



**PROJECT IDENTIFICATION FORM (PIF)<sup>1</sup>**

**PROJECT TYPE: Full-sized Project**

**TYPE OF TRUST FUND: MULTI-TRUST FUND**

**PART I: PROJECT IDENTIFICATION**

<b>Project Title:</b>	Promotion of climate-smart livestock management integrating reversion of land degradation and reduction of desertification risks in vulnerable provinces		
<b>Country(ies):</b>	Ecuador	<b>GEF Project ID:<sup>2</sup></b>	4775
<b>GEF Agency(ies):</b>	FAO	<b>GEF Agency Project ID:</b>	615693
<b>Other Executing Partner(s):</b>	Ministry of Environment (MAE) and Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP)	<b>Submission Date:</b>	30 November, 2011
		<b>Resubmission Date:</b>	December 12, 2012
		<b>Resubmission date:</b>	January 21, 2013
			February 21, 2013
<b>GEF Focal Area (s):</b>	Multi-focal Areas	<b>Project Duration (months):</b>	48
<b>Name of parent program (if applicable):</b> SFM/REDD+ ➤ For SFM <input type="checkbox"/>		<b>Agency Fee:</b>	366,326

**A. FOCAL AREA STRATEGY FRAMEWORK<sup>3</sup>:**

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Indicative GEFTF/LDCF/SCCF Financing (\$) a	Indicative Co-Financing <sup>a</sup> (\$) b
LD-1	Outcome 1.2: Improved agricultural management	Output 1.2 : Types of innovative SL/WM practices introduced at field level	GEFTF	1,181,451	3,525,421
LD-1	Outcome 1.4 Increased investments in SLM	Output 1.4: Appropriate actions to diversify the financial resource base	GEFTF	575,909	2,326,266
CCA-1	Outcome 1.1: Mainstreamed adaptation in broader frameworks at country level, and in targeted vulnerable areas	Output 1.1.1: Adaptation measures and necessary budget allocations included in relevant frameworks	SCCF	527,816	2,201,130
CCA-2	Outcome 2.2: Strengthened adaptive capacity to reduce risks to climate-induced economic losses	Output 2.2.1: Adaptive capacity of national and regional centers and networks strengthened to rapidly respond to extreme weather events	SCCF	167,858	733,710
CCA-3	Outcome 3.1: Successful demonstration, deployment, and transfer of relevant adaptation technology in targeted areas	Output 3.1.1: Relevant adaptation technology transferred to targeted groups	SCCF	699,409	1,500,489
CCM-5	Outcome 5.1: Good management practices in LULUCF adopted both in the forest land and in the wider landscape.	Output 5.1: Carbon stock monitoring systems established Output 5.2: Forest and non-forest land under good management practice	GEFTF	527,030	1,833,670
<b>Sub-Total</b>				<b>3,679,473</b>	<b>12,120,686</b>
<b>Project Management Cost<sup>4</sup></b>				<b>176,587</b>	<b>606,034</b>
<b>Total Project Cost</b>				<b>3,856,060</b>	<b>12,726,720</b>

<sup>1</sup> It is very important to consult the PIF preparation guidelines when completing this template.

<sup>2</sup> Project ID number will be assigned by GEFSEC.

<sup>3</sup> Refer to the reference attached on the Focal Area Results Framework when filling up the table in item A.

<sup>4</sup> GEF will finance management cost that is solely linked to GEF financing of the project.

## B. PROJECT FRAMEWORK

**Project Objective:** To reduce soil degradation, increase adaptive capacity to climate change, and mitigate GHG emissions by implementing cross-sectorial policies and climate-smart livestock management, with emphasis in the vulnerable provinces.

Project Component	Grant Type (TA/INV)	Expected Outcomes	Expected Outputs	Trust Fund	GEF/SCCF	Indicative Co-Financing
					(\$) a	(\$) b
1. Strengthening of institutional capacities and coordination to adopt climate-smart livestock as strategy of integrated and adaptive territorial management, and of cross-sectorial instruments and policy development	TA	1.1. Climate change adaptation and mitigation policies in the agricultural sector and Land Use and Development Plans (LUDPs) have incorporated the climate-smart livestock management approach.	<p>1.1.1 A Climate-smart livestock management strategy for climate change adaptation, has been designed in an inter-institutional and participatory manner and mainstreamed into the existing National Climate Change Adaptation Plan (NCCAP).</p> <p>1.1.2 A Nationally Appropriate Mitigation Action (NAMA) designed in an inter-institutional and participatory manner, and an appropriate MRV methodology designed/applied. The NAMA should have 2 end products: a) A climate-smart livestock management strategy (CSLMS) for climate change mitigation, b) A Policy for sustainable integrated livestock farm management.</p> <p>1.1.3 Climate-smart livestock approach incorporated into the LUDPs of the Decentralized Autonomous Governments (DAGs) of the following provinces: Loja, Manabí, Santa Elena, Guayas, Napo, Pastaza and Imbabura, reducing vulnerability towards climate change impacts.</p> <p>1.1.4. Five zoning plans for livestock production developed and included into existing vulnerable micro-watershed management plans (in arid, semi-arid and dry sub-humid zones in Loja,</p>	SCCF &	531,551	2,201,130
				GEFTF (CCM)	94,865	422,667

		1.2 Institutional capacities to implement climate-smart livestock strategies and to mainstream them into national and local programmes and plans, have been strengthened.	Manabí, Santa Elena, Guayas and Imbabura), which have been selected with replicability criteria. 1.2.1 40 key representatives of MAE, MAGAP, provincial councils, and municipalities, with strengthened capacities to implement climate change adaptation and mitigation measures for different livestock production systems (2 workshops for pilot province).	SCCF & GEFTF (CCM)	164,123 31,622	733,710 140,889
2. Strategies of Technology Deployment, Transfer and Implementation for Climate-Smart Livestock Management	TA	2.1. Restored agro-ecosystem services and increased climate resilience in 35,000 ha. of degraded grasslands (increasing soil fertility, carbon sequestration and the rehabilitation with drought and climate chock resilient varieties of otherwise lost areas) allowing for an increased agricultural productivity in the livestock sector (increase of +10% to +20% of livestock meat productivity in the pilot areas; increase of +24.4 of livestock milk productivity per unit area of recovered pasturelands - measured against baseline of degraded pastureland)	2.1.1 Seven local networks have been created with 280 small- and medium-scale livestock farmers in the selected provinces, and have been trained through 7 Agrarian Revolution Schools (ERAs) on: (i) strategies for use, sustainable management and conservation of land and water incorporating management of risks and local vulnerabilities to face climate change, (ii) design of agroecological corridors in livestock landscapes and implementation of best livestock and agrosilvopastoral practices aiming at increasing the resilience to adverse effects of climate change <sup>5</sup> and to revert land degradation <sup>6</sup> . 2.1.2 Best management practices (see output 2.1.1) implemented in 35,000 hectares of degraded areas, with the participation of small- and medium-scale farmers. 2.1.3 An on-line	SCCF & GEFTF (LD)	699,409 1,181,451	1,500,489 3,525,421

<sup>5</sup> Some farm management practices including livestock and agrosilvopastoral practices for adaptation to climate change, which will be applied in this component are: sowing of flood- or drought-tolerant grass species, rotational systems for grassland management and flexible animal load according to forage supply, efficient use of rain water, crops and livestock integrative systems, cross-breeding systems, and forage improvement.

<sup>6</sup> Practices to reverse land degradation generated by livestock activity to be implemented by this component: associations of leguminous species, perennial shrubs and grasses, herd production records and traceability deployment, introduction of leguminous and grasses and leguminous mixtures, programmed reproduction systems, and incorporation of silvo-pastoral systems in selected farms.



3. Improving the overall GHG balance from livestock activities by promoting sustainable livestock management in degraded or degrading areas of Loja, Manabí, Santa Elena, Pastaza, Guayas, Imbabura, and Napo.	INV	3.1 Reduction in GHG emissions (30% of the total CO <sub>2</sub> eq per kilogram of milk produced in grazing systems, and 50% decrease in total CO <sub>2</sub> eq per kilogram of meat produced), and increased carbon sequestration (6-13 tons of carbon per hectare of grassland recovered; 4.03 t/CO <sub>2</sub> /h in silvo-pastoral systems; 4.62 t/CO <sub>2</sub> /h in agroforestry systems)	3.1.1 A GHG monitoring system established in each selected pilot area 3.1.2. Best practices for climate change mitigation for small- and medium-scale farmers have been implemented in 35,000 hectares <sup>7</sup> .	GEFTF (CCM)	400,543	1,833,670
Sub-Total					3,679,473	12,120,688
Project Management Cost				GEFTF (LD)	85,751	606,034
				SCCF	67,000	
				GEFTF (CCM)	23,836	
Total project Costs					3,856,060	12,726,720

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

Sources of Co-financing for baseline project	Name of Co-financier	Type of Co-financing	Amount (\$)
National Government	Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP)	Grant	7,245,325
National Government	Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP)	In-kind	506,032
National Government	Ministry of Environment (MAE)	Grant	1,850,000
National Government	Ministry of Environment (MAE)	In-kind	440,000
GEF Agency	FAO	Grant	1,061,027
GEF Agency	FAO	In-kind	108,999
Local Government	Provincial Governments (DAG) Santa Elena	Grant	482,942
Local Government	Provincial Governments (DAG) Loja	Grant	1,032,395
<b>Total Co-financing</b>			<b>12,726,720</b>

#### D. GEF RESOURCES REQUESTED BY AGENCY (IES), FOCAL AREA(S) AND COUNTRY(IES)

GEF Agency	Type of Trust Funds	Focal Area	Country Name/ Global	(in \$)		
				Project amount (a)	Agency Fee (b)	Total c=a+b

<sup>7</sup> Best practices for climate change mitigation in livestock production systems to be implemented by this component: forage improvement and change, manure management, adoption of one type of forage that favors GHG reduction, biogas development, introduction of trees (agrosilvopastoral systems), animal breeding, and improved grassland management. These practices will be implemented integrated with CCA and SLM practices promoted under component 2 under the CSLM approach.

FAO	GEFTF	Land Degradation	Ecuador	1,843,111	175,096	2,018,207
FAO	GEFTF	Climate Change	Ecuador	550,866	52,332	603,198
FAO	SCCF		Ecuador	1,462,083	138,898	1,600,981
<b>Total Grant Resources</b>				<b>3,856,060</b>	<b>366,326</b>	<b>4,222,386</b>

## **PART II: PROJECT JUSTIFICATION**

### **A. DESCRIPTION OF THE CONSISTENCY OF THE PROJECT WITH:**

#### **A.1.1 THE GEF FOCAL AREA STRATEGIES:**

The proposed project is consistent with FA Objective LD-1. Component 2 will implement Strategies of Technology Deployment, Transfer and Implementation for Climate-Smart Livestock Management focused at improving agricultural management (outcome 1.2 LD) through innovative SL/WM practices introduced at field level. Component 2 will also support increasing investments in sustainable land management (outcome 1.4 LD) in the livestock sector, through appropriate actions to diversify the financial resource base (see details in section B2 below).

This proposal is also consistent with FA objectives CCM-5 and CCM-6. Component 1 will aim at implementing agreements and recommendations under the United Nations Framework Convention on Climate Change (UNFCCC) (outcome CCM 6.1). In particular it will support the design of a Nationally Appropriate Mitigation Action (NAMA) document, in an inter-institutional and participatory manner, and an adequate MRV methodology. The NAMA will include: a) A climate-smart livestock management strategy (CSLMS) for climate change mitigation, b) A Policy for sustainable integrated livestock farm management. To implement this NAMA at national and provincial level, Component 1 will promote capacity development among key personnel of the Ministry of Environment (MAE), the Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP), and the Decentralized Autonomous Governments (DAGs) of 7 selected provinces: Napo, Pastaza, Guayas, Imbabura, Loja, Manabí and Santa Elena (see section A.2 and B.1 below to understand the selection of these pilot provinces). Component 3 will implement good management practices in LULUCF adopted in the forest and wider landscape (outcome CCM-5.1), focusing on livestock-dedicated provinces. It will also address GHG emission reductions and will implement carbon monitoring systems in pilot areas for up-scaling in the future.

#### **A.1.2. FOR PROJECTS FUNDED FROM LDCF/SCCF: THE LDCF/SCCF ELIGIBILITY CRITERIA AND PRIORITIES:**

Ecuador is a signatory to the UNFCCC as a non-Annex I country. The proposed project is consistent with the SCCF eligibility criteria since it addresses priorities identified in Ecuador's Second National Communication (SNC) to UNFCCC (<http://unfccc.int/resource/docs/nat/ecunc2.pdf>). The SNC encourages climate change adaptation and response programs that promote inter-institutional coordination and socialize their actions among key stakeholders. Particular attention is drawn to fragile ecosystems. In addition, the SNC informs that Ecuador aims at implementing CCA measures to reduce climate impacts and vulnerability under the *Good Living National Plan 2009-2013* (GLNP 2009-2013) (described in section A.2). This project will be implemented in vulnerable areas of the country, as identified by the SNC<sup>8</sup>. Over the past four decades in Ecuador the anomalous weather events have gradually increased, i.e.: from the Sierra to the Coast as well as in the Amazon. In the period 1960-2006, annual precipitation has changed. Average annual precipitation increased by +33% in the Coastal Region and +8% in the Inter-Andean Region.

The proposed project is consistent with the SCCF criteria because it is cost-efficient and is aligned with poverty reduction and sustainable development national strategies, defined in the GLNP 2009-2013.

Component 1 will address SCCF objective CCA-1 by designing in a participatory manner a Climate-Smart Livestock Management Strategy for Climate Change Adaptation, and by mainstreaming it into the existing

<sup>8</sup> The SNC bases its analysis of extreme weather events and natural disasters on the DESINVENTAR<sup>8</sup> database (2007).

