



## PART I: PROJECT IDENTIFICATION

<b>Project Title:</b>	Integrated national Monitoring and assessment System on Forest Ecosystems (SIMEF) in support of policies, regulations and SFM practices incorporating REDD+ and biodiversity conservation in forest ecosystems.		
<b>Country(ies):</b>	Chile	<b>GEF Project ID:<sup>1</sup></b>	4968
<b>GEF Agency(ies):</b>	FAO	<b>GEF Agency Project ID:</b>	616813
<b>Other Executing Partner(s):</b>	Centro de Información de los Recursos Naturales (CIREN) Corporación Nacional Forestal (CONAF); Instituto Nacional Forestal (INFOR)	<b>Submission Date:</b>	17, August 2012
<b>GEF Focal Area (s):</b>	BD, CCM and SFM/REDD+	<b>Project Duration (months):</b>	48
<b>Name of parent program (if applicable):</b>		<b>Agency Fee:</b>	629,368
	• For SFM <input checked="" type="checkbox"/>		

### A. FOCAL AREA STRATEGY FRAMEWORK<sup>2</sup>:

Focal Area Objectives	Expected FA Outcomes	Expected FA Outputs	Trust Fund	Indicative Grant Amount (\$)	Indicative Co-Financing (\$)
CC-5	Outcome 5.1: Good management practices in LULUCF adopted both within the forest land and in the wider landscape	Output 5.1: Carbon stock monitoring system established Output 5.2: Forest and non-forest lands under good management practices	GEFTF	3,448,167	14,333,634
BD-2	Outcome 2.2: Measures to conserve and sustainably use biodiversity incorporated in policy and regulatory framework	Output 1: Policies and regulatory frameworks (2) for production sectors Output 2: National and sub-national land-use plans (2) that incorporate biodiversity and ecosystem services valuation	GEFTF	1,048,096	4,613,501
SFM-2	Outcome 2.1 Enhanced institutional capacity to account for GHG emission reductions and increase in carbon stocks  Indicator: capacities to certify forest-derived carbon credits (score as recorded by tracking tool).	National Forest Carbon Monitoring System in place (One national system)	GEFTF	1,498,421	5,101,211
Sub-Total				5,994,684	24,048,346
Project management cost <sup>3</sup>				299,000	1,200,000
<b>Total project costs</b>				<b>6,293,684</b>	<b>25,248,346</b>

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

<sup>1</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>3</sup>GEF will finance management cost that is solely linked to GEF financing of the project.

## B. PROJECT FRAMEWORK

**Project Objective:** To develop, and implement an Integrated Forest Monitoring and Assessment System on carbon stocks and biodiversity in Forest Ecosystems (SIMEF for its Spanish abbreviation) supporting the National Greenhouse Gases Inventory and the development of policies, regulations and SFM practices incorporating REDD+ and biodiversity conservation in forest ecosystems.

Project Component	Grant Type	Expected Outcomes	Expected Outputs	Trust Fund	Indicative Grant Amount (\$)	Indicative Co-financing (\$)
1. Development of institutional coordination framework and capacities for the implementation of the SIMEF	TA	<p>1.1 Institutional coordination and work framework operating supporting the operation of the SIMEF</p> <p>1.2 Technical and knowledge capacities for the implementation of the SIMEF developed at national and regional levels.</p>	<p>1.1.1 National Steering Committee (CD) with the participation of institutions with competencies in forest ecosystems (CONAF, CIREN, INFOR, and others) functioning based on operations regulations and implementing medium and long term work plans with budgets for the implementation of the SIMEF and monitoring of its impacts on national and regional forest and land-use policies and practices.</p> <p>1.1.2. 13 Regional Implementation Committees (RICs), the Technical Consultative Committee, and the Communication and Dissemination Committee functioning ensuring a high technical quality of the SIMEF and supporting its implementation ensuring the participation of local stakeholders.</p> <p>1.2.1 A set of cost-efficient methodological tools and protocols for data collection, analysis and construction of indicators related to the monitoring and assessment of forest ecosystems standardized and published in accordance with international policies and best practices (Montreal process, LULUCF, REDD+) and reporting needs of the conventions in particular UNFCCC covering: a) Carbon stock and carbon fluxes; b) biodiversity related to forest ecosystems; c) dynamics in land-use changes; and d) socioeconomic drivers for deforestation and forest degradation and incentives for SFM and REDD+ adjusting .</p> <p>1.2.2 100 technical staff, decision-makers, and local and national interest groups in forest policies and land-use planning capacitated in: a) LULUCF and REDD+; b) monitoring and assessment of forest ecosystem biodiversity indicators, changes in carbon stocks, forest ecosystem resources and related socioeconomic issues based on the Montreal criteria and indicators complemented by other indicators to capture socio-economic drivers; c) relationship between land-uses, forest biodiversity, and ecosystems functions; and d) assessment of alternative methodologies for data collection and analysis and harmonization of standards</p>	GEFTF	530,000	1,000,000
2. Implementation of SIMEF	INV	2.1. The National Forest Inventory expanded to a	2.1.1 Statistically valid data and information collected and analyzed	GEFTF	4,522,684	19,931,346

		<p>Geospatial data model populated with data on 13.4 million ha of forest ecosystems covering the whole country including 3.5 million additional ha of native forest not included in previous NFIs representing: a) more than 2 GtCO<sub>2</sub>-eq in carbon stocks; and b) habitats for biodiversity-endemic to Chile in particular in the native prehistoric araucaria forests, temperate rainforests, and alerce forests.</p> <p>2.2 Data and information generated by the NFI and SIMEF on carbon stocks and fluxes, forest ecosystems biodiversity, and land-use changes and the socioeconomic drivers for REDD or SFM disseminated country wide.</p>	<p>covering forest ecosystems country wide, and indicators calculated for: a) carbon stocks; b) forest ecosystem biodiversity; c) drivers for land-use changes impacting forest ecosystems; and c) socioeconomic drivers for deforestation and forest degradation and incentives for SFM and REDD+.</p> <p>2.1.2 Thematic maps on forest ecosystems, species distribution, carbon stock and land use changes prepared published and saved on geodatabase.</p> <p>2.2.1 WEB based information system operating connected to the Integrated Monitoring and Assessment system giving user groups (national, regional and local decision makers on forest management and land-use planning, the private sector dependent or impacting on forest ecosystems, and universities and NGOs working on SFM and REDD+ issues) easy access to the data and information generated.</p> <p>2.2.2 One biennial thematic report published on forest carbon stocks and fluxes, forest ecosystem biodiversity status, dynamics in land-use changes impacting forest ecosystems, or socioeconomic drivers for deforestation and forest degradation and incentives for SFM and REDD+.</p>		<p>CCM: 2,659,167 BD: 806,696 SFM: 1,056,821</p>	
3. Application of the information generated by SIMEF in local, regional, and national policies and regulations	TA	<p>3.1 At least three regional governments (covering 49 local governments) are using the information generated by the SIMEF to mainstream BD conservation, and REDD+ in land-use planning and sector development policies and regulations leading to: a) reduced fragmentation of an estimated 15,000-35,000 ha of forest habitat 5 years after the end of the project (EOP); b) forest degradation rate reduced from 100,000 ha/year to 20,000-50,000 ha/year by EOP and 0 ha/year five years after EOP; c) recuperation of degraded forest by 100,000 ha 20 years after EOP; and d) stabilization of populations of key threatened species (biodiversity indicators and targets to be established during full project preparation)</p> <p>3.2 Adoption of SFM, LULUCF and REDD+ practices recuperating 2,000 ha of degraded native forest and increasing carbon captures</p>	<p>3.1.1 Special tool for tracking and assessment of the utilization of data, maps and reports generated by the SIMEF by local, regional and national governments and other institutions and organizations developed and applied the last two years of the project supported by RICs (output 1.1.2).</p> <p>3.1.2 Three regions have received TA in valuation of forest ecosystem services and biodiversity based on the information generated by SIMEF and are incorporating this valuation in regional land-use plans, zoning and use regulation. Based on experiences a corresponding guideline is developed and disseminated through the RICs</p> <p>3.1.3 Three region, sub-region or local sector policies and regulations have been developed and applied incorporating forest ecosystem biodiversity conservation and incentives for SFM practices in LULUCF and REDD+ through TA in the utilization of the information generated by SIMEF. Based on experiences a corresponding guideline is developed and disseminated through the RICs.</p> <p>3.2.1 One pilot implementing SFM practices conserving forest ecosystem services (carbon stocks and habitat for global important species) have been conducted with local stakeholders and lessons learned published ("Forests Model of Panguipulli" commune of</p>	GEFTF	<p>942,000</p> <p>CCM: 471,000 BD: 188,400 SFM: 282,600</p>	3,117,000

		with 6 t CO <sub>2</sub> -eq/ha/year.  3.3 Local and/or regional MRV systems are functioning for 100,000 ha of forest under SFM and REDD+ initiatives accounting for an estimated 4x10 <sup>5</sup> t C emission reductions and increase in carbon stocks (capacities to certify forest-derived carbon credits increased measured through score as recorded by SFM/REDD+ tracking tool)	Panguipulli in the Region of the Rivers).  3.3 Three government or non-government institutions or private sector associations have received TA in establishing MRV systems and certify forest-derived carbon credits based on the information generated by the SIMEF. Based on experiences a corresponding guideline is developed and disseminated through the RICs.			
Sub-Total					5,994,684	24,048,346
Project management Cost					299,000	
					CCM: 172,000	
					BD: 52,000	
					SFM: 75,000	1,200,000
<b>Total project costs<sup>4</sup></b>					6,293,684	25,248,346

