PROJECT IDENTIFICATION FORM (PIF)
PROJECT TYPE: Full-sized Project
TYPE OF TRUST FUND:GEF Trust Fund

PART I: PROJECT IDENTIFICATION

Project Title:	Multiplying environmental and carbon benefits in high Andean ecosystems		
Country(ies):	Ecuador & Peru	GEF Project ID:	4750
GEF Agency(ies):	UNEP	GEF Agency Project ID:	00810
Other Executing Partner(s):	CONDESAN	Submission Date:	04/12/2012
GEF Focal Area (s):	MULTIFOCAL AREA	Project Duration(Months)	48
Name of parent program (if applicable): ➢ For SFM/REDD+ ☒		Agency Fee:	USD 479,636.36

A. FOCAL AREA STRATEGY FRAMEWORK:

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Indicative Grant Amount ($)	Indicative Cofinancing ($)
BD-2	2.1. Measures to conserve and sustainably use biodiversity incorporated in policy and regulatory frameworks.	1.1 At least 5 subnational land-use plans that incorporate biodiversity conservation and ecosystem services valuation. 1.2 At least 2 policies or regulatory frameworks in place to conserve biodersity.	GEFTF	1,647,890	4,250,000
CCM-5	5.1. Restoration and enhancement of carbon stocks in forests and non-forest lands, including peatland.	5.1.1 Carbon stock monitoring systems established.	GEFTF	726,975	1,800,000
CCM-5	5.2. Good management practices in LULUCF adopted both within the forest land and in the wider landscape.	5.2.1 Forest and non-forest lands under good management practices.	GEFTF	484,650	2,750,000
LD-3	3.1: Enhanced cross-sector enabling environment for integrated landscape management	3.1.1 Integrated land management plans developed and implemented.	GEFTF	226,580	600,000
LD-3	3.2. Integrated landscape management practices adopted by local communities	3.2.1 INRM tools and methodologies developed and tested 3.2.2 Information on INRM technologies and good practice guidelines disseminated.	GEFTF	198,260	2,000,000
LD-3	3.3. Increased investments in integrated landscape management	3.3.1 Appropriate actions to diversify the financial resource base.	GEFTF	141,620	1,500,000
SFM/REDD-1	1.2. Good management practices applied in existing forests.	1.2.1 Forest area (hectares) under sustainable management, separated by forest type. 1.2.2 Types and quantity of services generated through SFM.	GEFTF	799,390	3,000,000
SFM/REDD-2	2.2. New revenue for SFM created through engaging in the carbon market.	1.1 At least 2 innovative financing mechanisms established.	GEFTF	342,600	1,550,000
		Sub-total		4,567,965	17,450,000
		Project management cost	GEFTF	228,399	700,000
		Total project costs		**4,796,364**	**18,150,000**

B. PROJECT FRAMEWORK

Project Objective: Enhance multiple environmental and social benefits provided by biodiversity and carbon stocks by overcoming critical scientific, institutional and financial barriers that undermine SLM and SFM in high Andean ecosystems.						
Project Component	**Grant Type**	**Expected Outcomes**	**Expected Outputs**	**Trust Fund**	**Indicative Grant Amount ($)**	**Indicative Co-financing ($)**
1. Science Base & Tools Development to support decision making	TA	1.1 Science base and decision-making tools that enable national institutions to assess multiple environmental and carbon benefits in the high-Andes and potential trade-offs developed and adopted by key stakeholders at multiple levels (national, subnational and local).	1.1.1 Knowledge base expanded on soil organic matter (SOM) stabilization process, carbon cycles and the provision of critical ecosystem services in the high Andes. 1.1.2 Methods, protocols and monitoring systems for biodiversity status and carbon stocks in above/belowground calibrated to high Andean ecosystems and soils in pilot sites. 1.1.3 Land use and cover change (LUCC) modelling in pilot sites taking into account effects on biodiversity and GHG emissions. 1.1.4 Decision-making tools based upon economic valuations and environmental scenarios developed and adapted by key-stakeholders.	GEFTF	**Total: 1,436,260** BD: 741,550 CCM: 666,390 LD: 28,320	**Total: 6,750,000**
2. Capacity building and advocacy at multiple scales for enhancing multiple benefits in the high Andes	TA	2.1 Enabling environment in place to integrate multiple benefits in cross-sectoral planning tools at the wider landscape supporting policy and decision-making processes in the high Andes. 2.2 National capacities enhanced to gain access to new and diversified sources of funding to promote SLM/SFM in the high Andes, including emerging global financial mechanisms.	2.1.1 Integrated sub-national land-use management plans across sectors developed through broad-based participation and implemented. 2.1.2 Cross-sectoral agenda, agreements and investment plans established through collaborative processes with representatives in each country. 2.1.3 Decision makers and public technicians aware, trained and using information and decision-making tools. 2.2.1 Monitoring systems established, adopted and used by key stakeholders (including national PES programs) in the high Andes. 2.2.2 Tracking-tool developed to monitor shifts in global financial mechanisms and appraise policy makers regarding relevant opportunities for the high Andes. 2.2.3 Public officers in both countries technically advised, trained and actively participating in international meetings regarding global financial mechanisms. 2.2.4 Establishment of International Advocacy Network of recognized scientists and influential policy-makers for investments in high Andean ecosystems within global financial mechanisms. 2.2.5 Resource Mobilization Strategy for the high Andes	GEFTF	**Total: 1,237,430** BD: 494,370 CCM: 60,580 LD: 339,880 SFM: 342,600	**Total: 2,840,000**

3. Field demonstration of multiple benefits in the high Andes through SLM/SFM practices in pilot sites	INV/TA	3.1 Environmental and carbon benefits enhanced through SLM/SFM investments and practices on forest and non-forest lands in the high Andes	3.1.1 High Andean ecosystems conserved and degraded lands restored within critical areas in pilot sites (tbd in PPG). 3.1.2 Management practices on forest and non-forest lands in the high Andes tested in pilot sited and adopted by local communities. 3.1.3 Methodologies and lessons learned on multiple benefits, good management practices & technologies for the SLM/SFM in the high Andes disseminated locally.	GEFTF	**Total: 1,665,880** BD: 329,580 CCM: 424,070 LD: 169,940 SFM: 742,290	**Total: 7,710,000**
4. Project monitoring and evaluation	TA	4.1 Project implementation based on results based management and application of project lessons learned in future operations facilitated	4.1.1 Project monitoring system operating providing systematic information on progress in meeting project outcome and output targets. 4.1.2 Midterm and final evaluation conducted. 4.1.3 Project-related "best-practices" and "lessons-learned" published. 4.1.4 Website to share the experience and information dissemination.		**Total: 228,395** BD: 82,390 CCM: 60,585 LD: 28,320 SFM: 57,100	**Total: 150,000**
				Sub-total	4,567,965	17,450,000
				Project management Cost	228,399	700,000
				Total project costs	**4,796,364**	**18,150,000**

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

Sources of Cofinancing for baseline project	Name of Cofinancier	Type of Cofinancing	Amount ($)
National Government	Ministry of Environment- Ecuador	Unknown at this stage	2,800,000
National Government	Ministry of Environment- Peru	Unknown at this stage	1,800,000
Others	University of Amsterdam, NL	In-kind	1,000,000
Others	Landcare Research, NZ	In-kind	1,200,000
Others	COSUDE, SW	Grant	2,500,000
Foundation	CONDESAN	In-kind/Grant	4,250,000
Others	Local partners	In-kind	1,250,000
Local Government	Regional governments	Unknown at this stage	1,500,000
GEF Agency	UNEP non IA work	In-kind	350,000
GEF Agency	UNEP projects	Grant	1,500,000
Total Cofinancing			**18,150,000**

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
UNEP	GEF TF	Biodiversity	Ecuador	1,730,283.49	173,028.35	1,903,311.83
UNEP	GEF TF	Land Degradation	Ecuador	594,784.94	59,478.49	654,263.44
UNEP	GEF TF	Climate Change	Ecuador	393,113.39	39,311.34	432,424.73
UNEP	GEF TF	Climate Change	Peru	879,090.91	87,909.09	967,000.00
UNEP	GEF TF	SFM-REDD		1,199,090.91	119,909.09	1,319,000.00
Total Grant Resources				**4,796,363.64**	**479,636.36**	**5,276,000.00**

PART II: PROJECT JUSTIFICATION

A. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:

A.1 THE GEF FOCAL AREA STRATEGIES: This project contributes directly to GEF's strategic goals #1, #2 and #3: Conserve, sustainably use, and manage biodiversity, ecosystems and natural resources globally, taking into account the anticipated impacts of climate change; Reduce global climate change risks by stabilizing atmospheric GHG concentrations through emission reduction actions, and assisting countries to adapt to climate change, including variability; and Build national and regional capacities and enabling conditions for global environmental protection and sustainable development. In particular, the project is in accordance to SO # 2 in Biodiversity Focal Area, SO # 5 in the Climate Change, SO # 3 in Land Degradation and SO # 1 and SO # 2 in Sustainable Forest Management.