National Climate Change Adaptation Plan (NCCAP). It will also address objective CCA-1 by incorporating the Climate-Smart Livestock approach into the existing Land Use and Development Plans (LUDPs) of the Decentralized Autonomous Governments (DAGs) of the provinces: Loja, Manabí, Santa Elena, Guayas, Napo, Pastaza and Imbabura, reducing vulnerability towards climate change impacts (Please see section B1 to learn how these livestock-dedicated provinces are vulnerable to climate impacts). In addition, it will develop five zoning plans for livestock production and will include them into existing vulnerable micro-watershed management plans (in arid, semi-arid and dry sub-humid zones in Loja, Manabí, Santa Elena, Guayas and Imbabura) selected with replicability criteria.

Component 1 is also consistent with objective CCA-2, since it will enhance national capacities by delivering training to key staff of MAE, MAGAP, provincial councils, municipalities and NGOs in climate change adaptation measures to be applied to different livestock production systems.

Component 2 will support the objective CCA-3, by promoting successful deployment, transfer and implementation of relevant adaptation technology in targeted areas (outcome CCA 3.1). It will implement Strategies of Technology Deployment, Transfer and Implementation for Climate-Smart Livestock Management (see detailed description of Component 2 in section B.2 below).

#### **A.2 NATIONAL STRATEGIES AND PLANS OR REPORTS AND ASSESSMENTS UNDER RELEVANT CONVENTIONS, IF APPLICABLE, I.E. NCCAPS, NBSAPS, NATIONAL COMMUNICATIONS, TNAS, NIPs, PRSPs, NPFE, ETC.:**

This proposed project is in line with:

The **Second National Communication (SNC)** to UNFCCC<sup>9</sup>, prepared by the Ministry of Environment of Ecuador with the support of UNDP in 2011. The SNC promotes CC mitigation actions related to land use, land use change and forestry (LULUCF). It recognizes that the agricultural sector is the biggest emitter of direct GHGs in Ecuador, followed by the LULUCF sector and then energy, waste and industrial processes (See Graphic 1 in Annex I of the PIF)<sup>10</sup>. The SNC identifies as key sources of CO<sub>2</sub> emissions: i) forests and grasslands conversion into other uses; and ii) soils use and management in the LULUCF sector. The proposed GEF-financed project aims at increasing potential of carbon capture in grasslands to mitigate emissions. In Ecuador there is a huge potential of soil carbon sequestration in grazing systems linked to the vast extension of grasslands that are highly degraded. The agricultural sector is also the main emitter of CH<sub>4</sub> (see Graphic 3 in Annex I of the PIF). Further explanation and quantitative data on the trends of GHG emissions and livestock systems is presented in Section B1.

The **National Action Programme to Combat Desertification and Drought (NAP)** – 3<sup>rd</sup> Version, that was submitted by the Government of Ecuador (GoE) to UNCCD in August 2004, and identified agro-ecological zones susceptible to desertification in Ecuador. The proposed project will implement actions to reverse land degradation in the vulnerable areas identified by the NAP, as follows:

- Dry Coast: a strip of 10km wide along the coast from the Equator line to the south (provinces of Manabí, Guayas and Santa Elena), with a hot and dry climate. The Santa Elena Peninsula is semi-desert, excepting in its extreme - where the temperature is regulated by the sea air. Soils are aridisols, mollisols, alfisols and vertisols. Coffee crops and subsistence livestock production are main activities in the Dry Coast;
- South Wet Coast: is located East of the dry coast and extends to the limit of 1200m in the Western foothills of the Andes, being covered mostly by the Guayas Basin (Guayas Province). Rainfalls are variable and increase from West to East, with a single rainy season for up to six months, while during the rest of the year there are droughts of variable intensity, often tempered by drizzle. Soils are predominantly inceptisols and mollisols. Agricultural production is concentrated on rice, bananas, corn, soybeans, sorghum, oil palm, citric, pastures for cattle, and in higher areas, coffee and cocoa;
- North Valleys are the inter-Andean valleys located from the border with Colombia to north Azuay Province (some sub-regions of the province of Imbabura are located here). These valleys have variable altitudes and are generally dry due to the "rain shadow" effect of the surrounding mountains. Valleys depend on rainfalls in mountains to supply drinking and irrigation water demand. Soils are predominantly inceptisols, and also entisols. North valleys are mainly pasturelands, due to higher commercial value of milk and meat compared with crops. There are also some bean and potatoes production;
- South Sierra: it extends from Azuay to the border with Peru, and tends to be drier than Northern regions (the province of Loja is located here). Topography is very irregular. Valleys are very narrow and land is quite unsuitable for agriculture. Most agricultural land is dedicated to livestock production or urban settlements.

<sup>9</sup> <http://www.ambiente.gob.ec/?q=node/727&page=0,3>

<sup>10</sup> SNC, 2011

Soils have not recent volcanic origins and are mostly entisols and vertisols, and then mollisols and alfisols.

In addition, the NAP identifies 4 processes that lead to land degradation in Ecuador: deforestation, unplanned land settlement, inappropriate soil use, and agricultural practices unsuitable to natural conditions. They generate losses in permanent vegetation, as well as soil erosion and deterioration, and interact with socioeconomic, climatic and topographic features, causing desertification risks in the above-mentioned areas. The NAP's general objective is to "establish a continuous planning process and participatory action to execute programs, projects and activities that address the: (...) i) reversion of land degradation in affected areas, ii) mitigation of drought effects". The NAP promotes Regional Action Programmes that develop and implement "integrated planning systems at provincial level for sustainable natural resources use in areas susceptible to/affected by desertification". The proposed project will address the priorities detected by the NAP in SLM by: i) implementing actions in the provinces of Manabí, Santa Elena, Guayas, Loja and Imbabura (affected or susceptible to desertification, see above); ii) promoting the dissemination of good livestock management among small- and medium-scale farmers in vulnerable areas; iii) restoring vegetative cover to revert soil degradation and deforestation through the implementation of silvopastoral systems, including in the Amazon Region; iv) designing agro-ecological zoning plans for sub-humid, semi-arid, and dry areas (See further details in section B.2).

The **Third National Report (TNR) to the United Nations Convention to Combat Desertification (UNCCD)**, submitted by the GoE in 2006, has identified the following priority areas to act against land degradation and desertification which will be supported by interventions of the proposed project: Loja, for projects related to irrigation, community-based initiatives to conserve dry forests, management of fragile micro-watersheds that provide water for human consumption; Manabí and Guayas, for reforestation and conservation of Chongon-Colonche Mountains; and Santa Elena, which is extremely dry and where land degradation affects livestock management (due to lack of pastures) and food security (due to low soil productivity).

The **Microfinance Strategy for Sustainable Land Management and Climate Change Adaptation in Ecuador (MFSLMCCA)**, designed in the framework of The **Global Mechanism (UNCCD)** and submitted by the Ministry of Environment in June 2011, makes Ecuador a pioneer country in using microfinance to fulfill its commitments under the UNCCD. The MFSLMCCA is supporting activities that reduce land degradation and CC impacts by promoting sustainable agriculture and livestock production. It addresses the creation of a Second-Level Micro Financing Programme (*National Program of People's Financing, Entrepreneurship and Solidary Economy - NPPFESE*) through an approach of financial and environmental sustainability and participation, in highly degraded and degrading areas, and vulnerable zones. The MFSLMCCA identified the Provinces of Loja and Santa Elena among the highest eroded, and Manabí and Guayas among the most susceptible (in hectares). It provides resources for 2 types of activities: i) supporting local people's financing institutions that deliver micro-financing to micro- and small-scale entrepreneurs without access to the traditional banking system; and ii) capacity-building, awareness-raising and technical assistance to local financing institutions and local organizations on LD, land desertification and CCA. The NPPFESE is financed by national public resources, external resources, and it might receive additional resources from CC-related funds. The MFSLMCCA identifies measures to be financed by the NPPFESE, such as tree planting, silvopastoral systems and sustainable grazing, among others. In view of this, the proposed GEF project will strengthen this existing financial mechanism (among others detailed in B.2) including its regulatory framework and sanctionary regime, to facilitate the transfer of silvopastoral technologies and other climate-smart livestock practices in degraded areas, in coordination with the funds delivered by the NPPFESE in Loja, Santa Elena, Manabí and Guayas. Once validated, piloting experiences may be scaled-up in the framework of the MFSLMCCA and may attract new public-private investments to CSLM. Component 2 (outcome 2.2) will be based on the microfinance model adopted by the MFSLMCCA: to channel second-level financing to local and qualified financing institutions that are located in high risk and vulnerable areas, in coordination with Decentralized Autonomous Governments (DAGs), while including technical assistance and community participation. This Component is further described in Section B.2

The project proposal is also consistent with national initiatives and legislation as follows:

- The *Constitution of the Republic of Ecuador* (Art. 14, 395, 413 and 414);
- The *Good Living National Plan (GLNP) (Plan Nacional del Buen Vivir) 2009-2013*: Objective 4 (to guarantee the rights of nature and to promote a healthy and sustainable environment); Policies 4.1 (to conserve and sustainably manage the natural heritage); 4.4 (to prevent, control and mitigate environmental pollution as a contribution to the improvement of life quality); 4.5 (to promote CCM and CCA to face climate variability); and 4.7 (to incorporate the environmental approach into social, economic and cultural processes within the public administration);
- The *National Environmental Policy*, led by MAE, in particular: Policy 2 (efficient use of strategic resources

for sustainable development: water, air, soil and biodiversity); and Policy 3 (CCA management to reduce social, economic and environmental vulnerability) and their strategies: (i) mitigating impacts on people and ecosystems provoked by climate change, natural and anthropogenic events; (ii) implementing integrated risk management to cope with extreme weather events; (iii) reducing GHG emissions in the production and social sectors;

- The *National Agreement for Environmental and Economic Sustainability* (Ministerial Act N°509-2009, MAE): creating, implementing and assessing environmental policy through environmental management and impact indicators;
- Article 5 of the *Environmental Management Act* (N° 37 RO/245, 1999) that "[...] *strengthens the environmental institutional framework*".
- Executives Decrees of the Presidency of the Republic: N° 1815/2009, which defines CCA and CCM as government priorities and sets the role of MAE to manage policies regarding climate change, sustainable production and consumption; and N° 495/2010, which creates the Inter-Institutional Committee on Climate Change.
- The *Agenda for Productive Transformation*, which promotes the internalization of environmental costs through "[...] *the implementation of carbon sinks that engage industrial and production sectors, to contribute to environmental remediation and repair*".
- The strategic objectives of the Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP), which are focused on: i) boosting agriculture modernization through collaborative and cooperation schemes that adopt sustainable production practices and adequate legal standards; and ii) raising the living conditions of farmers and rural communities by involving small- and medium-scale farmers and linking them to national and international markets. One MAGAP's policy to achieve objectives i) and ii) is the Sustainable Livestock National Plan (SLNP) that will be detailed in B1.

## **B. PROJECT OVERVIEW:**

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

Ecuador is located in the northwest of South America, bordered by Colombia on the North, Peru on the East and South, and by the Pacific Ocean to the West. The country is divided into 24 provinces, distributed in four natural macro-regions: Amazonia or "East" (116.644 km<sup>2</sup>), Coast (59.920 km<sup>2</sup>), *Sierra* or Andes (70.672 km<sup>2</sup>), and Insular Region (7.998 km<sup>2</sup>), named Galapagos. Its total land area is 255.234 km<sup>2</sup>. Its location in the Equatorial zone, as well as the presence of the Andes Mountains, the Amazonian forest and the Pacific Ocean determine diverse climate features, spatial and seasonal variations by natural macro-regions. Nevertheless, most of the country is characterized by having two defined seasons: one dry and one rainy.

The country aridity index is 23%, which means that 5.998.341 hectares have a ratio between potential evapotranspiration and precipitation equal to or less than 1. The annual average rainfall is 2087mm: 1482mm/year in the coastal zone (where Manabí, Santa Elena and Guayas are located); 1459 mm/year in the *Sierra* (Loja and Imbabura); and 1572 mm/year in the Amazon (Napó and Pastaza)<sup>11</sup>. Differences between dry season and wet season cause water deficits in winter. Natural vegetation covers 55,16% of national territory (13,60 million has), including 43,32% of forest (10,69 million has.); 5,28% of *páramo* (1,3 million has.); and 6,56% of shrubby formations (1,62 million has)<sup>12</sup>. Forests are featured mainly as tropical rainforest, dry forest, and montages forest. Most of forest remnants are still in the Amazon region, the largest rainforest in the world and the world's terrestrial biodiversity reservoir. At country level, 40% is forest land (10,26 million has.), while 29% is productive land for agro-livestock use (7,5 million has)<sup>13</sup>. Agricultural land is divided in arable land (17%), permanent cropland area (17%), and pastures (66%). Rainfed land represents 90% of total agriculture land (6,7 million has), while only 10% is irrigated (0,76 million has). Even though, water resources are predominantly used in agriculture (92%)<sup>14</sup>, followed by municipal drinking (6%)<sup>15</sup> and industrial use (2,5%)<sup>16</sup>.

### **Livestock production, human livelihoods and productivity trends**

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<sup>11</sup> TNR-UNCCD, 2006

<sup>12</sup> *The Use and Coverage Map, Ecuador*, 2008.

<sup>13</sup> FAO, 2008

<sup>14</sup> 13,96 (2000)  $\times 10^9$  m<sup>3</sup>/year

<sup>15</sup> 1,293 (2005)  $\times 10^9$  m<sup>3</sup>/year

<sup>16</sup> 0,549 (2005)  $\times 10^9$  m<sup>3</sup>/year

In Ecuador, livestock is a major economic activity. The average contribution of the agricultural and livestock sector to the national economy during the period 1985-2005 was 13%<sup>17</sup>. In 2008, agricultural and livestock participation in the GDP was 10.7%, ranking secondly after oil production. The primary sector<sup>18</sup> has rapidly grown in the last decade. For example, in 2011 the sector registered a GDP annual variation of +5%<sup>19</sup>.