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

Sources of Co-financing	Name of Co-financier	Type of Co-financing	Amount (\$)
National government	Centro de Información de los Recursos Naturales (CIREN); Corporación Nacional Forestal (CONAF); Instituto Forestal (INFOR)	In-kind	14,497,058
National government	Instituto Forestal (INFOR): (Proj: Inventario Continuo de Ecosistemas Forestales NFI)	Grant	2,765,829
National government	Centro de Información de los Recursos Naturales (CIREN); (Proj:Infraestructura de Datos Espaciales IDE)	Grant	1,542,339
National government	Corporación Nacional Forestal (CONAF) : Proj Catastro Nacional)	Grant	1,631,320
National government	Ministry of Environment	In-kind	611,956
National government	Other institutions ODEPA,FIA	Grant	756,340
GEF Agency	FAO	In-kind	350,000
GEF Agency	FAO (TCP "best SFM cases")	Grant	67,000
National government	Ministry of Defence (Satelite images)	In-kind	3,026,504
<b>Total Co-financing</b>			25,248,346

**D. GEF/LDCF/SCCF RESOURCES REQUESTED BY AGENCY (IES), FOCAL AREA(S) AND COUNTRY<sup>1</sup>**

GEF Agency	Type of Trust Funds	Focal Area	Country Name/	(in \$)		
			Global	Project amount (a)	Agency Fee (b)	Total c=a+b
FAO	GEFTF	BD	Chile	1,100,096	110,009	1,210,106
FAO	GEFTF	CCM	Chile	3,620,167	362,017	3,982,184
FAO	GEFTF	SFM/REDD+	Chile	1,573,421	157,342	1,730,763
<b>Total Grant Resources</b>				6,293,684	629,368	6,923,053

<sup>1</sup> In case of a single focal area, single country, single GEF Agency project, and single trust fund project, no need to provide information for this table

## **PART II: PROJECT JUSTIFICATION**

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

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

The project is a multifocal area project consistent with the GEF strategies for Climatic Change objective 5 (CCM-5), Biodiversity objective 2 (BD-2), and Sustainable Forest management/REDD+ objective 2 (SFM-2) by focusing on establishing a Integrated Forest Ecosystem Monitoring System (SIMEF for its abbreviation in Spanish) providing periodic updated information on the state of forest ecosystems the related biodiversity and carbon stocks and fluxes for improved SFM policies and regulations and land-use planning at state and local levels.

In relation to the alignment with BD-2 the project will support the implementation of a periodic monitoring of habitat conditions for global important biodiversity in forest ecosystems (ex. Valdivia Ecoregion). This information tool will support the mainstreaming of biodiversity conservation in forest landscapes and ecosystems and the LULUCF management sector. In particular this will be done through mainstreaming in policy and regulatory frameworks in the forestry sector and sectors impacting on forest ecosystems such as the energy sector (project output 3.1.3) and systematic incorporation of the valuation of forest biodiversity in land-use planning at the regional and local level (project output 3.1.2) supporting GEF BD outcome 2.2. The pilot areas for those two outputs, in the regions of Bio Bio, Araucania and Los Ríos, are particular affected by forest habitat fragmentation and degradation. Output 3.1.3 and 3.1.2 will include zoning and use regulation to stop further habitat fragmentation, facilitate medium-term improved connectivity between already fragmented habitat and support forest recuperation as well as specific measures for the conservation of threatened species in each pilot case. Under component 3 output 3.2.1 a pilot of SFM in a forest landscape will also be supported incorporating BD and habitat conservation based on the systematic information generated by the SIMEF. This experience together with the before mentioned outputs 3.1.2 and 3.1.3 will provide the basis for mainstreaming biodiversity conservation in forest landscapes and the forestry sector through improved policy, regulatory and planning frameworks and management strategies.

In relation to the project's consistency with objective CCM-5 the project will support the addition of a carbon monitoring component to the national forest inventory as part of the establishment of the SIMEF which will support the enhancement of carbon stocks in land-use planning and forest and non-forest management practices. The periodic carbon monitoring as part of the SIMEF will serve as an important feed back to decision-makers on the effectiveness of such planning and management practices in relation to increased carbon stocks and if any corrections in approaches needs to be taken.

In relation to objective SFM/REDD+-2 the project will support the development of capacities of institutions related to forestry (CIREN, CONAF, INFOR) in carbon monitoring in the different forest ecosystems in Chile including carbon stored in trees above ground and below ground an understory and understory living biomass and eventual also in dead mass of litter, woody debris and soil organic matter depending on considerations of cost-effectiveness of the carbon monitoring system to be assessed during full project preparation. The effectiveness of SFM/REDD+ policies and practices in terms of avoiding emissions from deforestation and forest degradation and increasing carbon stocks will be periodically monitored. The development and implementation of the SIMEF will be specifically tailored to provide the basis for establishment of Measurement, Reporting and Verification (MRV) systems and TA will be provided to develop capacities in utilizing the SIMEF information for certifying forest derived carbon credits.

As a whole, the project will support the capacities of the public sector institutions related to promoting biodiversity conservation and sustainability of forest ecosystem services in Chile based on systematic generated and timely information on key biodiversity, carbon, land-use-change and socioeconomic indicators.

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

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

To inform the programming of Chile's STAR resources none binding consultations have been held. The present project proposal is included as priority 1.1 under multifocal area projects related to two or three conventions in a summary report of the consultations submitted to GEFSEC "CHILE'S PRIORITIES FOR GEF-5 STAR-FUNDED PROJECTS - GEF National Project Prioritization Workshop".

The project is also consistent with the current policy framework in Chile and policies currently under development in relation to biodiversity sustainable use and conservation and climate change mitigation from land-use-changes, deforestation and forest degradation.

### **Biodiversity**

The project will support several of the strategic lines of actions established in the National Strategy on Biodiversity, which was approved in 2003, and its Action Plan, approved in 2005, (NSBAP) including: ecosystem and species conservation, sustainable productive practices, intersectorial coordination, capacity building, and the enhancement of available information on biodiversity and ecosystem services and threats. ~~The NSBAP includes two main instruments for biodiversity conservation which are the National Policy on Protected Areas under which the National System of Protected Areas has been created and the National Policy on Protection of Threatened Species.~~ The proposed project will support the objectives of both these instruments by providing systematic monitoring and harmonized information on biodiversity in forest ecosystems which will allow for the adaptive adjustment of management plans for forest ecosystems and species conservation both outside and inside protected areas. Likewise, the monitoring of biodiversity using key indicators for forest species and ecosystem health will allow for systematic supervision of these ecosystems and species and inclusion of targeted conservation interventions in land-use planning and sector development policies and regulations.

As part of the updating and alignment of the NSBAP with the 2020 Strategic Plan and the Aichi goals agreed under the CBD the Ministry of Environment (MMA) has as main objective to design a well informed National Biodiversity policy. In this context the proposed project will provide valuable harmonized information on biodiversity and forest ecosystem on regular bases and allow for prioritizing the allocated of resources for conservation approaches to specific areas of interest and direct management instruments to threatened biodiversity and forest ecosystems. As part of the up-dating of the NSBAP but also as part of the implementation of the National Climate Change Plan, the MMA is preparing the Biodiversity and Climate Change Plan. The basic idea is to take an integrated approach to climate change mitigation and biodiversity conservation (two areas which have previously been treated separately) especially in the land-use sector. The forest ecosystem approach to inventory and monitoring of forest resources including biodiversity as well as carbon indicators taken by the proposed project is fully in line with this integrated approach and the proposed project will be able to inform the development of the Biodiversity and Climate Change Plan.

### **Climate Change**

In relation to CC Chile just submitted the second National Communication on CC to the UNFCCC secretariat. The chapter II of this document provided the estimations of GHG emissions from different sectors based on the GHG National Inventory shown in Figure 1 below. The inventory on the LULUCF (sector CUTS in Figure 1) was made using very basic information on CO<sub>2</sub> emissions and carbon sequester from the expansion of forest biomass. As it can be seen forest ecosystems seems to have an important positive impact on Chile's carbon balance even though decreasing since 1999.