Overall, this project aims to multiply environmental and social benefits provided by biodiversity and carbon stocks reducing critical institutional, financial and scientific barriers that undermine sustainable land and forest management (SLM/SFM) in high Andean ecosystems (e.g. upper montane forest, paramo, puna, wetlands). The project will address land-use and cover change trends, which are a major driver of biodiversity loss and GHG emissions in both Andean countries, maintaining carbon stocks in high Andes soils and ecosystems through SLM/SFM practices and policies. The project will contribute to creating an enabling environment in both countries to mainstream biodiversity conservation, promote climate change mitigation and upscale SLM/SFM in the wider landscape. National and local capacities will be strengthened to include environmental benefits in land use planning and policies, and foster economic incentives aligned within global financial mechanisms with proper, cost-effective monitoring systems in place and embraced within national Monitoring, Reporting and Verification (MRV) systems. Given the interdependence between soil organic carbon (SOC), biodiversity, and hydrological services, this project will have an impact on maintaining critical ecological functions which contributes to enhance local livelihoods in historically impoverished communities of the Andes. The project will also contribute with new scientific knowledge on the synergies between biodiversity conservation, land management in the high Andes and climate change mitigation strategies, developing a sound scientific base and tools that support decision making. On-the-ground activities will be developed and executed in pilot sites in alliance with local stakeholders and partnering institutions. On the basis of such findings, efforts will be made to incorporate high Andes ecosystems within REDD+ strategies –or any other related global and regional financial mechanism, such as the voluntary market– in order to create new sources of revenue for sustainable management practices in these fragile ecosystems. Thus, the long-term goal of the project is to increase opportunities for both Andean countries for accessing global financial mechanisms (or any other emerging source of funding) to support key investments that secure the flow of ecosystem services including carbon stocks in forest and non-forest lands in the highlands. By bridging the gap about the carbon dynamics and monitoring systems in high Andean ecosystems, the project will bring to the attention of mainstream and emerging financial mechanisms the potential of these ecosystems and soils as carbon sinks. This project will build upon on-going efforts to promote SLM/SFM in the high Andes, particularly Ecuador's national economic incentives programs (i.e. government financed PES; Socio Bosque) and other GEF projects which have addressed carbon pools (particularly SOC) and associated environmental benefits, developing measuring, modeling and monitoring methods that will be further used and adapted by the project to the high Andes.

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

The project builds upon the growing political commitment and associated core investments being made by both Andean countries to protect biodiversity and reduce GHG emissions. The two countries are signatories of the CDB, UNFCCC, and UNCCD, and have made consistent efforts to meet their declared commitments within several national strategies. At **global** level, this proposal addresses the CBD Work Program on Mountain Ecosystem Biodiversity, especially the climate change related activities set up at Decision X/30. At the **regional** level this project and contributes to the implementation of the Regional Biodiversity Strategy for the Tropical Andean States declared by the Andean Community (CAN), particularly by Objective I, Lines of Action 1 and 3, as well as under Objective VI, Line of Action 1. This project is also framed within the **Bi-National** Plan that governs the cross border relationship between both countries and will help to fortify the Environmental Management Program agreed among both countries which aims to enhance a sustainable and healthy environment providing safe access to water, soil and air. At the **national** level, the project is consistent with several environmental policies in each country. This includes the Environmental Plan, the National Strategy of Biodiversity Conservation, and Andean Ecosystems Policy for Ecuador. For Peru, the project is in line with the National Environmental Policy, the National Strategy of Climate Change, and the Action Plan for Adaptation and Mitigation of Climate Change.

Since 2008, Ecuador has embraced a progressive Constitution that safeguards and promotes the conservation of biodiversity, soils and fragile ecosystems (Art. 276; 404; 409). The Constitution explicitly recognizes high Andean ecosystems, such as the paramo and wetlands, as fragile and critical ecosystems for human wellbeing, and therefore,

encourages their conservation and sustainable use. Furthermore, the Constitution emphasizes the need to address climate change through the mitigation of GHG emissions, in particular the decrease on deforestation rates of natural vegetation (Art. 414). Such commitments have been explicitly included in the National Development Plan, the main planning tool in the country, and other environmental plans and strategies in place. In such context, the project will provide information, knowledge and analyses to support policies 4.1, 4.5 and 5.6 of Ecuador's National Development Plan in regard to: conservation and sustainable use of biodiversity, in particular fragile ecosystems; promote adaptation and mitigation responses to climate variability; and encourage external relations, in particular within the global financial mechanisms to face climate change. Regarding the National Environmental Policy, the guiding document on the environmental level conservation and biodiversity and natural resources in Ecuador, the project provides a significant contribution to Policy 1: Economic and Environmental Sustainability through including good practices and incentives; Policy 2: Efficient use of strategic resources (water, soil, biodiversity) by promoting land use plans that integrate conservation, management, and an equitable distribution of benefits among stakeholders; Policy 3: Climate change adaptation to reduce social, economic and environmental vulnerability through mitigating impacts of climate change and reduction of GHG emissions; and Policy 6: Strengthen the institutional framework for ensuring environmental management through applied research.

In the case of Peru, the project is fully in line with the countries' Action Plan for Adaptation and Mitigation to Climate Change: i) enhancing its scientific capacity through the development of a GHG emission methodology applicable to high Andean ecosystems and establishing a monitoring system for carbon stocks that fully address GHG emission from land use and cover change in the high Andes, ii) addressing vulnerability of social and natural systems linked to the loss of carbon stocks since they are linked to several critical ecosystem services (e.g. species habitat, water regulation, soil productivity, local livelihoods), iii) supporting mitigation of GHG emissions by promoting sustainable land-use management in fragile mountainous ecosystems and reducing pressures at the landscape and local levels, and iv) enhancing national institutions capacities and have a leading role in further climate change negotiations, REDD+ and other financial mechanisms.

The project is also consistent with the main conclusions of the II National Communication to UNFCCC submitted by both countries (Peru: June 2010; Ecuador: January 2011). Given that in both Ecuador and Peru land use conversion is one of the main sources of GHG emissions, the need to develop specific mitigation actions for the sector is explicitly stated. Considering that agriculture is a major source of GEI emissions (methane and nitrous oxide) in both countries, creating an enabling environment to reduce pressures over conversion of pastures, specifically in highlands, and to modify management practices that releases GEI into the atmosphere are national priorities. Although, so far national efforts have focused primarily on strictly forested areas in the narrower sense, those have been driven to a great extent by the mainstream of climate change mitigation worldwide (e.g. REDD+) which does not imply the lack of national interest in highland ecosystems. The project will contribute to filling the gap left by the relative absence of REDD+ work in high Andean ecosystems through the prioritization of these ecosystems, in order to achieve more comprehensive national assessments on GEI inventories (i.e. not restricted only to forested lands). Additionally, in the Second National Communications to UNFCCC, both countries have emphasized that the lack of quality data and solid methodologies are major limitations, particularly in soils and deadwood, to attain accurate estimations of carbon stocks, impairing a proper quantification of GHG emissions in each country.

Thus, high Andean ecosystems rank highly within the environmental agenda of both countries, in particular due to the vulnerability of high mountain environments to climate change and their importance in supporting livelihoods in significant extensions of rural areas suffering high levels of poverty. Within several policy frameworks of Ecuador and Peru (e.g. Environmental Plans, National Strategies of Biodiversity Conservation, the Regional Biodiversity Strategy for the Tropical Andean States and Ecuador's Andean Ecosystems Policy), high Andean Ecosystems are recognized as fragile, critical and strategic ecosystems for the provision of multiple environmental services.

B. PROJECT OVERVIEW:

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

The Tropical Andes is a biodiversity hotspot containing fragile ecosystems with very high levels of endemism (over 40%; Myers et al. 2000, 2007). The Tropical Andes are a mosaic of forest (i.e. upper Andean forests) and non-forest lands (compromising all related short vegetation and forest/bush patches within the paramo and puna biome) where boundaries between the two of them (i.e. forest line, not treeline) are often anthropogenic in nature. The paramo –in the Northern Tropical Andes–, the puna –in the Central Tropical Andes–, the upper montane forests and wetlands are important high Andean ecosystems above the 2.800 meters contour line. The paramo covers over 35.000 km^2 and its predominantly low vegetation has adapted to the extreme and variable climate conditions of the Andes (Josse et al. 2009). Yet, scattered patches of forests (e.g. polylepis) are found throughout the landscape. The puna –including both humid and dry– is much more

extensive as it covers more than 280.000 km^2. Its vegetation has adapted to variability of water availability due to seasonal changes (Josse et al. 2009). Upper montane forests constitute the most vast ecosystem in the Tropical Andes with over 372.000 km^2 (equivalent to 25% of the Tropical Andes; Cuesta et al. 2009b, Josse et al. 2009), while high Andean wetlands are made-up of swamps, marshes, peatlands, lakes, and waterlogged soils. These high altitude mountain ecosystems are known for their strong accumulation of carbon, particularly in their soils. Thus the Tropical Andes shall be conserved, not only because of its rich biodiversity, but also for its very high stocks of carbon (Tonneijck 2010). Yet, under current predicted climate change scenarios, montane forests, paramos and punas are among the most vulnerable ecosystems in the region (Zimmermann et al. 2010, Cuesta et al. 2009a).