The livestock sector is fundamental to achieve food security in Ecuador. It is also an important source of employment and income in selected provinces, characterized by the predominance of small- and medium-scale farmers. In most areas of the country the stocking density of animals is 1.5 livestock unit (LU) per hectare, while in some minor areas this figure is 0.96 LU per hectare<sup>20</sup>.

According to the Third National Agricultural Census (MAGAP, 2001<sup>21</sup>), there were 3.382.740 has. of cultivated pastures, divided in 349.883 Agricultural Productive Units (APUs), distributed as followed:

- 195.275 APUs from 1 to 10 hectares, with a total of 188.209 hectares representing 56% of the total of APUs;
- 135.404 APUs from 10 to 100 hectares, with a total of 1.745.225 hectares and accounting for 39% of total APUs;
- 19.203 APUs of 100 or more hectares, with a total of 1.449.305, accounting for 5% of total APUs.

It is estimated that small and medium-sized farmers represent 95.5% of APUs in the country. Less-than-20-hectares production units supply 41% of national milk production. Livestock production is more spread than crop production at national level. The areas with natural and cultivated grasses used for livestock production represented 67% over the total agricultural areas in 2006, and have increased since 1990 when represented 63% of total agricultural areas<sup>22</sup>.

The grassland area in the *Sierra* (Andean region) increased from 37% in 1990 to 42% in 2006; the Coast shows a decrease from 45% in 1990 to 41% in 2006, while in the Amazon, its distribution has remained almost constant (17% from 1990 to 2000 and 16% in 2006) in relation to the total area used as grasslands<sup>23</sup>. Livestock production mainly includes cattle, which has significantly increased from 1990 (total number of cattle: 4.539.000) to 2006 (total number of cattle: 5.034.652)<sup>24</sup>.

In light of these increasing tendencies and its contribution to the rural sector economy, livestock production is key to ensure human livelihoods for the 40% of the population living in rural areas, and more than 25% of them developing a farming activity in Ecuador.

However, livestock production is still highly unsustainable in some provinces, generating three main threats to the local and global environment: i) soil losses and desertification risks; and ii) increasing pollutants and GHG emissions; and iii) extension of the livestock frontier:

- i) Cattle production requires large grassland areas. In Ecuador, these areas have deteriorated soils due to the intensive management, and the lack of sustainable management initiatives to increase or keep stable the production levels. Excessive animal load and aggravating droughts have made meadows more vulnerable and exposed to severe erosive processes. Soils can become unproductive, and their recovery and restoration processes would need time and new investments;
- ii) Unsustainable livestock management practices have also generated pollutant releases such as animal wastes, antibiotics and hormones, chemicals used to dye fur, fertilizers and pesticides to fumigate the fodder crops<sup>25</sup>. In order to counterbalance productivity losses, the process of soil recovery (compensation of elements N, P, K) has been mainly achieved via chemical fertilization. It negatively impacted on water resources and has generated greater GHG emissions from the agricultural sector in the past decade (see GHG emissions trends in Section B.1 below);

<sup>17</sup> <http://www.iica.int/Esp/prensa/Comuniica/Comuniica/2005/n4-esp/n4.aspx>

<sup>18</sup> Primary sector is composed by agriculture, livestock, hydrocarbons, hunting, forestry, fisheries, mining and quarrying activities.

<sup>19</sup> Central Bank of Ecuador, 2012.

<sup>20</sup> MAGAP, 2011

<sup>21</sup> The Fourth National Agricultural Census (MAGAP) is still under preparation. Update data is expected to be available during the full project preparation.

<sup>22</sup> According to the Ecuadorian National Institute for Statistics and Census (INEC)

<sup>23</sup> National GHG Inventory in the Agricultural Sector, MAGAP, 2008.

<sup>24</sup> Id.

<sup>25</sup> Id.

iii) If un-sustainable and extensive livestock production continues, Ecuador will need an additional 1 million hectares for grazing by 2020<sup>26</sup>, generating more land degradation and GHG emissions.

### Land degradation

During decades, the development strategy in Ecuador has put pressure on natural resources and natural heritage. Land degradation affects 47% of the national territory as a result of erosion, overgrazing, loss of soil fertility, pollution and loss of vegetation. In 1982-2003, 14.2 % of the total national land (34,686 km<sup>2</sup>) were degraded; of which 25.9% was in the Andean region, 30% in the Coastal region, and 44% in the Amazon region<sup>27</sup>.

Land degradation is a key problem in some provinces located in the *Sierra* and at the Coast, due to land dryness and seasonal rainfall scarcity, whereas in the Amazon (Napo and Pastaza) land degradation is caused by unsustainable livestock practices. These practices also accelerate the desertification processes in the Coastal areas (mainly in Manabí, North Guayas and Santa Elena) and *Sierra* (Loja is heavily degraded, and Imbabura)<sup>28</sup>. Soil fertility deterioration and productivity decreases are perceptible in: i) the erosion level, which is the most visible sign of degradation; ii) the decrease in the amount of organic matter (carbon) captured; iii) draining and hydrophobia originated by grazing and tillage; iv) soil compaction; v) qualitative and quantitative loss of water resources, affecting agricultural production and human consumption; and vi) loss of biodiversity, including agrobiodiversity.

In the livestock-dedicated provinces of Ecuador, unsustainable livestock production is worsening land degradation through: i) inadequate management practices (e.g.: grazing in strong slopes, burn and slash to renovate fodder, deforestation, irrational use of pesticides and chemical fertilizers) that directly impact on soil, water and forests; ii) degrading soil uses and increased urban demand of natural resources, that cause a reduction of plowed areas<sup>29</sup> and areas with natural vegetation; and iii) inadequate land management, which is worsened by natural disasters, climate change impacts and geophysical threats.

From a socio-economic perspective, land degradation is a negative driver for rural productivity and threatens local and national food security. It causes average annual losses of agricultural gross production value (GPV) by -7,6% (-10% in the Coast, and -6,3% in the *Sierra*)<sup>30</sup>. Soil degradation has also generated social consequences, such as the migration process from Loja and Manabí towards other productive areas since early 1980s. Having lack of access to productive lands, rural population moved out to new settlements (mainly, in the Amazon) and cities, seriously impacting on the socio-economic and environmental conditions of their new habitats.

Desertification still affects population of vast areas in Ecuador and aggravates poverty, which in turn forces to over-exploit natural resources, fostering a vicious circle which accelerates the process of land degradation. The lack of access to financing sources that would enable a more sustainable and productive land use at small-scale level, worsens poverty levels, that operate simultaneously as cause and consequence of desertification. Therefore, desertification generates unbalanced socio-economic development, rural migration and displacement, and needs to be addressed in the livestock-dedicated provinces in an integrated manner.

### Impacts of climate change

Regarding climate conditions, Ecuador has experienced a reduction of total rainfall level in some areas, and an increase of annual average, maximum and minimum temperatures in the whole country, excepting few areas. In the period 1960-2006, average annual temperature increased by +0,8°C, maximum temperature by +1,4°C, and minimum temperature by +1,0°C<sup>31</sup>. Furthermore, the *Sierra*, Coast and Amazon have been recently distressed by extreme weather events potentially caused by climate change (i.e.: El Niño, La Niña, exceptional floods, short-term and long-term droughts) that pose adaptation challenges for small- and medium-scale livestock farmers, causing serious socio-economic and environmental impacts. Precipitation intensity has also suffered unbalances (see details in section A.1.2 above). At social level, 62% of the most vulnerable households which were affected by floods had as main income source payments for work in agricultural areas. In the period February-May 2010, the Government had to declare the national state of emergency of power grids due to lack of rain, while in April 2010 a state of emergency in some Amazon areas was declared as a result of the rigorous winter season.

<sup>26</sup> MAGAP's estimations calculated during the formulation of the Sustainable Livestock National Program, 2011

<sup>27</sup> Second National Communication (SNC)

<sup>28</sup> Some of the selected provinces of this project have the most alarming aridity indexes of the country<sup>28</sup>: Santa Elena 0.11; Manabí 0.28; Guayas 0.70; Imbabura 0.62, Loja 0.33 (TNR, 2006).

<sup>29</sup> From 0.42 has./habitant in 1954, to 0.21 has./habitant in 2001 (NAP, 2006)

<sup>30</sup> MAGAP, 2011

<sup>31</sup> Data obtained from 39 stations, National Institute of Meteorology and Hydrology, Ecuador.

Insufficient investments in irrigation and natural waterways regulation have made agriculture systems more vulnerable and defenseless to face drought seasons and water deficits.

In particular, climate change is affecting livestock production and productivity, through increased heat stress and reduced water availability, and indirectly through reduced feed and fodder quality and availability, the emergence of livestock diseases and competition for natural resources with other economic sectors.

Small-scale livestock producers have been the most affected by climate impacts in the rural sector. The economic losses caused by climate events also impacted on the national economy both as GDP decreases and as increases of national expenditures to face emergencies in vulnerable rural areas (e.g: subsidies, emergency funds). The dramatic droughts of 2009-2010 severely affected the livestock sector in several provinces. In 2009, 500,000 units of cattle and 473.309 has. of pastures were affected, and the following year, 207.021 units of cattle and 107.907 has. of grass were also hit. In order to address this problem, the GoE disbursed USD 2.705.060 and USD 1.841.759 respectively<sup>32</sup>, to provincial governments.

While the effects of climate change on livestock are likely to be diverse, more serious impacts are anticipated in grazing systems, due to their close linkage with the natural resource basis which is being redefined by climate change, and their limited adaptation opportunities. Since livestock production is an important part of many farmers' livelihoods, climate change poses a risk to food security (e.g.: access to food) and human health, in some particular regions of Ecuador that are *per se* vulnerable. The Coast, *Sierra* and Amazonian regions have been affected by climate variability in the recent two decades. The selected 7 provinces are particularly vulnerable to climate impacts in different aspects:

- The Coast: Manabí, Santa Elena and Guayas are twice as vulnerable to desertification than national standards, having the most alarming rates of soil degradation (over national rates) and low precipitation levels.
  - Manabí is highly vulnerable to droughts. Its soils are relatively fertile and good textured, but shallow, highly exposed to erosion in steep slopes. Cattle raising is the main economic activity. *Saboya* pastures are the most used in grasslands for livestock production systems, being handled in monoculture. This species of erect growth has little grass tillering and is not drought-tolerant. No legumes herbaceous are cultivated in this province.
  - In Santa Elena and Guayas, the reduction of rainfall (-20 mm/year<sup>33</sup>) and desertification signals are affecting land areas that previously had a great agricultural and livestock potential. Based on vegetation cover, the river sub-basins with potential problems of desertification are: *Daule*, *Chimbo*, *Babahoyo*, *Vinces* and *Santa Elena* (where the Guayas River watershed is located, which is source of more than 40% of the national GDP). Livestock production is the most important economic activity, seconded by crop production.
- The *Sierra*: the most vulnerable provinces are Loja and Imbabura, that suffer erosion and desertification due to overgrazing in livestock-dedicated areas, very heavy rainfall, loss of surface soils, and inadequate livestock practices on hillsides. Loja and Imbabura are facing an overall and accelerated land deterioration process, worsened by the effects of climate change and variability. The local economy is based on livestock production, and only secondly on crop cultivation.
- The Amazonia: Pastaza and Napo have suffered unusual winter seasons in the last decades, affecting human livelihoods that are mainly based on livestock production at subsistence levels. Crops production has low profit in this region, and therefore settlers and some indigenous communities living near the roads develop ranching and grazing activities, taking advantage of the relative land abundance.

### GHG emissions in the livestock sector

In 2006<sup>34</sup> the agricultural sector emitted around 210,000 kTon CO<sub>2eq</sub> (51% of all GHG emissions), while direct GHG emissions generated by LULUCF were around 162,000 kTon CO<sub>2eq</sub> (40% of all GHG emissions). In addition, in the period 2000-2006 emissions from the agricultural sector grew by +39.5%, and emissions from LULUCF diminished by -7.3%.

The livestock sector has been identified as one major source of GHG emissions at national level (SNC, 2011). Emission reduction policies should therefore be directly connected with the behavior of this economic sector.

The SNC shows that N<sub>2</sub>O and CO<sub>2</sub> are the main direct GHGs emitted by the country, followed by CH<sub>4</sub> emissions:

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<sup>32</sup> MAGAP, 2011

<sup>33</sup> SNC, 2011

<sup>34</sup> The most updated data reflected by the SNC is from 2006

- Between 1990-2006, total N<sub>2</sub>O emissions increased from 151,590 kTon CO<sub>2eq</sub> to 201,581 kTon CO<sub>2eq</sub> (+33%). The agricultural sector has been the main source of N<sub>2</sub>O emissions at the national scale (95.7%). However, these increases have not necessarily reflected in the intermediate period (1990-2000), when N<sub>2</sub>O emissions fell -5.8%. The SNC attributes this reduction to the decrease of grazing animals, which reduced emissions from pastures. In 2006, the number of grazing animals increased again, pushing up the N<sub>2</sub>O emissions from the agricultural sector. N<sub>2</sub>O is the most important GHG emitted in Ecuador. Any CCM strategy in the country should address the agricultural sector and include sustainable livestock management in pastures, as identified by the SNC (see Graphic 2 in Annex I of the PIF). N<sub>2</sub>O emissions are caused by the use of synthetic nitrogen fertilizers, livestock grazing and manure. According to MAGAP, in 2003 Ecuador had 4.724.231 has. of pastures and in 2010 increased to 5.214.028 has, leading to higher total N<sub>2</sub>O emissions<sup>35</sup>.
- CO<sub>2</sub> is the second most important GHG emitted in Ecuador. CO<sub>2</sub> emissions nearly doubled from 98,069 ktonnes CO<sub>2eq</sub> in 1990 to 188,973.6 ktonnes CO<sub>2eq</sub> in 2006. The LULUCF sector is the largest CO<sub>2</sub> generator (84% of the total CO<sub>2</sub> emissions), followed to a lesser extent by the energy and agriculture sectors. In the period 1990-1994 pasture areas increased by +172,000 has, and in 2000-2006 they expanded by +511.000 has. Therefore, livestock farming activities (i.e: management of pastures and *páramos*) have become an increasing source of GHG emissions in the country. In 1990-2006 total GHG emissions in the livestock sector grew from 11.033,51 KTon CO<sub>2</sub> (1990) to 11.196,61 KTon CO<sub>2</sub> (2006) (+1.45%)<sup>36</sup>.
- CH<sub>4</sub> is the third most important GHG emitted in Ecuador. It increased in 1990-1994 (+ 18.6%), decreased slightly in 1994-2000, increased again in 2000-2006 (+20% in 1990-2006). According to the SNC, the decrease in 2000 responded to the reduction of the number of grazing animals, which resulted in reduced CH<sub>4</sub> emissions both from enteric fermentation and manure management. The livestock sector is the main source of methane emissions<sup>37</sup>. In 2006, CH<sub>4</sub> emissions in Ecuador amounted to 19.456,4 kTon (kTon CO<sub>2eq</sub>), of which 46% can be attributed to activities in the agriculture and livestock sectors and 12% to LULUCF activities<sup>38</sup>.