In chapter VI of the second National Communication on CC, Chile's commitment to contribute to the global efforts in climate change mitigation and adaptation is highlighted. In 2010 Chile volunteered to do an effort to reduce the countries GHG emissions assuming a commitment to remain 20% below the projected emissions for the period 2007-2020 (Appendix II Copenhagen Agreement). To achieve this goal Chile has identified priority actions in energy efficiency, non-conventional renewable energy and in LULUCF. From 2011 Chile has also began the implementation of the Agreement of Cancun that for the LULUCF and REDD requires the development of MRV systems and an increased frequency (2 years) in the reporting to the conventions on national GHG inventory. Chapter VI of the second National Communication on CC also emphasises the need of developing capacities in the country to further improve the GHG inventory report. The proposed project will be a crucial support to fulfil this need and to improve the quality and frequency of the GHG inventories allowing for better prioritized actions of climate change mitigation through LULUCF and REED+.

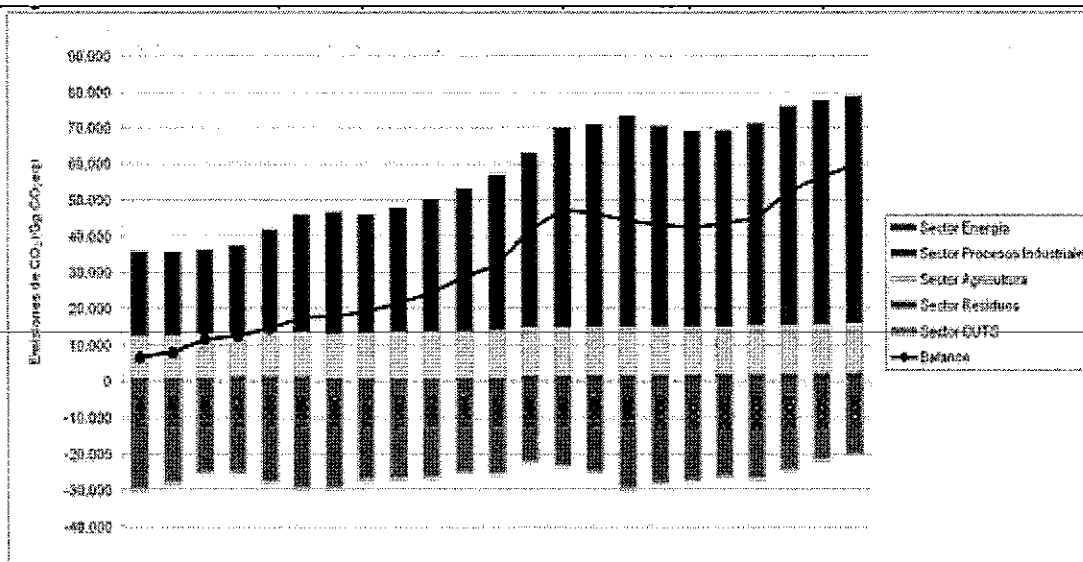


Figure 1. Emissions, sequestration and GHG balance in Chile (1984-2006)

## B. PROJECT OVERVIEW:

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

Chile has 16,0 million hectares of forest cover of which 13.5 million hectares are natural forests and the remaining forest are plantations with exotic species supplying raw material mainly to pulp and the wood product industry. Chile's natural forest possesses almost one-third of the world's few remaining large tracts of relatively undisturbed temperate forests ranging from Chilean palm forests and Sclerophyllous forests (composed of tree species adapted to drier climates), in north-central Chile, to prehistoric araucaria forests, temperate rainforests, and alerce forests (the Southern Hemisphere's largest conifers which can be over 3 000 years old -the "redwoods of the Andes") to the South. Virtually every type of temperate forest native to the Southern Hemisphere can be found in Chile. These forests are of great ecological and conservation value. They store significant quantities of carbon, control flooding, purify water, cycle nutrients and soil, and house an incredible array of species that provide the genetic material for valuable new products and a foundation for the resilience of natural systems. According to the National Forest Inventory (NFI, INFOR 2011), the 10 million ha, covered by the NFI of Chile's natural forests, are sequestering at stem level a total of 0.094 GtCO<sub>2</sub>-eq./year as a result of their natural growth and, represent a total stock of 5.79 GtCO<sub>2</sub>-eq.

Natural forests have in the past century accounted for 16.6 million ha. According to the first national forest inventory (NFI), performed in 1944-45, the total annual industrial cutting was 37.5 million m<sup>3</sup> but the indicated annual renewal in terms of growth was only 20.6 million m<sup>3</sup> at the time resulting in an unsustainable demand causing deforestation, one of the most important results of this first NFI. Although, this forest inventory results were acknowledged by the relevant authorities, few actions were evidenced in forest policy or new legal instruments at the time to obtain sustainability in the use of forest resources.

During 1993-97, the governmental institution in charge of the environment (Comision Nacional de Medio Ambiente, CONAMA) demanded the implementation of a national land vegetation cover cadastre of the whole country, also known as "Catastro Nacional de las Formaciones Vegetacionales de Chile" (CONAMA-CONAF). This project allowed the authorities and various stakeholders to gain information in a form of comprehensive reports about the spatial distribution of forest types and their species composition for the whole country. During the years 2000-2004, after several attempts to get funds, the second NFI was implemented by the National Forest Institute (INFOR). The NFI was proposed to the government in 1989, 1995, and finally accepted in 1999, and is since 2005 receiving financial support from the Ministry of Agriculture under regular basis (see below). The NFI was designed to provide solid statistical sampling applying the concepts of multisources, multilevels, and multiresources and a permanent forest inventory focusing on forest ecosystem goods and service's state and conditions and, covering up-to-date a total of 10 million hectares.

These improvements in official data on the status and conditions of forest ecosystems in Chile has let to improved policies and practices stopping overall deforestation. However, two main issues related to forest ecosystems have been of major concern during the last decade: i) the continuous degradation of forests (an estimated 100,000 ha/year with 1,000,000 ha currently affected), in particular those forest concentrated in the center and Southern part of the territory, recognized to have unmeasured consequences for ecosystem

functions especially biodiversity; and ii) the increasing demand of energy in support of economical development involving excessive carbon emissions (Chile has doubled its emissions since 1990, see Fig.1) and the generalized non sustainable uses of wood biomass to cover household heating demand, which imply a serious threat to the forest ecosystem integrity.

Regarding forest ecosystems state and conditions and its relation to biodiversity, REDD+ and LULUCF, Chile does not face a deforestation problem, which is considered as controlled and negligible, but its major concern is forest degradation, which is mainly concentrated between the regions of Maule and Los Lagos, with a total forest area of 4.06 million ha. The most relevant forest types included in this area involves the Oak-Raulí-Coihue and evergreen forest types. According to INFOR (2008) around 85% of the consumed fuel woods every year come from natural forests, i.e., 9.0 millions m<sup>3</sup> per year. The consequences of this rate of degradation affect not only the forest structure and carbon sequestration capacity but also the biodiversity related to forest ecosystems and its resilience to climate variability and changes. Forest biodiversity, including species and genetic diversity and ecosystems/habitats, is vital for human well being. Biodiversity, as a key element on sustaining ecosystem functions, is affected by the process of forest degradation by slowly but systematically, reducing habitats (for example habitat fragmentation of the biological corridor from the coast to the Andes in the Valdivian eco-region is estimated to affect 35,000 ha), changing species composition, losing keystone species and redundant species including important pollinators, all of which unfortunately is among the several issues that still remain un-monitored. In general, Chile faces un-mapped and monitored consequences on populations of birds, arthropod, rare species/habitats, mammals and others organisms which strongly depend on, and interact with forest ecosystems including pollinators and keystones species.

Main drivers for degradation are recognized as: 1) Poverty condition or subsistence needs from rural small landowners using the forest as a financial buffer used when facing economical needs. As such, the cutting does not follow a sustainable cutting allowance related to a particular management regime conserving the forest, but the volume of trees cut and wood extracted is based on the currency needs of the landowner at the moment. 2) The second driver for forest degradation is generated by the strong demand of fuel wood coming from the people living in the big cities and towns, i.e., covering household heating needs based on burning wood biomass. Both the need for financial resources on one side, and the increasing demand coming from cities and big towns explain the degradation of forest every year. Thus, stress on forest ecosystem in Chile is deeply-rooted in socio-economical issues which are still not adequately monitored.

The process of degradation is globally recognized as a difficult technical and methodological issue when it comes to monitoring. Unlike deforestation, a certain level of forest logging causing degradation is difficult to detect by the use of remote sensing, especially when cutting is focused on understory vegetation and changes in vegetation cover are minor or too small to be detected. On the other side, when the monitoring approach involves using ground sample data coming from the NFI the large scale sampling framework, typical of a NFI, is not detailed enough to accomplish a thorough assessment of forest degradation. However, a study on forest degradation conducted by INFOR in 2011 using forest structure as a proxy for detection and remote sensing suggested that reduction of forest cover larger than 40% had a good chance to be detected using this approach, reductions under this limit have increasing uncertainties in detection.