Globally, soils contain the largest pool of terrestrial organic carbon in the form of soil organic matter (SOM) and are major potential sources or sinks of the greenhouse gas carbon dioxide (Tonneijck et al. 2010, Lal 2004). In the high Andes, the sequestration of organic carbon in soils is a major process, primarily due to its climatic setting: cool and humid conditions prevailing in high altitude landscapes favor soil carbon accumulation (Poulenard 2003). These result in deep humic or even peaty soils that are not apt to erode because of high infiltration rates and water holding capacity. Soil carbon accumulation is further enhanced when these high altitude soils are developed in volcanic ash. Such volcanic ash soils have been recognized worldwide as containing very large stocks of SOM per unit area: approximately 5% of global soil carbon within only 0.84% of the earth's surface. For the high Tropical Andes, several studies report exceptionally high stocks for volcanic ash paramo soils (Tonneijck et al. 2010, Podwojewski et al. 2002, Poulenard et al. 2003).

Preliminary studies suggest that carbon stocks in high Andean ecosystems are comparable to those in tropical forests if both biomass and SOC pools are considered (Sevink 2009). For instance, in the case of low-biomass ecosystems such as paramo, despite abovegroud biomass is rather low (25-30 t/ha = 12-15 t C/ha; Hofstede et al. 1995), carbon stocks in soils have been estimated to contain 500 t C /ha (and potentially >800 t C /ha in wet climatic conditions). Lower, but still considerable values have been found for puna soils in Peru (e.g. Den Haan 2012). Forest soils and wetland soils, where developed on volcanic ashes, most probably have similar stocks of soil carbon (e.g. Zimmermann 2010). Additionally, available data in the case of forest patches, estimates aboveground biomass in Alnus forest in 240 t ha and 365 t ha in Polylepis forest (i.e. 120-180 t C /ha; Fehse et al. 2002). In upper montane forests the carbon stock in vegetation is expected to be higher, especially if epiphytes plants and deadwood are considered (12-44 t C/ha = 6-22 t C ha-1; Veneklaas 1991). Preliminary data suggest that land use change implies serious loss of carbon (within a range of 25% to 100%) in paramo, puna, jalca and upper montane soils depending on post-clearance processes (i.e. enhanced mineralization to complete degradation; Coppus et al. 2001). Forests and forest patches seem to be particularly vulnerable to degradation upon deforestation (up to 300 t C/ha; Tonneijck 2009). Hence, whether soils become a net carbon source or sink in the Andes will largely depend on current and future trends in land use and cover.

Land use and cover change (LUCC) is a rapid process in the Andes, with high rates of conversion (Vanacker et al. 2003), that creates a major challenge to long term sustainable development, threatening ecological integrity and biodiversity. The Andean highlands have been subject to historical degradation processes such as soil erosion, habitat fragmentation, deforestation etc. (e.g. Romero 2005, Buytaert et al. 2005, Hofstede et al. 2003, Coppus et al. 2001, Cuesta et al. 2009b). Though, human activities in the Tropical Andes have increased drastically over the last three decades (Conservation International 2007, Wassenaar et al. 2007). The Andes, as many other high altitude tropical regions, have been heavily deforested. Some studies estimate that less than 10% of its forest cover remains intact in countries such as Ecuador and Colombia (Gentry 1993, Cuesta et al. 2009b). Upper montane forests are one of the most threatened of all tropical forest vegetations, and deforestation hotspots in the Andes include the interandean valley and eastern hillsides (Cuesta et al. 2009b, Murphy et al. 1997, Wunder 1997). Selective logging, fires, extensive grazing, crops and pastures expansion, are major drivers of forest deforestation and biodiversity loss in the high Andes (Cuesta et al. 2009b). Mining has also become an increasing threat to highland ecosystems and rural livelihoods, as Andean governments are fostering investments to achieve substantial financial returns to the economy. Mining represents a direct impact on biodiversity since complete removal of vegetation is executed during exploitation, and threats the provision of critical ecological services including access to high quality water (e.g. Cajamarca, Peru).

Land degradation due to unsustainable agricultural practices (cultivation, tillage, fires), overgrazing, afforestation with exotic species, deforestation and mismanagement of water resources threatens ecosystem integrity, biodiversity conservation and functioning in the Andean highlands (Buytaert et al. 2006, Farley et al. 2004, Podwojewski et al. 2002, Poulenard et al. 2003). As Cuesta-Camacho (2007) concludes, land use practices have a significant, negative effect on the composition and structure of the vegetation (Hofstede 1995, Ramsay and Oxley 1997, Suárez and Medina 2001), on their above-to-below ground biomass ratio (Hofstede et al. 1995, Ramsay and Oxley 2001), on the hydrological behavior of the system –in particular water yield and regulation capacity (Farley et al. 2004, Buytaert et al. 2006, 2007)–, and on the

chemical/physical properties of the soils (Poulenard et al. 2001, 2004, Podwojewski et al. 2001). A high proportion of the land in the Andes is characterized by water erosion on steep slopes in fragile ecosystems, restricting agricultural use and livestock raising (Saavedra 2005). Several authors suggest that erosion depends more on land use than on soil conditions in mountainous regions (Romero 2005, Stroosnijder 2009), and that erosion rates are highly variable (Romero 2005). When poorly managed the inherently fragile soils quickly degrade, losing their ecological integrity and function, often irreversibly (Poulenard 2003).

Most land-use changes in Andean highland ecosystems are anticipated to increase the net flow of carbon from the soil to the atmosphere (Tonneijck et al. 2010) and, unless management actions are taken, also to threaten biodiversity structure, composition and functions (i.e. ecosystem services). Furthermore, climate change impacts represent a serious threat to the ecological integrity of these mountain ecosystems and it is likely that LUCC impacts will be magnified under these novel conditions (IPCC 2007, Jetz et al. 2007, Foster 2001, Bradley et al. 2006). Thus, inappropriate land use practices followed by overexploitation and clearance of forest resources and non-forest lands have exacerbated environmental degradation in the high Andes (Sarmiento 1995).

The UNFCCC's COP-15, held in Copenhagen in December 2009, recognized the crucial role of reducing greenhouse gas (GHG) emission from deforestation and forest degradation, and the need to establish positive incentives to provide multiple environmental benefits (such as REDD+). It also highlighted the importance of proper measurement, reporting and verification of mitigation actions. In such context, national efforts in both Andean countries have been undertaken; most of them as part of REDD+ strategies that are currently being designed and pursued by each country. On-going activities in both countries share a common road map where straightforward advances are taking place, though at different paces.

As a UN-REDD country, Ecuador has started measurements to establish the National Forests Inventory (FAO/Finlandia) taking into account all five carbon pools. Results are expected by the end of 2012. The government has also carried out Ecuador's official historical deforestation map (1990, 2000, 2008), which will be used in the near future to establish GHG emissions in LULUCF. Complementarily, REDD+ SES (Social and Environmental Standards) is being applied into the National REDD+ Strategy to assess the social and environmental quality of the design phase, recognizing the importance of considering multiple benefits. A spatial assessment of co-benefits has been carried out by UNEP/WCMC at the national scale. Such assessment recalls the need to generate detailed data on SOC stocks, especially in the Andes, where preliminary results based on global data on soil carbon revealed that the contribution of Andean ecosystems might be even larger than low-land forests once SOC is considered.

In the case of Peru, a REDD+ Readiness Preparedness Plan (RPP) has been prepared with inputs from civil society and Indigenous Peoples, and submitted to the Forest Carbon Partnership Facility (FCPF)/World Bank for approval. Funding has been allocated to enable Peru to move ahead with the preparation for Readiness, and as a FIP country they are starting the design of Peru's Investment Plan. Same as Ecuador, an important step is the preparation of the National Forests Inventory (FAO/Finlandia), where methodologies will still be under discussion during this year (2012), including whether SOC stocks should be estimated or not. Finally, additional funding provided by KFW and the Gordon and Betty Moore Foundation seeks to foster scientific and technical capacities for carbon monitoring developing the national MRV system and reference scenarios at subnational levels in five regions (mainly amazon and dry forests).

Nonetheless, all on-going activities carried out in both countries have been restricted to forest lands, driven by global international agreements which have focused on biomass. Even under the lenses of climate change, the role of SOC dynamics has not yet been widely recognized. Globally, there is a lack of understanding of the relationships describing how SOC stocks change (Lal 2004, Nierop 2009), aggravated in the tropics by the paucity of data available. Thus, high Andean ecosystems (including forests patches within paramo and puna biomes) have been systematically excluded, as well as its carbon storage within their soils despite that they globally store twice as much carbon as terrestrial vegetation (Bell 2009, Lal 2004). The lack of attention in the global agenda and national on-going efforts to carbon stocks in high Andean ecosystems (which include forest and non forest lands rich in SOC) means that a significant source and sink of GHG emissions has been omitted in national monitoring systems(and unaccounted at global scales). For instance, in low-biomass ecosystems such as paramo and puna this means overlooking SOC stocks that more than 20 times as much as those stored in their biomass. Given the importance of carbon stocks in soils for the provision of multiple ecosystem services (e.g. climate control, water storage, agricultural productivity), this omission impairs the delivery of global environmental benefits and fails to also encourage sustainable land management in mountainous regions.