Emissions from manure and enteric fermentation (CO<sub>2eq</sub>) are broken down per type of livestock as follows:

Type of livestock	CO <sub>2eq</sub> tons from enteric fermentation and manure management
Dairy cattle	203.865
Non dairy cattle	75.987
Buffalo	0.000
Sheep	5.022
Gouts	0.810
Camels	0.000
Horses	8.023
Mules and donkeys	3.326
Pigs	4.780
Poultry	1.071
Total	302.885

Source: National GHG Inventory in the Agricultural Sector, MAGAP, 2008.

In agricultural soils, 78% of the N<sub>2</sub>O emissions originate from grassland management, grazing and animal droppings (manure deposited in the field). 19% are direct N<sub>2</sub>O emissions from agricultural soils. Indirect N<sub>2</sub>O emissions mainly come from nitrogen leaching and run-off from agricultural soils. In Ecuador, N<sub>2</sub>O emissions in the subsector of agricultural soils are distributed as follows<sup>39</sup>:

**Tons CO<sub>2eq</sub>. % over total agricultural soils**

<sup>35</sup> SNC, 2011

<sup>36</sup> MAGAP, 2008

<sup>37</sup> SNC, 2011

<sup>38</sup> SNC, 2011

<sup>39</sup> National GHG Inventory in the Agricultural Sector, MAGAP, 2008.

N <sub>2</sub> O direct	37.919.200	19,24
N <sub>2</sub> O animals	153.859.200	78,08
N <sub>2</sub> O indirect	5.285.500	2,68
<b>Total</b>	<b>197.039.100</b>	<b>100</b>

Source: National GHG Inventory in the Agricultural Sector, MAGAP, 2008.

The baseline scenario shows a combination of variables that are risky for sustainable livestock production in vulnerable areas, affecting soil composition, GHG emission levels, and disaster risk management. Rural people living in vulnerable provinces have been seriously affected by land degradation and desertification, since both have affected small- and medium-scale farmers' livelihoods and food security, and therefore, have increased rural poverty levels. Poverty is a key driver that explains natural resources over-extraction and depletion, and accelerate the process of land degradation. Poverty is both cause and consequence of desertification. The livestock sector is framed into this context of poverty, climate-related economic losses and land degradation, while having a big potential to reduce GHG emissions. It is one major economic sector affected by climate change adverse impacts, that at the same time could have a huge impacts on climate change mitigation. As such the livestock sector should be included both in adaptation and mitigation national strategies.

### **Baseline initiatives**

In the livestock sector, the MAGAP - through the Secretariat of Livestock Promotion (SLP)- is responsible for coordinating policies, while increasing the efficiency of public support and improving field interventions. The SLP-MAGAP is concentrated on limiting livestock production that affects fragile ecosystems, as well as to regulate the production developed in areas that supply environmental services (i.e.: water, biodiversity) or associated with protected areas, through incentives to sustainable soil management. For this purpose, the SLP has created the Sustainable Livestock National Plan (SLNP).

The SLNP will provide co-financing to this proposed project by USD 7.245.325.

The SLNP is subdivided into 3 programs:

#### 1. *The National Meat Program 2010-2015*

Objectives: To support the livestock sector to achieve a more efficient production, improve incomes, and promote better natural resources management, while decreasing its negative environmental impacts. It promotes the application of sustainable livestock practices (efficient management of pastures, adoption of alternative methods for animal feeding, genetic improvement, implementation of mechanisms to manage information in real-time, and training and technical assistance to small farmers). Its current approved budget is USD 4.642.185/year, and every year this amount will increase based on MAGAP's performance over its implementation targets.

This program has not mainstreamed climate change adaptation as a challenge into its programmatic approach. Similarly, GHG emissions reduction and land degradation reversion are only partly addressed. The programme is composed by 4 subprojects:

- (i) the *Animals Identification and Traceability System* (SITA, for its name in Spanish): aimed at tracing cattle to facilitate decision-making for enhanced livestock productivity. By identifying cattle stocking rates and defining appropriate sites for grazing, SITA can provide information on how to better determine the cattle rotation. However, it does not implement concrete adaptation practices in the vulnerable pasturelands of each livestock-dedicated province.
- (ii) the *Genetic Improvement Project*: seeks to improve livestock production of small- and medium-scale producers in a sustainable manner, through the establishment of genetic improvement centers throughout the country, which offer genetic material according to the ecological conditions of the different regions. It is focused on sustainably improving and increasing milk and meat production. It would be an information source for creating drought- and flood-resistant species, but climate impacts and genetic adaptation options are not included within its tasks. As well, it would be a good basis to target the improvement of animal feed, as an option to reduce GHG emissions, but climate change mitigation is not directly covered in the project scope.
- (iii) the *Action Plan for the Unit of Silvopastoral Systems* seeks to develop and promote silvopastoral technologies for efficiently managing natural resources in livestock production systems, including the:
  - (a) identification of timber and non-timber forest species as alternatives to forage pasture;
  - (b) production of maps of natural resources inventories at provincial and cantonal level, maps of

environmental vulnerabilities with an emphasis on the availability of water and quality of soils, and maps of social and economic conditions; (c) capacity development for sustainable livestock systems; (d) deployment of units of production, conservation of pastures and forages, workshops for silvopastoral and livestock good practices; and (e) sustainable management of grassland. This subproject is well addressing vulnerabilities to climate impacts and land degradation risks, but has not implemented field actions that could be up-scaled at national level. It does not envisage a GHG monitoring system in the areas where silvopastoral systems would reduce emissions.

- (iv) the *Animal Health project*: aims at ensuring herd health and improving the productivity and competitiveness of the national livestock sector. It supports small-scale farmers to improve their practices through training and *in situ* technical assistance. 10,827 livestock producers are beneficiaries in Napo, Pastaza, Imbabura, Manabí, Loja, Santa Elena and Guayas. Although cattle diet improvements (digestible and high-quality feeds) would reduce CH<sub>4</sub> emissions, this subproject does not directly address climate change mitigation.
2. The *National Dairy Program* promotes community-based gathering centers (80% is financed by the Program, and 20% is contributed as infrastructure by benefitted communities or associations). This program is dedicated to improve the life quality of small- and medium-scale milk producers, by establishing short value-chains for raw milk, improving the quality of milk and dairy products, and reaching a fair price for producers. The current approved budget is USD 2.475.325/year and every year this amount will increase based on the MAGAP's performance against its implementation targets. Although incomes stability can allow dairy farms to improve their resilience towards climate impacts, climate change adaptation has not been directly incorporated into this program.
  3. The *National Program for the Management and Commercialization of Sheep, Goats and Camels* aims to develop technical capacities of producers of fiber, wool, meat and milk, from sheep, goats and South American camels. The main activities of this program are providing technical assistance, technology transfer, monitoring and on-going assessment to define production zones, ensuring the proper management and conservation of the páramo ecosystem, and promoting natural resources preservation and food security. Its approved budget is USD 195,221/year and every year this amount will increase based on MAGAP's performance against its implementation targets. Its focus is mainly productivity, without specifying any environmental outcomes.

At institutional level, the SLNP encourages inter-institutional coordination among MAGAP, MAE, the National Water Secretariat (SENAGUA), the Ministry of Economic and Social Inclusion (MIES), regional and local governments, rural development leaders, and agencies responsible for knowledge management on natural resources and land planning. The SLNP has also created a professional team specialized in food, agro-livestock management, land-use and socio-economic challenges. Therefore, the SLNP will co-finance Component 1, which will address institutional strengthening to adopt climate-smart livestock as a strategy for integrated and adaptive territorial management, and of cross-sectoral instruments and policies development.

The SLNP will also co-finance Components 2 and 3 through its activities focused on: (i) ecological restoration of degraded landscapes; (ii) creating mechanisms of payment for environmental services to local communities; (iii) community-based activities for sustainable rural development and poverty reduction; (iv) sustainable genetic resources use, adapted to local features; (v) adding value, product differentiation and linkage with niche markets through fair trade, green markets, and origin certification; (vi) training of small- and medium-scale farmers in good livestock practices, and SLWM; (vii) implementation of silvopasture systems; (viii) pastures conversion into production forests; (ix) technology transfer (e.g. breeding, animal traceability, and fodder conservation).

(Technology transfer that is directly related to CCA will be financed by SCCF resources. Please see description in section B.2 below).

Some baseline initiatives are being implemented at provincial level:

The Loja Provincial Government is starting the implementation of two projects financed within the investment program of its productive agenda: i) *Strengthening the Implementation of Programs and Campaigns of Vaccination and Control of Livestock Diseases*, whose overall objective is to increase the performance of the livestock sector through research and technology transfer, improving the capacities of small- and medium-sized farmers to prevent, control and eradicate livestock diseases. Its budget is USD 230,000 for five years; and ii) *Establishment of the Provincial Livestock Traceability System*, aimed to increase productivity of the livestock sector and the quality of their products and by-products. Its budget is USD 485,000 for five years, and is implemented in the cantons Gonzanamá, Sozoranga, Saraguro, Chaguarpamba, Macará, Puyango and Zapotillo.

The Loja Provincial Government is also implementing a programme to reduce pressures on forest ecosystems by improving livestock productivity and natural resources management, in the cantons Gonzanamá, Espindola and Sozoranga. Its budget is USD 32,568. It is also improving nutritional silos with the use of forages, in cooperation with the association of communities of the river basin Catamayo – Chira, to enhance food security and bovine quality. Its budget is USD 197,449.

DEPROSUR EP is a public-owned company of the Loja Provincial Government. It is currently executing the project *Improvement of Bovine Productivity in Loja*. Its objectives are to establish strategic partnerships for cooperation and inter-institutional strengthening (DAGs and DEPROSUR EP), develop a preventive program for using bovine health mobile veterinary units, implement pasture management technologies and fodder production, and foster technology transfer for genetic improvement. Its budget is USD 87,377.

In the context of the Country Programme Framework (CPF), FAO provides technical assistance to small- and medium-scale livestock producers in Ecuador. FAO is implementing the project *Design and implementation of the action framework for food and nutritional security of Ecuador*, which aims at strengthening technical capacity of agricultural and livestock professionals in food production to enhance human development in rural areas. It also promotes the development of healthy and safe food production projects that include technical assistance in best agricultural practices, in order to sustainably increase productivity. The budget for this initiative is USD 70,000.

FAO is also supporting the regional project *Strengthening of a sub-regional mechanism to support the eradication of foot-and-mouth disease in the members countries of the Andean Community of Nations (CAN)* (GTFS/RLA/172/ITA, financed by the Italian Cooperation in Peru, Ecuador, Bolivia and Colombia). It is aimed at strengthening the veterinary care infrastructure at field and laboratory levels. It will benefit large areas of livestock production, integrating the infrastructure and technical capacity of veterinary services into other rural development projects that are being carried out in the region. Its beneficiaries are livestock producers, and it will provide USD 300,000 as co-financing. It is complementary and have similar goals to FAO project GCP/RLA/178/SPA detailed in Section B.6 below.

The above-mentioned baseline initiatives will provide co-financing to the proposed GEF project, by contributing partially or totally with their budgets.

#### **Baseline initiatives that address land degradation in the livestock sector**

Land recovery mechanisms started being implemented in the last decade (i.e.: land restoration, declaration of natural protected areas –NPAs-, and degraded forests rehabilitation), rehabilitating 1600km<sup>2</sup> between 2000 and 2005. The GoE is now aiming at stopping degradation processes in Loja and Manabí, and at converting degraded grasslands into sustainable livestock systems, in order to increase productivity and avoid further expansion of the agricultural frontier.

The GoE has prioritized livestock to promote sustainable land management. MAGAP's approach is based on sustainable soil management to support food security goals.

As described above, the Sustainable Livestock National Plan is led by MAGAP. By 2020, the SNLP aims to: (1) recover 1 million hectares by implementing forest conservation projects and agro-forestry and silvopastoral projects; (2) to improve nutritional and reproductive parameters in livestock; (3) to promote an intensive livestock management with a stocking density of 4.5 LU per hectare. The SLNP stimulates the inter-institutional coordination and has nominated a technical assistance team. However, the reach of the SLNP is still limited, and many unsustainable livestock management practices and technologies that worsen land degradation are still being applied in the field.

In the context of the CPF, FAO is providing technical assistance for reducing land degradation through the project *Interregional Program for poverty alleviation and fight against desertification through the collaborative management of river basins, in Manabí*. FAO has with this project been seeking to combat poverty, improve food security and promote good governance, supporting key actors in the combat of desertification and land degradation, through the development of integrated programs for the management of river basin in arid and semi-arid lands. With a budget of USD 691,027, the project is supporting the following activities: reversal of grasslands to agro-forestry and agro-silvopastures, restoration of degraded lands, climate monitoring, monitoring of degradation of soils, inter-institutional coordination to fight desertification and management of water resources, education and information to the community on issues related to production, combat desertification and land degradation.