### **Baseline projects and deficiencies**

Chile has since the 90's been testing the various methodological, statistical and technological alternatives in relation to the implementation of the NFI which has been running for 10 years already with the financial support of the Ministry of Agriculture (currently USD 370,000 per year). INFOR jointly with other institutions initiated the NFI programme in 2001 when the INFOR Board of Directors decided on a change of paradigm after the Rio Summit recognizing the need for capacity development in the area of forest inventory and monitoring. A postgraduate program for INFOR professionals was established together with the first agreement between the Finnish Forest Research Institute (METLA) and INFOR. After a period of collaboration with various international institutions the first pilot study of a proposed sampling design for the NFI was performed testing optimal distance between sample plots, type of sample plots, field data collection and processing protocols, and defining products like thematic maps using geo-statistics. Today the NFI has accomplished its first cycle of measurement accounting for 10,3 million ha under sampling, representing 67% of Chile's forest resources focusing at productive forest (forest that provide wood for industrial use and biomass for heating or other uses), and with a accumulated cost of \$2.5 million. The main product disseminating the findings of the NFI is a document that summarizes in four chapters the state of forest in Chile ("Los Recursos Forestales de Chile").

The NFI is targeting the forest ecosystems and not only trees and is as such a multisource, multi resources and multilevel inventory where everything within the limits of the sample is measured and registered from soil to



large trees, and visible arthropod, mammals, birds and other animals. As such the NFI produces data and information about growing stock, species, vegetation, soil productivity, health condition, carbon, biodiversity indicators like wood debris, habitats, water, etc. The data collection and analysis is made based on geographically grid of 5x5 km in East-West direction and 7x7 km in North –South direction making the grid asymmetric and triangular. The sample unit is a cluster of 3 circular sample subunits of 500 m<sup>2</sup> in an inverted “L” layout. To capture landscape characteristics the vertex sample plot are used as a center of a circle of 500 m radius, which is normally related to Landsat or similar satellite images.

Regarding the monitoring of land-use changes the vegetation cover cadastre (see above) produces data about land use trends and changes provided periodically. This task is currently by law under CONAF, and the applied methodology is a ‘wall-to-wall’ approach where the baseline goes back to 1997. The maps generated by this project are based mainly on air photographs but lately satellite material, mainly SPOT, has been applied too. Chart of land occupation (COT) classification methodology is used developed in Montpellier in mid 70’s and modified to suit the conditions of Chile. The aim of the COT methods is to characterize the vegetation by biophysical observation, where the degree of ‘artificialization’ is also estimated by discrete classes in a set of known samples. The classification is based on structure, species composition, and degree of anthropogenic intervention and combine land-use with land cover. The spatial resolution is 6.25 ha which is currently being increased to 1 ha. The vegetation-cover cadastre represents a accumulated cost of USD 5.0 million in baseline investment.

Although the current NFI coverage is partial covering 67% of the total forest area in the country, the level of information provided to decision makers and stakeholders emphasize the importance of having this tool in combination with the vegetation cover cadastre tool, allowing for monitoring the state and condition of forest ecosystems and targeting sustainable forest management (SFM) and conservation initiatives. However, there is still a lack of data and information on: 1) non-direct productive forest ecosystems not covered by the current NFI which contains important biodiversity endemic to Chile in particular the native prehistoric araucaria forests, temperate rainforests, and alerce forests) in the southern part of the country; 2) socioeconomics drivers affecting the forests which information could improve decision making on policies and regulations to target root causes of forest degradation.

Other deficiency of the current forest monitoring affecting policy making is related to the lack of integration and coordination and even cost effectiveness. The two current programmes, although complementary, operate independently without any coordination. To date, only a weak connection exists between the two programmes in terms of the NIF using the estimated areas with different vegetation cover generated by the Cadastre to make extrapolations of its own results calculating total carbon stocks, biomass, etc.. Some efforts have been made to improve the inter-institutional coordination, but with little or none results until now.

This lack of institutional coordination in relation to the monitoring of the forest ecosystems, especially the monitoring of carbon stocks and land-use changes, is caused by a competition for financial support between the two institutions the last two decades, which have promoted a strong asymmetry in the budgetary availabilities. Under this scenario the insecure financial situation is currently impacting the long-term sustainability of both programmes and the lack of coordination has also resulted in sometimes even contradictory and confusing information and products generated by the two programmes which makes the usefulness for decision-makers and other organizations related to the formulation of policies and regulation inadequate. Without the GEF financing, providing the seed money for the integration and amplification of the two programmes into a user-friendly Integrated Monitoring System of Forest Ecosystems (SIMEF) tailored for forest resource decision-makers at all levels, this situation would need to be solved at a much lower speed, affecting important decisions and remedial actions related to REDD+ and the conservation of forests ecosystems and biodiversity. Important development of related capacities and the inter-institutional coordination framework would take place at a much lower speed.

A key benefit of the SIMEF will be the cost-efficient provision of opportune information and data on the state of the forests and the tendencies in land-use dynamics. In the scenario without GEF resources given the present budgetary availabilities, this information for the entire country will only be available medium- and long-term and the information on land-use dynamics will continue to lack the behind socio-economic causes which are extremely important for decision-makers. Without GEF incremental contribution, the biannual reporting on GHG inventory and carbon balance to the UNFCCC will still, in the LULUCF sector, be based on extrapolations of data only covering 67% of the country and representing the forest which currently have a productive function. Likewise in the current scenario the monitoring of forest ecosystem goods and services beyond what is immediate important for the productive function is not being conducted in a systematic and frequent manner.

**B. 2. INCREMENTAL / ADDITIONAL COST REASONING: DESCRIBE THE INCREMENTAL (GEF TRUST FUND) OR ADDITIONAL (LDCF/SCCF) ACTIVITIES REQUESTED FOR GEF/LDCF/SCCF FINANCING AND THE ASSOCIATED GLOBAL ENVIRONMENTAL BENEFITS (GEF TRUST FUND) OR ASSOCIATED ADAPTATION BENEFITS (LDCF/SCCF) TO BE DELIVERED BY THE PROJECT:**

The proposed project provides the country with an excellent opportunity to expand the current NFI design covering the whole territory and including non-productive native forest and socioeconomic variables creating an Integrated Monitoring System of Forest Ecosystems (SIMEF). With improved official data on the state and conditions of forest ecosystems and their services, the project will support the government to better identify suitable corrective actions on already existing instruments related to forest management (example, the recently approved new Law on Native Forest, 2008) and further develop and implement new policies, legal instruments and normative, all aiming at SFM and forest ecosystem conservation.

Expanding the current NFI framework to the whole country including island and archipelagos in the South and adding socio-economic indicators to better understand drivers behind land-use changes and forest degradation processes are necessary steps toward the implementation of the SIMEF providing efficient and timely information supporting: a) calculation of suitable emission factors and National Greenhouse Gases Inventory in Chile; b) LULUCF and REDD+ processes; c) establishment of MRV systems for the participation in carbon markets securing national and international credibility of the provided data and information; d) identifying trends and drivers related to biodiversity losses and improve conservation of biodiversity in forest landscapes; and e) accounting for forest ecosystem integrity as a whole. The establishment of the SIMEF as an inter-institutional effort will also foster an enhanced collaboration and coordination framework among the Ministry of Agriculture institutions (INFOR, CONAF, CIREN) and the Ministry of Environment (Climate Change Office and Natural Resources Division).

CIREN, CONAF and INFOR will provide an indicative total amount of USD 14.5 million in in-kind co-financing in terms of staff time, already existing data from the NFI and the vegetation cover cadastre, and office space and utilities and USD 1.5 million, USD 1.6 million, and USD 2.8 million respectively in grant co-financing from projects supporting the SIMEF (see table D above). The Ministry of Environment will provide USD 0.6 million in grant co-financing and further USD 3 million in co-financing will come from the Ministry of Defence providing satellite images from the first Chile Satellite brought into space in 2011 with among other objectives to provide data on the countries natural resources.

**The objective of the proposed project** is to develop, and implement an Integrated Forest Monitoring and Assessment System on carbon stocks and biodiversity in Forest Ecosystems (SIMEF for its Spanish abbreviation) supporting the National Greenhouse Gases Inventory and the development of policies, regulations and SFM practices incorporating REDD+ and biodiversity conservation in forest ecosystems.

To achieve this objective the project activities are grouped in the following three components:

**Component 1:** Development of institutional coordination framework and capacities for the implementation of the SIMEF. The objective for this component is to develop a smooth coordination mechanism and develop the required capacities among all institutions related to forest ecosystem issues to secure the implementation of the SIMEF initiative and the timely supply of information necessary to report on carbon stock changes, land use dynamics and forest ecosystems integrity status and trends. The coordination mechanism will be built on a strengthening of the already existent institutional coordination and collaboration framework of the Ministry of Agriculture (INFOR, CONAF) and the Ministry of Environment. Building on this existing framework contributes to the sustainability of project outcomes.

