.g. shade coffee, sustainable extraction of NTFPs) **1.3 PA management instruments strengthened to address climate change induced threats and pressures likely to undermine resilience**: • Regionally specific forecasts of meteorological trends and associated CC impacts on ecosystem functions • Nationwide Atlas, GIS BD database and map layers produced and linked to annual operational planning and budgetary allocation for the management of vulnerable ecosystems • PA management plans reconfigured making provision for the implications of CC on ecosystem pattern and process and the magnitude and nature of threats that are undermining resilience • Staff deployment plans reflecting modifications to threats and management approaches **1.4 Strengthened PA enforcement capacities**, reflecting increased and/or modified threats resulting from CC, including: • Equipment for surveillance, communication and transport, available to PA staff and collaborators, enabling them to detect and respond effectively to threats. **1.5 Monitoring mechanisms** • System for monitoring, analysing, disseminating and responding to information on the impacts of climate change on PAs and on the effectiveness of vulnerability reduction strategies • Long term BD monitoring systems in place for targeted species and ecosystems **1.6 Financing framework for PA and landscape management** • Internal budgetary restructuring (in MINAM, MINAG and MEF) to allow finance and human capital to be deployed to address specific risks • Brokering finance from national budgets to address CC threats to vulnerable ecosystems			
Component 2. CC-resilient production landscapes buffering PAs		**Improved flows of global environmental benefits in buffer zones** (variables and baseline/target values to be defined/confirmed during the PPG phase): • Biodiversity: **No net loss of critical major habitat blocks** (e.g. Peruvian yungas, Southwest Amazon moist forest and Central Andean wet puna) in buffer zones **Increases in ecosystem connectivity**, as indicated by increases in connectivity, integrity and resilience indices and reduction in distance between major habitat blocks in priority buffer zones (to be measured by the bd intactness index) • Land Degradation: **Reduced soil erosion rates** in areas under improved management **Stable habitats of plant and**	**2.1 Institutional framework for buffer zone management**: • Cross sectoral institutional platform for planning, implementation, enforcement and monitoring of the management of buffer zones, involving MINAM, MINAG, provincial and municipal governments. • Integrated Natural Resource Management plans, to reduce conflicting land uses adjacent to PA areas and provide spatial planning to guide current and future baseline investments for: a) appropriate SLM practices to avoid, reduce and off-set LD (emphasis in Andean Puna ecosystem); and b) adoption of appropriate SFM practices in forest fragments in the yungas and Southwestern amazon forest (coffee shade; NTFP; forest enhancement etc) . **2.2 Sustainable CC-resilient SLM practices generating LD benefits and conserving ES in target location in the Puna** including: , • Eco/agrotourism • Sustainable management of high altitude camelid	GEFTF	3,707,292	29,081,374

		animal species in production landscapes and adjoining ecosystems (e.g. coffee forests and high altitude grasslands) I**ncreases in indices of water quality and flow** (incorporating variables of BOD, sediment load, aquatic invertebrate indicator species and flow variability) in major water courses in the target areas - **Increased carbon sinks (253,500tC[1] in 5,000ha of agroforestry systems)** • SFM/REDD: **Avoided deforestation of 8,000 ha of lowland forest with a net gain of 2,900,000tC**[2] in relation to the without-project scenario **Avoided deforestation of 4,000ha of yungas forest with a net gain of 808,000tC** in relation to the without-project scenario **Reductions in CC-related pressures affecting vulnerable ecosystems in buffer zones**, including: rates of human immigration and settlement, rates of agricultural clearance, rates of conversion of high altitude camelid grazing areas to intensive pastures/ agriculture, areas affected by fire **Adaptive capacity of environmental authorities cost-effectively enhanced to address implications of CC for vulnerable ecosystems**: At least 20% **increase in Capacity Scorecard ratings for SERNANP and regional and provincial Governments in target areas** (baseline to be established during PPG)	pastures and irrigation traditional water management systems **2.3 CC-resilient SFM practices which allow effective conservation of forest ecosystems in the landscape (yungas and southwestern amazon moist forest)**, including: • Low impact production systems (e.g. Climate resilient shade coffee, Sustainable management of forests for non-timber forest products Integrated fire management, • Enrichment planting and/or selective thinning to maintain ecosystem structure and connectivity **2.4 Capacities for the development, transfer and application of CC-resilient production systems,** enabling farmers to implement resource management practices that generate BD and LD benefits, including: • Integrated training modules for extension agents, resulting in more effective and participatory delivery of extension services aimed at encouraging sustainable land management • Integrated training and extension modules for producers, focusing on BD- and LD-friendly production practices • Mechanisms for systematization, recuperation and horizontal transfer of knowledge, particularly regarding indigenous practices for the management of water and high-altitude pastures			
			Sub-Total		8,563,270	47,642,385
			Project Management Cost	GEFTF	428,164	2,382,119
			Total Project Costs		8,991,434	50,024,504

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	National Protected Areas Service	In-kind	6,954,036
National Government	National Protected Areas Service	Grant	2,070,468
National Government	Ministry of Environment	Grant	5,000,000
Local Government	Cusco Regional Government	Grant	17,000,000
Bilateral Aid Agency	Belgium Technical Cooperation Agency	Grant	13,000,000
GEF Agency	UNDP	Grant	6,000,000
Total Co-financing			50,024,504

[1] Agroforestry systems in the yungas zone (multistrata plantation of Bactris/Cedrelinga/Inga/Columbrina) have been found to contain 114.3tC/ha, 50.7tC/ha more than pasture

[2] Primary forest in lowland rainforest in Peru has been found to contain 365tC/ha more than pasture, and 202tC/ha more in the case of yungas forest..

D. GEF/LDCF/SCCF 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 c=a+b
UNDP	GEF TF	BD	Peru	4,495,716	449,571	4,945,287
UNDP	GEF TF	LD	Peru	2,247,859	224,786	2,472,645
UNDP	GEF TF	SFM/REDD	Peru	2,247,859	224,786	2,472,645
Total Grant Resources				**8,991,434**	**899,143**	**9,890,577**

PART II: PROJECT JUSTIFICATION

A. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

A.1. THE GEF FOCAL AREA STRATEGIES:

1. This project will transform the management of vulnerable ecosystems in Peru's mountain ecosystems to alleviate the direct and indirect impacts of climate change (CC) on globally significant biodiversity and ecosystem functionality, through a three-pronged approach: development of management systems (monitoring and early warning systems, management decision making tools and sustainable financing) in order to optimize national readiness to address the implications of CC on mountain ecosystems; expanding and strengthening PAs in landscapes that are particularly sensitive to CC, in order to protect refugia and corridors and build readiness to address specific CC impacts; and promoting sustainable land management in landscapes surrounding PAs in order to anticipate increased threats from current land uses for BD and ecosystem functions. This will reduce pressures on ecosystems and make them more resilient to expected CC impacts.

2. The project directly advances the objectives of the GEF Biodiversity Focal Area, as CC is predicted to become one of the principal drivers of BD loss in Peru in the future, compounding existing anthropogenic threats. Specifically, it will spearhead **Strategic Objective One (SO1) on protected areas**. PAs currently play a central role in BD conservation in Peru; for them to continue to function effectively in this regard, the project will ensure that changing conditions and threats resulting from CC are factored into their management. It will also ensure that their spatial configuration takes into account CC-related phenomena such as the migration of ecosystem boundaries due to isotherm shifts, and resulting fragmentation. It will contribute to expanding the PA system to incorporate critical refugia for threatened BD. This corresponds with GEF 5 guidance governing investments in PAs: to support "the development and integration of adaptation and resilience management measures as part of PA management projects".

3. The project will contribute to the following goals of the CBD Programme of Work on Protected Areas (POWPA): 1.1 "To establish and strengthen national and regional systems of PAs integrated into a global network"; 1.2 "To integrate PAs into broader land- and seascapes and sectors so as to maintain ecological structure and function"; 1.5 "To prevent and mitigate the negative impacts of key threats to PAs " and particularly 1.4 "To substantially improve site-based PA planning and management", which makes specific reference to the "[integration] of climate change adaptation measures in PA planning, management , and in the design of PA systems" (activity 1.4.5).

4. The project also addresses the objectives of the **Land Degradation Focal Area**, given that CC is expected to undermine ecosystem functionality—and thus the ability of ecosystems to supply ecosystem goods and services. Specifically, it will contribute to SO3-reducing pressures on natural resources from competing land uses in the wider landscape through its support to spatial planning at landscape level and the adoption by local communities of CC-resilient land management practices.

5. Finally, it will advance the objectives of the **SFM-REDD Focal Area**, specifically SO1 (reduce pressures on forest resources and generate sustainable flows of forest ecosystem services). The SFM/REDD resources assigned to this project will allow it to develop management regimes specifically aimed at the yungas and amazon moist forest ecosystems in and around PAs of the Eastern flank of the Andes (including Integrated fire management, enrichment planting and/or selective thinning to maintain ecosystem structure and connectivity, and Low impact production systems (e.g. shade coffee, sustainable extraction of NTFPs), given their importance for carbon storage and other global environmental benefits (biodiversity and sustainable land management) as well as ecosystem services (especially water) of national importance. The BD, SLM and CC mitigation aspects of the project will be closely linked: by helping to make ecosystems more resilient to the adverse effects of CC it will in turn reduce the risk of carbon emissions being generated as a result of their degradation.

A.2. NATIONAL STRATEGIES AND PLANS OR REPORTS AND ASSESSMENTS UNDER RELEVANT CONVENTIONS:

6. The country's **10 year Bicentennial Plan (Peru to the Year 2021)** recognizes the strategic importance of natural resources (including ecosystem function and BD) for the country's economy, given their contribution to satisfying the basic needs of the population and the development of activities that generate goods and services[3]. It also recognizes that CC will have negative effects on the country's BD, as well as increasing the incidence of forest fires and soil erosion. The National Objective of the Plan in relation to natural resources and the environment is the "conservation and sustainable use of natural resources and biodiversity with an integrated and ecosystem focus, environment which permits a good quality of life for the human population and the existence of

[3] http://www.mef.gob.pe/contenidos/acerc_mins/doc_gestion/PlanBicentenarioversionfinal.pdf pp19, 226

ecosystems which are healthy, viable and functional in the long term." The policy priorities of the Plan include the promotion of the conservation and sustainable use of the country's natural heritage… carrying out actions to protect biodiversity [and] control the loss of forests and ecosystems; strengthening of the National Protected Areas System; promotion of mitigation and adaptation to climate change; and prevention, control and reversal of desertification and land degradation.

7. The 2001 **National Biodiversity Strategy and Action Plan (NBSAP)** recognizes Peru's BD as one of the pillars of its national economy, which plays a direct role in sustaining a large part of the population, has an important role for culture, science and technology and provides essential environmental services in terms of soil fertility, air quality and water supply. The vision of the strategy is that by 2021, Peru will be the first country in the world to have the best benefits for its population from its conserved and sustainably used BD, as well as having restored all its BD components in order to meet the basic needs and well-being for present and future generations. The 8 specific strategy lines of the NBSAP include the conservation of BD in Peru; integrating sustainable use of BD into the management of natural resources; establishing special measures for the conservation and restoration of BD faced with external processes; promoting participation and engagement from the Peruvian society in the conservation of BD; improving knowledge of BD; and perfecting the instruments needed for management of BD. Strategic Objective 3.5 of the NBSAP refers to increasing knowledge on the impacts of CC on BD, taking into account the distributions physiological tolerance limits, predictions of the responses of ecosystems and species, and modeling their implications for future needs for conservation and sustainable use.