The above-mentioned baseline initiatives will provide co-financing to the proposed GEF project, by contributing partially or totally with their budgets.

### **Baseline initiatives that address the impacts of climate change in the livestock sector**

MAE has recently developed the National Climate Change Strategy, including agriculture and livestock among its priority areas. The National Climate Change Adaptation Plan (NCCAP) constitutes one pillar of the Strategy. Both the Strategy and the Plan are laying the ground for mainstreaming adaptation in existing relevant sector policies and plans. The NCCAP considers food sovereignty (including the livestock sector) as one of its eight priority sectors. Its objective is to implement measures that guarantee food sovereignty within the context of climate change impacts.

The Directorate of Climate Change Adaptation of MAE is responsible for executing the NCCAP, with a running budget of USD112.128/year. In addition, it is implementing the *Climate Change Adaptation Management* project (GACC, for its name in Spanish), which aims to strengthen capacities of social, economic and natural systems to properly address climate change impacts. It includes pilot projects where local actors generate adaptation strategies in the Pastaza watershed. GACC will provide co-financing to the proposed GEF project by USD 1.200.000.

In the context of the CPF, FAO has developed a baseline study on the milk production sector in Ecuador through the regional project: *Technical economic and operational feasibility study for the creation of a regional observatory of the dairy sector* (TCP/RLA/3304/01), already closed. This study consolidated key information about the social, economic and technological context of the milk producers, and analyzed how to forecast CC-related emergencies and risks situations that would affect those producers. FAO has also supported the establishment of a regional observatory with the objective of improving the competitive and sustainable performance of the milk chain, with particular emphasis on the thousands of smallholders and small- and medium-size milk enterprises. This enhanced performance will generate broader social improvements given the uniqueness of the milk sector – due to its territorial presence and work organization - in comparison with other economic sectors in Ecuador. The proposed GEF project will take into account this baseline information and analysis in the full project design and implementation of Component 2 and 3.

Some other baseline initiatives are being implemented at provincial level:

The Santa Elena Provincial Government, in coordination with MAGAP, is running a project for the creation of a management, selection and conservation center for Creole cattle. Its objective is to provide genetic material, ensuring animal health and reproductive capacity of this type of cattle that has greater ability to adapt to extreme climates (drought, lack of food and clean water consumption), which in turn will help to have more competitive production systems that provide better quality products. The total amount of this project is USD 482.942 and its beneficiaries are 21,227 cattle UPAs managed by small- and medium-scale livestock farmers in Santa Elena, Guayas and Manabí provinces.

The above-mentioned baseline initiatives will provide co-financing to the proposed GEF project, by contributing partially or totally with their budgets.

Finally, two new credit lines will allow for the scaling up of adaptation and SLM technologies and capacities supported by the project component 2 and are as such important baseline initiatives. One is the credit line that MAGAP and the National Promotion Bank (*Banco Nacional de Fomento-BNF*) is currently opening and which goal is to reduce vulnerability of livestock systems. The second one is a microfinance strategy to fund initiatives for sustainable land management, which is being developed as part of the *National Program of People's Financing, Entrepreneurship and Solidarity Economy* (NPPFES).

### **Baseline initiatives that address GHG emissions in the livestock sector**

Regarding CCM, the GLNP 2009-2013 has set specific GHG reduction emission targets in the LULUCF sector by 2013 to be achieved through: i) increasing land areas under conservation or environmental management by +5%; and ii) reducing the deforestation rate and carbon footprint by 30%; and iii) to avoid exceeding the biocapacity of Ecuador.

The National Climate Change Mitigation Plan (NCCMP) constitutes the second pillar of the National Climate Change Strategy developed by MAE. It aims at identifying and incorporating appropriate practices for mitigating climate change in the agricultural sector, which can at the same time strengthen and improve its production efficiency and competitiveness. It envisages the development of a sustainable livestock public policy to promote the reduction of GHG emissions from the livestock sector. Furthermore, it proposes the identification and implementation of at least two mitigation measures in the livestock sector, through sustainable practices, including improvements in the techniques of grazing, use of machinery and light equipment, among others. The Directorate of Climate Change Mitigation - MAE is responsible for executing the NCCMP. Its operational budget is USD 437.872 part of which will provide co-financing to the proposed GEF project

The GoE has selected three criteria to identify priority areas for GHG emissions reduction. First, addressing the sectors that most generate emissions<sup>40</sup>, and which emissions are projected to increase. Second, considering the importance of the sector within the national economy. Third, considering future commitments of Ecuador for reporting GHG emissions to the UNFCCC. As described above, livestock is a major source of GHG emissions in Ecuador. However, no actions specifically focused on reducing these sectorial emissions have been adopted yet. Similarly, no carbon and other GHG monitoring system for the livestock sector has been tested.

Ecuador has only addressed climate change mitigation through the design of a National Plan of Afforestation, which aims at managing afforestation and reforestation actions through agro-forestry and silvopastoral practices. MAE will be the responsible for issuing guidelines for afforestation and reforestation models. It will also carry out technical inspection of the processes, and will provide technical assistance to provincial governments and parish councils on programs and projects of afforestation and reforestation that will be run by local governments. This Plan will provide an in-kind contribution of USD 440,000 to the proposed project.

In conclusion, the GoE is addressing the livestock sector challenges through a food security perspective. MAGAP's approach is focused on improving productivity. Climate change adaptation and mitigation are not systematically considered in its long-run plans, even if sustainable livestock production will probably depend on these drivers. MAE's goal is to mainstream the concepts of climate change mitigation and adaptation into national plans and policies, but their scope of action is restricted due to limited funds. Although MAE's strategies for the livestock sector are already mentioned in national policies they still need to be implemented. At the same time, low capacities are visible at local levels. Small- and medium-sized livestock producers, the most affected by land degradation and climate impacts, have very low adaptive capacities and technological knowledge, and lack of resources to adopt effective risk management strategies. Currently, they grow their cattle under very simple approaches: letting cattle graze in very large areas when it is possible, without preventing overgrazing and its consequences. The livestock sector needs to improve their productivity while being able to cope with climate change and prevent land degradation, in order to decrease their vulnerability to severe climate-induced shocks. As well, better mitigation practices should be implemented to reduce sectorial GHG emissions.

The baseline scenario shows **3 main barriers:**

- 1. The institutional framework is lacking an integrated livestock approach to reverse land degradation, increase climate change adaptation and reduce GHG emissions. Livestock policies are fragmented, and do not integrate multi-variable strategies. There is a poor institutional knowledge about the interactions between climate change mitigation and adaptation in the livestock sector. There are low institutional capacities to implement integrated livestock management at field level**
- 2. Livestock producers in the field apply unsustainable livestock management practices and technologies that worsen land degradation and increase vulnerability to climate change impacts.**
- 3. The application of unsustainable livestock management practices in the field generate an increase in GHG emissions without offsetting them. GHG emissions cannot be measured and monitored to support improved mitigation strategies due to the lack of monitoring systems in the field.**

**B. 2. INCREMENTAL REASONING: DESCRIBE THE INCREMENTAL ACTIVITIES REQUESTED FOR GEF FINANCING AND THE ASSOCIATED GLOBAL ENVIRONMENTAL BENEFITS TO BE DELIVERED BY THE PROJECT:**

The current unsustainable management of the livestock sector in Ecuador is causing a decrease in multiple benefits in livestock ecosystems through land degradation, rising emissions of GHG, and increasing vulnerability to climate variability and shocks. This is the reason why funding from multiple trust funds are being sought for this project, which will allow for an integrated approach to increase multiple benefits needed in the livestock sector in Ecuador. Climate-smart livestock management (CSLM) is an approach supporting the achievement of these multiple benefits. CSLM is defined by FAO as a livestock approach that integrates both CC adaptation and mitigation practices in the agro-livestock sector, and supports the development of sectorial policies aimed at combating desertification and reducing land degradation, while enhancing the achievement of national food security and development goals. FAO has recently developed the concept of *climate-smart agriculture* which is the basis for explaining the concept of CSLM adopted by this project. *Climate-smart agriculture* embraces the sustainable increase of productivity and incomes, strengthens resilience to climate change and variability, and reduces agriculture's contribution to climate change through a decrease in GHG emissions and supporting an increase of carbon capture in farmlands. The CSLM's approach recognizes that livestock is an integral part of

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<sup>40</sup> Based on the results of the National GHG Inventory for the SNC, 2011.

many farming systems as well as the largest contributor to GHG emissions within the agricultural sector<sup>41</sup>, but it is also impacted by the CC effects. While livestock – both for dairy and meat production - generates about 1.5% of total global GDP, many livestock breeds are in risk because they cannot be genetically improved fast enough to adapt to climate change<sup>42</sup>. For this reason, developing climate-smart activities associated with livestock-based systems is critical to the way-forward for sustainable livelihoods in the context of climate change. The integration of trees and soil management practices can increase soil carbon accumulation and system resilience to climate variability, and offset livestock-related emissions. CSLM approach is applicable to Ecuador as confirmed by the preparation studies of the MICCA programme (FAO) (see description of MICCA in Section B6) and is suitable to address concerns identified by the SNC regarding livestock production (CCA and CCM) (see Sections A1.2 and B1 for detailed SNC description). FAO is currently also designing a Verified Carbon Standard Methodology (VCS) for Sustainable Grassland Management in a project in China which will estimate the reduction of greenhouse gas emissions from the adoption of sustainable grassland management practices (SGM) that increase soil organic carbon (SOC) stocks. This methodology and experience can be adapted and applied to the present proposal.

In light of this, this project will aim to reduce soil degradation, increase adaptive capacity to climate change, and mitigate GHG emissions by implementing cross-sectorial policies and climate-smart livestock management, with emphasis on vulnerable provinces (project objective). Seven provinces have been identified, according to the baseline scenario detailed in B1: Manabí, Santa Elena, Guayas, Imbabura, Loja, Napo and Pastaza. Pilot areas (in these provinces) will be selected during the full project preparation.

Since the FAO CSLM approach addresses both climate change adaptation and mitigation, Component 1 will be partly financed by GEFTF (CCM FA) and SCCF resources. Component 2 will be partly supported by GEFTF (LD FA) and SCCF resources, addressing land degradation, desertification and climate change vulnerability in vulnerable areas. Component 3 will address CCM actions and will be financed by GEFTF (CCM FA). There will be a close link between SLM and adaptation practices implemented in Component 2 output 2.1.2 and climate change mitigation practices implemented in Component 3 output 3.1.2, through the application of the CSLM approach in both components covering the same 35,000 hectares of highly vulnerable livestock production ecosystems.

The incremental financing from the GEFTF will be supporting the three components as detailed below:

**Component 1: Strengthening of institutional capacities and coordination to adopt climate-smart livestock as strategy of integrated and adaptive territorial management, and of cross-sectorial instruments and policy development**

This component will reinforce institutional capacities and coordination to develop cross-sectorial policies and instruments. Through a participatory and inter-institutional process at national level, a NAMA for the livestock sector will be designed, and an adequate MRV methodology will be designed and applied. The NAMA will have two end products: a Climate-Smart Livestock Management Strategy for CC mitigation; and a policy for sustainable integrated livestock farm management. The design process will include participatory workshops with representatives of national, provincial and local governments, rural producers associations, civil society and academic institutions, with at least 25% participation of women. The baseline of national and sectorial GHG emissions will be determined during this process, which will provide carbon budgets on emission reduction levels, investment and mitigation costs and financing requirements. Specific mitigation actions and the allocation of GHG reduction targets for the livestock sector will also be set. This process will require cross-sectorial planning. In addition, capacity-building with a gender focus will be delivered to 40 representatives of national, provincial and local governments (MAE, MAGAP, provincial councils, and municipalities) in climate change mitigation measures for different livestock production systems (2 workshops for pilot province), including identified actions in the NAMA.

**Component 2: Strategies of Deployment, Transfer and Implementation of Technologies of Climate-Smart Livestock Management**

This component will promote the exchange of information, dissemination of best practices, and the transfer and implementation of relevant technologies for the reduction of land degradation in the livestock sector, with a gender approach. It will also promote the access of 350 small- and medium-scale livestock farmers (selected with replicability criteria) to financial instruments to invest in sustainable land management techniques in selected degraded areas. It will develop local networks with the participation of 280 small- and medium-sized farmers in

<sup>41</sup> Livestock generates large shares of emissions of gases other than CO<sub>2</sub>: 37% of anthropogenic CH<sub>4</sub>, mostly from enteric fermentation by ruminants, and 65% of anthropogenic N<sub>2</sub>O, mostly from manure (MICCA, FAO, 2011)

<sup>42</sup> In developing countries, livestock contributes over 50% of the agricultural GDP and employs about 1.3 billion people, creating livelihoods for about one billion of the world's poor (FAO, 2012).

the selected 7 provinces, to be trained through 7 existing Schools of the Agrarian Revolution (ERAs) on: i) strategies for use, sustainable management and conservation of land and water; ii) design of agroecological corridors in livestock landscapes and implementation of best livestock and agrosilvopastoral practices aiming at reverting land degradation. Training modules and field guides will be developed to strengthen the participation and association capacities of small- and medium-sized livestock producers. Local capacities developed by Component 2 will be supported by the strengthened institutional framework addressed by Component 1, and by the regulatory framework already developed in the country<sup>43</sup>.