For the purpose of coordination the project will support the establishment of the following entities:

The Steering Committee (CD) conformed by high level official representatives from the Ministry of Environment and Agriculture, like executive directors of CIREN, CONAF, INFOR, Ministry of Environment Climate Change Office and Natural Resources Division. The CD will take care of budget planning, annual working planning, monitoring of progress in the implementation of the SIMEF, information and data dissemination strategy, monitoring of the impacts of SIMEF on national and regional forest and land-use policies and practices, and coordination with FAO staff.

The consultative technical committee (CTC) will provide technical and methodological advice to the CD securing the harmonization with standards according to international processes. The CTC will be formed by a group of scientific expert nominated based on their merits. In this committee also some observers may be invited if the CTC members decide as necessary.

To avoid highly complex organization, the CD and CTC will be connected to already existent entities belonging to the Ministry of environment (MMA) and Ministry of Agriculture (MA) like the Climate Change group (MA) and technical committee on climate change (MMA).

Besides the above committees at regional level 13 Regional Implementation Committees (CIR) will monitor and facilitate SIMEF activities at regional level, propose improvements or alternatives securing activities are progressing as planned. As such the CIR will constitute a consultative instance for local authorities to participate in and provide support to the project. The concept of “forest tables” will be applied here, where all local actors (forest owners, farmers and other rural communities associations, indigenous communities, forest product producers, etc.) have the chance to participate and give their opinion. Finally, the Dissemination and Communication Committee (CDC) will be devoted to all the issues regarding general public information and overseeing the implementation of the dissemination and communication strategy for the products generated by the SIMEF.

To insure that the required capacities is in place for the implementation of the SIMEF and for sustaining the system after the end of the project the component will support technical assistance for the development of a set of cost-efficient methodological tools and protocols for data collection, analysis and construction of indicators related to the monitoring and assessment of forest ecosystems. These tools and protocols will be standardized and published (available as open source to all users as a way to enhance and expand project impact). The indicators and tools and protocols for data collection and processing will built on international policies and best practices (Montreal process criteria and indicators for SFM, LULUCF, REDD+) and reporting needs of the conventions in particular UNFCCC and will cover: a) Carbon stock and carbon fluxes; b) biodiversity related to forest ecosystems; c) dynamics in land-use changes; and d) socioeconomic drivers for deforestation and forest degradation and incentives for SFM and REDD+. The capacity development will also involve on-the-job and formal training of 100 technical staff, decision-makers, and local and national interest groups in: a) LULUCF and REDD+; b) monitoring and assessment of forest ecosystem biodiversity indicators, changes in carbon stocks, forest ecosystem resources and related socioeconomic issues based on the Montreal criteria and indicators complemented by other indicators to capture socio-economic drivers; c) relationship between land-uses, forest biodiversity, and ecosystems functions; and d) assessment of alternative methodologies for data collection and analysis and harmonization of standards.

The capacity building of different stakeholders and human resources at national, regional and local level will not only sustain their active participation in the SIMEF after the end of the project but is also crucial for supporting the use of the information generated by the SIMEF by the various stakeholders and decision-makers for improved SFM, REDD+ and conservation of biodiversity in forest ecosystems. As such the capacity building activities in this component complemented by the technical assistance and capacity building provided in component 3 are important to sustain the outcomes of the project.

**Component 2: Implementation of the SIMEF.** The objective of this component is to expand the current NIF (including forests within and beyond the limits of protected areas) to an additional 4.4 million ha making the NIF cover the whole country and add socioeconomic indicators to the vegetation cover and land-use changes monitoring to obtain a complete operational SIMEF. The project will under this component support the collection and analysis of statistically valid data and information covering forest ecosystems country wide, and the calculation of indicators for: a) carbon stocks; b) forest habitat conditions for biodiversity; c) drivers for land-use changes impacting forest ecosystems; and c) socioeconomic drivers for deforestation and forest degradation and incentives for SFM and REDD+. Based on the data collection and analysis the component would also support the preparation and dissemination of thematic maps on forest ecosystems, species distribution, carbon stock and land use changes supported by a geo-database and a WEB based information system giving user groups (national, regional and local decision makers on forest management and land-use planning, the private sector dependent or impacting on forest ecosystems, and universities and NGOs working on SFM and REDD+ issues) easy access to the data and information generated. Further biennial thematic reports oriented to different users will be published on forest carbon stocks and fluxes, forest ecosystem biodiversity status, dynamics in land-use changes impacting forest ecosystems, or socioeconomic drivers for deforestation and forest degradation and incentives for SFM and REDD+. Special attention will be given to the user friendliness of the presented data and capacity development of interest groups enabling them to analyze and interpret the information generated by SIMEF. This will also include making public the methodologies applied in data collection and analysis and the calculation of indicators.

In the development of methodologies for the implementation of the SIMEF the interest and needs of different user groups will be taken into account including the relevance of the information for the decision makers at local, regional and national level. A key aspect in this component is to provide a better understanding of land-use changes and their influence at country level on the trends in the national GHG inventory. The SIMEF

should also be able to early detection of deforestation/degradation and its drivers to allow for mediate actions. For this end the use of remote sensing covering the entire country will be necessary taking advantage of the recently launched Chilean satellite (FASAT AC).

**Component 3:** Application of the information generated by SIMEF in local, regional, and national policies and regulations. The objective of this component is to facilitate that the information generated by the SIMEF is used to improve policies, regulation and planning processes that promote SFM, REDD+ and conservation of biodiversity in forest ecosystems at local, regional and national levels.

To achieve this objective the component will in collaboration with the RIC of the River Region support the development and application of a special tool for tracking and assessment of the utilization of data, maps and reports generated by the SIMEF by local, regional and national governments and other institutions. The findings of this assessment will be used as important inputs to improve the information generated and presented by the SIMEF to continuously improve its relevance and user-friendliness.

To facilitate the impact of the SIMEF the component will support the implementation of a SIMEF communication and dissemination strategy and provide technical assistance to a series of pilots on the utilization of the information generated by the SIMEF. These pilots will include two biodiversity conservation and incentives for REDD+ mainstreaming pilots, one pilot with local communities implementing SFM practices, and one pilot on local and regional MRV systems as described below:

a) Valuation of forest biodiversity and ecosystem services based on the information generated by SIMEF and incorporation of this valuation in at least three regional land-use plans and regulations. The land use in Chile is governed by regional land-use plans and regulations issued by regional governments considering the protection of special areas and local development strategies. Together with pilot b) below supporting mainstreaming of biodiversity conservation in sector (forestry, energy, etc.) development policies and regulations, the pilot a) will take an important first steps in mainstreaming conservation of biodiversity and forest ecosystem services in regional land use plans. The pilot areas for this pilot a) and pilot b) below (located in the regions of Bio Bio, Araucania and Los Ríos in the Northern and central part of the country) are particular affected by forest habitat fragmentation and degradation. The outputs from those two pilots (output 3.1.3 and 3.1.2) will include zoning and use regulation to stop further habitat fragmentation, facilitate medium-term improved connectivity between already fragmented habitat and support forest recuperation as well as specific measures for the conservation of threatened species in each pilot case. The three regions to be supported in this regard, covering 2.5 million hectares of forest ecosystems, is an ambitious and challenging mainstreaming goal for INFOR and CONAF because it involves three different regional (states) governments with different political emphasis and approaches. These differences will provide diversity in examples from the pilot mainstreaming exercise which will be the key for the further replication in a bottom up strategy for biodiversity conservation mainstreaming based on the improved access to data on forest biodiversity and ecosystem services.

b) Mainstreaming of forest ecosystem biodiversity conservation and incentives for REDD+ in regional, sub-regional or local sector policies and regulations based on the utilization of the information generated by SIMEF. As explained above under pilot a), this pilot is closely linked to the mainstreaming of the conservation of biodiversity and forest ecosystems services in three regional land-use plans. After the zoning and use regulation have been defined, this pilot b) will support an analysis of sector policies and regulations to identify adverse incentives, contradictions, and opportunities for adjustments to insure that forest biodiversity conservation as well as incentives for REDD+ is mainstreamed in these policies and regulations and that they are supporting the conservation and sustainable use objectives of the regional land-use plans. The main sector frameworks to look at would be the forestry and energy sectors, but also other sectors including agriculture relevant in each region will be included. As explained under pilot a), coherent frameworks of sector policies and regulations and land-use planning in the three selected pilot regions will provide diverse and important examples demonstrating mainstreaming of biodiversity and forest ecosystem conservation which will be the key for the further replication in a bottom up strategy;

c) Pilot implementation with local stakeholders of SFM practices conserving forest ecosystem services (carbon stocks and habitat for global important species) supported under output 3.2.1. This pilot will be based on the experience gathered in SFM models in alliances between local communities, the private sector and government agencies under the Ibero-American Forest Model Network which has been established to systematize, share, and promote best SFM practices in the South and Central American region, Caribbean, Canada, and Spain supported by international agencies including FAO. These forest models are diverse but all build on SFM at a landscape level and broad representation and inclusion of all stakeholders in the forest territories. One of the participating forest models in Chile is the "Forests Model of Panguipulli" commune of