Fortunately, since the COP-16 held in Cancun in 2010, global efforts have moved forward to start recognizing the importance of carbon in soils and biodiversity conservation within mitigation activities. Wetlands and peatlands have become a new focus of attention and future negotiations may include countries within international agreements (e.g. Scotland, Russia, Indonesia). However, Andean countries will still require external scientific support in order to establish

proper monitoring systems within national MRV schemes and to be recognized as valuable and cost-effective pools of carbon in the highlands, as well as to create the enabling environment that reduce LUCC pressures over forests & non-forest lands, species and ecosystems. Thus, this project is considered by national authorities as a clear contribution to on-going activities in each country and its national priorities.

Complementarily, both countries have launched incentive based policies to conserve biodiversity in private and communal lands (i.e. government financed PES schemes). In Ecuador Socio Bosque has invested through direct payments in a total of 882.000 ha (and 90.000 beneficiaries), of which at least 6% corresponds to high Andean ecosystems. Currently, Socio Bosque is working in a strategy to promote restoration practices in degraded lands, though no on the ground activities have been developed in the program, nor critical degraded areas to be targeted have been identified, and no monitoring efforts to account for enhancing multiple benefits have been yet developed or agreed on. In Peru, the National Forest Conservation Program, aiming to conserve 54 million hectares of forests by 2021, was officially launched in 2009, yet the program is still under design and no clear criteria to prioritize conservation areas or monitor individuals' compliance and ecosystem services enhancement have been envisioned. Both programs are strategically placed to support ecosystem services in human-dominated landscapes densely inhabited as the Andes. Nonetheless, as many other similar government programs in Latin America (i.e. government financed PES), addressing specific design, implementation and monitoring caveats will greatly enhance the provision of multiple benefits and its contribution to GEBs.

In the business-as-usual scenario, both countries will continue to omit land use and cover changes impacts over SOC stocks in the highlands and underestimate their total GHG emissions. Although there are clear linkages with them, the project fundamentally fulfills a substantial gap in current efforts to enable both countries in order to ensure more comprehensive national carbon stocks estimations in the near future. These will greatly gain in accuracy when they adequately take into account high Andean ecosystems and, in particular, their unique carbon dynamics. This also applies to undergoing MRV activities that –in practice– will be pursued by both countries during the next two years (e.g. UN REDD/Ecuador, FAO Finlandia). The lack of knowledge over SOC stocks, its relationship with biodiversity, and the insufficient recognition of its importance to provide multiple benefits to support local livelihoods and enhance ecological integrity, are serious barriers to overcome degradation drivers and trends that undermine the natural resource base in the Andes. Traditional resource management will not reduce land degradation in the Andes, and development strategies will continue to erode the fragile natural resource base that sustains local livelihoods. Without GEF's intervention, current management approaches and investments will not be able to optimize the provision of multiple benefits in the high Andes, target critical areas within land-use planning, redirect investments to diversify the financial resource base, mainstream conservation through reformed policies that retrieve from old fashion believes, or gain better access to global financial mechanisms to provide positive incentives for a greener economy that takes into account externalities and encourages a sustainable management in the wider landscape. While efforts are underway to reduce the depletion of the natural resource base by redirecting investments, the enabling conditions for sustainably ensuring the stability of ecosystems and biodiversity is not in place yet. Thus, the project faces a setting where scientific, political and institutional barriers discourage SLM/SFM strategies and the adoption of an ecosystem approach within planning.

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

Although important improvements in favor of an enabling environment have recently occurred in both countries, developing a sound knowledge base to support policy-making and enhancing local and national capacities are still critical factors to reduce barriers that undermine biodiversity conservation, climate change mitigation, SLM and SFM in the high Andes. The project's main contribution will be the recognition of high Andes ecosystems and soils as important sources of carbon storage providing multiple environmental and social benefits at global, national and subnational levels. Strengthening the existing linkages between focal areas is the basis of the proposal, and synergies regarding conservation and restoration of carbon stocks in forest and non-forest lands (BD, CCM, SFM, LD) will be pursued. For example, diminishing carbon pools further exacerbates forest and land degradation, is interconnected to biodiversity loss, and also involves negative effects on water provision. A better understanding of how anthropogenic activities contribute to the depletion of the carbon pool, a deeper comprehension of its consequences over biodiversity conservation, the provision of critical environmental services and support of local livelihoods, and identifying alternative management practices, can help practitioners, policy- makers and decision-makers confront the consequences of global environmental change in the high Andes.

The project embraces a landscape approach that promotes ecosystem principles and enhances the connectivity, resilience and stability of ecosystems. Acknowledging socioeconomic and biophysical dynamics governing changes in the Andean landscape, the project will foster an integrated ecosystem approach as the best way to reduce pressures induced by land-use conversion. A Science base will be developed to overcome current and critical knowledge gaps in the Andes, and it

will be integrated to support decision-making. Sustainable land and forest management among competitive uses will be integrated through more comprehensive national development policies and subnational land use plans. Such tools will rely on broad-based participation to promote collaboration across sectors in the wider landscape. Innovative financial mechanisms will be supported and fostered (e.g. PES and other benefit sharing mechanisms) in order to diversify the financial resource base, and on the ground activities will be developed in pilot sites to reach local communities and influence land use practices. Thus, the project will contribute to overcome critical scientific, institutional and financial barriers that undermine the provision of multiple environmental, carbon and social benefits in the high Andes.

Through **Component 1 (Science Base & Tools Development to support decision making)**, the project aims to integrate new knowledge base within decision-making tools, enabling national institutions and key stakeholders at multiple levels (national, subnational, local) to undertake biodiversity assessments, account for carbon stocks and monitor GHG emissions in the high Andes from LULUCC. For instance, the Andean countries face the lack of regional estimations of carbon stocks in high Andean soils and ecosystems. Regional estimations of soil organic carbon stocks worldwide are highly variable depending on altitude, temperature, vegetation, and land-use history (Pene 2010, Cock 2010). Existing models are not readily applicable to high Andean soils because of the specific decomposition processes and pathways, and relevant input parameters are scant (Sevink in press). This implies that global models of soil carbon dynamics may seriously underestimate soil carbon stocks on the basis of erroneous assumptions for the Andes (Tonneijck et al. 2010). Thus, improved knowledge of SOM stabilization mechanisms in non-allophanic Andisols including forest and non-forest lands is needed to calibrate models. **Output 1.1.1** will address this directly, expanding the knowledge base available in the high Andes regarding SOM stabilization processes, carbon cycles and accumulation dynamics in the high Andes. This will include a comprehensive review of available literature and field experimentation in pilot sites. The project will also deepen the understanding of the relationships between SOM, LUCC trends, biodiversity and the provision of critical ecosystem services which heavily depends on the integrity of ecosystem processes arising from the interplay of: a) the vegetation composition and structure, b) the hydro-physical properties of the soil, and c) the water cycle. Nonetheless, to a big extent there are important gaps of knowledge that should be filled in order to integrate science within decision-making process in order to design better policy choices and monitor management actions in the high Andes. On such basis, **Output 1.1.2** will design, adapt and calibrate an accurate methodology to assess biodiversity health status and estimate carbon stocks taking into account above/belowground biomass, deadwood and soil organic matter in forest and non-forest lands, including peatlands. The methodology and its protocols will be based upon other relevant and available methodologies, yet adapted to the high Andean characteristics. For instance, to improve estimates of organic carbon stocks and flows in volcanic ash soils in the high Andes, models of soil organic carbon dynamics need to incorporate Al_p/Al_o rations instead of clay content (Tonneijck 2009). Ultimately, this can be the basis for offering more comprehensive national and regional estimates of carbon stock in the high Andean countries. Methodological discussions with regional experts and government officials in both countries will be undertaken to guarantee that such methods are applicable and recognized by international standards. The participation of public officers is necessary as a mean to increase technical capacity in both countries, but also to enable tools and methods to be relevant and useful within decision making processes at multiple scales. Additionally, specific carbon stock accounting methodologies will consider different land uses and shifts in management practices that can be further validated through international standards (i.e. VCS). A monitoring system of biodiversity and carbon stocks will be established at pilot sites, validating methods and protocols in the field with different histories of land use, which will offer the scientific basis to infer trends and patterns at larger scales in the future. Pilot sites will be selected during the PPG considering biophysical and socioeconomic characteristics, as well as existing and historical patterns of LUCC, in order to have a set of representative areas of the diversity of the Andes. The system will be nested within the monitoring systems of the Ministries of Environment in line with priorities and procedures set by each country and will be included within monitoring, reporting and verification activities (MRV) of each country. **Output 1.1.3** will develop site-specific LUCC models in the high Andes, which will identify areas of rapid conversion, transition matrices, proximate and underlying causes of change and GHG emissions. Finally, **Output 1.1.4** will develop user-friendly tools to support decision making based upon i) economic-environmental scenarios including economic valuations of biodiversity (i.e. replacement costs, contingent valuations, choice-experiments, cost-benefit analysis), estimations of GHG mitigation and adaptation costs, ii) spatially explicit trade-off models between different land use options to identify and target critical areas for environmental and carbon benefits, and iii) vulnerability assessments of environmental changes that affect social and natural systems in the pilot sites. Such tools will be further disseminated among policy-makers in component 2 to assess cross-sectoral analysis and support decision making processes.