8. The project also responds closely to the country's **National Climate Change Strategy (NCCS)**[4] (approved by Supreme Decree Nº 086-2003-PCM): this decree is binding and must be included in policies, plans and sectoral and regional programmes. The objectives of the NCCS include the reduction of the impacts of CC through integrated assessment of vulnerability and adaptation in vulnerable areas or sectors where adaptation programmes apply. The NCCS is currently undergoing revision under the responsibility of the National Committee on Climate Change with the support of the Technical Adaptation Group (TAG), led by SENAMHI. The strategic priorities of the NCCS include the management of fragile ecosystems, particularly mountain ecosystems, as a means of mitigating vulnerability to climate change.

9. The project will contribute to the national REDD+ strategy of Peru. The project will represent an important addition to the investments of the **Forest Carbon Partnership Facility (FCPF)** in order to establish a national readiness framework that will address forest governance issues and MRV challenges. The project will also respond to Peru's **Forest Investment Programme (FIP)** which particularly targets the reduction of pressures on Amazon forests and ecosystems through the strengthening of institutional capacities to counter the direct and underlying causes of deforestation and forest degradation, and most specifically to Components II (conservation of forests, mitigation of deforestation and valuation of forest goods and services) and III (reduction of pressures on forests). The project will address issues related to forest fires, land productivity and poor land practices, all of which are identified as causes of deforestation and forest degradation in the national FIP strategy and the Readiness Preparation Proposal (RPP-FCPF) .

10. The **Organic Law of Regional Governments** (Law Nº 27867 of 2002) explicitly states that it is a function of regional governments to "formulate, coordinate, conduct and supervise the implementation of regional strategies with respect to BD and CC, within the framework of the respective national strategies"

B. PROJECT OVERVIEW

B.1. DESCRIBE THE BASELINE PROJECT AND THE PROBLEM THAT IT SEEKS TO ADDRESS:

11. **Overview:** Peru lies between 68°39'27 and 81°15'9 West longitude, and from 0°01'48 North to 18°21'03 South latitude, covering a territory of approximately 1,285,216.60 km². The Andes are the main geomorphologic feature of the country and divide it into three main geographic regions: 1) the coastal region, in the west, is a narrow plain, largely arid area ,except for valleys created by seasonal rivers flowing out of the Andes (52 in total); b) the Andes Mountains which run from north to south and form the geographic spinal cord of the country; and c) the Amazon basin which extends from the eastern flanks of the Andes towards the Brazilian border. Almost 60% of the country's area is located within the Amazon basin that is home to only 7% of the total population; approximately another 30% of the territory is located in the Andes, hosting 18% of the population. Approximately 65% of Peru's total population lives along the Pacific coast that accounts for 10% of the total territory, with 9 million living in the capital, Lima. Hydrographically, Peru is made up of three important watersheds: a) the Pacific coastal basin; b) the Amazon basin; and c) the Titicaca basin, the largest high-altitude freshwater lake of the world. Peru has significant surface water resources (lakes, ponds, rivers, streams, springs, etc.) distributed in 159 hydrographic units.

12. **Biodiversity:** Peru is one of the world's 10 most "megadiverse" countries, for its rich diversity in ecosystems, species, genetic resources and culture. Peru hosts about 25,000 plant species (10% of the world total) with 30% endemism. Of these, 4,400 species have known properties and are used by the population. In terms of fauna, Peru is first in number of fish species (close to 2,000 species, 10% of the world total); second in bird fauna (1,736 species); third in amphibians (332 species); third in mammals (460 species); and fifth in reptiles (365 species). There are about 5,528 plant species and 760 animal species endemic to Peru. There are a total of 222 endangered species of which 31 are facing extinction, 89 are classified as vulnerable, 22 are rare and 80 have an indefinite status. Peru is also rich in ecosystem BD with the major biomes being marine, mountain, forest, freshwater and

[4] http://www.sernanp.gob.pe/sernanp/archivos/imagenes/Estrategia%20Nacional%20de%20Cambio%20Climatico.pdf

agricultural ecosystems. It has 84 of the 104 life zones identified in the planet, the 4th largest area of tropical forest, the most extensive tropical mountain range, and 70% of tropical glaciers. Peru also has very high cultural diversity with 14 linguistic families and 44 distinct ethnic groups, of which 42 are found in the Amazon.

13. The project will focus on the eastern side of the Andes, stretching from the *altiplano* to the lowland rainforests as far as the Brazilian border. This area contains 98 PAs and constituent BD of highest global importance, covers a wide diversity of ecosystems and conditions, and are highly vulnerable to the effects of CC on ecosystem intactness and biological processes. The main ecoregions in the target area, which have been prioritized for attention by the Government of Peru due to their biological diversity, vulnerability and importance for the provision of environmental goods and services, are the following:

14. The *Southwest Amazon moist forest* ecoregion, which is characterized by a relatively flat landscape with alluvial plains dissected by undulating hills or high terraces. It contains a very rich biota because of dramatic edaphic and topographical variations at both the local and regional levels. It has the highest number of both mammals and birds recorded for the Amazonian biogeographic realm: 257 mammal species with 11 endemics, and 782 bird species with 17 endemics.

15. The *Peruvian yungas*, which are tropical and sub-tropical moist broadleaved forests on the eastern slopes and valleys of the Andes. They form a transition zone between the Southwest Amazon moist forests and Ucayala moist forests at lower elevations to the east and the Central Andean *puna* and wet *puna* at higher elevations to the west. The climate in this ecoregion varies from a tropical rainforest climate in the north to a subtropical highland climate in the south. This ecoregion contains over 3,000 species of plants and over 200 species of vertebrates, including the cock of the rock (*Rupicola peruviana*) (LC), Kalinowski's agouti (*Desyprocta kalinowski*) and the hairy long-nosed armadillo (*Dasypus pilosus*) (VU), all of which are national endemics. The national coverage study of the SINANPE recognizes that the yungas forests should be the subject of particular attention for PA expansion, given their particular fragility and their long and narrow configuration (a function of their restriction to a narrow altitude belt along the eastern slopes of the Andes), which makes them particularly vulnerable to fragmentation.

16. The *Central Andean wet puna* ecoregion: this occurs above 3,500m and consists of high-elevation, wet, montane grasslands and lakes amidst plateaus, valleys, and high mountains. It is bordered on the west by the Sechura Desert and on the east by the yungas. To the north it transitions to the Cordillera Central páramo and to the south, the Central Andean puna. The ecoregion can be subdivided into three subregions: the high andean puna, wet puna, and wet montane grassland. The high Andean puna lies between 4,200 and 5,000m: the wet puna is located in the altiplano at elevations between 3,700 and 4,200 metres; and the wet montane grasslands occur in the eastern section of the ecoregion, at elevations of 3,800- 4,200m.

17. **Protected Areas in Peru.** The National System of Protected Areas (SINANPE)[5] has an area of over 22 million ha (almost 17% of the territory), composed of 75 national PAs (ANPs- 19,5 million ha), 15 Regional Conservation Areas (RCAs- some 2.4 million ha) and 51 Private Conservation Areas (PCAs - 196,481ha). The PA estate has grown significantly in recent years, by more than 530,000ha: in 2006, there were only 60 ANPs covering just over 19 million ha. Under national PA legislation, PAs are comprised of **core zones**, which are the responsibility of SERNANP, and which may be internally sub-divided into zones with different management regimes (from strict protection through to controlled extraction); and surrounding **buffer zones** where productive sector ministries (such as the ministries of agriculture and mining) have lead responsibilities but where SERNANP has an advisory role.

18. The project will focus specifically on two large target PA/landscape complexes, selected by the Government of Peru, each of which comprises a chain of PAs gazetted under different PA categories and their associated buffer zones (see C.Annex 1). The total area of the complexes is 11,996,203ha (the locations and extents of the precise areas where the project will work will be confirmed during the PPG phase). These areas are in many ways typical of conditions in Peru inasmuch as they include a range of ecosystems from lowland tropical forests through to high altitude moorlands. Furthermore, they are large landscape-wide complexes comprising protected and non-protected areas, the boundaries between which are highly porous in biological terms. The biological porosity of these boundaries is exemplified in particular by species such as the Andean spectacled bear and the jaguar: these species depend on PAs as refuges but also hunt and forage widely outside. Conversely, the PAs are (both by design and in practice) open to the production activities of the local populations, including camelid grazing on high-altitude natural pastures and subsistence agriculture and the extraction of non-timber forest products at lower altitudes. The status of the Manu NP as a Biosphere Reserve, for example, presupposes the existence of sustainable interactions between humans and natural resources; while the Yanachaga complex includes communal reserves similarly intended to allow indigenous communities to continue using natural resources in a sustainable manner in accordance with their cultural traditions. As discussed further below, the nature and sustainability of these interactions are also highly climate-dependent.

19. Within these areas, the activities of the project will be focused specifically on key locations identified as being crucial for promoting resilience, for example:

- Transition zones between ecosystems, where CC-related stresses to ecosystems are expected to be most immediate and pronounced

[5] http://www.sernanp.gob.pe/sernanp/contenido.jsp?ID=9

- Key areas of habitat for species which are particularly vulnerable to the effects of climate change (by virtue of baseline endemism or threat status, or narrow tolerance ranges to environmental conditions)
- Areas where the principal production systems are at particular risk of degradation or failure as a result of changes in environmental conditions, with consequent risks of loss of ecosystem function and services, and/or emigration to other important or fragile ecosystems as a result of livelihood failure.
- Those parts of buffer zones which are judged to be particularly susceptible to immigration and incursions by people from other parts of the country.

20. The **Manú PA complex** stretches from the high Andes to the Brazilian border. This complex includes the Manú and Alto Purus National Parks, Megantoni National Sanctuary and Amarakaeri Communal Reserve. ***Manú National Park*** (NP) is a UNESCO Biosphere Reserve and World Heritage Site. The area covers 18,811 km², including a 914 km² Cultural Zone, encompassing virtually the entire watershed of the Manú River, from the sources of its tributaries high in the Andes, to its distributary in the Madre de Dios River. Its altitude ranges from 150m.a.s.l. to 4,200m.a.s.l.: at the lower extreme the dominant ecosystem is Southwest Amazon moist forests; this blends at middle elevations to Peruvian yungas and eventually to Central Andean wet puna in the highest areas. Because of this topographical range, it has one of highest levels of BD of any park in the world. Overall, more than 15,000 species of plants are found in Manú, with up to 250 tree species/ha. The ***Alto Purús NP and Communal Reserve*** were created in 2004 and cover 25,107km^2 created on November 20, 2004. The productive activities of the indigenous communities in this area include raising the 'living fossil' fish (*Arapaima gigas*), turtle breeding and planting of the moriche palm (*Mauritia flexuosa*). The ***Megantoni National Sanctuary*** (2,159km^2), also created in 2004, is of crucial importance for connectivity, as it acts as a corridor between Manú National Park and the neighbouring Vilcabamba PA complex. The 4,023km^2 ***Amarakaeri Communal Reserve*** was established in 2003, and forms part of an international conservation corridor that includes PAs in Bolivia and Brazil.

21. The **Yanachaga complex** is composed of the Yanachaga-Chemillén National Park, the Yanesha Communal Reserve and the San Matias San Carlos Protection Forest. The 1,220km^2 **Yanachaga–Chemillén NP** includes part of the Peruvian Yungas and Ucayali moist forests ecoregions. The Palcazu river, Huancabamba river, and Pozuzo river s flow through this PA. The **Communal Reservation Yanesha** or **Yanesha Community Reserve** was established in 1988 to protect both wild fauna and indigenous people, and covers an area of 34,744 km^2 (13,415 sq mi) in the Palcazu River basin. The **San Matías–San Carlos Protection Forest** was established in 1987, to preserve the soils and to protect infrastructure, towns and farming land against the effects of the water erosion and flash floods (huaycos). It also designated to preserve the cultural values of the native communities. The **El Sira Communal Reserve** protects the Cordillera El Sira, which is a unique ecosystem. It is a steep mountain range, rising up some 2,500m and clad with tropical forest, embraced by the Pachitea and Ucayali Rivers in Peru's central jungle. The reserve aims to conserve the area's biological diversity, benefiting neighboring native communities.