Panguipulli in the Region of the Rivers which will serve as the basis for this pilot looking at how the information generated by SIMEF in practice can be used by local SFM alliances for better monitoring and understanding of the forest ecosystem outcomes of different management practices and to improve their model through adaptive planning and management. Of particular focus in this pilot will be local stake holders capacity building in relation to the interpretation and use of the SIMEF generated data and the recuperation of native forest ecosystems through sustainable management and use and improved monitoring of ecosystem status and services. The pilot experience will also allow for adjustments in the SIMEF itself to make sure it fits the need of local and regional SFM models.

d) Establishment of at least three MRV systems allowing for the certification of forest-derived carbon credits based on the information generated by the SIMEF with three government or non-government institutions or private sector associations supported under output 3.3.1. The three pilot MRV systems will cover approximately a total area of 100,000 ha including 50,000 ha owned by landowners associations known as "Aprobosque Ltda". The remaining 50,000 ha will be identified during full project preparation. The piloting will focus at addressing capacity building needs in MRV and how the information generated by SIMEF will be able to feed into MRV systems at a local and/or regional scale with partners and in areas with REDD+ initiatives. When experience have been gained at this scale, the carbon monitoring component of the SIMEF might be adjusted to provide for a national MRV system linked to REDD+ and certification of forest-derived carbon credits.

Based on experiences gained in each pilot corresponding guidelines will be developed and disseminated through the RICs.

### **Incrementality of GEF and co-financing resources**

The forest ecosystems and their resources in Chile with a productive objective are mainly providing wood for industrial use and biomass for heating or other uses which have been the focus of the NFI so far. However, the forest provides a lot broader set of goods and services which are emergent properties generated by the natural evolution of the dynamics of the forests. These goods and services will be covered by the SIMEF to be established by the proposed project supported by the incremental GEF resources and co-financing. Considering also the ability to monitor and respond to the needs for mitigation and adaptation to climate change and conserve important genetic resources and biodiversity in forest ecosystems, the required information in relation to forest monitoring should not only focus at the areas of productive forest. The incremental co-financing and the financing from GEF will allow for the inclusion in SIMEF of 3.5 million hectares of native and primary forest areas in the southern part of the country which constitute important reservoirs of carbon and global important biodiversity found in the prehistoric araucaria forests, the temperate rainforests, the alerce forests. These forest ecosystems all provide important ecosystems services to be consider when defining forest biodiversity conservation, SFM, LULUCF and REDD+ strategies.

The information to be collected and monitored, based on key indicators, should provide an understanding of the integrity and stability of the forest ecosystem. The incremental financing from GEF and the government co-financing will allow for: a) an expansion of the NFI to cover non-productive forest; b) improvement in capacities and methodologies to monitor forest degradation and land-use changes and its impacts on carbon stocks and habitat conditions for biodiversity and the behind socio-economic drivers; c) and the integration of the NFI with the Cadastre programme into the SIMEF tailored to the needs of forest decision-makers under a solid inter-institutional coordination and financing framework insuring cost savings and effectiveness. The establishment of the SIMEF will allow decision-makers to perceive the value of the forests in its whole and enhance their understanding of the necessities of new policies and legal instruments and improvements on the already existing ones. SFM programmes will have the needed information to be better targeted to LULUCF and REDD+ and the provision of local and global environmental benefits including the conservation of habitats for endemic forest species. Likewise the expansion of the NFI to cover natural forest without a direct wood production function and the integration with land-use change data will cover important forest ecosystem biodiversity aspects allowing for enhanced conservation at a landscape level in sector policies and regulations. Finally, the financial support from GEF resources will allow for the establishment of MRV system and certify forest-derived carbon credits giving access to a new financing source for SFM and conservation of forest biodiversity.

### **The global environmental benefit will be:**

Benefits from the development and implementation of the SIMEF (Component 1 and 2):

- Expansion of the NFI and integration into the SIMEF covering an additional 3.5 million hectares of native primary forest in the southern part of the country representing significant carbon stocks (more

than 2 GtCO<sub>2</sub>-eq) which will be accounted for in the National Forest Inventory laying the grounds for improved SFM and carbon stock conservation policies and regulations;

- Improved precision in the National GHG Inventory for carbon estimates in forest carbon monitoring from 10% to 7% uncertainties as a result of inclusion in the SIMEF of the additional 3.5 million hectares of native primary forest in the southern part of the country and inclusion of monitoring of the impacts of illegal activities causing forest degradation (estimated 9 million m<sup>3</sup>/year)
- Improved data and information on forest habitat conditions and threats covering 3.5 million additional hectares of primary forest classified by forest types in the Southern part of the country including important primary forest habitat for biodiversity endemic to Chile in particular the native prehistoric araucaria forests, temperate rainforests, and alerce forests (the “redwoods of the Andes”) of which limited official data exist today. Chile’s forest has been identified by CI and IUCN as one of 25 world hotspots for biodiversity conservation because of its unique genetic resources and habitat service to a high number of endemic species (11 species of mammals, 24 species of amphibians, 5 species of reptiles, 13 species of birds, and 13 species of fish) as a result of their geographical isolation since the Tertiary Period of geologic history from other tropical and sub-tropical forest formations. A better understanding of the threats on these species from forest degradation and fragmentation of habitats in particular in the central and northern part of the country and forest degradation in the southern part of the country will be crucial for improving conservation policies and mainstreaming.

Benefits of the implementation of the pilots using the information generated by SIMEF (component 3):

- Conservation and sustainable use of forest biodiversity mainstreamed into sector (forestry, energy, etc.) development policies and regulatory frameworks as well as local and regional land-use planning, zoning and use regulation (supported in mainstreaming pilots output 3.1.2 and 3.1.3) covering 2.5 million hectares of forest ecosystems in three pilot regions of Bio Bio, Araucania and Los Ríos resulting in: a) reduced fragmentation of an estimated 15,000-35,000 ha (target to be revisited during full project preparation) of forest habitats for threatened forest species endemic to Chile; b) forest degradation rate reduced from 100,000 ha/year to 20,000-50,000 ha/year by the end of the project and 0 ha/year five years after the end of the project; c) recuperation of an estimated 100,000 of degraded forest (20 years after the end of the project) and an estimated 1,000,000 ha<sup>4</sup> of degraded forest (50 years after the end of the project ) as overall long-term project impact; and d) stabilization of populations of key threatened species (species and indicators to be selected for each of the pilot regions during full project preparation). Currently in Chile it is estimated that the forest degradation rate is 100,000 ha/year and that 1,000,000 ha of native forest is suffering forest degradation. The significant reduction of this deforestation rate and recuperation of currently degraded forest will benefit the endemic species and threatened species dependent on forest habitats such as: pollinators; forest birds (ex. Magellanic Woodpecker, and Slender-billed Parakeet); Pudu (South America’s smallest species of deer); “monito del monte” (*Dromiciops gliroides*); austral spotted cat (*Oncifelis guigna*), the South Andean deer (*Hippocamelus bisulcus*) and tree species (the southern belloto (*Beilschmiedia berteriana*), the queule (*Gomortega keule*), the ruil (*Nothofagus allessandri*), and the pitao (*Pitavia punctata*))
- Forest biodiversity conservation and improved SFM in pilots supported under output 3.2.1 leading to the adoption of SFM practices in LULUCF and REDD+ recuperating at least 2,000 hectares of native forest and leading to an increase in carbon capture with an estimated 12 t CO<sub>2</sub>-eq/year by the end of the project;
- MRV systems functioning supported under output 3.3.1 for 100,000 ha of forest under SFM and REDD+ providing for the certification of forest-derived carbon credits for 4x10<sup>5</sup> t CO<sub>2</sub>-eq which potentially could be converted to an estimated USD 4.8x10<sup>6</sup> in the carbon market.

The below table shows the indicative benefits to be provided by the Project. The figures will be revisited during full project preparation when more precise baseline and project scope has been defined.