This component demands direct coordination with the Carbon Benefits Project (UNEP) in order to calibrate their methodology for modeling, measuring and monitoring carbon stocks and GHG mitigation benefits for GEF projects. The project pursues in the same line that earlier GEF projects on soil organic carbon (e.g. GEF-SOC and Carbon-Benefits

Project) have concluded and recommended further action: i) the need to deepen SOC knowledge, particularly in tropical areas where the biggest changes in land use are expected while least data is available, and ii) the importance to promote sustainable land and ecosystem management as a key climate change mitigation measure to safeguard current carbon pools in soil. The project intention is to take lessons and tools previously developed to account for carbon stocks (particularly within the Carbon Benefits Project, CBP), and calibrate them to the high Andes taking into consideration new information and knowledge base generated through the project including forest soil carbon. During PPG, the project will use the CBP Simple Assessment to do an ex-ante analysis of C-benefits in the project region, establishing a baseline and the project scenario. The baseline will take into account land use change models in pilot areas, and consider the expected land use/management situation change during the project (e.g. forest land, grassland, wetlands, annual cropland, perennial cropland, settlements, livestock). Complementarily, a Measurement and Monitoring Plan will be developed taking into account the CBP framework developed in order to include carbon pools and emissions that will improve the project's overall C/GHG estimate. During the project implementation field data will be gathered to fulfill the CBP Detailed Assessment that is based upon activity data on different land use categories and management practices (i.e. mosaic deforestation and degradation). In addition, the CBP will also support upscaling of project impacts in the long term in its capacity as an open access platform where project findings can be accessed by other Andean countries to improve their carbon accounting and access to financing mechanisms.

The project also envisages the participation of local universities to develop national capacities, and will count with the technical and financial contribution of international organizations with relevant experience, such as the University of Amsterdam (Netherlands), and Landcare Research (New Zealand). Methodologies and final results of this component will be spread among a network of experts established by CONDESAN in the region and other leading academics groups (e.g. International Mire Conservation Group-IMCG). This is expected to internationally validate methodologies and tools, and achieve greater dissemination of the project's results within the scientific community.

Component 2 (Capacity building and advocacy at multiple scales for enhancing multiple benefits in the high Andes) aims to create the enabling conditions in the high Andes. Capacity building is an important emphasis of this component, involving both strengthening institutional capacities at national and subnational levels and increasing financing opportunities to diversify financial resource base. Given that there are no tracking tools for GEF cross-cutting capacity building projects, an adapted version of the Project Level Capacity Development Scorecard (Monitoring Guidelines of Capacity Development in GEF Projects) will be used by the project. At the subnational/national level, this component will identify a wide range of engagement activities with key stakeholders (e.g. municipalities, communities, private sector) across sectors (e.g. forestry, agriculture, livestock, mining) to plan, implement activities and undertake tasks that address land degradation, biodiversity loss and contribute to SLM and SFM. At the global level, the project will enhance both countries' abilities to negotiate in international meetings aiming to increase the likelihood to gain access to financing including a resource mobilization strategy for high Andean ecosystems. An integrated and coordinated effort among the two Andean countries will be required at this point. Specific mechanisms to foster binational cooperation will be designed during the PPG as one of the critical success factors for the project. Among the activities already envisioned to promote this kind of work are periodic consultative meetings and technical workshops with national representatives and authorities of both countries aiming to establish and implement a common agenda which recognizes respective national interests yet defines minimum agreements. Recognizing such differences and building common priorities early in the project is an empowering mechanism to gain strong commitments from national authorities, which can further mobilize human and financial resources within the project.

In order to optimize the provision of multiple carbon and environmental benefits, the project will enhance a cross-sector enabling environment that integrates multiple benefits across the landscape (Outcome 2.1). Thus, mainstreaming BD, CCM, SLM and SFM into policy frameworks and integrating them within planning processes will be pursued with the goal to reduce the pressure of proximate and underlying causes of LUCC at the wider landscape. It is critical to assist new planning and management processes in the high Andes that reverse degradation drivers and trends, and GEF's contribution can optimize the provision of multiple benefits within integrated land-use planning and policies in the wider landscape.

Output 2.1.1 will design integrated land-use plans promoting sustainable and alternative regimes of land use aiming to slow down degrading processes in land, biodiversity and forests. The project foresees land use plans as valuable tools that will contribute to integrate multiple benefits within land management at multiple levels. It also acknowledges that to be successful, a broad-based participation, a locally driven agenda and that it needs to build on existing local capacities (Bolger 2000). Additionally, given decentralization processes being undertaken in both countries, land use plans will support planning processes of subnational governments who have the competencies regarding natural resources management, yet lack capacities to identify critical areas for CC-BD-LD-SFM. Through them, synergies can be fostered and potential trade-

offs managed while establishing management actions at multiple scales. In order to achieve this, the project will involve all relevant stakeholders in both countries, including national governmental planning agencies (e.g. SENPLADES and SENAGUA in Ecuador) and other important sectoral institutions. Partnerships among subnational and national stakeholders will also be built. By integrating BD, SLM, SFM and CCM principles within land use plans and mainstreaming multiple benefits into national and subnational policies, the project will influence decision-making, not only regarding land-use planning, but also budgeting, policy and strategy development. **Output 2.1.2** will pursue in establishing a cross-sectoral agenda, agreements and investment plans through collaborative processes with representatives in each country. For most sectors across Peru and Ecuador, the only agenda is of a short-term nature. This poses the menace of allocating resources to issues or targets that in principle could be useful for the day-to-day needs, but do not necessarily reflect the real needs of both countries in terms of climate change, much less biodiversity conservation or sustainable land and forest management in the long run. Strengthening environmental governance in the high-Andes will be based on minimum agreements with a broad-based participation among intersectorial representatives, including the private sector in relevant issues (e.g. mining, agriculture). A coordination mechanism will be established –on the basis of agreed terms of reference among relevant stakeholders–with periodic meetings and a workplan. Investment plans will be designed and financial commitments promoted as a means to achieve mid-and-long term sustainability and mobilize resources from regional governments and the private sector to support actions. Finally, it is also expected that by informing decision-makers with solid scientific knowledge and providing them useful and friendly tools to support the decision-making process, a cross-sector enabling environment can be enhanced in the high Andes. Hence, **Output 2.1.3** involves specialized training programs for key policy and decision-makers as well as public technicians to raise awareness and strengthen their abilities to embrace multiple benefits. Specific training programs will include methods/protocols to quantify carbon stocks and GEI emissions, development of monitoring systems (within national MRV activities), and use spatially explicit tools to target conservation and land restoration in critical areas. The purpose is that tools developed in C-1 will be used during decision-making process in order to deliver further policy instruments.

The project will also pursue to increase the opportunities to gain access to new funding in existing and emerging global financial mechanisms by enhancing national capacities (Outcome 2). The project acknowledges that the lack of proper monitoring systems in place and international attention to SOC stocks are critical obstacles to overcome while mobilizing new sources of revenue into the region. On the basis of the new knowledge base and tools developed in Component 1, joint efforts with environmental authorities of both countries will be carried out to establish proper accounting and a monitoring system suitable for high Andean ecosystems in the context of national systems for monitoring, reporting and verification (MRV). Such effort is necessary to fulfill requirements of any global financial mechanism, such as REDD+ schemes or voluntary markets, in order to diversify the financial resource base and support policies and institutional changes to promote cost-effective mitigation activities in the LULUCF sector. Thus, **Output 2.2.1** will establish monitoring systems, and foster their adoptation and use by key national and subnational stakeholders (including national incentives programs in both countries). Through establishing a rigorous cost-effective monitoring system, the project can also support national incentive programs to upscale and increase country-wide impacts in both countries. These include evaluating environmental and socioeconomic impacts (including comparison groups), targeting key areas that can provide multiple environmental and carbon global benefits, and controlling for spatial demand spillovers. Additionally, in the case of **Ecuador**, the project will support the Socio-Bosque Program with tested actions and practices that can be replicated. In the case of **Peru**, the project can influence national authorities to include high Andean ecosystems within the governmental conservation program and assist them in targeting key areas. With the purpose of identifying new financing opportunities, **Output 2.2.2** will set up a tracking-tool (e.g. Andean Observatory of Climate Change Policy) to follow-up changes within global financial mechanisms relevant to high Andean ecosystems. Policy makers will be informed and appraised on any relevant shift in the global agenda, integrating technical-political input to support their proposal in international negotiating processeses. Complimentarily, **Output 2.2.3** will offer technical advise and training to public officers in both countries, and support their active participation in international meetings regarding global financial mechanisms. Specific courses on negotiating skills relevant for REDD+, the voluntray market and other relevant global financial mechanisms will also be promoted as mean to enhance national capacities in such isues. In order to gain broader attention in the global arena, **Output 2.2.4** will coordinate and establish an international network of recognized scientists and influential policy-makers to advocate in favor of fostering investments in high Andean ecosystems. Through them, the project will not only diseminate results globally (i.e. carbon estimations, methodologies and monitoring systems) but also champion the mobilization of financial resources to support SLM and SFM in order to secure carbon stocks and environmental benefits provided by Andean ecosystems. As a whole, the result would be the international acknowledgment of the high Andean ecosystem not only as biodiversity hotspots, but also as potentially cost-effective carbon sinks delivering social and environmental benefits. On that basis, **Output 2.2.5** will

design and implement a Resource Mobilization Strategy for the high Andes that can envisage mechanisms through which current and emerging global financial mechanisms can be applicable to the andean landscape. Particularly, the project expects to increase available funding for government-financed PES through either bundling or layering strategies among several financial mechanism available (e.g. REDD+), and at local levels, efforts will be set to exploit biodiversity, water and carbon synergies in the voluntary market. Thus, the project will also foster the development of small-scale PES programs, although mindful if viable conditions are present at local levels (e.g. tenure, organization base, socioeconomic conditions, etc).