22. **Threats:** the Andean landscape and the middle- and low-altitude ecosystems into which it transitions have been subject to anthropogenic transformation over the millennia, which has led to a fragmentation of the natural ecosystems, pushed out to marginal areas less suited for agriculture or livestock. Higher altitude forests are the most affected by this fragmentation. In addition to the remnants of native forests which are mostly confined to the steep slopes descending into the narrow valleys of the high Andes, much of the *puna* has also been affected by overgrazing, especially by sheep and cattle, which provoke more ecological damage than the native camelids (alpaca, llama and vicuña). Both the forests and the puna play important roles in regulating the hydrological cycle, as well as providing essential goods in the form of timber, firewood, wild foods (berries, herbs, mushrooms, etc) and pasture. Freshwater ecosystems, especially the high mountain watersheds, which traditionally have been well managed by local populations, have suffered considerable deterioration due to factors such as loss of the vegetative cover and increased soil and wind erosion. Modern developments, such as urban expansion, roads, dams and mining, have all contributed to further fragmentation of high mountain Andean ecosystems. Threats affecting lowland forest ecosystems include both over- hunting and habitat fragmentation, which impact species such as tapirs, jaguars, harpy eagles, cracids like the helmeted curassow, and monkeys. Aquatic fauna are also affected by illegal mining and dynamite fishing.

23. Deforestation has major effects on carbon sinks. Primary rainforest in the Peruvian lowlands was found in one study[6] to contain 465.84t/ha of carbon (total, taking above ground and soil biomass into the equation) compared to 195.73t/ha in home gardens, 193.69t/ha in shade coffee, 180.99t/ha in secondary forest, 119.75t/ha in silvopastoral systems and 97.26t/ha in pasture. Conversion from primary forest to pasture therefore involves a loss of 365.58t/ha of carbon. In the case of the Peruvian yungas, primary forest was found to contain 241.1tC/ha, compared to 173.3tC/ha when managed for timber, 172.3tC/ha and 40.8tC/ha for 15 and 3 year old fallow respectively, 31.0tC/ha for maize fields and 39.5tC/ha for degraded pasture. In the yungas, therefore, conversion from primary forest to pasture involves a loss of 201.6tC/ha of carbon.

24. The principal **features of climate change** in Peru are expected to be (see Annex 2):

[6] "Cuantificación del Carbono Secuestrado por algunos SAFs y Testigos, en Tres Pisos Ecológicas de la Amazonía del Perú". D. Callo-Concha, L. Krishnamurthy, J. Alegre (2001). Simposio Internacional Medición y Monitoreo de la Captura de Carbono en Ecosistemas Forestales. 18-20 October 2001, Valdivia, Chile.

- ***Modification of rainfall regimes***, including increases of up to 20% in some parts the central Andes, decreases of up to 20% in other parts of the central and southern Andes, and reductions in the frequency of extreme rainfall events;
- ***Increases in temperature extremes*** (both minima and maxima): maximum temperatures are expected to increase by up to 1.6°C (0.53°C/decade), with the greatest increases in the coast, the northern, central and southern Andes and the northern jungle area.

25. These changes will have a number of direct and impacts on BD and natural resources both within and outside PAs. The species composition of natural ecosystems is likely to change, due for example to the substitution of existing species by others with different ranges of physiological tolerance; ecological processes are likely to be modified, due for example to changes in the phenology of flowering plants due to shifts in the timing of climatic triggers; ecosystems are likely to undergo increased fragmentation, due to modifications in the spatial configuration of ecosystems within the landscape; and ecosystems will become increasingly susceptible to fire, due to increasing ambient temperatures and falling humidity.

26. Unless corrective measures are taken, these changes will reduce the effectiveness of PAs for conserving species and ecosystem diversity: their management prescriptions and spatial configurations may lose their relevance and effectiveness as the conditions under which they were defined undergo changes. Yungas forests, for example, occupy a relatively narrow altitude band, and as the isotherms that define its ecological limits move upwards due to temperature increases, there is a risk that the ecosystem will progressively migrate outside the limits of PAs, which were defined based on its current range. Unless upper PA limits are modified or new PAs are established, the new upper frontier of the ecosystem may be left without effective protection and be unable to establish itself effectively, and thereby to compensate losses at the receding lower edge. At the lower edge, management prescriptions based on the natural characteristics of the yungas may lose relevance as conditions become more favourable for other ecosystems normally occurring at lower altitudes: an example is shade coffee, which is capable of conserving many of the aspects of the composition and structure of yungas forests in PA multiple use zones, but may lose its productive viability as temperature and moisture conditions change (also affecting the role of shade coffee in maintaining stability and BD in buffer zones). Similar considerations apply in lowland humid forests, as hitherto sustainable offtake levels of game and non-timber forest products risk becoming unsustainable as climate conditions affect the population biology of the target species.

27. As climatic conditions change, biological connectivity (between PAs and between remnant habitat blocks in buffer zones) will become increasingly crucial for the continued viability of some species: fauna with narrow tolerance limits to climatic and habitat variables, such as tapirs, will need to be able to migrate as the conditions which they require move within the landscape. At the same time, however, unless corrective measures are taken, CC will undermine connectivity by causing ecosystem regression. This effect will be particularly felt in those connectivity areas which are already narrowest and most fragmented, either as a result of natural biophysical conditions or anthropogenic pressures such as conversion to non-forest land uses (agriculture or ranching). Changes in temperature and moisture regimes will also affect lowland forests, in both PAs and their buffer zones. Amazon lowland forests are undergoing a progressive process of drying out, which is increasing their susceptibility to fire: this is expected to lead to a progressive transition to savanna, which in turn will generate harmful a positive feedback loop by reducing the contribution of evapotranspiration from these forests to regional rainfall. The resilience of these forests to this process is being undermined by baseline threats, namely disturbance from agriculture and logging, which is opening up the canopy, reducing humidity at the microclimate level, and increasing the relative proportions of pioneer vegetation which tends to be more susceptible fire than species typically found in primary forests. Furthermore, there is an increased incidence of fire outbreaks affecting natural ecosystems, as they come into increasing proximity with agriculture and ranching activities in which fire is routinely used.

28. CC will also affect the viability of production systems, especially in buffer zones and other surrounding landscapes. Rain-fed production systems, which are central to the livelihood support systems of most smallholders, will be affected by changes in the intensity and timing of rainfall events on which they depend: late or insufficient rains at sowing time or during development may lead to crop failure, while excessive or untimely rains at harvest time may lead to spoilage. Irrigated production systems may also be affected by reduced availability of glacier melt-water, on which they depend: it is estimated that in the next 10 years, all of the country's glaciers below 5,000m.a.s.l. may disappear. The sustainability of the management of high altitude camelid pastures is also being affected by changes in temperature and humidity regimes. These processes are resulting in land degradation, as producers are obliged to move to more fragile marginal areas, and BD loss as producers migrate to areas with hitherto intact ecosystems such as yungas and lowland humid forests: without adequate governance conditions and with limited access to sustainable productive alternatives, this has led to high levels of ecosystem degradation and deforestation, through the unsustainable extraction of forest products and the conversion of forest to agriculture and ranching. This emigration, due to CC-induced livelihood collapse, also has a feedback effect, through the weakening of traditional systems of environmental governance and natural resource management. This is of particular relevance to the high altitude punas, where long established (indigenous) community-based norms and mechanisms regulating the management of camelid pastures and the distribution and use of glacial runoff water for irrigation are being progressively eroded.

29. In addition to direct impacts on BD itself, CC is likely to have indirect impacts by modifying the nature and magnitude of anthropogenic threats currently affecting BD. Increases in ecosystem degradation and fragmentation due to CC-related stress and altitudinal regression are likely to increase their exposure to encroachment by agriculture and logging, which in a 'vicious circle' effect will in turn lead to further degradation and fragmentation. These processes will also place increased demands on the management capacities of environmental and PA authorities, opening up new ecosystem edges that need protecting and requiring

modifications in management practices. CC will also affect the dynamics of production landscapes surrounding natural ecosystems and PAs, again with indirect implications for the ecosystems. Increased water stress may affect the functioning of existing production systems in these landscapes, leading farmers to expand areas with crops or livestock into hitherto intact ecosystems, or abandon their existing production areas and migrate into these areas. CC may also affect the ecological functioning and species/ecosystem composition of production landscapes, reducing their value for connectivity between natural habitat blocks, as well as their capacity to provide environmental services for the population at national and local levels. One example is shade coffee farms, which play a vital role in these regards; in the absence of adequate adaptation measures, CC may lead to increased incidence of coffee crop failure, and consequent conversion of these farms to less BD-friendly production systems. The project will build upon a large and solid **baseline** of projects and investments (see Annex 4 for detail). These address a range of issues of relevance to the project, including PA management, biodiversity conservation, natural resource management, sustainable economic development, ecosystem service provision, adaptation to climate change and spatial land use planning. These issues are, however, addressed in a disparate manner: they do not provide for the kind of landscape-wide, cross-sector integrated approach which is required to ensure that PAs are able to continue to function effectively as a core element of the country's biodiversity conservation strategies under conditions of CC, or for multiple environmental benefits (including biodiversity conservation, sustainable land management, sustainable forest management and carbon capture) to be delivered simultaneously through the effective management of PAs and their integration with the landscapes that surround them.

30. ***Protected areas***: SINANPE invested around $4.4 million in PA management in 2009: this compares with an estimated annual funding requirement of $24 million under the basic scenario and $41.8 million under the optimal scenario. SINANPE is strengthening the PA system through a range of initiatives including the GEF/KFW project *Strengthening of biodiversity conservation through the National Protected Areas Program* and the Belgian government-funded *Program for sustainable economic development and strategic management of natural resources in the Apurímac, Ayacucho, Huancavelica, Junin, and Pasco Regions.* GEF is also supporting the development of an updated National Biodiversity Strategy and Action Plan. The combined investment of these initiatives is more than US$35 million. These investments will significantly contribute to the sustainability and effectiveness of PAs. However, under the baseline situation they would lack a harmonized and integrated programmatic focus on addressing the implications of climate change for PA functionality. The locations of the limits of the PAs do not make adequate provision for the migration of ecosystem boundaries due to climate change. Similarly, the management regimes foreseen in PA management plans do not adequately reflect the modified conditions and threat levels that are likely to result from climate change, such as the reduced viability of BD-friendly shade coffee in lower altitude multiple use zones of yunga PAs and the modified permissible off-take levels of game and NTFPs. As a result, these may cease to function effectively as motivations for the maintenance of vegetation cover by local inhabitants, leading to the conversion of the areas in question to agriculture. Furthermore, the design and management of PAs do not take adequately into account landscape-level considerations vision, such as the landscape-wide foraging and hunting habits of species such as jaguars and spectacled bears, and the impacts of productive practices in the wider landscape (such as burning of agricultural and pasture areas): this limits their effectiveness as refugia complementing conservation efforts in the broader landscape. Human and logistical resources are assigned in an ineffective manner to activities and locations that do not reflect the true balance of needs and priorities. The ability of PA managers to combat threats is likely to be further weakened in the future as opportunities for effective co-management become scarcer, as a function of processes of demographic change that weaken social capital in rural areas..