<sup>4</sup> This fiscal year 2012 INFOR has planned to generate the first map on forest degradation for a pilot region in Chile which will improve the baseline data for this estimated indicator

Focal Area	Direct project benefits	Potential area influenced by the project (ha)	Estimated project direct carbon benefits based on mean C stock values (tCO <sub>2</sub> -eq)	Estimated long term carbon benefits (tCO <sub>2</sub> -eq)
<b>Benefits from the development and implementation of the SIMEF (component 1 and 2)</b>				
CCM SFM/ REDD+	1. Improved periodic information on and acknowledgment of primary forest state and conditions in SFM, forest biodiversity and carbon stock conservation policies and regulations	~3,500,000 additional ha. included in the NFI and integrated into the SIMEF	~2 x 10 <sup>9</sup> t C additional forest carbon stocks monitored	~2 x 10 <sup>9</sup> t C additional forest carbon monitored
CCM REDD+	2. Improved precision in the National GHG Inventory for carbon estimates in forest carbon monitoring from 10% to 7 % uncertainties	13,500,000 total ha. covered by the SIMEF	~7.79 x 10 <sup>9</sup> t C total carbon stock covered by the SIMEF	~7.79 x 10 <sup>9</sup> t C total carbon stock covered by the SIMEF
BD	3. Improved data and information on forest habitat conditions and threats including primary forest habitats for biodiversity endemic to Chile in particular the native prehistoric araucaria forests, temperate rainforests, and alerce forests in the southern part of the country for which limited official data exist today.	10,000,000 ha with improved BD data and 3,500,000 additional ha of primary forest with first time data and systematic BD monitoring		
<b>Benefits from the implementation of the pilots using the information generated by SIMEF to improve forest ecosystem conservation and management practices (component 3)</b>				
BD CCM REDD+	4. Conservation and sustainable use of forest biodiversity mainstreamed into sector development policies and regulatory frameworks and local and regional land-use plans covering 2.5 million hectares of forest ecosystems (mainstreaming pilots output 3.1.2 and 3.1.3) resulting in: a) reduced fragmentation forest habitats; b) forest degradation rate reduced from the current 100,000 ha/year; c) recuperation of degraded forest; and d) stabilization of populations of key threatened species (biodiversity indicators and	a) 15,000-35,000 ha.; b) to 20,000-50,000 ha/year by end of project (EOP) and 0 ha/year five years after EOP; and c) 100,000 ha. 20 years after EOP and 1,000,000 ha. 50 years after EOP <sup>5</sup>	b) 3 x 10 <sup>6</sup> t C/year – 2 x 10 <sup>6</sup> t C/year in avoided carbon emissions by EOP (Mean C stock lost: 39.58 t CO <sub>2</sub> -eq/ha/year);	b) 4 x 10 <sup>6</sup> t C/year in avoided carbon emissions 5 years after EOP  c) 57 x 10 <sup>6</sup> t C increase in C stocks 20 years after EOP and 670 x 10 <sup>6</sup> t C 50 years after EOP (Mean C stock recovery potential 571

5 Estimated by INFOR 2010 "Estudio de potencial de mitigacion de la ley de Recuperacion de Bosque Nativo" ODEPA-Ministry of Agriculture

	targets to be established for each region during full project preparation)			t CO <sub>2</sub> -eq/ha)
BD CCM SFM/ REDD+	5. Adoption of SFM practices in LULUCF and REDD+ recuperating degraded native forest (SFM pilots output 3.2.1)	2,000 ha recuperated by EOP	12,000 t C/year increase in C stocks by EOP (mean C stock value 6 t CO <sub>2</sub> -eq/ha/year)	240,000 t C increase in C stocks 20 years after EOP
CCM REDD+	6. MRV systems functioning (MRV pilots output 3.3.1) for forest under SFM and REDD+ initiatives allowing for the certification of forest-derived carbon credits	100,000 ha under SFM covered by MRV systems	4x10 <sup>5</sup> t C under MRV system potentially eligible for carbon credits	Could potentially generate USD 4.8x10 <sup>6</sup> in the medium term (4x10 <sup>5</sup> t C x USD 12/ t CO <sub>2</sub> -eq) <sup>6</sup>

**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.”:**

Chile has an estimated of at least 7% of total population<sup>7</sup> dependent on forest ecosystems goods and services including fuel wood producers, producers of other wood products, ecotourism guides and service providers, including indigenous people<sup>8</sup>. The socioeconomic benefits of improved SFM, LULUCF and REDD+ strategies as a results of the data and information generated by the SIMEF would be increased sustainability of forest resources and as such incomes dependent on forest ecosystems goods and services. Establishing the basis for MRV systems and access to carbon credits would also provide new income opportunities for forest owners. The inclusion of socioeconomic data and a better understanding of the related drivers behind forest degradation, LULUCF as well as socioeconomic incentives for SFM in the SIMEF will provide the basis for better policies and instruments targeting co-benefits between global environmental benefits and local socioeconomic benefits. This is key for the sustainability of any SFM, REDD+ and/or forest ecosystem biodiversity conservation initiative. During full project preparation a detailed analysis of socioeconomic benefits segregated by gender related to the project will be conducted and the findings incorporated in the project design to maximize these co-benefits.

Considerations on how the SIMEF can create equal job opportunities for men and women in relation to data collection and analysis will also be taken in the full project design. Further, In rural areas in Chile the domestic economy and dependences on the use of ecosystem goods and services to cover household needs are managed by women. Women tend to be more flexible to accept changes, while men are more reluctant to changes, new approaches or information. In that context data and information from SIMEF will certainly be more effective on women in rural areas given also that they intrinsically value the good and services provided by the ecosystems. Sustainable use of resources especially fuel wood from forest will benefit the family economy as a whole, but thorough understanding of the importance of forest biodiversity, SFM and climate change issues disseminated by SIMEF will lead to more concrete actions supported mainly by women. The project design will therefore take into consideration how to facilitate that the information generated by SIMEF is accessible for in particular rural women.

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

The main risks for successful implementation of the project, their rating and mitigation measures are listed in the table below.

<sup>6</sup> According to the “State of the Voluntary Carbon Market” Ecosystem Marketplace and Bloomberg New Energy Finance, 2012, prices for forest carbon credits are highly stratified depending on the market. The average price for SFM and REDD project credits where in 2011 USD 12/ t CO<sub>2</sub>-eq.

<sup>7</sup> Total rural population in Chile is 13% where the half are related to forests.

<sup>8</sup> Just this year 2012 the socioeconomical survey was added to the NFI to improve this kind of data



<b>Risk</b>	<b>Rating</b>	<b>Mitigation Measures</b>
<p><b>Climate change:</b> The Analysis on Climate Change and the vulnerability of forest ecosystems (INFOR) indicates the movement of the dry and warmer climate from north to south in Chile in the coming decades causing changes in rainfall patterns and increase in extreme temperatures. The main impact will be that the current environmental growth conditions will move about 150 to 200 km towards the South, which is an important change in the long, but very narrow territory of Chile. If cultivation areas move to the south they will move into main primary forest areas.</p>	Low (The design of the SIMEF has already taken this need into account)	In order for the SIMEF to provide adequate LULUCF management information to handle this situation the land-use monitoring component must be intensified. This will require adequate budget allocations for increased operational costs derived from an increase in the numbers of samples for monitoring land-use changes and the behind socio-economic drivers in the design of the SIMEF.
<p><b>Access to Biodiversity and other data collection:</b> Chile is characterized by landowners who highly value and oversees their property rights. Access to private property requires explicit permission from the owners to perform data collection in the forests. In addition, there have recently been some problems for the NFI brigades to access areas privately designated for conservation.</p>	High (However, total conservation areas under private property are limited)	Involvement of private land owners in local 'forest tables' and RICs (component1) combined with an effective SIMEF communications and dissemination strategy explaining the objectives and the benefits of the monitoring of forest ecosystems (component 3).
<p><b>Lack of support and participation from CONAF and other key institutions at the regional level:</b> At the national government level all key institutions (CONAF, CIREN, INFOR, and the Ministry of Environment) are behind the proposed project and have already started a coordination process during the formulation of this PIF. However, at the regional level priorities of local political authorities may impact the engagement of regional CONAF offices and other stakeholders in the implementation of the SIMEF.</p>	Low	Involvement of regional institutions in local 'forest tables' and RICs (component1) combined with an effective SIMEF communications and dissemination strategy explaining the objectives and the benefits of the monitoring of forest ecosystems (component 3).
<p><b>Low or medium quality of generated Information:</b> The quality of the information generated by SIMEF is dependent of keeping high quality in all steps in the information generation process from the field data collection, the data base upgrading, the data processing including the calculation of key indicators, and the results dissemination.</p>	Low	The present NFI already has quality control procedures which will be included in the design of the SIMEF including methodologies and protocols for data collection and processing and careful selection and periodical training of data collection brigades.
<p><b>Lack of participation and buy in of interest groups:</b> The validation of the SIMEF data collection and processing methodologies by interest groups at national and local level is crucial for the credibility of the information and products generated by the SIMEF and therefore also for the utilization of the same to improve forest policies and legal instruments and SFM, REDD+ and forest ecosystem conservation practices. There are examples in Chile of interest groups questioning the validity of government supported monitoring causing delays in the approval of new legislation. For example it took 15 years to approve the Natural Forest Law.</p>	Medium	This risk will be mitigated by inviting interest groups and key stakeholders to participate in the 'Forest Tables', RICs and the CTC (component1). A detailed participatory stakeholder analysis conducted during the full project preparation will identify representatives to be invited. Further, both the RICs and the CTC should have clear terms of reference, with transparent and formalized procedures and participation opportunities for all interest groups.