Best management practices (see output 2.1.2 in Table B) will be implemented in around 35.000 has in the selected provinces with small- and medium-scale farmers. The project will recover degraded pastures and improve existent grasslands management. The sustainable pasture management systems will avoid overgrazing and degradation, improving the efficiency of pastures production and preventing the livestock frontier expansion into fragile areas, where high land coverage should be kept to prevent degradation processes. In addition, a Certification System will be established to certify production units that apply climate-smart livestock practices in degraded areas selected with replicability criteria. The potential of up-scaling of the project is enormous. FAO studies<sup>44</sup> has documented that 1 million hectares of pastures may be recovered in Ecuador. The best practices tested and applied in these 35.000 has. may be replicated countrywide by the SLP and MAGAP, after project completion.

In addition, two already existing financial mechanisms and incentives for silvopastoral technology transfer will be strengthened in terms of SLM focus and implemented at field level. One of them is the credit line that MAGAP and the National Promotion Bank (*Banco Nacional de Fomento*-BNF) are currently opening and the second one is a microfinance strategy to fund initiatives for sustainable land management, which is being developed as part of the *National Program of People's Financing, Entrepreneurship and Solidarity Economy* (NPPFES) as mentioned in section B.1. These two credit lines offers an important baseline structure allowing for up-scaling of the SLM capacities developed and technologies transferred under this component among farmers. Regarding incentives, MAE has created a certification program (Ministerial Decree 075) for livestock producers that works with silvopastoral systems<sup>45</sup>. The certification program will entitle livestock producers to get tax credits (reimbursements) in the payment of the rural land tax. GEF funds will support capacity building activities for livestock producers to better understand and qualify for this incentive. In addition, MAGAP's Agricultural Insurance Unit is currently developing a livestock insurance to cover cattle losses through death and forced slaughter. Information needs to be gathered and studies need to be conducted on the development of livestock insurance for natural disasters, as drought is highly affecting livestock production. GEF funds will support this research and capacity building for producers to become eligible for this insurance.

### **Component 3: Improving the overall GHG balance from livestock activities by promoting sustainable livestock management in degraded or degrading areas of Loja, Manabí, Santa Elena, Pastaza, Guayas, Imbabura, and Napo.**

This component will improve the overall GHG balance, particularly methane emissions, from livestock production by promoting climate-smart livestock practices in degraded areas. It will implement livestock management innovative systems for CCM along with small-scale and medium farmers in 35,000 hectares in 7 pilot provinces. These systems will include silvo-pastoral, agroforestry, integrated crop-livestock management and grassland management. Best management practices will cover: sustainable land and water management, increasing feed efficiency through improved genetics and better farming practices, improving manure management, use of higher quality feeds (digestibility and balancing of N content), rational grazing management (grazing pressure depending on seasonality and forage availability), implementing green manure, contour plowing, silage of forage graminoids, trees and forage of greater digestibility. Recovering degraded pastures and sustainably managing grazing systems will improve carbon fixation and pasture quality. The increased digestibility of dry matter available on the pasture will decrease the proportion of emitted methane by output unit<sup>46</sup>. As a whole, recovery of degraded pastures, sustainable management of grazing systems and improvement

<sup>43</sup> Including: a) National CC Adaptation and Mitigation Plans (MAE); b) the Good Living National Plan and the National Environmental Plan that provide guidance for CC adaptation and mitigation activities; c) MAE as responsible for coordinating the institutional measures for CC adaptation and mitigation between governmental institutions; d) The CC Mitigation Directorate (MAE) coordinating actions for CC mitigation in energy, industry, forestry and agriculture and livestock sectors.

<sup>44</sup> FAO RLC, 2011

<sup>45</sup> Combining trees, shrubs and grasses with density of at least 80 plants or shrubs per hectare, and plantations formed in rows as "windbreak curtains", which are living fences to integrate livestock activities.

<sup>46</sup> Studies have shown that in systems of milk production through grazing, measures that increases digestibility, reduce the proportion of methane per liter of milk produced decreases (FAO, 2010). According to FAO, the average emissions of CO<sub>2eq</sub> per kilo of milk

of pasture quality will also improve the animals gain per weight (fattening), making production more efficient and mitigating emissions<sup>47</sup>. The project strategy will reduce emissions per unit of product, and increase carbon sequestration in well-managed pastures<sup>48</sup>. GHG monitoring systems will be established in the 7 pilot areas to provide data on the emissions and mitigation potentials of different livestock practices and activities. This data will be extremely useful, also feeding back into national measurement, reporting and verification (MRV) systems.

**Global environmental benefits (GEBs):** The SLP-MAGAP, MAE, the DAGs of Loja, Manabí, Santa Elena, Guayas, Pastaza, Imbabura y Napo, small- and medium-scale livestock farmers, public-private institutions, producers' associations, local development stakeholders, and local rural communities involved in the project will contribute to deliver the following GEBs:

1. An overall reduction of GHG emissions from livestock activities due to: i) the improved and more efficient livestock management that has lessened the pressure on converting further land for livestock, decreasing forest and grassland conversion; and ii) the more efficient management of grasslands, which are an important carbon sink globally. Measurable indicators: reduction in GHG emissions<sup>49</sup> (30% of the total CO<sub>2eq</sub> per kilogram of milk produced in grazing systems, and 50% decrease in total CO<sub>2eq</sub> per kilogram of meat produced), and increased carbon sequestration (6-13 tons of carbon per hectare of grassland recovered<sup>50</sup>; 4.03 t/CO<sub>2</sub>/h in silvo-pastoral systems<sup>51</sup>; 4.62 t/CO<sub>2</sub>/h in agroforestry systems<sup>52</sup>).
2. Increase agricultural productivity in the livestock sector and restored agro-ecosystem services will have been fostered through the rehabilitation of grasslands, conservation of forests and the application of best practices of livestock and land management through silvo-pastoral and agroforestry techniques and integrated crop-livestock systems. Measurable indicators: increase of +10% to +20% of livestock productivity in the pilot areas (meat production); increase of +24.4 of livestock productivity (milk production) per unit area of recovered pasturelands (measured against baseline of degraded pastureland) in the pilot areas; higher diversity of crops and trees in farming systems.
3. Degraded areas and grasslands will have been restored and put under improved management, allowing for increasing soil fertility, rising carbon sequestration and the rehabilitation of otherwise lost areas. Measurable indicators: improved pasture management and restored grasslands (35.000 ha).

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produced in grazing systems is 2.72 kg CO<sub>2eq</sub>, but this can reach 7.5kg in degraded or low quality pastures and low production animals. Therefore, pastures recovery and sustainable management and the proposed best practices of animal management, could help decrease at least 30% the total CO<sub>2eq</sub> per kilogram of milk produced in grazing systems in Ecuador, if the current level of degradation of pastures in the proposed project areas are taken into account (FAO RLC, 2011).

<sup>47</sup> For example, in a degraded or badly managed pasture, daily animal gain per weight may be around 200-300 grams. In contrast, in a recovered and well-managed pasture, daily weight gain may be around 700 grams. Therefore, to reach the weight of sacrifice (400 kg, for example) an animal would need only half the time in a well managed pasture, thus emitting 50% less emissions throughout its life, in relation to animals grazing in degraded meadows. An adult cow produces around 50kg methane per year. If the age of slaughter is around 12 months, due to achieving 400kg of weight, the amount of methane that ceases to be emitted is around 50kg per every 400kg of meat. Thus, the emission reduction is a result of the efficiency expressed in a younger age at the time of slaughter. In addition, a recovered and well-managed pasture can store about 0.59 Mg carbon per hectare per year (FAO RLC, 2011).

<sup>48</sup> The proposed project will promote the strategy of improving grasslands for capturing carbon and reducing CH<sub>4</sub> emissions. In Ecuador there is a huge potential of soil carbon sequestration in grazing systems linked to the vast extension of grasslands that are highly degraded. Diverse FAO's studies have confirmed these type of sequestration can be increased by recovering degraded pastures, improving their management, incorporating better quality- and adapted species, including the development of silvopastoral systems, and enhancing animal husbandry practices.

<sup>49</sup> According to FAO, the average emissions of CO<sub>2eq</sub> per kilo of milk produced in grazing systems is 2.72 kg CO<sub>2eq</sub>, but this can reach 7.5kg in degraded or low quality pastures and low production animals. Therefore, pastures recovery and sustainable animal management could help to decrease at least 30% of the total CO<sub>2eq</sub> per kilogram of milk production in grazing systems in Ecuador, given the degradation rates in the country (FAO RLC, 2011).

<sup>50</sup> Scientific research has already proven that grasslands fix large amounts of carbon. Up to 30% of the carbon on the ground around the world is in pastures (*Review of evidence on drylands pastoral systems and climate change*, FAO, 2009). Because of the vast amount of grassland in Ecuador (4.985.890 ha of natural and cultivated grassland) and their high level of degradation, there is a significant potential of carbon fixation in the soil through grazing. The pasture degradation can result in losses of approx. 6-13 tons of carbon per hectare (Woomer, et al., 2004). Therefore, recovery of pastures and sustainable management of grassland in at least 3 million hectares in Ecuador, would represent more than 39 million additional tones of fixed carbon. It has also been proven that the conversion from pastures to croplands is one of the major causes of emissions, with estimated losses of 60% of the carbon in the soil in relation to the content in soils with pastures (FAO RLC, 2011).

<sup>51</sup> Nair et al. (2009)

<sup>52</sup> Ibidem

**B.2.2. FOR PROJECTS FUNDED FROM LDCF/SCCF: ADDITIONAL COST REASONING: DESCRIBE THE ADDITIONAL ACTIVITIES REQUESTED FOR LDCF/SCCF FINANCING AND THE ASSOCIATED ADAPTATION BENEFITS, TO BE DELIVERED BY THE PROJECT:**

As described in B.1, the FAO CSLM approach addresses both climate change adaptation and mitigation. Component 1 and 2 will be partly financed by SCCF resources. With additional SCCF financing the proposed project will implement:

**Component 1** will design the Climate-Smart Livestock Management Strategy (CSLMS) for climate change adaptation, through an inter-institutional and participatory process, and will support its mainstreaming into the National CC Adaptation Plan (led by MAE). In addition, the CSLM approach will be incorporated into existing Land-Use and Development Plans (LUDPs)<sup>53</sup> of the Decentralized Autonomous Governments (DAGs) of the 7 selected provinces, to reduce vulnerability towards climate change impacts. The LUDPs will contain information needed to design 5 zoning plans for livestock production, which will be developed under the supervision of the National Planning Secretariat (SENPLADES), and will be included (through municipal ordinances) into existing management plans of vulnerable micro-watersheds in dry arid, semi-arid and sub-humid areas (only in Loja, Manabí, Santa Elena, Guayas and Imbabura) selected with replicability criteria (applying FAO Information System for Land Resources Planning -SIRT Plan- and LADA). Capacity-building with a gender focus will be delivered to 40 representatives of national, provincial and local governments (see B.2) to mainstream climate smart-livestock strategies for climate change adaptation into local and national programs and plans (at least two workshops per selected province).

**Component 2** will promote the transfer and adoption of adaptation technology through good practices for adaptation: use of drought or flood-tolerant grass species, rotational grassland management systems and flexible animal load based on forage supply, efficient use of rainwater, integrated crop-livestock systems, cross-breeding systems, and forage improvement. In combination with resource from the LD focal area, two already existing financial mechanisms and incentives for silvopastoral technology transfer will be strengthened in terms of adaptation focus and implemented at field level. One of them is the credit line that MAGAP and the National Promotion Bank (*Banco Nacional de Fomento-BNF*) are currently opening and the second one is a microfinance strategy to fund initiatives for sustainable land management, which is being developed as part of the *National Program of People's Financing, Entrepreneurship and Solidarity Economy* (NPPFES) as mentioned in section B.1. These two credit lines offers an important baseline structure allowing for up-scaling of the adaptation capacities developed and technologies transferred under this component among farmers. Also in combination with LD FA resources, component 2 will develop local networks with the participation of 280 small- and medium-sized farmers in the selected 7 provinces, to be trained through 7 ERAs on: (i) strategies for use, sustainable management and conservation of land and water incorporating management of risks and local vulnerabilities to face climate change; (ii) design of agro-ecological corridors in livestock landscapes and implementation of best livestock and agrosilvopastoral practices aiming at increasing the resilience to adverse effects of climate change<sup>54</sup> (see description of local capacities and training in section B.2).

Component 2 will also support the development of an on-line knowledge platform that gathers, systematizes and disseminates lessons learned of best practices for livestock management involving local stakeholders, producers' associations, DAGs (7 provinces and 10 municipalities), and national and international organizations. The system will be linked to the Agricultural Insurance Unit platform of MAGAP and the United System of Environmental Information at MAE. In addition, one CCA technology package will be developed and implemented in 7 pilot areas (35.000 has) in the selected provinces including: i) agro-climate and geo-referenced information systems (based on agro-meteorological stations at farm level) for grassland management, and ii) registration systems of pastures utilization and pregnancy synchronization that optimizes seasonal availability of dry matter.

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<sup>53</sup> The Organic Code of Territorial Organization, Autonomy and Decentralization (COOTAD, as known in Spanish) -entered into force in October 2010- assigned the Decentralized Autonomous Governments (DAGs) the responsibility of making their own Land Use and Development Plans (LUDPs), as a first stage of land planning in Ecuador. The Climate-Smart Livestock concept will be incorporated into 7 LUDPs of DAGs in 7 provinces: Manabí, Santa Elena, Loja, Guayas, Imbabura and Napo through provincial ordinances.

<sup>54</sup> Some farm management practices including livestock and agrosilvopastoral practices for adaptation to climate change, which will be applied in this component are: sowing of flood- or drought-tolerant grass species, rotational systems for grassland management and flexible animal load according to forage supply, efficient use of rain water, crops and livestock integrative systems, cross-breeding systems, manure management, and forage improvement.