To achieve outputs 2.2.1 through 2.2.5, the project will rely on the expertise of international partners including Landcare Research, the International Mire Conservation Group (IMCG) and University of Amsterdam, who will assist and play in favor of advocating in the global arena. The project will work closely and directly with environmental authorities (e.g. MAE and MINAM in Ecuador and Peru respectively), and particularly with implementing PES national programs in forests and other native ecosystems conservation (i.e. Socio Bosque-EC and Forest Conservation-PER) aiming to gain resources from the global carbon markets. Furthermore, the General Secretariat of the Andean Community (SG-CAN) will be invited to facilitate discussions among government representatives of all four Andean countries.

Additionally, the project will execute field demonstrations as mean to support policy making, validate a sound knowledge base and gain access to financial mechanisms (e.g. SOC stocks, monitoring systems, LUCC models) is also necessary to foster BD conservation, SLM, SFM and CCM within planning processes at multiple levels. **Component 3 (Field demonstration of multiple benefits in the high Andes through SLM/SFM practices in pilot sites)** is expected to enhance carbon and environmental benefits in the high Andes through SLM/SFM practices on forest and non-forest lands (Outcome 3.1). On the ground investments in pilot sites are meant to facilitate innovation, dissemination and replication of good management practices. On such basis the project will also offer policy and decision-makers specific recommendations on sustainable management options, tested and validated in pilot sites in Ecuador and Peru. Overexploitation of forest resources and inappropriate land use practices have exacerbated environmental degradation to a point that land restoration and natural regeneration of vegetation are being considered as valuable options for conservation and support local livelihoods in the high Andes (Sarmiento 1995). Improvements in quality and quantity of the SOC pool, through soil conservation practices, and restoration of high Andean ecosystems can increase biomass/agricultural production, enhance water quality, reduce sedimentation of reservoirs and waterways, and mitigate risks of global warming (Lal 2004, Perez 1992). **Output 3.1** involves the conservation of Andean ecosystems and restoration of degraded fragile lands through SLM/SFM practices in pilot sites. SLM refers to restoration practices in degraded lands (e.g. native plants propagation, planting, and rescue; relocation of soil and vegetation paths; building protective erosion structures) and alternative management activities (e.g. soil conservation techniques such as terraces and crops rotation, no burning areas, improvement in the grazing and rangeland management techniques, and agroforestry systems). Those include activities based on technical knowledge, as well as traditional practices. Many projects have ignored the importance of local practices regarding natural resource management, including adaptive responses to environmental changes. Nonetheless, this project will pursue an integrated approach that takes into account local knowledge and add-in technical innovations that can enhance local adaptive capacity. SFM activities are more closely related to conservation practices that would prompt a natural recovery process. An adequate vegetation cover guarantees the soil's water absorption, reduces the kinetic force of rain impact on the ground (cutting back potential erosion), becomes part of pastures eaten by animals and serves as raw material to build their shelters. Thus, protection and conservation of critical areas selected by local communities (e.g. fences) and establishing conservation agreements with local stakeholders (including communities or private landlords) will be also pursued. **Output 3.2** involves testing different management practices (including different land cover and uses) in forest and non-forest lands in pilot sites. Carbon benefits provided by different land covers, uses and management practices as well as different GEI emission factors will be quantified and monitored taking in consideration IPCC Good Practice Guidelines. Capacity development is important to gain support and promote long lasting changes. Thus, **Output 3.3** will locally disseminate methodologies and lessons learned on multiple benefits, good management practices & technologies for the SLM/SFM in the high Andes. Pilot interventions will also be based on strengthening local institutions and fostering participation of community members.

Overall, this component will assist landowners and communities in the protection and restoration of their lands by providing scientifically based guidelines and disseminating key and practical information. A set of reliable and easy-to-use indicators on SOM quantity and quality will be building together with them to underpin management and restoration strategies in their own plots (Martius et al. 2001), fostering capacity development in local stakeholders. In this component, the project will work with sub-national governments, communities, nongovernmental organizations (e.g. NGO in Peru), and national universities.

Finally, **Component 4 (Project monitoring and evaluation)** aims to evaluate project implementation based on

results based management and gain feedback on lessons learned during the project to replicate success and prevent failures in future operations. **Output 4.1** involves designing and establishing the project's monitoring system to provide systematic information on progress (including outcomes and outputs targets, and budget execution). **Output 4.2** will conduct Midterm and Final technical and financial evaluations. **Output 4.3** will promote an on-going systematization process regarding the project's related best practices and lessons learned whose final result is a publicly available publication. Lastly, **Output 4.4** will entail the project website to share and disseminate information produced by the project.

GEF's contribution through this project is crucial to remove barriers and create the enabling conditions to promote CCM, SLM and SFM focused practices to help provide multiple environmental benefits in the high Andes. The project will offer direct benefits in at least 6 pilot sites (to be defined in PPG) covering a total area of approximately 150,000 hectares where land-use plans will be designed with local participation. Within those areas, SLM and SFM on the ground activities in priority sites will be implemented in roughly 50,000 hectares in forest and non-forest lands, improving habitat for biodiversity, sustaining water flows for downstream users (total number still to be defined during PPG) and maintaining above and belowground C stocks for an estimate of ~22,790,000 t C. Additionally, avoided emissions from reduced deforestation and degradation will be pursued in pilot sites in at least 10% and 20% of total land area in forest and non-forest lands respectively. Indicative CO2 benefits of the project are estimated to be 4,312,250 t CO2, which translates to a preliminary estimate of $1.11/tCO2 (=$4,796,364 /4,312,250 tCO2). All targets are indicative until PPG when the baseline will be established; however conservative figures based on the available literature have been considered regarding mean C stock values. Table 1 shows details about indicative benefits provided by the project.

Table 1: Indicative benefits provided by the project

Direct Benefits in Pilot Sites	**Land Area** (HA)	**Mean C stock values** (t C/ha)	**Expected Benefits**	
Improved habitat for BD and number of species mantained in the wider landscape	**50,000**	-	**50,000 ha**	In both forest and non forest-lands
Sustained water flows in at least 5 watersheds	**50,000**	-		[Total water users to be defined during PPG]
Sustainable land management	**35,000**	-	**35,000 ha**	
Sustainable forest management	**15,000**	-	**15,000 ha**	
Above/belowground C stocks mantained in forest and non-forest lands within pilot sites	**50,000**		**22,790,000 t C**	Includes both aboveground biomass and SOC estimations.
Non-forest lands (*paramo, puna*)	35,000	514	17,990,000 t C	Based on data of Tonneijck (2009) for SOC; Hofstede et al. (1995) for aboveground biomass
Forest lands *(polylepis, alnus and upper montane forest*)	15,000	320	4,800,000 t C	Based on data of Zimmermann (2010) for SOC, Fehse et al (2002) and Veneklaas (1991) for aboveground biomass including epiphytes.
Avoided emissions in pilot sites	**8,500**	**-**	**1,175,000 t C**	**Equivalent to 4,312,250 t CO2**
Non-forest lands under degradation (20% of total land area in pilot sites)	7,000	125	875,000 t C	Based on data of Coppus 2001, where minimum loss is equivalent to 25% of carbon stocks in SOC.
Forest lands under deforestation (10% of total land area in pilot sites)	1,500	200	300,000 t C	Considering total loss of carbon stocks from biomass and 10% in SOC.

Additionally, at least in three (other) scales, indirect benefits will also be pursued extending project impacts geographically beyond project sites, reaching cross-thematic into other areas such as specific adaptation efforts and fostering long term impact to last beyond project duration:

- Close related on-going initiatives in the region (e.g. REGATA EBA-Peru) using tools, field measurements and demonstrative actions developed in components 1 and 3, rolling out project's activities and outcomes (Tier 2).
- At the national scale, government's incentive programs decisions and actions supported by science-base methods developed at pilot sites, upscaling project's outcomes (Tier 3).

- South-south cooperation enhanced through calibration of the Carbon Benefits Project tools and measurement protocols to assess carbon stocks in non-forest land (Tier 4).

B.3. SOCIOECONOMIC BENEFITS TO BE DELIVERED BY THE PROJECT AT THE NATIONAL AND LOCAL LEVELS, INCLUDING CONSIDERATION OF GENDER DIMENSIONS:

The main socio-economic benefit delivered by the project will be the sustainable enhancement of local livelihoods through the maintenance of critical ecological services of high Andean ecosystems. Communities as direct natural resource users are better positioned than any other agent to ensure protection of the soil and vegetation cover, and it is only through full participation of community members that degradation processes can be stopped and reversed. The direct gain for local communities is the maintenance of ecosystem services as means to support of their livelihoods. The Andes is home to millions of people facing high levels of poverty. Water stresses and soil nutrients are undoubtedly a critical issue that undermine local livelihoods, and are linked to carbon stocks in soil and LUCC. SLM/SFM field demonstrations, measurements and monitoring systems will be executed in pilot sites with active participation of local communities. All interventions at the community level will take into consideration the way women are part of the decision-making process at the farm level –in many cases they are the ones taking decisions on how, why and where to cultivate– and, on the other hand, how vulnerable they are to a decrease of the provision of critical ecological services. Thus, a gender dimension will be essential in Outputs 1.4 / 3.1 / 3.2. Additionally, in order to foster land management and start the recovery of the vegetation cover and establish incentives programs (included government financed PES), it is necessary to strengthen local institutions.