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

The project will be co-executed at the national level by the Ministry of Agriculture responsible for the management of forest resources through its three agencies: Centro de Información de los Recursos Naturales (CIREN – Center for Information on Natural Resources); the Corporación Nacional Forestal (CONAF – National Forest Corporation); and the Instituto Forestal (INFOR - Forestry Institute). Among others partner institutions the Climate Change Office and the Natural Resources Division of the Ministry of Environment will participate at committee level and will provide USD 0.6 million in grant co-financing. FAO will be the GEF implementing Agency and will provide supervision and technical backstopping and advice during the project preparation and implementation.

The roles of the three executing partners are as follows:

1. INFOR will be responsible for the management of the data base, the data collection in relation to the expanded sampling of the NFI, data quality control, data processing, generation of emission factors, calculation of changes in carbon stocks, and will describe the trends of forest biodiversity and the stability of the forest ecosystems.
2. CONAF, in accordance with the Law N°20.283, will be responsible for the monitoring of land-use changes including collection of sample data based a methodology of multitemporary analysis of satellite images.
3. The data and geo-spatial information dissemination (generated by INFOR and CONAF) will be the responsibility of CIREN under a concept of user-friendliness and using maps servers technology.

In the below table is an initial mapping of other key stakeholders and interest groups and their eventual role in the project which will be further confirmed and detailed during full project preparation. See also the description in section B.2 component 1 on the coordination and consultation framework for the SIMEF including the regional implementation committees and environmental table to insure the involvement of local governments and stakeholders (forest owners, farmers and other rural communities asociacions, indigenous communities, forest product producers, etc.).

Institution/Organization	Scope	Main interest	Role
Agrupación por el Bosque Nativo (NGO)	National	SFM and Forest Conservation	CTC
WWF (NGO)	National	Forest Ecosystem Conservation	CTC
Forest Model- Panguipulli	Local	SFM	CDC
Forest Model-Chiloe	Local	SFM	CDC
Forest Model-Lonquimay	Local	SFM	CDC
Agenda 21 (NGO)	Regional/Local	Social issues related to forests Local communities	CTC
Colegio de Ingenieros Forestales	National	SFM	CTC
Municipality- Panguipulli	County	Land use planning	CIR and CDC
Gobierno regional de los Rios	Regional	Land use planning	CIR and CDC

CTC: Consultative Technical Committee

CDC: Communications and Dissemination Committee

CIR: Regional Implementation Committee

CD : Steering Committee

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

A preliminary search has identified the following other project and initiatives that the proposed project should be coordinated with to maximize synergies and avoid duplications in SFM, LULUCF, REDD+, and conservation of biodiversity in forest ecosystems. A further description of coordination opportunities and mechanisms will be developed during full project preparation.

Various initiatives supporting protected areas in Chile with forest ecosystems including the GEF ID 2772 *Building a Comprehensive National Protected Areas System: A Financial and Operational Framework* and GEF ID 1725 *Biodiversity Conservation in Altos de Cantillana*. The proposed project will provide valuable information for forest protected areas (PA) and their buffer zones facilitating the formulation of SFM strategies and these initiatives will on the other hand identify requirements for the SIMEF system in order to increase the relevance of the information generated for the management of forest PAs and their buffer zones. The coordination with these initiatives will be guaranteed by the Ministry of the Environment executing the PA projects and at the same time closely involved in the SIMEF project.

The GEF ID 4104 *Sustainable Land Management* executed by CONAF with the objective to develop a national incentive program for mainstreaming sustainable land management planning and practices in order to combat land degradation, conserve biodiversity of global importance and protect vital carbon assets. The information generated by the SIMEF supported by the proposed project will inform the decision-making and policies and incentives development for SLM in areas with forest ecosystems to be promoted by the GEF ID

4104. The coordination between the two initiatives will be ensured by CONAF participating in the execution of both projects.

The GEF ID 3998 Design and Implementation of a Biodiversity Management System in the Ministry of Public Works (MOP) which will provide guidance to the MOP on the impacts on the Biodiversity from Public Works projects applying a valuation of global important biodiversity approach. This project could provide guidance on information requirements to the SIMEF and on the other hand SIMEF will deliver valuable information of on biodiversity related to forest ecosystems.

Chile just recently (INFOR 2008, CONAF 2011) recognized the issue of forest degradation and is currently applying for a REDD+ project under the FCPF program by the World Bank (details on <http://www.forestcarbonpartnership.org/fcp/>). If this project is approved it will be strictly coordinated with the proposed project through INFOR and CONAF and synergies and complementarities will be carefully built into the full design of both projects.

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

FAO has a long track record and significant expertise in SFM, NFI and development of national forestry policy frameworks and implementation of projects related to the forestry sector, such as: (i) mitigation of climate change through the implementation of projects related to conservation and sequestration of carbon in forest ecosystems; (ii) conservation and sustainable use of natural resources and planted forests, including aspects related to health and vitality of forests, prevention, control and management of fires, recuperation of germoplasm and genetic resources. Particularly in Chile, FAO collaborates on specific project such as Criteria and indicators of sustainable forest management (Montreal Process), the project of Compilation of exemplary cases for sustainable forest management, Global forest resources assessment (FRA) where representatives of INFOR is a member of the advisory committee where the global variables are identified for international reporting and global forestry definitions are agreed. Furthermore, forestry political and institutional aspects have also been jointly elaborated with the government of Chile as well as support to small forest enterprises and forestry information systems.

The methodology that FAO uses to support the countries in elaboration of NFIs facilitates information related to forestry resources uses. It also helps to document land-use dynamics including land-use changes, deforestation, and degradation and facilitate monitoring through permanent sample plots. This is an innovative approach compared to traditional forest inventories, relevant for a changing environment where socio economic and physical dynamics need to be monitored. This global methodology, which has been used in more than 64 countries throughout the world with national and local adaptations, allows the assessments of key common variables which have impacts on forest policies and permits monitoring not just of forest management practices but also forestry policies and legislation.

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

FAO will provide an estimated total of USD 350,000 in-kind for project implementation and USD 67,000 in grant from a regional technical cooperation project on good SFM examples.

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

The project addresses FAO's Strategic Objective (SO) "Sustainable management of forests and trees" and the Organizational Results (OR): RO E1, "Policies and practices affecting forests and silviculture are based on reliable and timely information"; ROE2, "Policies and practices affecting forests and silviculture are strengthened through international cooperation and debate"; and, RO E6, "Forests and silviculture take advantage of a more widely and effectively applicable conservation strategies of forest biodiversity". Also, in Chile the project TCP/RLA/3203 related to the monitoring, reporting and evaluation of sustainable forest management based on criteria and indicators was implemented with the main objective to strengthen national capacities of the Southern Cone countries of Latin America for the implementation of SFM as well as to promote cooperation among these countries. An appropriate use of forest resources has a direct impact on socioeconomic and environmental development of the sub-region, specially on forest dependent communities. The contribution of the project was around USD 296,000. Moreover, FAO participated together with the Chilean government in the implementation of a regional strategy of forest health in the countries of the Southern Cone. The project's objective was to perform an analysis of the political, legal, technical and institutional framework of the Southern Cone countries, related to forest health and to identify areas

of cooperation in these subjects for the countries of the sub-region. The total contribution was of USD 55,000. The Latin American and Caribbean Forestry Commission is consuetudinary body of FAO. Delegates have identified forest inventories, information and forestry knowledge as the working priority of the Region and recognized FAO's leadership in the development of these activities. Today, a total of 17 projects on forest resources are being implemented for approximately USD 44 million and a total of 531 regional projects totaling USD 455 million.

The Regional Office of FAO for Latin America and the Caribbean, located in Santiago, Chile has 3 forestry officers and operational staff who will support the implementation of the proposed project backed by the Forestry Department and the GEF Coordination Unit in the Investment Center Division in FAO Headquarters in Rome.

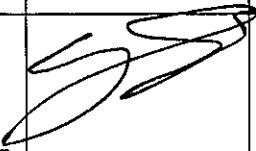
**PART III: APPROVAL/ENDORSEMENT BY GEF OPERATIONAL FOCAL POINT(S) AND GEF AGENCY (IES)**

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

NAME	POSITION	MINISTRY	DATE (Month, day, year)
Ms. Ximena GEORGE-NASCIMENTO	GEF Operational Focal Point	Ministry of Environment of Chile	June 19, 2012

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

**This request has been prepared in accordance with GEF/LDCF/SCCF policies and procedures and meets the GEF/LDCF/SCCF criteria for project identification and preparation.**

Agency Coordinator, Agency name	Signature	Date (Month, day, year)	Project Contact Person	Telephone	Email Address
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