31. ***Production landscapes:*** MINAM is coordinating national investments in socioeconomic and land use planning and the Ecological and Economic Zoning (ZEE) on which it is based. Responsibilities for the implementation of ZEE are spread between different ministries, and regional and local governments. MINAM produces Biennial Operating Plans for ZEE and Territorial Land Use Planning, maintains a register of ZEE processes in the country and presides the Technical-Consultative Committee for Territorial Land Use Planning (CTCOT), which is a multi-sector entity comprised of 40 institutions (ministries and decentralized public organisms represented by regional and local governments, as well as indigenous organizations, representatives of the private sector and NGOs). ZEE processes are underway in all 24 provinces: they are 100% complete in 5 of them and at least 50% so in 13 provinces[7]. Under the baseline situation, however, these territorial land use planning initiatives would not adequately take into account the full implications of CC in terms of the spatial location of ecosystem vulnerability hotspots and the migration of the boundaries of ecosystems and priority areas for conservation.

32. A number of productive alternatives exist with proven potential under the conditions of the project target areas to deliver direct SFM and SLM benefits, and (largely indirect) BD benefits, such as shade coffee, tree-rich agroforestry with annual crops and NTFPs. At present, these types of production models are typically designed, promoted and applied with a 'static' perspective, without adequately taking into account how climate change will affect their viability (which is strongly dependent on the physiological tolerance limits of their components, such as coffee which is highly altitude/temperature sensitive). As a result, there is a risk that they will fail under conditions of climate change, leading to forest clearance and land degradation.

33. The country, with support from a wide range of international agencies, is estimating more than $30 million in addressing climate change, in reflection of the high levels of CC vulnerability in Peru, due to its biophysical and socioeconomic characteristics.

[7] http://geoservidor.minam.gob.pe/atlasperu/Default.asp?WCI=PltOTerritorial&WCE=4.2.0

This baseline is almost exclusively focused on the vulnerability of human populations and the natural resources on which they depend, and corresponding adaptation strategies (including ecosystem-based approaches): missing from this baseline is a concerted and systematic focus on ensuring the continued ability of PAs to deliver broader environmental benefits of importance from a global perspective (biodiversity, sustainable land management and carbon capture), or, again to apply a macro landscape-wide vision which takes into account the potential of climate change to generate inter-regional imbalances of demographic, biological and productive processes (for example the displacement of population from climate-stressed upland areas to more intact lowland ecosystems).

34. One of the major initiatives in the country in relation to sustainable forest management is the *Cusco Regional Reforestation Program*, with an investment of more than US$58 million, which intends to increase forest cover in order to guarantee the provision of ecosystem services, particularly water, for the local population. This programme focuses principally on the implications of climate change for the generation of local ecosystem services such as water for local people. This baseline investment represents an opportunity for the project to build upon by addressing the broader range of global and national environmental values provided by PAs and apply a "macro" level approach to address landscape-wide biological, productive and climatic dynamics.

35. The *Forest Investment Programme (FIP)* is a key element of the country's REDD+ strategy and aims to reduce pressures on Amazon forests and ecosystems through the strengthening of institutional capacities to counter the direct and underlying causes of deforestation and forest degradation. There will be strong links particularly in the amazon forest ecoregion and the projects will complement each other. The Forest Carbon Partnership Facility (FCPF) is also investing resources in Peru to increase the countries national REDD+ readiness capacities, specifically targeting issues related to forest governance, benefit sharing, stakeholder´s consultation and MRV. The project will also ensure strong links with this initiative during the PPG phase and throughout the execution phase

36. The Government has given clear indications that it will continue to invest in addressing conservation priorities, strategic land-use planning, climate change and vulnerability issues as key priorities of its programme. The current volume of investments is likely to remain the same or increase over the next 5 years.

37. The **long-term solution** to the climate change-related threats to priority vulnerable ecosystems in Peru is for PAs and their surrounding landscapes to be zoned, managed and buffered against changing conditions in an integrated, complementary and simultaneous manner, which recognizes the interdependence between BD conservation, sustainable land management and ecosystem service flows, and between natural ecosystems and those subject to active management for economic production. On the one hand, the project will help to combat threats which are currently reducing the natural resilience of ecosystems; on the other, it will improve the management and configuration of PAs and their surrounding landscapes in order to respond to anticipated changes in the future nature and magnitude of threats. Economic demands on land and other natural resources make it impractical to protect in PAs the entire ranges of any of the priority species or ecosystems in the target areas: the effective conservation of BD in the target ecosystems therefore depends on PAs being complemented by sound management in the landscapes that surround them, resulting in diverse and BD-friendly mosaics of different land uses: To this end, the project will apply the principles of ecosystem resilience, within the context of the landscape approach, proposed by Fischer et al., 2006 (see Annex 5). Examples of the resource management strategies and corresponding environmental benefits to be applied by the project are provided in Annex 6.

38. The following barriers exist, which currently prevent the gaps in the baseline situation from being addressed effectively, and this long term solution thereby being achieved:

39. Inadequate capacities, systems and resources to take CC risks into account in PA planning and management: the conservation strategies of the Government to date have depended primarily on PAs; the priority at present is to consolidate the management of these and, until this is achieved, resource limitations mean that significant further expansion of ANPs is not considered feasible. There is little experience with applying in practice the legal provisions that exist for alternative protection modalities, such as Regional Conservation Areas, Private Conservation Areas, Conservation Concessions and Management Agreements with local communities. These management shortcoming are due in part to limited access on the part of PA planners and managers (at central and local levels) to reliable information on the magnitude, nature and implications of climate change, specific to the conditions of the PAs for which they are responsible; and on the effectiveness in practice of their management activities, as measured by the threat levels and the conservation status of target species and ecosystems. The enforcement and management capacities of PA managers are in addition limited by technical, logistical and financial deficiencies, which are becoming more acute due to CC-related increases in threat levels.

40. Inadequate capacities to address the landscape-wide and inter-sector nature of the implications of CC for vulnerable ecosystems. To date, the degree of integration between the management of PAs and buffer zones, and between SERNANP and productive sector ministries such as MINAG, that is required to achieve the effective application of the landscape approach to conservation, has not been achieved in practice, due to a lack of adequately functioning channels for communication and coordination. The development and application of production systems capable of delivering LD, SFM and/or BD benefits under conditions of CC is hindered by the fact that extension agencies (Government and NGOs) have limited depth of understanding of the potential implications of CC for these systems, and for the socioeconomic and biophysical contexts within which they are required to function. There are similar

limitations of understanding and experience with participatory, "adaptive" approaches to technology development which would increase the inherent resilience of the production systems, permitting them to evolve in response to such changing conditions.

B. 2. INCREMENTAL COST REASONING AND THE ASSOCIATED GLOBAL ENVIRONMENTAL BENEFITS:

41. The **objective** of the project will be to strengthen the resilience of priority vulnerable ecosystems in the two target PA/landscape complex to the impacts of climate change, and thereby to conserve threatened BD and ecosystem functionality. Under the baseline situation, PAs would be subject to increasing demographic pressure as the result of immigration of people from areas affected by CC-related decline of production and livelihood support systems, and their management and boundaries would lose relevance and effectiveness as the characteristics, ecological functioning and spatial configuration of the ecosystems that they seek to protect are subject to CC-induced changes. The project will build upon a solid baseline of investments in relation to protected area management, climate change adaptation and territorial land use planning, introducing a landscape-wide, cross-sector integrated approach which will ensure that PAs are able to continue to function effectively for the delivery of multiple environmental benefits of global as well as national importance.

42. The project will consist of two complementary components, which correspond to the barriers identified above. Given the porous nature of the boundaries which separate the PAs and surrounding landscapes, the project will support the application of a "macro" landscape approach to spatial planning and environmental management. This will ensure that decision-makers have access to reliable and updated information and are able to understand the diverse implications of development and conservation initiatives; that initiatives in different sectors are coordinated in order to minimize the risk of unintended negative impacts between sectors, and maximize the potential for cross-sector synergies; that land managers themselves have the capacities to apply resource management practices that optimize environmental benefits; and that local communities are able to participate effectively in decisions related to resource management, in order to minimize the risks of conflicts between their livelihood support systems and the conservation of BD and the natural capital on which these systems depend.

Table 1: Baseline, alternative and global environmental benefits

Current situation	Alternative to be put in place by the project	Selected environmental benefits
1. Protected areas		
PA expansion and management: large PA estate, undergoing expansion and consolidation but: - Reduced resilience and increased fire risk due to CC - Increasing incursion into PAs due to migration - Static management regimes - Boundaries do not contemplate ecosystem migration with CC - Financial resources inadequate for expansion	- Expansion of PA coverage including new management regimes with PAs under different ownership modalities - Strengthened PA management instruments (e.g. GIS, management plans) - Strengthened PA enforcement capacities - Monitoring mechanisms of CC and management effectiveness - Financing framework for expansion and management	**BD**: - Major habitat blocks, and BD patterns and processes, protected from modified threats - Increased effectiveness of enforcement in 9 PAs covering 6 million ha and 3 ecosystems (Puna, Yunga, southwestern moist amazon forest) - Improvement in conservation status of vulnerable species in PAs (e.g. *Myrmecophaga tridactyla*), *Dinomys branickii*, *Tapirus terrestris*, *Tremarctos ornatus*, *Mazama chunyi, Callimico goeldii)* - Additional 100,000ha of PAs protect core refugia
2. Production landscapes		
Socioeconomic planning: ZEE underway in all 24 provinces, but: - Inadequate incorporation of CC implications (locations of priority ecosystems, vulnerability hotspots, ecosystem migration)	- Cross sectoral institutional platform supporting planning, implementation, enforcement and monitoring of buffer zone management - Integrated Natural Resource Management plans, directing investments in LD and SFM in non-PA areas.	**LD**: Reduced land use conflicts in 6,000,000ha of buffer zones result in: - Reduced land degradation in puna - Reduced deforestation in yungas - Well-functioning ecosystem services (eg water supply) **SFM/REDD:** - Increased forest patches through refocused baseline reforestation programmes in vulnerable areas **BD** - Improved connectivity through appropriate location of land uses and corridors in landscape
Rangeland management: - Agricultural and grazing practices in highlands under decline due to CC	Sustainable CC-resilient land management systems, including: , - Eco/agrotourism - Sustainable management of high altitude camelid pastures and irrigation traditional water management systems	**LD:** - Reduced soil erosion rates - Stable habitats of plant and animal species in production landscapes (e.g. coffee forests and high altitude grasslands) - Increases in indices of water quality and flow - Increased carbon sinks (253,500tC in 5,000ha of agroforestry systems)
Forest management: - Conversion of yungas and	CC-resilient resource management systems allow sustainable management and	**SFM/REDD:** - Avoided deforestation of 8,000 ha of lowland forest with a net

lowland forests to agriculture and grazing - Drying out of lowland forests and progressive conversion to savannas	effective conservation of forest ecosystems, including: - Climate resilient shade coffee - Sustainable management of forests for non-timber forest products	gain of 2,900,000tC - Avoided deforestation of 4,000ha of yungas forest with a net gain of 808,000tC - Reductions in CC-related pressures affecting vulnerable ecosystems in buffer zones

<u>Component 1:</u> Core PAs with increased resilience to CC

43. Activities under this component will focus principally on promoting the effective conservation of biodiversity in core PAs, and will therefore be the main target of the BD1 resources assigned to the project.

Output 1.1 Additions to protected area coverage

44. A key element of the conservation strategy promoted by the project will be the creation and strengthening of mosaics of areas subject to effective *in situ* protection. In accordance with the recommendations of Fischer et al. (2006) for promoting ecosystem resilience, this will serve to maintain and create large, structurally complex patches of vegetation, maintain small areas of native vegetation keystone structures, maintain structural complexity throughout the landscape, and mimic the matrix of natural vegetation patterns, in order to provide permanent habitat for endemic species, serve as corridors/enhance species movement, aid gene-flow and key processes such as pollination and seed dispersal, and reduce edge-effect impacts like micro-climate changes that can increase disturbance-adapted species. Within the specific context of the project area, this strategy will have the following aims:

- The protection of additional areas of natural ecosystems in transition areas likely to be affected by the altitudinal migration of ecosystems and species, in order respond to their new spatial configurations
- Increases in the levels of protection afforded to ecosystems and species reflecting increases in anthropogenic pressures resulting from climate change (such as the immigration of population from areas affected by CC-related productive failure and livelihood collapse)
- Permitting flexibility in *in situ* conservation in the light of the uncertainties associated with climate change.