B.4 RISKS, INCLUDING CLIMATE CHANGE RISKS AND PROPOSED MITIGATION MEASURES:

RISK	LEVEL	MITIGATION MEASURE
Low degree of appropriation of monitoring system by environmental authorities.	Low	The project will involve key representatives of MAE and MINAE in the design of the monitoring system in order to guarantee that it responds to their needs and demands. The system will also be nested within the ministries monitoring systems and MRV actions. Therefore, it will increase the likelihood of the monitoring system to be institutionally embraced by both gov't agencies.
Limited political will of governments to promote sound SLM/SFM at the landscape and local levels among cross-sectoral stakeholders.	Moderate	Competing land uses in the high Andes, including large mining projects in both countries, pose a serious challenge to gain support from governmental agencies. Risks on cross-sectoral cooperation will be mitigated through an strategic involvement of key stakeholders at multiple levels that will be developed during PPG, and that will also address assess scientific, political and institutional gaps & strategic priorities in the context of multiple sectors and government departments operating in different levels and with different competencies. The project will work closely, not only with environmental authorities but also with relevant planning agencies in charge of governments' infrastructure plans and policies. The main argument to gain support for SLM for gov't agencies is the importance of SLM and biodiversity conservation to the provision of critical ecological services (e.g. water regulation) and, thus, reducing vulnerability of social systems. In order to gain support, the project will also have to offer innovative approaches to conceal competitive uses in the wider landscape.
Low level of acceptance of the project's results and methodologies within the international community.	Low	The project will get involved within recognized networks of academics and policy-makers (e.g. IMCG) to disseminate the methods and results on SOC and biomass in the high Andes. The project also includes outreach other countries and regions that share similar ecosystems and geological conditions (e.g. Kenya, New Zealand) by establishing strategic alliances with key international partners (e.g. Landcare Research) This way the project will increase the exposure of its scientific and political efforts, and moreover, such efforts will be backed-up by a highly renowned group of specialists worldwide.
Volatility of international negotiations regarding REDD+	Moderate	International negotiations on climate change are volatile and highly political. In such scenario, the project will have to take advantage of all available opportunities and to learn to manage time-lags effectively. Alternatively, regional organizations (e.g. CAN, UNASUR) as well as the voluntary market or any other related financial mechanism will also be considered as important and alternative boards.

Climate change impacts over carbon stocks and accumulation processes.	Moderate	The project will establish alliances with research partners that are interested specifically in the effects of warming on carbon stocks and cycle to address potential climate change risks.

B.5. IDENTIFY KEY STAKEHOLDERS INVOLVED IN THE PROJECT INCLUDING THE PRIVATE SECTOR, CIVIL SOCIETY ORGANIZATIONS, LOCAL AND INDIGENOUS COMMUNITIES, AND THEIR RESPECTIVE ROLES, AS APPLICABLE: The project relies in the participation of public and private actors at different scales. These include major planning government agencies as well as environment ministries, sub-national governments, academic and research organizations including national and international universities (e.g. University of Amsterdam), international networks (e.g. International Mire Conservation Group –IMCG–), research centers (e.g. Landcare Research), and local/indigenous communities. Government agencies and institutions will lead institutional changes to promote SLM at the landscape level, while local/indigenous communities will implement SLM practices in specific pilot areas. Research organizations and other NGOs will offer technical support and advice for the development of Component 1 and 3 respectively. CONDESAN is currently recognized by both Ministries of Ecuador and Peru as a solid partner for the project's work, and will have a leading role as technical advisor in both countries, coordinating actions with international and national research centers, act as an articulator among all different cross-sectoral partners, and assuring that applied methodologies and monitoring systems are consistent between Peru and Ecuador and in line with emerging global state of the art.

CONDESAN is a consortium of non-governmental organizations operating at multiple levels (from local to regional levels) along the Andes, and is especially interested in cross learning between countries, ecosystems, political environments. Through its projects, CONDESAN has gained a twenty years' experience in crucial issues of the high Andes, and its expertise includes technical and social sciences' topics and abilities (biodiversity, hydrology, soils, sustainable livelihoods, agricultural innovation, land cover and use change). As regional coordinator of the Paramo Andino Project (GEF-UNEP), CONDESAN has already relied on its network of partners to execute activities at local levels. During PPG, implementation arrangements for the project will be defined, including partnerships with key stakeholders taking advantage of their own strategic capabilities in order to have an articulated process among components and levels. Additionally, CONDESAN will assist both countries in developing a common agenda and minimum agreements that will allow comparable results among them, yet flexible enough to allow each country to emphasize their work in their own scenarios and set priorities. Finally, through international academic and non-academic networks (such as the International Mire Conservation Group, IMCG; Mountain Forum), CONDESAN and its partners will also help disseminate the information about carbon stocks in the high Andes and advocate in order to gain support in the international arena.

In **Ecuador** the project will involve directly MAE's Under-Secretaries of Climate Change (with the Mitigation National Direction, and Adaptation National Direction) and Natural Patrimony (Biodiversity Direction, and the Forest Direction and the National Forest Inventory Program). Meanwhile, in **Peru**, the National Climate Change MINAM development will be in charge of specific activities. Efforts will be placed to coordinate project's activities with on-going actions in both countries. Key cross-sectoral governmental institutions (e.g. SENPLAES, Ministry of Environment, regional governments) and private organizations (e.g. agriculture associations, mining companies) will be identified and partnerships strategically established during PPG. Nonetheless, considering that in both countries a multisectoral committee on Climate Change has been established, instead of creating new instances, the project will support decision-making processes within such committees and their members, strengthening communication mechanisms among government departments. During the project preparation phase, specific identification of relevant emerging instances and participative planning of cooperation mechanisms will be defined. The project will also pursue defining a common agenda among most relevant decision making actors and cross-sectoral strategy for the provision of multiple benefits including capacity building and financing.

All transboundary actions will be framed within the Bi-National Plan that governs the cross border relationship between both countries and the specific agreement between Ecuador and Peru on cooperation in shared Environmental Agenda issues. CONDESAN has the required expertise of collaborative work with national authorities of both countries through a series of regional projects including GEF, and with the Andean Community (CAN) shaping environmental policy, which bodes well for collaboration towards Andean wide dissemination/application of project findings and impact.

The project will take advantage of this expertise and networking. Specific mechanisms to foster transboundary cooperation between the two countries will be designed during the PPG as one of the critical success factors for the project. Nonetheless, a set of activities have already been envisioned to promote this kind of work, such as to conduct consultative meetings and technical workshops with national representatives and authorities of both countries to establish a common

agenda that recognizes the respective priorities and main interests of each country, and defines a set of minimum agreements. Recognizing such differences early in the project is an empowering mechanism to gain strong commitments from national authorities, which can further mobilize human and financial resources within the project.

Executing arrangements will be defined during the PPG phase, and synergies with other agencies will be pursued. The project will coordinate closely with ongoing related activities further described in B1, validating methods and approaches. In Ecuador, UN-REDD will be a key partner, in particular regarding to i) establishing mechanisms and a monitoring system to enhance the provision of multiple benefits and ii) the design and implementation of a national monitoring system of GEI emissions (including MRV features). In Peru, the Regata project will be considered among key partners to explore and exploit mitigation-adaptation synergies.

Finally, international institutions involved in research provide technical support for the development of methodologies for monitoring biomass, SOC and LUCC models and implementation of plans for land use. The University of Amsterdam will provide the project scientific knowledge and analytical skills, particularly with regard to carbon storage in soils. In the case of Landcare Research, a public-private applied research institution from New Zealand, its expertise includes: i) methodologies for quantifying soil carbon and biomass, ii) modeling and mapping LUCC, and iii) advocacy in global funding mechanisms.

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

Given the complementary nature of the project with the Carbon-Benefits Project, close collaboration between the two projects will be pursued, as well as with any other global or regional initiative relevant for the SLM/SFM, biodiversity conservation and carbon sequestration of the high Andes. In particular, Components 1 and 3 will be closely coordinated with other on-going GEF Projects to promote synergies and avoid duplicating actions, such as "Management of Chimborazo's Natural Resources" in Ecuador, "Promoting Sustainable Land Management in Las Bambas" in Peru, "Adaptation to the impact of rapid glacier retreat in the Tropical Andes" and "Valuation of Environmental Services of High Andean Wetlands" in both countries, where close bonds with most of the leading organizations of those projects have already been established through previous partnerships with CONDESAN. Similarly, the project will be aware of previous lessons learned of other relevant projects (e.g. Andean Paramo Project) and will be ready to incorporate them within the project's design and implementation. Additionally, the project will involve the participation of national PES programs. In Ecuador, the governmental program "Socio Bosque" which promotes biodiversity conservation in forest lands and sustainable land management in the highlands, and in Peru, the Forest Conservation Program. The project would be vital in supporting both ministries and programs to develop appropriate baselines and GHG monitoring systems in order to access REDD+ financial sources (or any other related mechanism). In the case of high Andean ecosystems, the need to include and account for SOC is strategic, yet both programs require the external scientific support that the project will provide to create the enabling conditions required (i.e. national regulations, policies, incentives, technical assistance and knowledge base).