**Adaptation benefits:** a) Livestock sector's vulnerability has been decreased at national level through the mainstreaming of the CSLM strategy for CCA into the NCCAP (MAE); b) the DAGs of 7 selected provinces have reduced their vulnerability by integrating the CSLM strategy for CCA into 7 LUDPs, and 5 zoning plans for livestock production and 5 vulnerable micro-watersheds management plans in dry arid, semi-arid and sub-humid areas have integrated climate resilience measures; c) 40 key representatives of national, provincial and local governments have increased their capacities to mainstream CSLM strategies for climate change adaptation into livestock-related programs and plans at local and national levels, with gender perspective; d) 280 small- and medium-scale livestock producers in 7 pilot areas have enhanced capacities in adaptation technologies and good livestock management practices for CCA; e) 50-75% of livestock producers, producers' associations in pilot areas, DAGs in selected provinces, and the national government have access to on-line knowledge platform that gathers, systematizes and disseminates lessons learned of best practices for livestock management; f) a CCA technology package has been deployed and implemented in 35.000 has of degraded and vulnerable lands, in 7 selected provinces and the adaptation focus of two government credit lines has been strengthened to support the further up-scaling.

**B.3. DESCRIBE THE SOCIOECONOMIC BENEFITS TO BE DELIVERED BY THE PROJECT AT THE NATIONAL AND LOCAL LEVELS, INCLUDING CONSIDERATION OF GENDER DIMENSIONS, AND HOW THESE WILL SUPPORT THE ACHIEVEMENT OF GLOBAL ENVIRONMENT BENEFITS(GEF TRUST FUND) OR ADAPTATION BENEFITS (LDCF/SCCF). AS A BACKGROUND INFORMATION, READ MAINSTREAMING GENDER AT THE GEF.":**

The proposed project will generate socio-economic benefits by enhancing the livelihoods of small- and medium-scale farmers involved in its implementation. Gender dimension is included throughout all project components. Micro-finance activities will consider women as key persons managing domestic savings and who have enormous influence in disseminating good livestock practices in their communities and villages. Women have a key role in livestock management, and FAO's experiences show that inclusion of women farmers is crucial for successful poverty reduction programmes. Thus, their capacity development and organization contribute to improve their labor conditions, livelihoods and life quality indicators (health, food, education and social inclusion). This project addresses women's access to natural and productive resources (i.e. land, livestock, credit) to increase their influence and social potentiality, and thus their control over local resources. Women will also be involved in the decision-making process both at local level (capacity-building workshops, revision of LUDPs to include CSLM) and national level (design of NAMA, and the CSLMS for CCA).

Component 2 and 3 will support directly small- and medium-scale producers of degraded areas in 7 targeted provinces. They will be empowered and trained on sustainable livestock practices to stimulate the adoption of adaptation technologies by targeted groups. As well, best practices for CCM will increase soil composition and agricultural system productivity and will therefore improve socio-economic conditions of vulnerable farmers. The project will impact positively in poverty and migration pressures at local level, helping avoid socio-economic disadvantages described in B1. By disseminating sustainable livestock practices, it will also reduce the need of expanding the agricultural frontier to increase household incomes. FAO has documented that small-scale milk producers lose incomes from milk sales as a result of pastures degradation, which vary between US\$ -42 and US\$ -157 per hectare per year. The recovery of 35.000 has will generate additional incomes for these people by around US\$ +1.470.000 to US\$ +5.495.000 during the whole project implementation. Since 1 million has of degraded lands may be still recovered, the evidence of restituted incomes in the rural sector may stimulate MAGAP to disseminate the CSLM approach as an environmentally and socially sustainable strategy of rural poverty reduction countrywide, after project completion.

The project will also promote small- and medium-scale producers' associations and local cooperatives. Soil conservation practices will revert land degradation trends at local level, and stimulate that unsustainable farming practices like grazing in slopes, hills and near water sources will be abandoned. Farm units owners will be able to diversify their production systems and articulate them with complementary goods in the livestock value chain, or in related activities. The project will also create compensation mechanisms for environmental services that might be used as inputs to set PES systems and foster local economies in the near future.

It is worth mentioning that the livelihoods enhancement due to livestock development will not imply a negative balance between CH<sub>4</sub> emissions and CO<sub>2</sub> sequestration. As detailed in Section B.2 (and related footnotes), the CSLM approach is focused on increasing socio-economic benefits by improving the efficiency of milk and meat production (more production units per area), but generating less emissions per unit of product. This reduction is achievable by recovering pastures (i.e.: capturing carbon) and sustainably managing the husbandry (i.e.: as explained, a better alimentation generates less CH<sub>4</sub> emissions, and better pastures enable the sacrifice of animals at younger ages). (Please see the detailed science-based methodology applied by FAO in footnotes # 46 to 50).

**B.4 INDICATE RISKS, INCLUDING CLIMATE CHANGE RISKS THAT MIGHT PREVENT THE PROJECT OBJECTIVES FROM BEING ACHIEVED, AND IF POSSIBLE, PROPOSE MITIGATION MEASURES THAT WILL BE FURTHER DEVELOPED DURING THE PROJECT DESIGN:**

Risk	Effect	Probability	Mitigation Measures
<p><b>Political and institutional risk:</b> Changing authorities in national counterparts</p>	<p>Co-financing commitments are not kept, or budgets are reassigned out of the project priorities</p>	<p>Middle</p>	<ul style="list-style-type: none"> <li>• Signing of letters of commitment by the national counterparts to guarantee project co-financing by CEO Endorsement.</li> <li>• Appointment of a technical focal point (from ministries) to the project operational unit</li> </ul>
<p><b>Socio-cultural risk:</b> Farmers are reluctant to adopt good livestock practices</p>	<p>Degraded hectares are not restored</p>	<p>Low</p>	<ul style="list-style-type: none"> <li>• Pilot projects based on existing experiences show farmers benefits of adopting environmental-friendly production systems (i.e.: sustained income, soil and water conservation).</li> <li>• Training and technical assistance is provided to livestock producers while adopting silvopastoral systems, to facilitate transition and encourage their active participation.</li> </ul>
<p><b>Socio-cultural risk:</b> Individual or communal land owners do not maintain their commitment of conserving vegetative cover in targeted areas</p>	<p>Vegetative cover is not conserved in targeted areas</p>	<p>Low</p>	<ul style="list-style-type: none"> <li>• Conservation agreements that define long-term commitments about the delimitation of conservation areas</li> <li>• Awareness-raising campaigns, mainly directed to decision-makers, might reverse depletion trends and find supporters to conserve fragile areas in DAGs.</li> </ul>
<p><b>Climate risk:</b> Extreme drought events</p>	<p>They aggravate land degradation, damages small- and medium-scale livestock producers' livelihoods, and threat food security of smallholders or peasants living in subsistence economies (i.e. in rural areas of vulnerable provinces)</p>	<p>High</p>	<ul style="list-style-type: none"> <li>• The adaptation technologies deployed and implemented in Component 2 (including agro-climate and geo-referenced information systems that will be based on agro-meteorological stations at farm level) will contribute to develop climate forecasts that complement meteorological reports, which will be shared with national and local governments through the online knowledge platform, and with the small- and medium-scale farmers through the producers' associations fostered by Component 2.</li> <li>• Component 1 will enhance institutional capacities to get the decision-makers ready to cope with extreme weather events (i.e. droughts and floods). Specific actions to manage droughts will be mainstreamed into the LUDPs, and envisaged by the CLSM strategy that will be included into the NCCAP (see Table B).</li> <li>• Component 2 will reduce soil vulnerability to extreme droughts events by improving soil quality before the disaster takes places, through the introduction of drought-resistant fodder and grass species, rotational systems for grassland management and flexible animal load according to forage supply, efficient use of rain water, crops and livestock integrative systems, and forage improvement. Cross-breeding systems will help make livestock species more tolerant to drought episodes. These practices will reinforce peasants and small-holders' livelihoods and will reduce their food insecurity risks.</li> </ul>

**B.5. IDENTIFY KEY STAKEHOLDERS INVOLVED IN THE PROJECT INCLUDING THE PRIVATE SECTOR, NGOS, CIVIL SOCIETY ORGANIZATIONS, AND THEIR RESPECTIVE ROLES, AS APPLICABLE:**

FAO, the Secretariat of Livestock Promotion (SLP)- MAGAP, and the MAE will be the main co-partners for project execution. The project will work closely with the DAGs of Napo, Pastaza, Guayas, Imbabura, Loja, Manabí and Santa Elena. Civil society will be integrated through national and local organizations of small- and medium-scale farmers, that are grouped by production purposes (dairy, meat), cultural identification (*chagras*, *montubios*), or cattle types (e.g.: Holstein, Brahman Association). National and regional farmers associations will be included as well. The roles of stakeholders participating in the proposed project are detailed below. The list of stakeholders is preliminary and will be further detailed during the full project preparation. Organizational and execution arrangements will also be further detailed and agreed during this phase.

Stakeholder	Interest in the project	Role in the project
FAO	To increase sustainable food security through the dissemination and promotion of climate-smart livestock strategies and policies in line with other initiatives developed at regional level (e.g. MICCA and UN REDD). To draw lessons and systematize good practices, lessons learned and recommendations that might be useful for other projects in this region.	GEF implementing agency
MAGAP	To promote policies of CCA, CCM and natural resources management (NRM), as well as strategies to combat desertification, in the agricultural sector.	Co-executing partner
Secretariat of Livestock Promotion (SLP)- MAGAP	To implement the national livestock sector policy, channeling resources and institutional competencies for this purpose.	Co-executing partner. Technical-political coordination to ensure synergy between baseline programmes and project activities.
MAE	To implement the national environmental policy in the rural (livestock) sector, channeling resources and institutional competencies for this purpose.	Co-executing partner. Technical-political coordination to ensure synergy between baseline programmes and project activities.
DAGs of the provinces of Napo, Pastaza, Guayas, Imbabura, Loja, Manabí and Santa Elena	To promote the inclusion of sustainable livestock production into the provincial LUDPs, and vulnerable micro-watersheds located in their provinces.	Partner for implementation at local level. Local resources mobilization, monitoring and evaluation at local level.
National and regional livestock associations	To strengthen the livestock sector through sustainable production initiatives. To improve the living conditions of its members. To incentive local markets and to promote the access to climate-smart livestock technologies.	Partners for Component 2 and 3 implementation.
Local organizations of small- and medium-scale farmers	To improve the living conditions of the small- and medium-scale producers by increasing their incomes. To facilitate the access of local producers to climate-smart livestock technologies and services.	Local promoters and direct beneficiaries of project implementation.
Vulnerable local livestock producers and peasants	To improve their living conditions by increasing their incomes and reducing poverty. To avoid migration and achieve productivity levels that allow them to stay at their rural communities. To have access to climate-smart livestock technologies and services. To reduce climate-related economic losses.	Direct beneficiaries of project implementation.

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

The proposed project is mainly related and will be coordinated with the *Sustainable National Livestock Plan* (SNLP) of the MAGAP (mentioned in B.1), the *Climate Change Policy in the Agricultural Sector* of the MAE

(idem), and the LUDPs of the selected DAGs (idem). It will also coordinate actions with the following initiatives currently under implementation or in starting phase:

- The *Mitigation of Climate Change in Agriculture (MICCA)* programme, led by the Division of Climate, Energy and Tenure (NRC) of FAO, which is also technically co-leading this proposed project. MICCA is mobilizing resources to start its full implementation in Ecuador. At present, MICCA is supporting the development of a National Agricultural Mitigation Programme in Ecuador, aimed to build up a national framework that strategically links policies to the productive, economic and environmental sectors, and to reduce GHG emissions in the agricultural sector in coordination with the forest sector. The policy framework and national policy are expected to enhance Ecuador's position in the international negotiations on CC. Furthermore, MICCA will undertake an analysis of sustainable agricultural practices that promote CCM, and improvement of methods to measure and determine GHG emissions from agriculture. It will also support capacity development for small-scale farmers adopting climate-smart practices. Analysis, methodology development and capacity building generated by MICCA will be complementary to the proposed GEF project. Once MICCA starts its full implementation, specific synergies will be identified among FAO, MAE and MAGAP, to avoid duplication of efforts and create synergies;
- The FAO project "*Strengthening policies and strategies for the prevention, control and eradication of foot-and-mouth disease in Peru, Bolivia, Ecuador, Colombia and Venezuela*" (GCP/RLA/178/SPA, funded by the Spanish Cooperation). It is complementary to project GTFS/RLA/172/ITA (detailed in B.1). Both projects have similar goals: to involve the CAN member countries and converge into the implementation of a single Integrated Regional Project for the Progressive Control of Foot-and-Mouth Disease, in order to achieve greater efficiency in the use of resources and effectiveness of international cooperation in the fight against FMD and other animal diseases. Both projects have the same geographical coverage of the proposed GEF project in Ecuador, and will provide their categorization of production systems and risks associated to CC and the FMD disease, and how they impact on the food security of small-scale producers. Besides, these FAO projects have developed a platform of sanitary education and databases of smallholders that will be used to address the sustainability of bovine milk production from smallholders and to carry out capacity-building activities by the proposed GEF project
- *Integrated Financial Strategy to Combat Desertification and Land Degradation* (being implemented by MAE), a framework to identify and promote the mobilization and effective allocation of financial flows for soil conservation, environmental management of farming and forestry systems, organic agriculture, agro-forestry, environmental-friendly livestock and sustainable land management. The lessons generated by Component 2 (outcome 2.2) of the GEF-proposed project might be channelized and up-scaled by this Strategy at national level during and after project conclusion;
- The global GEF co-financed project *Decision Support for Mainstreaming and Scaling Up Land Management* (also known as LADA II), which will be implemented by FAO and the WOCAT Secretariat. This project will implement a pilot in Ecuador. Its Component 1 will support decision-making on desertification, land degradation and drought, and thereby it is complementary with the Component 1 of the proposed project that will strengthen institutional capacities and coordination for CCA and CCM, avoiding duplications. The INRM methodology and tools developed and tested by LADA I and to be implemented in Ecuador through the LADA II will be used to measure the delivery of GEBs in the LD focal area (Component 2);
- The program PROFORESTAL (MAGAP), oriented to management, conservation and development of national timber resources. Its mission is to deploy and implement the *National Forestation and Reforestation Plan*. Its main components are: i) a planting program to protect and recover degraded soils; ii) production and improvement of water quality; (iii) protection of infrastructure; and iv) Subprogram of Social Forestry and Agro-forestry which is community-based (7500 has./year). PROFORESTAL is focused on forestry and its knowledge and field experience will feed the application of silvopastoral best practices in targeted areas (see Component 2 and 3);
- The *Program of Sustainable Management of Natural Resources* (GESOREN) implemented by GIZ, which applies strategies and methods for the sustainable management of natural resources and the increase of NR-based incomes in Ecuador. GESOREN's focus is concentrated on protected areas, ecological corridors and buffer zones, and it is implemented in the Napo Province, among others. The proposed GEF project will cover other type of areas in the same province, developing strategies only in the livestock sector.
- The GEF-FAO project *Conservation and Sustainable Use of Biodiversity, Forests, Soil and Water to Achieve the Good Living (Buen Vivir / Sumac Kasay) in the Napo Province* (under full project preparation)

which is co-financed by GESOREN, is complementary to the proposed GEF project. The Napo project will promote sustainable livestock practices and the signing of conservation agreements financed by conservation incentives in the upper area of the Napo Province. Its focus is mainly on biodiversity conservation in protected areas and buffer zones, and SFM/REDD+, while the proposed GEF project will address the other type of areas in the Napo Province and will be focused on climate change and land degradation. Both initiatives share project partners (MAE, MAGAP, FAO, the Napo Provincial Government) and will keep fluid communications to share lessons learned and failures.