45. The nature and locations of the proposed additions will be confirmed on the basis of the GIS analyses proposed under Output 1.3, which will overlay the locations of priority species, ecosystems and areas of connectivity and management, and the implications on these of climate change.

46. SERNANP is presently focusing on consolidating management effectiveness in its existing estate of National Protected Areas (ANPs). The proposed expansion in the area of coverage of *in situ* conservation will be achieved through alternative models of conservation, namely:

- **Regional Conservation Areas:** are aimed at *in situ* BD conservation and form part of the national PA estate. They are subject to approval by Supreme Decree, and they are administered by the Regional Government of the area in question.
- **Private Conservation Areas:** established on private lands, at the request of their owners, by Resolution of the Minister of the Environment for a renewable period of at least 10 years. Their main objective is *in situ* BD conservation, and priority is given to areas located in the buffer zones of national ANPs.
- **Conservation Concessions:** established on national lands, preferably in areas suited to forestry use, with the aim of conserving BD and capturing carbon. They are given to NGOs, by the Minister of Agriculture, for renewable periods of up to 40 years.
- **Management Agreements:** these are entered into between ANP Directors and local people, so that the local people can carry out activities in support of the management and conservation of BD in ANPs.

Output 1.2 Management regimes for PAs, which enhance the resilience of ecosystems and their ability to deliver ecosystem services

47. Climate change will place additional stresses on PAs, and require innovative approaches to be applied for their management. This is especially the case with forest ecosystems, which constitute the cornerstone of the national REDD strategy due to their importance as carbon sinks, and which are also vital for the delivery of other global environmental benefits (biodiversity and sustainable land management) as well as ecosystem services (especially water) of national importance. The project will promote the following strategies (to be confirmed and possibly expanded during the PPG phase) of benefit to forest ecosystems:

- Fire management: modification and regulation of burning regimes in production systems which currently depend on fire (such as pasture management) in order to reduce the risk of uncontrolled wildfires and to reflect changes in the composition and fire response of species and ecosystems.
- Enrichment planting and/or selective thinning, to maintain ecosystem structure and connectivity under conditions of modified environmental pressures.
- Promotion of low impact, sustainable production systems, such as shade coffee and the sustainable extraction of NTFPs, which permit the maintenance of semi-natural species compositions and ecosystem structures, while at the same time providing economic incentives to local communities for protecting forest cover and ecosystem structures.

Output 1.3 PA management instruments strengthened to address climate change induced threats and pressures likely to undermine resilience

48. The National Meteorological and Hydrological Service (SENAMHI) has developed detailed predictions of climate change scenarios in Peru, as presented in the Second National Communication on Climate Change. The project will combine these predictions with information on the ecological characteristics of the different PAs, resulting in the generation of predictions of how they would each be affected under CC scenarios. These analyses will cover a range of factors, including:

- Movements of the spatial limits of the ecosystems, which in mountain areas may be affected by the upward displacement of isotherms and changes in rainfall regimes
- Modifications to the internal structure and ecological dynamics of the ecosystems, for example as a result of changes in phenology and the competitive pressures affecting key elements of their BD.
- Modifications in demographic and productive pressures, for example due to the impacts on related climate-sensitive production systems such as high altitude grazing and shade coffee production.

49. The project will support the development of an inter-institutional and inter-sector decision support system, into which the results of these analyses will be fed. Key elements of this system will include an atlas portraying the spatial implications of CC for different PAs and surrounding landscapes, a GIS database, an online portal (inserted into the existing internet portal of MINAM[8]), and publications on key findings tailored to the information needs and capacities of a range of target audiences. The project will also provide methodological support to each of the main target institutions for the internal application of the decision support systems, for example in the formulation of their medium and long term strategic and investment plans, and will provide them with specific technical guidance on natural resource management issues.

50. On the basis of this information, the project will support the development or modification, as appropriate, of management plans for existing, new or expanded conservation areas, reflecting the changed conditions expected as a result of CC and including provisions for resilience and adaptation. The specific management strategies to be applied will be developed in more detail during the PPG phase and validated during the implementation phase: initial indications, with corresponding references, are provided in Table 2 above. These management plans will be complemented by new or modified financial and staffing plans, adjusted to reflect the financial implications of CC for PA management: for example, the cost of including and managing additional areas to allow for the upward migration of the upper limits of mountain ecosystems and to compensate for CC-related fragmentation, and the need for additional staffing and logistical resources to address increases or changes in threats to PAs as a result of expected influxes of population from other areas affected by CC-related livelihood and productive collapse.

51. PA staff will be provided with the training, equipment and systems required to allow them detect signs of the impacts of climate change, to monitor these impacts, and the effectiveness of strategies for resilience and adaptation, over time, and to respond to the results of monitoring through the definition and application of corresponding management strategies. These decision-support systems will be backed up by concrete investments needed for the management strategies to be put into practice, such as fire control equipment; in addition, the project will fund specific management actions in a limited number of conservation areas selected as being of particularly high priority (in terms of their vulnerability and the significance of their BD or the ecosystem services which they provide), or as having particularly high potential to act as pilots.

Output 1.4 Strengthened PA enforcement capacities

52. The management tools proposed under Output 2.2 will necessarily be accompanied by the strengthening of capacities among PA staff for enforcing their provisions in practice. Additional resources will be required for enforcement, above current levels, given the risk of increased flows of population to the target ecosystems as a result of CC-related livelihood and productive collapse in other areas; the progressive thinning out of the canopy of lowland forests canopies as a result of their CC-related drying out, which will make them more vulnerable to conversion to agriculture and ranching; and the weakening of traditional governance structures as a result of CC-related migration processes. To this end, PA staff will be provided with equipment for surveillance, monitoring, communication and transport, enabling them to detect and respond effectively to threats. This will be complemented by the provision of training to PA staff in order to develop their technical capacities, in terms of increased awareness and technical knowledge of the implications of CC for ecosystem characteristics and threats, and of corresponding options of enforcement strategies.

Output 1.5: Monitoring mechanisms

53. In order to ensure the effectiveness of the adaptive management and financial planning proposed above, the project will invest in the establishment of a system for monitoring, analysing, disseminating and responding to information on the impacts of climate change on PAs, and on the effectiveness of vulnerability reduction strategies, and early warning systems for detecting threats exacerbated by climate change. The existence of adequate capacities and systems for such monitoring is particularly important given the levels of uncertainty that existing regarding the magnitude and nature of the impacts of CC. This will include provisions for long term biological monitoring of targeted species and ecosystems, covering issues such as the breeding success of target species, the physical structure and microclimatic conditions of ecosystems, and the status of species selected as indicators of ecosystem integrity.

Output 1.6: Financing framework

[8] http://geoservidor.minam.gob.pe/intro/

54. Based on the results of the analysis of the implications of CC scenarios for the target ecosystems, the threats affecting them and associated production systems, analyses will be carried out of their resource implications for key institutions, and an inter-institutional strategic financing plan will be developed accordingly. Issues to be considered will include, for example, the following:

- Needs for additional specialized staff to analyses and develop strategic solutions for new, CC-related technical challenges;
- The geographical reassignment of staff due to spatial changes in the nature and location of threats,
- Needs for additional staff and equipment to counter increased levels of threat such as increased incidence of fire and pest outbreaks
- The introduction and/or improvement of systems for the monitoring of CC implications and the effectiveness of adaptation support measures.

55. The financing plan will complement existing initiatives, for example in relation to the strengthening of the financial sustainability of PAs in the country, and will explore opportunities for diversifying and increasing income sources and for increasing efficiency through the development of inter-institutional synergies. Particular attention will be paid to exploring and developing opportunities for the payment of ecosystem services: this is especially relevant given that the degradation of mountain ecosystems, as a direct and/or indirect result of CC, is reducing their ability to buffer the implications of CC for human populations. Improved CC resilience of forests, for example, will help to maintain their beneficial effect on the stability of hydrological flows from Andean watersheds, offsetting the increased flow variability and overall reduction in water yield that are expected to result from CC. The project will also assist the increased budgetary assignations from the Government to cover the cost implications of increasing ecosystem resilience to CC: to this end, it will generate and disseminate convincing, science-based information on the implications of CC impacts on mountain ecosystems for the national economy, in terms of the loss of ecosystem services. Dissemination instruments to this end will include a specific PA atlas depicting these impacts in easily understandable terms, supported by smaller publications and maps suitable for mass distribution, conferences, media events, email postings and website(s), in accordance with a communication strategy to be developed during the implementation phase based on initial proposals to be developed during the PPG phase.

<u>Component 2:</u> CC-resilient production landscapes buffering PAs.

56. This component will support multi-sectoral planning (INRM) proposed under Output 2.1, in order to reduce conflicts between land uses (such as mining and overgrazing) in conformity with the LD3 strategy. Under conditions of climate change, and the related processes of migration and productive change, the effects of competing land uses over the landscape will increase: this is particularly true in the altitudinal transition complexes which dominate the target areas. INRM plans will be developed to reduce in the medium and longterm conflicting land uses adjacent to PA areas and providing spatial planning to direct current and future baseline investments for: a) appropriate SLM practices to avoid, reduce and off-set LD (emphasis in Puna ecosystem); and b) adoption of appropriate SFM practices in forest fragments in the yungas and southwestern amazon moist forest (reforestation for rehabilitation, coffee shade; NTFP; forest enhancement etc) . In parallel SLM and SFM practices will be set-up in selected locations in the Puna and the forest ecosystems respectively to provide direct benefits in the short term and feed into the plans.

57. SFM/, will ensure the effective conservation of forestry patches in specific targeted (non-PA) areas under conditions of climate change. This will bring direct CC benefits. It will also indirectly enhance and lever BD benefits because it would increase connectivity and resilience, allowing the non-PA forest patches to complement the ecosystems in PAs targeted in component 1 (hence SFM/REDD+ benefits) . These SFM practices will generate BD benefits which would not be possible if PA and non-PA areas were treated in isolation.

Output 2.1: Institutional framework for planning and managing buffer zones

58. The project will support the application of a landscape-wide approach to planning the configuration and management of the buffer zones that surround PAs, under principles of INRM, in order to anticipate and compensate effects of CC such as the fragmentation and spatial migration of ecosystems, reductions in the sustainability of traditional resource management systems, and corresponding increases in anthropogenic pressures on hitherto intact ecosystems. This will serve to orient and reconfigure baseline investments on Ecological and Economic Zoning (EEZ) to ensure they take adequately into account the implications of CC and incorporate the INRM approach. A prerequisite for applying this approach is that decision-makers have access to updated, accurate and relevant information on the biological importance, fragility and productive potential of ecosystems, now and under a range of CC scenarios. To this end, the project will support the development of integrated inter-institutional Geographical Information Systems, including maps, databases and corresponding protocols and mechanisms for making information available in an accessible format. Furthermore, capacities and tools will be developed for Strategic Environmental Assessments (SEA) of the landscape-level impacts of infrastructural or productive development programmes, and for incorporating the implications of CC into these assessments. Although the lead institution will be MINAM, SEA will require the participation of multiple actors from diverse sectors, and the corresponding development of capacities in each.