Furthermore, this project will be coordinated in-house with the efforts that UNEP and partner agencies are presently carrying out in the UN REDD framework of actions. This initiative is currently making progress in Ecuador and looks forward to advancing work in Peru, for which the present project bodes well. Specific complementarities with the present initiative will be discussed and collaboration agreed during the project preparation phase to maximize efficiencies in the support to aligned objectives. Finally, the countries in the region are continuously receiving support and guidance from UNEP regarding the work in the area of Green Economy, The Economics of Ecosystem and Biodiversity and on the Intergovernmental Platform on Biodiversity and Ecosystem Services. The activities of this project will be aligned with said support and to the emerging developments in these areas.

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

UNEP's comparative advantage derives primarily from its mandate to coordinate UN activities with regard to the environment, being the only agency in the system charged with keeping the environment under review for development of environmental policy. Furthermore its convening power, its ability to engage with different stakeholders to develop innovative solutions and its capacity to transform these into policy- and implementation-relevant tools.

For projects dealing with ecosystem management in particular, this entails the strengthening of scientific understanding of ecosystems functions, including assessment and review as well as policy and law development in relation to ecosystem management that takes socio-economic aspects into account. UNEP's coordinating role on ecosystem services through the MA is an important building block for its work in the GEF. Its mid-term strategy centers on an ecosystem management approach, making UNEP an even more reliable agent among different stakeholders. UNEP's work in sustainable land management has helped putting in place integrated approaches to land use management at regional and

landscape levels. Its portfolio of interventions shows vast experience in bi-national and regional transboundary ecosystems and production systems across national border in various ecosystem types.

A further comparative advantage of UNEP lies in its broad range of relevant programmatic and project experiences, proof of innovative concepts, and the best available science and knowledge foundation on which it can base its investments.

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

UNEP in house expertise that will be contributing to this project, consisting of coordination between programs and related projects, technical inputs and backstopping, provision of methodologies, participation in project development and implementation (other than IA-functions) and the like, is being estimated between 300 and 600 thousand USD, depending on how much of it will happen during the PPG phase and-or the FSP implementation period, which will be ultimately defined during the preparation phase. This contribution would be considered as in kind staff time mostly. On the other hand, preliminary coordination with ongoing UNEP initiatives in the participating countries and the region have resulted in an estimation of somewhere between 1.5 and 2.5 million USD in projects alligned with this proposal. How much of this is taged as cofinancing will be defined during the PPG. UNEP will also be instrumental in leveraging additional cofinancing from partners, related initiatives and further UNEP lead projects to be identified as they emerge in the program of work.

C.2 HOW DOES THE PROJECT FIT INTO THE GEF AGENCY'S PROGRAM (REFLECTED IN DOCUMENTS SUCH AS UNDAF, CAS, ETC.) AND STAFF CAPACITY IN THE COUNTRY TO FOLLOW UP PROJECT IMPLEMENTATION:

UNEP has actively participated in the development of the current UNDAFs for both countries. In Ecuador the project would contribute mainly to Outcome 5: "By 2014 the competent institutions and local stakeholders promote- and social stakeholders possess improved skills and tools to carry out their right to a healthy and safe environment and environmental sustainability, including the conservation of biodiversity and integrated management of natural resources and the environmental." In Peru the UNDAF calls the UN system for support in sustainable management of natural resources and biodiversity conservation as well as technical assistance to foster climate change mitigation and access carbon and ecosystem finance mechanisms. These area areas the project will contribute to, in particular to Outcome 11: "The state, with participation of civil society, the private sector, scientific and academic institutions will have designed implemented and/or strengthened policies, programs and plans with an environmental sustainability approach, for the sustainable management of natural resources and conservation of biodiversity." Pertinent updates will be done at the time of the respective UNDAF's mid term reviews. The project fits within and complements the objectives and expected outcomes of the UNEP Programme of Work 2012-2013 (approved in Feb 2011). The project specifically fits into UNEP's Programme of work:

Sub-programme 1 (Climate Change) through the following UNEP-expected accomplishments:

(a) Adaptation, including an ecosystem-based adaptation approach, is incorporated into country development planning and policymaking based on scientific assessments, policy and legislative advice and lessons learned from pilot projects supported by UNEP and adaptation experiences, including an ecosystem-based approach, showcased at the global level.

(d) Reduction in deforestation and land degradation with countries moving towards sustainable forest management, conservation and full terrestrial carbon accounting based on tackling all drivers of deforestation, and taking fully into account co-benefits and safeguards.

(e) Increased access of target audiences to relevant climate change assessments and information for decision-making and long-term planning.

Sub-programme 3 (Ecosystem Management) through the following UNEP-expected accomplishments:

(a) The capacity of countries and regions increasingly to integrate an ecosystem management approach into development and planning processes is enhanced;

(b) Countries and regions have the capacity to utilize and apply ecosystem management tools and

(c) The capacity of countries and regions to realign their environmental programmes and financing to address degradation of selected priority ecosystem services is strengthened; and

Sub-programme 4 (Environmental Governance) through the following UNEP-expected accomplishments:

(b) Enhanced capacity of States to implement their environmental obligations and achieve their environmental goals, targets and objectives through strengthened institutions and the implementation of laws.

(c) National development processes and United Nations common country programming processes increasingly mainstream environmental sustainability into the implementation of their programmes of work (UNDAF).

This project further feeds from UNEP's Ecosystem Management Program which assists countries and regions to integrate an ecosystem approach into development and planning processes; acquire and improve the capacity to use

ecosystem management tools; realign their environmental programmes and finance priority ecosystem services.

Mandated by the Forum of Environment Ministers of Latin America and the Caribbean and within the framework of the Latin America and Caribbean Initiative for Sustainable Development (ILAC), UNEP leads the working group on environmental indicators. This includes producing a core set of indicators at the national and regional level and developing the necessary software platform to make them available to decision makers. The project will profit from substantive baseline work in this area, updating information and pursuing a harmonized set of indicators for sustainable development at the regional level. Additional benefits will be derived from the fact that ILAC promotes south – south cooperation within countries of the region, further strengthening the potential of the project and a comon position on the environmental finance agenda.

In country follow up of project implementation (as an Implementing Agency) will be carried out by the Task Manager from the Division of Environmental Policy Implementation in charge of the project, who will i) participate in periodic Steering Committee (SC) meetings with the other project partners, ii) customary supervision visits to both participating countries including field visits to project pilot sites and to participating institutions, iii) reception of project reporting as per the agreement signed between the IA and EA and iv) other activities detailed in the project supervision plan annexed to the agreement. Alike other GEF Implementing agencies, UNEP falls under the category of non-resident agencies in the UN system and as such works through a network of regional offices rather than country offices. Project implementation will thus be followed up from the regional office for Latin America and the Caribbean located in Panama and through the above mentioned visits to the project countries. IA and EA functions are clearly differentiated and separated through commissioning of project administration tasks to an external executing agency, a standard practive for UNEP which has been applied successfully in GEF projects and UNEP's program of work as well. In this case, for regional and in-country project management it will have the collaboration of long time partners network through CONDESAN, with experience in GEF projects, specialized staff and ample expertise in ecosystem management and environmental governance. CONDESAN has offices and staff in both Ecuador and Peru.

Within the Division of Environmental Policy Implementation in UNEP the project can count on ample expertise from the Ecosystem Management Program and draw from the community of knowledge and collaboration from within UNEP's GEF ecosystem services/management related portfolio. It will furthermore be supported by the scientific and technical structure from the Division of Early Warning and Assessment and its expertise in assessment and methodologies such as the GEO process, and the global platform established by the Carbon Benefits Project including its modelling, measurement and monitoring tools for assessment of carbon benefits derived from GEF projects in the land degradation area. In the area of climate change, the project will profit from the collaboration with the Division of Technology, Industry and Economics, cooperation/coordination with relevant projects and their respective community of knowledge, and profit from UNEP's extensive work in assisting countries in the region and worldwide to reduce their ecosystem borne carbon emissions and gain access to existing and emerging global financial mechanisms for carbon and ecosystems. Finally it will be coordinated with UNEP's work in REDD+ profiting from the efforts in several countries where UNEP is helping establish REDD+ capacities, which include Ecuador and Peru as well.

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

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

NAME	POSITION	MINISTRY	DATE *(MM/dd/yyyy)*
Marcela Agüiñaga Vallejo	Minister of Environment	Ministry of Environment, Ecuador.	Nov/25/2011
Antonio González Norris	Secretary General	Ministry of Environment, Peru	Nov/29/2011

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
Maryam Niamir-Fuller, Director, GEF Coordination Office, UNEP		04/12/2012	**Robert Erath** Task Manager LAC Biodiversity and Land Degradation UNEP/GEF	+507 305 3171	robert.erath@unep.org