- The SCCF-UNDP project *Adapting to climate change through effective water governance* seeks to reduce the vulnerability to climate change through the efficient management of water resources. This initiative incorporates national and local CCA into water management practices included in development plans, and into information and knowledge management systems. The proposed GEF project will use data from the vulnerability studies developed for watersheds in Loja, Manabí and Guayas, and will build upon adaptation technologies for water management already in place in these provinces.
- The SCCF-World Bank regional project *Adaptation to the Rapid Impact of Glacier Retreat in the tropical Andes*, aimed to contribute to the resilience of local ecosystems and economies to the impacts of glacier retreat in the Tropical Andes, through pilot adaptation activities. The proposed GEF project will consider the adaptation measures already tested that might be applicable to the livestock sector in the selected Andean provinces.

### **C. DESCRIBE YOUR AGENCY'S COMPARATIVE ADVANTAGE TO IMPLEMENT THIS PROJECT:**

FAO has the last decade built up important expertise and has developed technical tools and guidelines in order to support its member countries in CCM and CCA related to different land uses and practices in the agricultural sector building on its long experience in sustainable management of agro-ecosystems. FAO has expertise in rural development, sustainable livestock production, land management (forages, pastures), food security, agro-biodiversity, local and/or community capacity building. The Climate, Tenure and Energy Division (NRC) of the Natural Resources and Environment Department has developed the climate-smart agriculture/livestock management approach, which has already been tested in Ecuador and other countries through the preparation of the MICCA project. The Animal Production and Health Division (AGAL) of the Agriculture Department is involved in a pilot project in China which aims to restore degraded grasslands using sustainable management practices including reductions in grazing pressure on overstocked sites, the sowing of improved pastures and better pasture management. Within this project the VCS methodology for Sustainable Grassland Management is also developed. AGAL is also proposing to work with the Natural Grassland Board of Uruguay to test the carbon sequestration potential from sustainable land use and grassland practices on overgrazed grassland areas (overgrazed degraded site) and soils eroded by conventional tillage (formerly cropped degraded site). In Ecuador, FAO is a key player that provides technical assistance for designing agricultural policies, supporting training activities, and strengthening management and conservation of natural resources in the communities. FAO has a global knowledge network that join experts worldwide with experience in livestock development and environmental policies, GHG emission monitoring, GIS, forestry, governance (including, voluntary codes), food production chain analysis, farmers organization and field schools.

#### **C.1 INDICATE THE CO-FINANCING AMOUNT YOUR AGENCY IS BRINGING TO THE PROJECT:**

FAO will provide USD 108.999 (in-kind) and USD 1.061.027 (grant) in co-financing through the projects detailed in Section B.1 above.

In addition, further co-financing is being explored through the UN REDD+ Programme Ecuador (UNJP/ECU/083/UNJ). REDD Readiness is now under implementation in Ecuador, until December 2013, through the National REDD+ Programme (PNREDD+). The PNREDD+ is part of the National Climate Change Mitigation Plan, which is itself part of the National Climate Change Strategy, currently under validation of the Inter-Institutional Committee on Climate Change (CICC). The PNREDD+ is the framework for the development and implementation of REDD+ activities in Ecuador and thus, aims at contributing to the goal of reducing deforestation established in the National Development Plan. The program will be a supporting tool for the implementation of policies, measures, projects and activities to reduce deforestation in the country and its associated GHG emissions. Its budget is USD 1.5 million. The subsequent UN REDD+ Programme is expected to start its implementation in 2014. The MRV systems validated by UN REDD+ will have an integrated landscape approach that include livestock systems which are a main cause of the deforestation processes. The complementarity between the proposed GEF project and UN REDD+ in Ecuador would focus on including silvo-pastoral systems in the MRV systems developed by the latter, and applying those MRV tools that are suitable to measure GHG emissions reduction in Component 3 of the former.

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

The project fits into the UNDAF Ecuador's priority area 3: "*Environmental sustainability and risk management*", and priority area 2: "*Production, employment, economic solidary system and food sovereignty*". It is also consistent with the FAO Country Priority Framework (CPF), which is focused on the strategic objectives *Rural Development* and *Forest Environment*. In addition, FAO is leading the Inter-Agency Thematic Group on Food Security and Nutrition, and participates in the thematic groups of Environmental Sustainability, Intercultural Exchange, Gender, Emergencies, and Disasters.

The FAO Representation in Ecuador (FAOEC) has a Project Task Manager with special training in GEF and natural resource management who will supervise the day-to-day project execution with executing partners supported by the Programs and Projects Assistant, the Administration-Finance officers, the Program Officer, and the FAO Representative in Ecuador. The office has an internal project coordination team coordinating all technical and operational issues related to the implementation of the field program ensuring synergies among the various projects. The technical backstopping of the project will be backed up by a Lead Technical Officer in the Climate, Energy and Tenure Division - Natural Resources and Environment Department in FAO Headquarters in Rome, and will be supported by a Livestock senior expert from the FAO Regional Office for Latin America and the Caribbean in Santiago, Chile. The project implementation will also be supported by the FAO-GEF Coordination Unit in Headquarters and a multidisciplinary Project Task Force will be set up to support the project implementation.

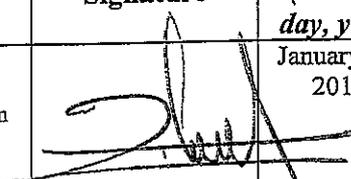
**PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY(IES)**

**A. RECORD OF ENDORSEMENT OF GEF OPERATIONAL FOCAL POINT (S) ON BEHALF OF THE GOVERNMENT(S):** (Please attach the country endorsement letter(s) or regional endorsement letter(s) with this template.)

NAME	POSITION	MINISTRY	DATE (Month, day, year)
Marcella Aguiñaga Vallejo	Minister of Environment	Ministry of Environment of Ecuador	November, 25, 2011

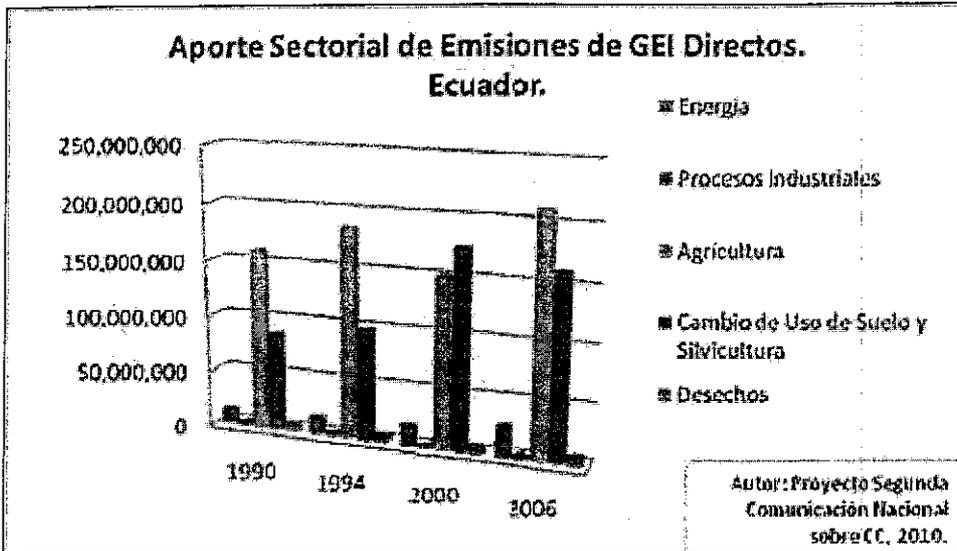
**B. GEF AGENCY(IES) CERTIFICATION**

**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 (Month, day, year)	Project Contact Person	Tele- phone	Email Address
Laurent Thomas Officer-in-Charge Investment Centre Division Technical Cooperation Department FAO Viale delle Terme di Caracalla (00153) Rome, Italy <a href="mailto:TCI-Director@fao.org">TCI-Director@fao.org</a>		January 21, 2013	Pierre Gerber, Senior Policy Officer, AGAL, FAO Rome	+39065 7056217	<a href="mailto:Pierre.Gerber@fao.org">Pierre.Gerber@fao.org</a>
Barbara Cooney FAO GEF Coordinator Email: <a href="mailto:Barbara.Cooney@fao.org">Barbara.Cooney@fao.org</a> Tel: +3906 5705 5478					

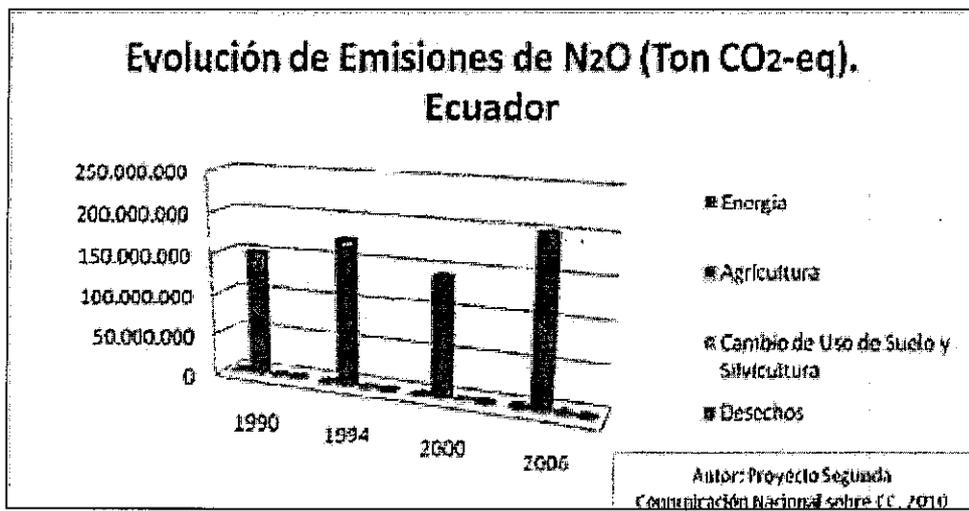
## Annex I

**Graphic 1 : Direct GHG Emissions (in Ton CO<sub>2</sub>eq) by sector, in Ecuador**



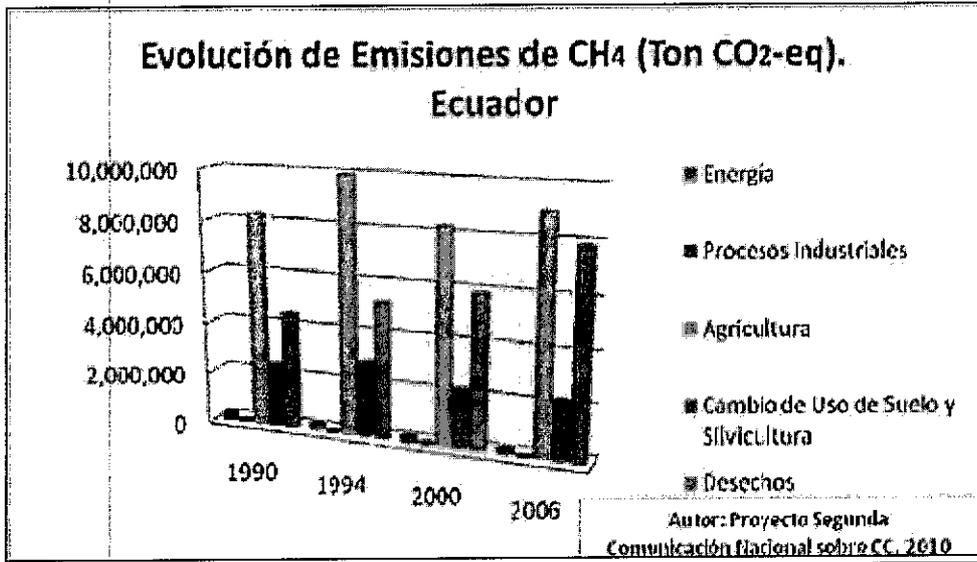
Source: Ecuador's Second National Communication to UNFCCC, 2011

**Graphic 2: Evolution of N<sub>2</sub>O emissions (in Ton CO<sub>2</sub>eq) by sector, in Ecuador**



Source: Ecuador's Second National Communication to UNFCCC, 2011

**Graphic 3: Evolution of CH<sub>4</sub> emissions (in Ton CO<sub>2</sub>-eq) by sector, in Ecuador**



Source: Ecuador's Second National Communication to UNFCCC, 2011