59. Spatial planning instruments will be developed at a range of levels, covering the whole of the target areas, defining priority areas for conservation and connectivity and the range of specific uses and management regimes appropriate to different site types, based on reliable, standardized and uniform data. These will include landscape-level land use plans, covering the whole of the target

areas, defining priority areas for conservation and connectivity and the range of specific uses and management regimes appropriate to different site types, based on reliable, standardized and uniform data. At the other end of the scale, community-based environmental plans based on participatory analyses of resource management options and zoning.

60. A system will be established for early warning of fires, and for the planning of fire management and control, including characterization of land units according to fire risk (determined by factors such vegetation type and proximity to agricultural areas, settlements and roads), vulnerability and ecological responses to fire, and definition of corresponding response strategies in the case of fire outbreaks.

61. The model proposed by the project assumes the integration and reconciliation of production sector and environmental issues, and therefore collaboration between the diverse institutions with responsibilities for these issues. To this end, the project will raise awareness among national stakeholders regarding the integrated, inter-institutional and landscape-wide approach that is proposed, and assist them to work together on its implementation. This will result in concrete benefits in terms of the nature and magnitude of the impacts generated by these institutions at field level. This awareness raising is of fundamental importance given the novelty of the approach proposed, which contrasts with the sector-based and vertical approaches that have tended to dominate to date. The adoption of the approach by the institutions in question (including MINAM, MINAG and MEF), and their commitment to inter-institutional collaboration, will be formalized by ensuring that this is incorporated into their strategic planning documents, which constitute multi-annual frameworks for their institutional actions. This will be complemented by more specific training of local and technical staff of these institutions on how to put the concepts promoted by the project into practice. Concrete mechanisms will be established for putting these commitments to communication and collaboration into practice, in the form of platforms or committees for the joint planning of institutional actions in key areas such as monitoring and enforcement. These will result in the establishment of integrated interinstitutional programmes for monitoring and evaluation and for enforcement that will pool resources, and link and harmonize the existing programmes of each of the major institutions involved, particularly MINAM and MINAG.

62. "Buy-in" by local communities to the proposed modifications to the management of buffer zones is essential for sustainability, and for optimizing the compatibility between environmental and social goals. To this end, the project will work strengthen the capacities of local communities and their participation mechanisms, enabling them to analyse in an objective and informed manner the proposals developed through the project, to channel the interests and opinions of local stakeholders, and to develop and present "counter proposals" as appropriate.

Output 2.2 Sustainable CC-resilient SLM practices generating LD benefits and conserving ES in target location in the Puna

63. The project will support the application of production systems that are resilient to climate change and that restore the functioning of landscapes and their capacity to provide ecosystem services, adapted to the range of biophysical, socioeconomic and productive conditions in the target areas, for promotion among producers and by extension agents.

64. These options may include sustainable agriculture, incorporating soil and water conservation practices; improved pasture and water management on high altitude camelid grazing lands (e.g. fencing, camelid rearing, sheds for livestock protection, provision of best animal loads in relation to LD risk and vulnerabilities, planting of permanent pastures, and grazing management guidelines, and the recovery of traditional governance systems and technical practices applied by indigenous communities); and agrotourism or ecotourism. This will serve to stabilize processes of land use change, thereby reducing the risk that climate change will oblige farmers to expand their areas under cultivation or to migrate into PAs. They will also generate environmental benefits *in situ*: in the case of sustainable pasture management they will include the reduction of land degradation processes which have ramifications at local, regional and global levels;; and ecotourism or agro-tourism, has the potential to provide direct economic incentives to farmers for managing the land in ways that deliver environmental benefits.

65. To this end, GEF funds will be used to establish pilot experiences of each of these production systems, focusing in particular on areas that are identified as being of particular importance for connectivity, or particularly vulnerable to productive collapse, where baseline initiatives exist on which to build and where there are opportunities for cofinanced support in order to maximize impact. A range of methods will be used to confirm and refine these productive options, including systematization exercises involving members of institutions involved in agricultural development, natural resource management and conservation, as well as representatives of producer organizations, and reviews of academic and grey literature from both Peru and overseas. The project will provide direct technical, organizational and marketing support to producers; and limited amounts of equipment and other inputs to "kick-start" the pilots, as required.

Output 2.3 **CC-resilient SFM practices which allow effective conservation of forest ecosystems in the landscape (yungas and southwestern amazon moist forest)** Specific attention will be paid to increasing the resilience of forest ecosystems (the yungas and the Southwest Amazon moist forests) to CC, through the application of sustainable forest management practices. These options may include promoting the diversification of coffee shade (building on the results in this part of Peru of the regional GEF/UNDP project on BD conservation in coffee, implemented by Rainforest Alliance), and the sustainable management and harvesting of non-timber forest products. Under the baseline situation, much coffee is produced in the yungas either under shade with very low levels of specific and structural diversity, or under full sun; while non-timber forest products and game are typically extracted on an unsustainable basis which fails to take into account the ecological requirements and reproductive biology of the target species). These investments in SFM will contribute to the maintenance of carbon sinks, and thereby to the achievement of the country's

REDD+ strategy, as well as the protection of habitat for flora and fauna, and the provision of watershed protection services.

Output 2.4 Capacities for the development, transfer and application of CC-resilient production systems

66. The project will support the development of integrated training and extension modules for producers and decision-makers in cooperatives and other producer organizations, focusing on BD-friendly production practices such as those presented above and on environmental considerations in more general terms. This support to producers will result in high levels of immediate impact: more significantly in terms of sustainability and long term impact, the project will also invest in "training the trainers", by developing integrated training modules and materials for the extension agents themselves, resulting in more effective and participatory delivery of extension services and the incorporation into extension messages of environmental issues including sustainability, resilience, production of ecosystem goods and services and the compatibility of productive practices with BD conservation.

67. The above set of activities and outputs will lead to major environmental benefits within the three focal areas covered by the project. In the **biodiversity** focal area, it will contribute to the conservation status of the Central Andean wet puna, Peruvian yungas and Southwest Amazon moist forest ecoregions, and their constituent globally important BD including species such as the jaguar (*Panthera onca*) (NT), ocelot (*Leopardus pardalis*) (LC), giant otter (*Pteronura brasiliensis*) (EN), giant anteater (*Myrmecophaga tridactyla*) (VU), South American tapir (*Tapirus terrestris*) (VU), Peruvian spider monkey (*Ateles chamek*) (EN), gray woolly monkey (*Lagothrix cana*) (EN), Dwarf Brocket deer (*Mazama chunyi*) (VU), Andean fox or culpeo (*Lycalopex culpaeus*) (LC), mountain paca (*Cuniculus taczanowskii*) (NT) and Andean spectacled bear (*Tremarctos ornatus*) (VU). This will be achieved through a combination of i) support to PAs as refugia of intact habitat, through improved management effectiveness and reduction of external threats; ii) conservation of smaller habitat blocks in buffer zones and surrounding landscapes, through alternative PA models; iii) promotion of BD-friendly production systems in buffer zones and surrounding landscapes and iv) promotion of connectivity between PA and non-PA habitat blocks. Reductions in pressures on forest habitat blocks will contribute to the goals of the **SFM/REDD** focal area, as it will avoid the major carbon emissions (estimated at 3,708,000tC) that would resulted from the deforestation of these carbon sinks. The project will furthermore generate major benefits for the **land degradation** focal area through the promotion of sustainable production systems, such as sustainable ranching practices in high altitude camelid pastures, tree-rich agroforestry systems for annual crops and shade coffee. These benefits will consist of i) enhanced ecosystem functionality, including sustained hydrological and nutrient cycles and natural pest/control balances (for example in the case of coffee, requiring reduced inputs of polluting agricultural chemicals) and ii) enhanced ecosystem services, such as increased water infiltration due to the presence of the tree component, reduced rainfall impact and erosion of soils due to increased soil cover, and increased carbon sequestration (estimated at 253,000tC) in the large amounts of woody matter and healthy soils present in agroforestry systems.

B.3. SOCIOECONOMIC BENEFITS TO BE DELIVERED BY THE PROJECT INCLUDING GENDER DIMENSIONS:

68. The project will help to ensure the long-term integrity and sustainability of both natural ecosystems and the production landscapes which surround them. This will enable them to continue generating environmental goods and services on which local populations, at a range of levels, are dependent, for example:

- By supporting the sustainable, CC-resilient management of high altitude grazing areas in the puna ecoregion, it will help to sustain traditional livelihoods there. This will generate combined social and environmental benefits, as it will contribute to reducing the migration from the *altiplano* to middle and low altitude forest areas.
- By supporting culturally- and environmentally sustainable and CC-resilient management practices in middle and low altitude forest areas (such as shade coffee, sustainable management for timber, sustainable management of non-timber forest products and ecotourism), it will help to broaden and strengthen local livelihoods.
- Improved conservation of the puna and the yunga forests, under conditions of climate change, will help to ensure the continuity of water supplies to the inhabitants of the Andean slopes and foothills, given the importance of these ecoregions for aquifer recharge.

69. During the PPG phase, studies will be carried out to determine how CC-related ecosystem degradation affects men and women differentially, and to define how to incorporate gender issues into project design, for example through the promotion of productive activities which actively promote the status of women while at the same time contributing to the conservation of BD and carbon stocks, and the sustainability of land and ecosystem management.

Sustainability

70. Specific provision is being made by the project to ensure the financial sustainability of its investments in improving the management of the target PA/landscape complexes, under Component 1. The project will develop a financial sustainability strategy for maintaining ecosystem resilience to climate change impacts in the long term, under different scenarios, emphasizing cost-effectiveness through the informed targeting of interventions, and the generation of funds from public and private sources in recognition of the potential economic impacts of non-action (in terms of foregone PA goods and services as a result of climate change). This will build upon and complement the mechanisms for financial sustainability developed through previous GEF-funded projects in Peru implemented by the World Bank. Institutional and social sustainability will be ensured by working through institutions that currently exist at central, regional, local, PA and community levels in support of PA management, land use planning

and regulation; these include environmental and productive sector ministries and their dependencies and municipal governments, in addition to well-established and respected national and international NGOs.

B.4. INDICATE RISKS, INCLUDING CLIMATE CHANGE RISKS AND MEASURES THAT ADDRESS THESE RISKS:

Risk	Rating	Risk Mitigation Strategy
Institutional rigidity and resistance to inter-institutional collaboration	M	The project will support SERNANP in raising awareness among diverse institutional stakeholders of the implications that the impacts of CC on BD and PAs will have for their institutional goals, and will actively promote and facilitate inter-institutional analyses of needs and mechanisms for cooperation.
Weak enforcement of land use stipulations in the landscape	M	The project will build on the considerable advances made to date by previous GEF projects in Peru with the strengthening and financing of PA management (including enforcement). This project will seek to ensure that financial sustainability strategies take into account the additional requirements arising from issues and threats related to climate change, with the result that enforcement capacities will develop in parallel with the magnitude of threats.
Uncertainty in anticipated threat profiles: strengthening PA and BD resilience is the project's central focus, however there is a risk that rates of CC, and associated pressures on PAs and BD, will exceed the levels on which the adaptation strategies are based.	L	The project will apply principles of adaptive management, updating its assumptions and strategies regularly on the basis of the most recent models of climate change that are available, keeping abreast of the latest advances with scientific knowledge and experiences regarding best practices for adaptation and resilience, and supporting the development of systems for monitoring and evaluation of the effectiveness of its strategies under evolving conditions of climate change (Component 1).
Limited buy-in by regional governments, which is essential in the context of Peru's decentralization policies	L	Regional governments will be fully involved in project design. During the design phase mechanisms will be developed for their participation in project implementation and beyond, for example through interinstitutional platforms in the target areas. The project will in addition seek to raise their awareness of the benefits of investing in ecosystem resilience, in terms of continued flows of ecosystem services of importance to their constituents.
Price fluctuations of coffee and other crops with potential to yield environmental benefits.	M	The project will build on the advance made by the GEF/UNDP/Rainforest Alliance regional project on BD conservation in coffee, helping producers to access niche and stable prices through certified markets.

B.5. KEY STAKEHOLDERS INVOLVED IN THE PROJECT:

Stakeholders	Project Implementation Role
Ministry of Environment (MINAM)	The purpose of MINAM is environmental conservation, so as to foster and ensure rational, sustainable and ethical use of natural resources thereby ensuring that present and future generations enjoy a balanced environment suitable for the development of life.
SERNANP	SERNANP is the governing body of the National System of Protected Areas (SINANPE) and works in coordination with regional and local governments and private conservation areas.
Ministry of Economy and Finance (MEF)	Implementing a Climate Change Unit with the following objectives: 1. Identify the economic impact of climate change in terms of its impacts on the welfare of the population and the country's competitiveness. 2. Identify business opportunities and promote greater competition generated around the mitigation activities. This includes promoting access to international carbon markets. 3. Identify and promote financial and economic instruments to finance activities related to climate change. 4. Coordination with MINAM of the launch and implementation of a national mechanism to manage international 42 funding for climate change adaptation and mitigation in Peru. 5. To monitor national progress in achieving national goals related to climate change adaptation and mitigation. These activities will be conducted in coordination with the MINAM and other relevant stakeholders.
Ministry of Agriculture (MINAG)	MINAG is responsible for the formulation and implementation of the national agricultural policy, by promoting sustainable use of natural resources, competitiveness and equity in the context of modernization and decentralization of government, with the aim of contributing to rural development and improving the quality of life of the population. Within MINAG, climate change is addressed by: 1. General Directorate of Forestry and Wildlife (DGFFS), which is responsible for the formulation of national policies, strategies, plans, programmes and projects related to sustainable use of forest and wildlife resources 2. General Directorate of Environmental Affairs (DGAA): Given the mandate for agricultural environmental management policy and strategy, DGAA chairs the Working Group on Food Security and Climate Change 3. National Water Authority (ANA): responsible for the development and implementation of the national policy and strategy for the sustainable management of freshwater resources, in coordination with regional and local governments and related sectors.

Stakeholders	Project Implementation Role
	4. National Service of Agrarian Health (SENASA): responsible for agricultural health and maintains the national system to monitor plant and animal health, in particular, pests and diseases that threaten food security. 5. National Institute for Agrarian Innovation (INIA), whose mission is to promote the development of agricultural technology to increase agricultural sustainability, productivity and competitiveness. 6. The Technical Working Group on Food Security and Climate Change, responsible for proposing sectoral vision to reduce the vulnerability of agriculture in relation to climate change.
Regional and Local Governments	Autonomous political administrative institutions responsible for governance of regions and local municipalities. Under the process of decentralization, they have assumed greater responsibilities in relation to the territorial planning and management of natural resources, as well as for the formulation and implementation of regional climate change strategies and plans.
Municipal governments	Responsible for overseeing natural resource management at local level, within their areas of jurisdiction, for ensuring that management strategies are appropriate to local needs and for ensuring that the needs of local stakeholders are taken into account in the definition of management strategies.
NGOs	Civil society organizations make an important contribution to the management of PAs and to obtaining resources. They will also be involved in providing technical assistance for the implementation of the project.

B.6. OUTLINE THE COORDINATION WITH OTHER RELATED INITIATIVES:

71. The project will build on and complement a number of other GEF-funded projects aimed at strengthening PAs, which include aspects of community development, indigenous management and sustainable use. GEF/UNDP Full-Sized Project (3276) on Promoting Sustainable Land Management in Las Bambas will provide a valuable source of lessons for this project regarding the sustainable management of high altitude camelid pastures, as will the regional GEF/UNEP (1918) on Conservation of the Biodiversity of the Paramo in the Northern and Central Andes. At the same time, it will build on the achievements of the regional GEF/UNDP project on Biodiversity Conservation in Coffee (2371), which has succeeded in promoting uptake of BD-friendly shade coffee in the yungas ecosystem, through supporting producers' insertion into global markets that reward sustainability. The relevant initiatives with which the implementation period of the present project will coincide most closely, and with which it will establish the closest collaborative links, will be the GEF/IFAD Full-Sized Project (4773) on Conservation and Sustainable Use of High-Andean Ecosystems through Compensation of Environmental Services for Rural Poverty Alleviation and Social Inclusion in Peru (PPG approved), and the project on Ecosystem-based Adaptation in Mountain Ecosystems, funded by Germany´s Federal Ministry of Environment, Nature Conservation and Nuclear Safety (BMU) and co-implemented by UNDP, UNEP and IUCN. The project will also complement a recently proposed and pre-selected project on Integrated Management of Climate Change in Communal Reserves, submitted for funding by Germany's BMU and to be implemented by UNDP.

72. The project will add value to the extensive portfolio of projects funded by GEF and other agencies in relation to BD conservation (including the strengthening of the PA system) and sustainable land management, by introducing two innovative elements: i) a highly integrated "ridge to jungle" approach to natural resource management, which takes into account the biological, physical and productive interrelations between contrasting ecosystems spanning wide altitude gradients (most of the other projects in the current portfolio have focused on single ecosystems), and ii) the importance of ecosystem resilience as a critical requirement for the sustainable delivery of environmental benefits in the long term, under conditions of climatic, as well as economic and demographic change (most of the projects to date have been based on static assumptions regarding their biophysical contexts).

C. DESCRIBE THE GEF AGENCY'S COMPARATIVE ADVANTAGE TO IMPLEMENT THIS PROJECT:

73. UNDP provides a comparative advantage for this project given its strengths as a development agency with significant experience in working with the management of PAs in Latin America, the Caribbean and worldwide as well as with productive economic sectors, specifically including initiatives to mainstream BD into their practices. UNDP's work on BD and environmental management through past and ongoing initiatives at the national and regional level has resulted in a strong relationship with the GoP that will facilitate effective actions by government executing agencies and stakeholders participating in this project. In addition, UNDP's extensive experience in developing governance frameworks and inter-sectoral coordination will be of great benefit to the project. The project will not only benefit from UNDP's extensive experience in the field of PA and landscapes management but will also build upon its current initiatives addressing wildlife and/or threatened species in countries such as Ecuador and Malaysia.

C.1. INDICATE THE CO-FINANCING AMOUNT THE GEF AGENCY IS BRINGING TO THE PROJECT:

74. UNDP's comparative advantage lies in its capacity to broker finance from national and international sources to assist countries to meet their environmental finance needs. In line with UNDP's mandate as chair of the UNDG, it plays a key role in the leveraging of resources from a range of funding sources in the construction of a project funding package. UNDP has brokered US$9,662,687 for this project from multiple sources, to be confirmed during further project preparation. UNDP also will provide in-kind support through its broader governance portfolio and through a range of technical staff working in the environment program

C.2. HOW DOES THE PROJECT FIT INTO THE GEF AGENCY'S PROGRAM AND STAFF CAPACITY IN THE COUNTRY TO FOLLOW UP PROJECT IMPLEMENTATION:

75. The proposed project is in line with the 2012-2016 United Nations Development Assistance Framework (UNDAF) agreed between the Government of Peru and the UN, in particular with its stated objective to "promote sustainable development through policies, programs, and plans that contribute to environmental sustainability, resilience to climate change, and disaster risk management." The project also is aligned with UNDP Peru's 2012-2016 Country Programme Document, which recognized the need to "develop strategies and management and environmental finance instruments to conserve biodiversity and enhance resilience to climate change." In this regard, the UNDP commits through the project to support capacity building at the national, regional and local levels. UNDP Peru has a well-established group of professionals in its environment team that will support project implementation, composed of 05 individuals who have worked for many years on the design, implementation and monitoring of GEF projects in BD, SLM and CC. This team will receive technical support from the specialists in UNDP's Environment and Energy Practice in the Latin American Regional Service Centre, as well as technical backstopping from UNDP's global network of specialists

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): (Please attach the Operational Focal Point endorsement letter(s) with this template).

NAME	POSITION	MINISTRY	DATE *(MM/dd/yyyy)*
José Antonio González Norris	GEF Operational Focal Point	Environment	**09-AUG-2012**

B. GEF AGENCY(IES) CERTIFICATION

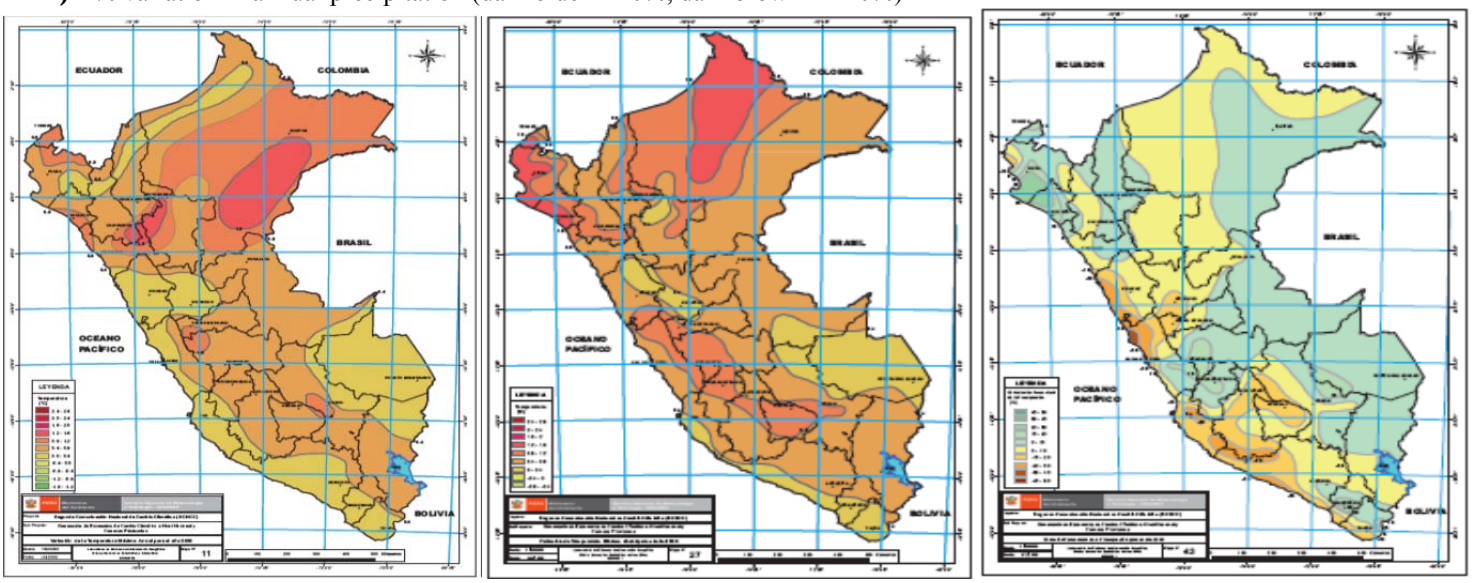
This request has been prepared in accordance with GEF/LDCF/SCCF policies and procedures and meets the GEF/LDCF/SCCF criteria for project identification and preparation.					
Agency Coordinator, Agency name	**Signature**	**Date** *(MM/dd/yyyy)*	**Project Contact Person**	**Telephone**	**Email Address**
Yannick Glemarec, UNDP/GEF Executive Coordinator		September 4, 2012	Lyes Ferroukhi, Regional Technical Advisor, EBD	+507 302-4510	Lyes. ferroukhi@undp.org

Annex 1. Target PA complexes

PA complex	Protected Areas	PA areas (ha)	Buffer zones	Total
Manu	Manú National Park	1,716,295		
	Alto Purús National Park	2,510,694		
	Purús Communal Reserve	202,033		
	Megantoni National Sanctuary	215,869		
	Amarakaeri Communal Reserve	402,336		
	Total	5,047,227	5,000,000	10,047,227
Yanachaga	Yanachaga – Chemillén National Park	122,000		
	Yanesha Communal Reserve	34,745		
	San Matías - San Carlos Protection Forest	145,818		
	El Sira Communal Reserve	616,413		
	Total	918,976	1,000,000	1,918,976
	Total	5,966,203	6,000,000	11,966,203

Annex 2. Projected variations in climate in Peru to 2030[9]

2) Variation in annual maximum temperatures (light brown = -8°C to -4 °C, dark red = +2.4°C to +2.8°C)
3) Variation in annual minimum temperatures (light brown = -8°C to -4 °C, dark red = +2.4°C to +2.8°C)
4) % variation in annual precipitation (dark blue = -40%, dark brown = +40%)



Annex 3. Principles of ecosystem resilience, within the context of the landscape approach, proposed by Fischer et al. (2006) :

1. Maintain and create large, structurally complex patches of vegetation, and maintain small areas of native vegetation keystone structures.
2. Maintain structural complexity throughout the landscape, and mimic the matrix of natural vegetation patterns, in order to provide permanent habitat for endemic species, serve as corridors/enhance species movement, aid gene-flow and key processes such as pollination and seed dispersal, and reduce edge-effect impacts like micro-climate changes that can increase disturbance-adapted species.
3. Create buffers around sensitive areas or buffer patches around native vegetation.
4. Maintain or create corridors or stepping stones to improve connectivity.
5. Maintain landscape scale heterogeneity and capture environmental gradients, and keep spatial patchiness and landscape pattern variability, including in highly productive, fertile soils.

[9] "Escenarios climáticos en el Perú para el año 2030: Segunda Comunicación Nacional de Cambio Climático. Resumen Técnico". http://redpeia.minam.gob.pe/admin/files/item/4d77e7ad5bb27_Resumen_Escenarios_climaticos_del_Peru.pdf

6. Maintain key species interactions and functional diversity by identifying keystone species and key seed dispersal agents.
7. Apply appropriate disturbance regimes (e.g., fire regimes, hydrological flow regimes).
8. Minimize threatening ecosystem-specific processes (e.g., chemical pollution, over-hunting).
9. Maintain species of particular concern (e.g., highly threatened/rare species).

Annex 4: Baseline investments

Protected area management

- *Strengthening of biodiversity conservation through the National Protected Areas Program*, which aims to improve the financial sustainability of the National Protected Areas System, improve the connectivity of key ecosystems and develop capacities at the national and subnational levels. At the regional level, the project articulates with land use planning processes and regional biodiversity conservation strategies, and facilitates coordination between regional governments regarding PA management (GEF: 8,891,000USD KFW: 6,500,000USD + other partners) .
- *Program for sustainable economic development and strategic management of natural resources in the Apurímac, Ayacucho, Huancavelica, Junin, and Pasco Regions*, which aims to contribute to poverty reduction through the conservation and sustainable use of biodiversity and natural resources. Strategies include the implementation of land use planning at the regional and local levels; and the inclusion of Protected Areas in regional and local sustainable development strategies (Belgian government: 2010-2016: 19,415,423 USD).
- *National Biodiversity Strategy and Action Plan Project*: Through this GEF-financed, UNDP-supported project, the Ministry of Environment will oversee the development of an updated National Biodiversity Strategy. Supporting studies will include the valuation of ecosystem services as well as potential impacts of climate change on biodiversity and ecosystems. The project will be implemented through the active participation of productive and economic sectors in the country.

Climate change

- *Glaciers to the Coast: Climate Change Awareness and Resistance in the Regions of Ancash and Piura*: implemented by the Mountain Institute (TMI), aims to strengthen research in climate change and design and implement an action programme in the upper sections of Santa and Chira river basins in northwestern Peru (2010 – 2013: USAID 1,250,000 USD).
- *Climate Change Adaptation Project, Arequipa Region 2011 - 2014*: Implemented by the Association for Sustainable Development (AEDES), aims to support farmers to implement improved practices of water, grasslands, forests and farm management to reduce local vulnerability to climate change and increase resilience. The programme also works with the Regional Government of Arequipa and local governments to incorporate CC risk management into development plans (USAID: 1,258,776 USD).
- *Integral and Adaptive Management of Environmental Resources to Minimize Vulnerability to CC in High Andean micro-watersheds*: Implemented by UNDP, UNEP and the FAO, aims to increase capacities to plan, develop, implement, inform and coordinate adaptation initiatives; strengthening the capacities of producers' associations and other grassroots organizations for the development, access and application of practices for sustainable management of natural resources; and the participation of the villagers and local producer associations in competitive and innovative models for managing natural resources (2008-2012: 3,900,000 USD).
- *Technical cooperation of the IADB*: The IADB is supporting four technical cooperation programmes, in close coordination with MEF and MINAM: 1. Replica Stern Review: Economic Impacts of Climate Change; 2. Adaptation Measures in four selected river basins, Piura, Santa, Mayo, and Mantaro Rivers; 3. Support for the formulation of Regional Strategies on Climate Change: Huánuco, Huancavelica, Ica, Moquegua, Ucayali and Puno (MINAM in coordination with the Regions); 4. Support to Rural Agricultural Production Development Programme (MINAG), focused on recovering high Andean terraces and water harvesting (2010 – 2013: 1,800,000 USD)
- *Territorial Approach to Climate Change*: Implemented by UNDP and executed by MINAM and the Regional Governments of Tumbes and Piura: will strengthen capacities of local and national authorities for the integration of CC adaptation and mitigation measures into territorial development plans and programs. In order to promote alternative sustainable development paths and cost effective measures to address current and future climate change impacts, regional strategies and investment plans will be formulated and innovative environmental financial mechanisms will be employed (2012 – 2013: 1,400,000 USD)
- *Integrated Management of Climate Change in Communal Reserves in the Peruvian Amazon*: Proposed by UNDP and pre-selected for funding by the German Ministry of Environment. Aims to increase the resilience of the indigenous populations that co-manage the Reserves through Ecosystem-Based Adaptation strategies. With co-financing from the Canadian Ministry of Environment, it will focus on the Amarakaeri, Purus and Tuntanain Communal Reserves located in Madre de Dios, Ucayali and Amazonas, respectively (2013-2017: 7,462,687 USD).
- *Mountain Ecosystem-Based Adaptation Program*: Co-implemented by UNDP, UNEP and IUCN: aims to build the economic and environmental case for Ecosystem-Based Adaptation, through the development of a pilot experience in the Nor Yauyos Cochas

Landscape Reserve in Lima and Junin Regions. The Ministry of Environment, SERNANP and Ministry of Economy and Finance are the national counterparts of this program (2012-2014: 3,000,000 USD).

- *Adaptation to Climate Change Program (Phases 1 and 2):* aim to build adaptation capacity at the regional and local levels through the elaboration of climate scenarios, vulnerability analyses, and institutional strengthening, with an emphasis on government planning frameworks (Swiss Development Cooperation Agency 2009-2016: 10,780,000 USD)

Sustainable forest management

- *Cusco Regional Reforestation Program*: Financed by the Cusco Regional Government, this program intends to increase forest cover in order to guarantee the provision of ecosystem services, particularly water, for the local population. There will also be quantifiable co-benefits related to carbon sequestration and biodiversity conservation. This program will place emphasis on areas that can improve connectivity between local, regional and national protected areas within the Manu Protected Area Complex, as well as on areas particularly vulnerable to climate change. UNDP will provide support for the implementation of the program (2012-2015: 58,633,485 USD).

Annex 6. Threats related to climate change, and corresponding responses

Threat	Responses	Benefits
Upward movement of lower and upper limit mountain ecosystems, due to temperature increases (upward movement of isotherms)	- Active management of areas affected by regression in order to maintain habitat conditions, for example by enrichment and selective thinning of yungas forest at its lower altitude limits to maintain its structural diversity in the face of encroachment by other ecosystems from lower altitudes	- Maintenance of effective sizes of habitats and populations
	- Declaration and management (regeneration and enrichment) of corridors to facilitate species movement under conditions of increased fragmentation, Particularly important for yungas forests (and constituent species such as T. ornatus) given their long narrow configuration and strong dependence of range limits on isotherm locations.	- Maintenance of connectivity, to counter fragmentation caused by upward movement of lower limits
	- Upward movement of upper limits of PAs, to include higher altitudinal areas into which ecosystems such as yungas can migrate as isotherms move upwards	- Facilitation of upward migration of upper ecosystem boundaries in order to compensate regression of lower limits
Modification of ecological functioning and species composition of natural evcosystems due to changes in climatic factors	- Strengthening of existing PAs and establishment of complementary reserves (in buffer zones and surrounding landscapes), to maintain large, structurally complex patches of vegetation, and maintain small areas of native vegetation keystone structures. - Promotion of structurally complex production systems (e.g. shade coffee and agricultural/ranching systems with high tree content), mimicking the matrix of natural vegetation patterns,	- Provision of permanent habitat for endemic species, corridors to enhance species movement, aid gene-flow and key processes such as pollination and seed dispersal, and reduce edge-effect impacts like micro-climate changes that can increase disturbance-adapted species.
Reduction in productive viability of shade coffee plantations in yungas area due to changed rainfall regimes, resulting in conversion to non-tree land uses	- Diversification and management of coffee shade (including CC-resilient shade species and increasing shade density to maintain microclimate) - Continued investment in market-based instruments (building on GEF/UNDP Rainforest Alliance project) to maintain the attractiveness of shade coffee even if productivity/ha falls	- Maintenance or increase of value of coffee forests as habitat for flora and fauna, as connectivity routes for fragmentation-sensitive species such as *T. ornatus*, and as source of environmental services such as water supply and soil protection
Decline in productivity and sustainability of agricultural and grazing practices in highlands, due to changes in moisture regimes and loss of glacier meltwater supply, leading to land degradation and migration to vulnerable forest areas	- Introduction of agroforestry systems to maintain humidity and nutrient cycles - Systematization, revival and adaptation of traditional knowledge and practices, such as raised-field systems, manuring and community-based mechanisms for the planning and regulation of camelid pasturing, and the management and regulation of irrigation water.	- Improved sustainability of land management *in situ* (reduced soil erosion, enhanced hydrological and nutrient cycles) - Reduction of migration trends to vulnerable ecosystems (e.g. yungas and lowland forests) by populations affected by productive and livelihood collapse
Conversion of yungas and lowland forests to agriculture and grazing by	- Technical, marketing and organizational support to sustainable management of forests for timber and/or NTFPs in order to strengthen the occupancy and use rights of	- Reduced deforestation rates

Threat	Responses	Benefits
immigrants from areas affected by land degradation and productive failure	existing populations, and to provide economically attractive alternatives to deforestation	
Drying out of lowland forests and progressive conversion to savannas	- Integration of integrated fire management practices (e.g. controlled burning, thinning and enrichment planting) into management plans[10] - Increased investment in fire control measures (equipment and early warning systems)	- Reduction in rates of transition of humid forest to savanna, and consequent maintenance of regional rainfall patterns
Changing demographic pressures	- Declaration of new PAs in priority areas vulnerable to future demographic pressures - Support to sustainable production systems (coffee, sustainable agriculture, NTFPs etc.) in buffer zones, to strengthen the occupancy rights of existing populations minimize and reduce the risk of their displacement by immigrants to more vulnerable areas - Support to local environmental governance structures	- Reduction in deforestation rates

[10] Rodríguez Trejo D.A. 2008. Fire Regimes, Fire Ecology, and Fire Management in Peru. AMBIO: A Journal of the Human Environment 37(7):548-556.